IBM Tools Base for z/OS
Version 1 Release 6

Policy Services User's Guide and Reference

IBM
Note:
Before using this information and the product it supports, read the information in “Notices” on page 543.

Fourth Edition (May 2020)
This edition applies to Version 1 Release 6 of IBM Tools Base for z/OS Policy Services (program number 5655-V93) and to all subsequent releases and modifications until otherwise indicated in new editions.
This edition replaces SC19-4374-03.

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About this information

IBM® Tools Base for z/OS® Policy Services (also referred to as Policy Services) is a core IMS Tools technology that can monitor specific database state by evaluating the sensor data collected by an IMS Tools product, and by providing a response to any conditions that exceed the threshold values specified for this state.

These topics provide instructions for installing, configuring, and using Policy Services.

To use these instructions, you must have already installed Policy Services by completing the instructions in the Program Directory for IBM Tools Base for z/OS (GI10-8819), which is included with the product media and is also available on the IMS Tools Product Documentation page.

These topics are designed to help database administrators, system programmers, application programmers, and system operators perform the following tasks:

• Understand the capabilities of the functions that are associated with Policy Services
• Install and operate Policy Services
• Customize your Policy Services environment
• Diagnose and recover from Policy Services problems
• Use Policy Services with other IMS products

To use these topics, you should have a working knowledge of:

• The z/OS operating system
• ISPF
• SMP/E
• IMS

Always refer to the IMS Tools Product Documentation web page for complete product documentation resources:

http://www-01.ibm.com/support/docview.wss?uid=swg27020942

The IMS Tools Product Documentation web page includes:

• Links to IBM Knowledge Center for the user guides (“HTML”)
• PDF versions of the user guides (“PDF”)
• Program Directories for IMS Tools products
• Recent updates to the user guides, referred to as "Tech docs" ("See updates to this information!")
• Technical notes from IBM Software Support, referred to as "Tech notes"
• White papers that describe product business scenarios and solutions

How to read syntax diagrams

The following rules apply to the syntax diagrams that are used in this information:

• Read the syntax diagrams from left to right, from top to bottom, following the path of the line. The following conventions are used:
  – The >>>-- symbol indicates the beginning of a syntax diagram.
  – The ---> symbol indicates that the syntax diagram is continued on the next line.
  – The >--- symbol indicates that a syntax diagram is continued from the previous line.
  – The --->< symbol indicates the end of a syntax diagram.
• Required items appear on the horizontal line (the main path).

  \[ \text{required_item} \quad \text{required_item} \]

• Optional items appear below the main path.

  \[ \text{required_item} \quad \text{optional_item} \]

If an optional item appears above the main path, that item has no effect on the execution of the syntax element and is used only for readability.

  \[ \text{required_item} \quad \text{optional_item} \]

• If you can choose from two or more items, they appear vertically, in a stack.
If you must choose one of the items, one item of the stack appears on the main path.

  \[ \text{required_item} \quad \text{required_choice1} \quad \text{required_choice2} \]

If choosing one of the items is optional, the entire stack appears below the main path.

  \[ \text{required_item} \quad \text{optional_choice1} \quad \text{optional_choice2} \]

If one of the items is the default, it appears above the main path, and the remaining choices are shown below.

  \[ \text{required_item} \quad \text{default_choice} \quad \text{optional_choice} \quad \text{optional_choice} \]

• An arrow returning to the left, above the main line, indicates an item that can be repeated.

  \[ \text{required_item} \quad \text{repeatable_item} \]

If the repeat arrow contains a comma, you must separate repeated items with a comma.

  \[ \text{required_item} \quad \text{repeatable_item} \]

A repeat arrow above a stack indicates that you can repeat the items in the stack.

• Keywords, and their minimum abbreviations if applicable, appear in uppercase. They must be spelled exactly as shown. Variables appear in all lowercase italic letters (for example, column-name). They represent user-supplied names or values.

• Separate keywords and parameters by at least one space if no intervening punctuation is shown in the diagram.
• Enter punctuation marks, parentheses, arithmetic operators, and other symbols exactly as shown in the diagram.
• Footnotes are shown by a number in parentheses; for example, (1).
IBM Tools Base for z/OS Policy Services (also referred to as Policy Services) is a core IMS Tools technology that supports conditional autonomic database health management functionality for participating IMS Tools products.

**Topics:**
- Chapter 1, “Policy Services overview,” on page 3
- Chapter 2, “Hardware and software prerequisites,” on page 15
- Chapter 3, “Sensor data service,” on page 17
- Chapter 4, “Policies, rules, and notification lists,” on page 21
- Chapter 5, “Domains, locales, and environments,” on page 43
IBM Tools Base for z/OS Policy Services (also referred to as Policy Services) is a core IMS Tools technology that can monitor specific database state by evaluating the sensor data collected by an IMS Tools product, and by providing a response to any conditions that exceed the threshold values specified for this state.

Topics:
- “What's new in Policy Services” on page 3
- “What does Policy Services do?” on page 4
- “Implementing policy-based database health management” on page 7
- “Policy Services components” on page 9
- “Service updates and support information” on page 12
- “Product documentation and updates” on page 12
- “Accessibility features” on page 13

What's new in Policy Services

This topic summarizes the technical changes for this edition.

New and changed information is indicated by a vertical bar (|) to the left of a change. Editorial changes that have no technical significance are not noted.

SC19-4374-04 - May 2020 - Fourth Edition (V1.6)

- APARs PH11800 and PH16187 - The Statistics Data Import Utility, which runs as a standard z/OS batch job, imports sensor data from CSV-formatted files and stores the imported data in a sequential data set. The utility also stores the import information in the IMS Tools Knowledge Base Sensor Data repository. For details, see Chapter 19, “Statistics Data Import Utility,” on page 133. Messages and return codes have also been added for this utility.
- APAR PH20916 - The History Data Summarization Utility, which runs as a standard z/OS batch job, reads information about the imported sensor data (utility history data) from the IMS Tools Knowledge Base Sensor Data repository and reports the resources (databases, partitions, and areas) whose sensor data was imported to historical sensor data sets. For details, see Chapter 20, “History Data Summarization Utility,” on page 151. Messages and return codes have also been added for this utility.
  Also the Sensor Data Extractor has been enhanced to support extracting sensor data from historical sensor data sets.
- The following data elements have been added:
  - DB_NUM_ALLOCATED_BLOCKS – see “Data elements related to database data set space” on page 166.
  - DB_MAX_NUM_IOVFCI_BY_UOW – see “Data elements related to overflow in an area” on page 176.

SC19-4374-03 - March 2019 - Third Edition (V1.6)

- Chapter 3, “Sensor data service,” on page 17 has been updated.
- APAR PI96507 - Topics Chapter 9, “Modifying rule thresholds,” on page 65 and Chapter 10, “Defining custom rule threshold values for individual databases,” on page 69 have been updated.
- Step-by-step instructions for creating a new maintenance environment have been added. See Chapter 16, “Creating a new maintenance environment,” on page 105.
• APAR PH03269 - The Sensor Data Extractor, which runs as a standard z/OS batch job, extracts sensor data from the IMS Tools Knowledge Base (IMS Tools KB) Sensor Data repository and generates various types of reports. For details, see Chapter 18, “Sensor Data Extractor,” on page 113. Messages and return codes have also been added for this utility.

• “Return/reason codes: Rules Data Store (BSN6400-6599)” on page 511 has been updated.

• Topic "Policy Services recovery" has been removed.

SC19-4374-02 - May 2018 - Second Edition (V1.6)

• APAR PI78387 - Policy Services client SMTP SYSOUT class enhancement

Updates to the topic “Viewing and modifying the SMTP variables for email and texting” on page 86.

• APAR PI88543

  New policy: IBM.DBDTYPE.FFDBALL

  New procedure topic: Modifying policy actions

• APAR PI93606 - updated maximum number of extents for data element DB_MAX_EXT_DS

• APAR PI93320

  New procedure topic: Chapter 10, “Defining custom rule threshold values for individual databases,” on page 69

  New message BSN7008I

  Update to table: Data elements related to root segments (added data element DB_FLAG_SENSOR_DBINFO)

SC19-4374-01 - October 2016 - First edition (V1.6)

Multiple topics were added or updated to support the RECOVERY domain for IMS Recovery Solution Pack, including:

• “Special conditions and best practices for environments” on page 48
• Part 7, “Reference: Domain RECOVERY,” on page 373

What does Policy Services do?

Policy Services is a core IMS Tools technology that supports conditional autonomic database health management functionality for participating IMS Tools products.

Conditional autonomies can provide the following functionality:

• Evaluate the need for any given database maintenance operation to occur or not
• Make recommendations for corrective actions based on user-defined (policy-driven) requirements

In a conditional autonomies environment, a sensor-enabled IMS Tools product can capture the measurement of the state of a specific database condition. This information, called sensor data, is handled by the IMS Tools Knowledge Base server and stored in a central IMS Tools Knowledge Base Sensor Data repository.

Policy Services uses a policy definition to evaluate this data against the threshold values specified for this condition. Policy Services can then provide a response to any events that exceed the threshold limits.

The response can consist of sending warning notifications to administrators and making a recommendation to the IMS Tools product to take a specific corrective action.

Policy-based autonomies can increase the value of IMS to the enterprise:

• Assist in decisions about when a database maintenance task is required, so that time and resources are not used unnecessarily
Avoid running jobs that consume direct-access storage devices (DASD) and tapes when a maintenance operation is not required at the time.

Provide feedback on the effectiveness of a policy-driven action by reevaluating the condition.

**Providing assistance for demanding DBA responsibilities**

Policy Services can help address the increasing demands being placed on database administrators (DBA) who are responsible for ever-growing information collecting and processing.

For example, database reorganization is one of the responsibilities of database administrators that involves complex analysis tasks. Generally, these are time-consuming tasks that require knowledge, expertise, and experience in IMS database space management.

Policy Services provides the following benefits for assisting the DBA:

- Conditionally control when and how often maintenance tasks, such as database reorganization, are performed.
- Avoid unnecessary tasks that are based on fixed schedules that do not consider if the tasks are actually required.
- Perform some of the often complex and time-consuming analysis tasks required to make effective database space management decisions.
- Provide relief in an environment where there is a shortage of knowledge due to insufficient process documentation, and a decline in the population of experienced DBAs.

**Policy Services details**

Policy Services technology is made up of the following services:

- Sensor data collection and storage services
  - Static information of database state is collected by the IMS Tools client and later used in policy evaluations.
  - Sensor data is stored in the IMS Tools Knowledge Base Sensor Data repository.
- Policy definition and management services
  - Policies are defined by rule conditions that can compare collected database state data with defined threshold limits for the database state.
  - Policy Services provides default policies that can be used by participating IMS Tools products.
    - For example, IMS Database Reorganization Expert uses policies that address the need for better space utilization in IMS full-function databases.
  - Policy definitions can be edited, customized, and newly created using the Policy Services ISPF user interface.
  - A wide range of warning levels allow you to configure multiple layers of responses for different policies as they apply to different databases.
- Policy analysis and evaluation services
  - Policy Services can help automate day-to-day database space management operations.
  - Policy Services can help evaluate the necessity for any action (response) to happen or not. For example:
    - What adjustments need to be made?
    - What changes need to be implemented?
  - Requested actions are conditioned on user-defined (policy driven) requirements.
IMS Tools integration with Policy Services

Specific IMS Tools products can use Policy Services technology to conditionally control the operation of specific database maintenance tasks.

For example, IMS Database Reorganization Expert offers database administrators the capability of centrally controlling the reorganization of IMS full-function databases when a reorganization of a database is truly required. This capability helps avoid unnecessary reorganizations that are based on fixed schedules that do not consider if a reorganization is actually required. Early warning notification can be provided when changes are necessary in database definition parameters or in space allocation parameters for the database data sets.

The combination of Policy Services, IMS Tools Knowledge Base, and the IMS Database Reorganization Expert tool can help you manage IMS database reorganizations effectively and efficiently by:

• Performing statistical analysis and apply policies to determine if action is appropriate
• Helping proactive planning for database management
• Improving database availability
• Reducing system resource waste
• Storing historical data for later analysis

IMS Database Reorganization Expert supports conditional control of the database reorganization maintenance task with the following features:

• Evaluate an IMS full-function database and determine the need for reorganization
• Request the reorganization process only when database reorganization need is deemed necessary as the result of policy evaluation
• Re-evaluate the reorganized database to check the effect of the reorganization action
• Provide a comprehensible summary report on the database status, and when the database is reorganized, detect any change in the status

IMS Tools Knowledge Base is the foundational infrastructure that provides a centralized information management environment for IMS Tools products. IMS Tools Knowledge Base allows you to store, manage, and access information resources (such as reports, sensor data, policies, and rules) that are generated or used by any tool product that has been enabled and registered to participate in this environment.

IMS Tools Knowledge Base provides a common information management service that allows the sharing of data generated and used by multiple tool products within a sysplex. IMS Tools Knowledge Base is managed from a single, centralized user interface.

The following functional overview diagram shows an environment composed of the following components and services:

• IMS Tools Knowledge Base central repository service
• Report service, for archiving reports generated by IMS Tools products
• Sensor data service, for collecting database state information (for use, in this example, by Policy Services)
• Policy Services, for providing evaluation of database state statistics (sensor data) against user-defined threshold limits (policies) on those states
• An IMS Tool product (for example, IMS Database Reorganization Expert), that provides conditional database reorganization capability and responds to recommendations from Policy Services for exception notification and action (REORG).
Implementing policy-based database health management

As an IMS database administrator (DBA), you have many IMS maintenance tasks to perform, often with too little time.

The following list identifies some of the major tasks required of a DBA to manage database health:

1. Gathering data on database activity
   - LISTCAT
   - Pointer checker
   - DASD volume analysis
   - Transaction performance
   - System resource use
2. Analyzing database state data
3. Identifying priority issues
   - Immediacy of problems

Figure 1. Example conditional reorganization scenario
• Service level agreements
• Application priority
4. Scheduling maintenance into time windows
• Application availability
• System resources
5. Monitoring IMS systems for problems
6. Analyzing results and reports

Policy-based conditional database management can relieve you from some of the more typical database maintenance tasks. Policy Services can be particularly useful in taking over the duties of capturing, storing, and analyzing database state information required to make decisions about performing specific maintenance tasks.

An important goal of Policy Services technology is to free up time and resources, and allow you to spend time using new IMS technologies that facilitate emerging business needs.

In the following sections, questions and solutions about implementing policy-based database health management are explored. The information in these sections uses the example of conditional database reorganization as provided by IMS Database Reorganization Expert.

Determining policy definitions

Questions:
• How can the space of this database be managed?
• Which database statistics can I observe?

Solutions:
You can write down answers to these questions, discuss them with fellow DBAs in your shop, and decide on those policies which would make the greatest impact on the efficiency of your organization.

Handling conditional reorganization

Questions:
• Is the database state so critical that I need to take immediate action?

Solutions:
• An IMS Database Reorganization Expert job, for example, can use its Smart Reorg utility and a policy to evaluate the current state of the database, determine the severity level of any threshold exception, and respond with message notifications and an action to perform database reorganization.
• The database can be reorganized only when reorganization is needed.

Refining exception detection and notification

Questions:
• What exception state is observed for the database?
• What database statistics can be observed to detect such exception states?
• What database states are considered so severe or critical that an immediate reorganization or restructure is needed?

Solutions:
• Policy condition exceptions are classified based on the exception type (class) and severity levels.
• A wide range of warning levels allow you to configure multiple layers of responses for different policies as they apply to different databases.
Establishing notification lists for exception messages

Questions:
• Who can know about exceptions to policy conditions?

Solutions:
• Exception messages can be sent to:
  – Designated TSO users by using TSO/E SEND command
  – Designated z/OS operator consoles by using z/OS WTO service
  – Designated email and text message addresses
• Exception messages are recorded in a report and in a journal.

Post-reorganization feedback, analysis, and fine-tuning

Questions:
• When was this database reorganized last time?
• Were the past database reorganizations effective?
• Could I know why the database was reorganized?
• Could I know whether the reorganization performed was effective in removing severe exceptions?
• Is the policy effectively configured for the database?

Solutions:
• The Diagnosis Report is produced by IMS Database Reorganization Expert.
• The Diagnosis Report provides the following information:
  – Summary of policy evaluation
    - Specific policy applied to the database
    - Reorganization need (phase 1)
    - Result of policy evaluation, including exception messages with exception class and level
    - Result of policy reevaluation (phase 2) after reorganization (if reorganization was performed)
    - A summary message for the reorganization effect
  – Database statistics before and after reorganization (and their differences)

Policy Services components

Policy Services uses a large set of components to implement the analysis of sensor data, evaluate policies against this data, and respond to threshold violations with exception messages and process actions.

Sensor Data Service component

The Sensor Data Service component provides services to construct and deconstruct the sensor data that is stored in the Sensor Data repository. The Sensor Data Service ensures that the data stored is known and valid.

The Sensor Data Service provides a transparent method for data storage and retrieval, and shelters the user from data format issues.

The communication between the client application (such as IMS Database Reorganization Expert and stand-alone DB Sensor) and the Sensor Data Service is handled by the Sensor Data API. This API creates a communications environment and manages requests and responses, such as writes, retrieves, and deletes.
Data Dictionary component

The Data Dictionary component provides a standardized method for the definition of data across multiple formats. The Data Dictionary component allows the various IMS Tools products to use data from each other without having to understand the tool-specific format of the data.

Sensor data is stored in the Sensor Data repository and is shared among the IMS Tools products participating in the Policy Services environment. Data stored in the present must be comprehensible in future years and releases. The Data Dictionary provides a homogeneous view of Policy Services data. The data is given a context that makes it independent of the actual format of the data. This context provides requesters of the data with a consistent data view.

The Data Dictionary describes all data elements that are stored in (and retrieved from) the Sensor Data Service. The dictionary documents the nature of the data and provides all data providers and consumers a clear understanding of the meaning of the data element values. The dictionary also documents the valid data values and ranges for data elements to enforce the data understanding and to enable dictionary services to protect the data consumers.

Policy Services API

The Policy Services API is the communication path for IMS Tools products and the ISPF user interface to connect to other Policy Services components.

Action Manager component

The Action Manager component is responsible for delegating actions to the IMS Tools product upon request. This component notes and records all action results reported by the client product.

In particular, notification actions are requested by the Action Manager component. Message actions are formatted and journaled by the Action Manager component. The Action Manager supports two-phase processing:

- The first phase of processing returns only processes and related messages.
- The second phase produces only message actions.

This phase allows for a reassessment of the state after the processes requested in phase 1 are effectuated, resulting in more meaningful messaging.

Policy Validation component

The Policy Validation component validates policies when they are created, during maintenance updates, and before evaluation.

Policy Evaluation component

The Policy Evaluation component evaluates policy rules in accordance with rule evaluation strategy and directives.

A given rule might be applicable to a subset of the resource types supported by the policy. Rule evaluation does not process rules that are not applicable to the resource being processed based on the resource type attribute for the rule.

Policy Data Store component

The Policy Data Store component provides access to and storage of policy definition objects. The Policy Data Store component is responsible for reading and writing policy definitions to and from the repository.

The Policy Data Store component provides transformation methods that convert between the data structure optimized for storage and the structures required for efficient functional reference. The component provides a full set of functions for creating and maintaining policy definitions.

Policy definitions exist in two forms:
Policy templates describe the contents of a policy and ultimately are transformed into policy streams at bind time. Policy streams are syntactically correct and functionally complete policy definitions. Policy streams represent the updating of a policy template with the most recent rule, notification list, and action definitions provided by maintenance updates.

The policy is defined and stored in template form only. A policy stream is generated for a policy on demand and then is disposed of when it is no longer needed. Advanced users can hand code and import a policy stream. These policy streams do not have a corresponding template. There is no transformation from a stream to a template.

Policies are referred to only by name. Therefore, policy templates and policy streams share the same name space.

**Rule Data Store component**

The Rule Data Store component provides access to and storage of rule objects.

Rule objects exist in two forms

- Rule templates
- Rule streams

Rule templates describe the contents of a rules stream and are transformed into rule streams. They exist to simplify and constrain the definitional process.

The Rule Data Store component is responsible for reading and writing rule objects to and from the repository.

**Notification List Data Store component**

The Notification List Data Store component is responsible for reading and writing notification lists and directory entries to and from the permanent media. The component provides transformation methods that convert between the data structure optimized for storage and the structures required for efficient functional reference.

**Notification List Manager component**

Policy actions include the ability to notify one or many parties. The Notification List Manager component provides a message broadcast service.

Messages sent to the Notification List Manager are forwarded to one or more destinations. Message destinations include:

- TSO
- WTO
- Email
- Texting

The Notification List Manager component provides a description of the destination including a name, address, destination type, and possibly an address of a delivery agent.

The component journals each notification request and the results of each notification attempted. The requester is informed of overall success (for example, all succeeded, all failed, some succeeded, invalid request, invalid notification list).
**Policy Environment Services component**

The Policy Environment Services component provides, through the ISPF user interface, the ability to maintain and distribute policies, rules, and notification lists. The component is responsible for maintaining policy environments and related information that is kept in the repository.

The Policy Environment Services component manages all knowledge of the physical data storage by manipulating the data structures and limiting access to these data structures.

**Journal Manager component**

Journaling provides a record of policy-related activities. The Journal Manager collects activities that document product usage at varying levels and collects diagnostic entries at varying levels.

The journal events are written to a file locally (based on DD presence). If no journal DD statement exists, the journal is not written. The purpose of this journal is to assist in Policy Services problem analysis.

**Service updates and support information**

Service updates and support information for this product, including software fix packs, PTFs, frequently asked questions (FAQs), technical notes, troubleshooting information, and downloads, are available from the web.

To find service updates and support information, see the following website:

**IBM Support: IMS Tools Base for z/OS**

**Product documentation and updates**

IMS Tools information is available at multiple places on the web. You can receive updates to IMS Tools information automatically by registering with the IBM My Notifications service.

**Information on the web**

Always refer to the IMS Tools Product Documentation web page for complete product documentation resources:

http://www-01.ibm.com/support/docview.wss?uid=swg27020942

The IMS Tools Product Documentation web page includes:

- Links to IBM Knowledge Center for the user guides ("HTML")
- PDF versions of the user guides ("PDF")
- Program Directories for IMS Tools products
- Recent updates to the user guides, referred to as "Tech docs" ("See updates to this information!")
- Technical notes from IBM Software Support, referred to as "Tech notes"
- White papers that describe product business scenarios and solutions

IBM Redbooks® publications that cover IMS Tools are available from the following web page:

http://www.redbooks.ibm.com

The IBM Information Management System website shows how IT organizations can maximize their investment in IMS databases while staying ahead of today's top data management challenges:

https://www.ibm.com/software/data/ims/

**Receiving documentation updates automatically**

To automatically receive emails that notify you when new technote documents are released, when existing product documentation is updated, and when new product documentation is available, you can
register with the IBM My Notifications service. You can customize the service so that you receive information about only those IBM products that you specify.

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2. Enter your IBM ID and password, or create one by clicking register now.
3. When the My Notifications page is displayed, click Subscribe to select those products that you want to receive information updates about. The IMS Tools option is located under Software > Information Management.
4. Click Continue to specify the types of updates that you want to receive.
5. Click Submit to save your profile.

How to send your comments

Your feedback helps IBM to provide quality information. Send any comments that you have about this book or other IMS Tools documentation to comments@us.ibm.com. Include the name and version number of the product and the title and number of the book. If you are commenting on specific text, provide the location of the text (for example, a chapter, topic, or section title).

Accessibility features

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use a software product successfully.

The major accessibility features in this product enable users to perform the following activities:

- Use assistive technologies such as screen readers and screen magnifier software. Consult the assistive technology documentation for specific information when using it to access z/OS interfaces.
- Customize display attributes such as color, contrast, and font size.
- Operate specific or equivalent features by using only the keyboard. Refer to the following publications for information about accessing ISPF interfaces:
  - z/OS ISPF User's Guide, Volume 1
  - z/OS TSO/E Primer
  - z/OS TSO/E User's Guide

These guides describe how to use the ISPF interface, including the use of keyboard shortcuts or function keys (PF keys), include the default settings for the PF keys, and explain how to modify their functions.
Chapter 2. Hardware and software prerequisites

Policy Services is installed by using SMP/E and standard RECEIVE, APPLY, and ACCEPT processing. IBM Tools Base for z/OS is installed using the SMP/E RECEIVE, APPLY, and ACCEPT process. For detailed instructions on how to install the product, refer to the Program Directory for IBM Tools Base for z/OS. The program directory is included with the product media and is also available on the IMS Tools Library page.

Hardware prerequisites
Policy Services (5655-V93) operates on any hardware configuration that supports the required version of IMS.

Software prerequisites
The installation and operation of Policy Services requires the following software:

Operating system:
- IBM z/OS, V2.1 (5650-ZOS) or later
Chapter 3. Sensor data service

Sensor data is the data collected by an IMS Tools product when it measures the condition (or state) of one or more databases.

This sensor data is information captured at an instance in time that represents the condition, or state, of one or more databases. The data can be used for later analysis and policy evaluation.

Policies consist of a set of rules that each define threshold limits for specific types of database conditions. The policy service mechanism evaluates threshold values against the actual data values that an IMS Tools product collects and stores in the IMS Tools Knowledge Base Sensor Data repository.

The sensor data is stored in the Sensor Data repository as records made up of data element values. The data record is stored in a well-understood and flexible format that allows its use years and multiple product releases later in time. The data and its format is understandable between products and releases to ensure reliable functionality.
Sensor Data repository

All sensor data is handled by the IMS Tools Knowledge Base server and stored in an IMS Tools Knowledge Base Sensor Data repository.

IMS Tools Knowledge Base provides a common information management service that allows the sharing of data generated by multiple tool products within a sysplex from a single, centralized interface.

Data records and elements

Sensor data is stored in the IMS Tools Knowledge Base Sensor Data repository in the form of records made up of data element values. A data element consists of a data element tag and a data element value pair.

Sensor data records are a collection of information related to a client application that are valid with their dictionary definitions and their element structure. A collection of sensor data records is processed as a group by using the record set identifier (RSI).
Data elements are used by services outside of sensor service functions, such as the policy evaluation component. The self-describing nature of a data element, as dictated by the Data Dictionary, facilitates generic data manipulation.

**Data Dictionary**

Sensor data is stored in the IMS Tools Knowledge Base Sensor Data repository and is shared among the IMS Tools products participating in the Policy Services environment. Data stored in the present must be comprehensible in future years and releases. The Data Dictionary provides the rigor in data type adherence for Policy Services.

The Data Dictionary describes all data elements (names and attributes) that are stored in (and retrieved from) the sensor data service. The dictionary documents the nature of the data and provides all data providers and consumers a clear understanding of the meaning of the data element values. The dictionary also documents the valid data values and ranges for data elements to enforce the data understanding and to enable dictionary services to protect the data consumers.

There is a set of rules for managing the elements defined in the dictionary that is available for both for the maintainer of the dictionary and for the client products.

**Sensor Data Store service**

The Sensor Data Store component provides services to construct and deconstruct the sensor data stored in the IMS Tools Knowledge Base Sensor Data repository. The sensor data store ensures that the data stored is known and valid.

The Sensor Data Store provides a transparent method for data storage and retrieval, and shelters the user from data format issues.

**Sensor Data Read service**

The Sensor Data Read component provides services to retrieve the sensor data from the IMS Tools Knowledge Base Sensor Data repository.

The Sensor Data Read reads the requested sensor data from the IMS Tools Knowledge Base Sensor Data repository, and then constructs a list of data elements for client components.

**Sensor Data API**

The communication between the client application (such as IMS Database Reorganization Expert and stand-alone DB Sensor) and the Sensor Data Store or the Sensor Data Read is handled by the Sensor Data API. This API creates a communications environment and manages requests and responses, such as writes, retrieves, and deletes.

**Data validation and transformational layer**

The Sensor Data Store uses a validation and transformational layer to ensure that all data being written to the repository is usable and that all data being retrieved is in a useful format.

Write validation ensures that all the data elements are defined in the dictionary and conform to their definitions. The validation service also ensures the integrity of the record and data structure.

Read validation also ensures the integrity of the record and data structures. The transformation service provides mapping of the data from the records into the format and location requested by the client product.
Chapter 4. Policies, rules, and notification lists

Policy Services is a core IMS Tools technology that can monitor specific database state by evaluating the sensor data collected by an IMS Tools product, and by providing a response to any conditions that exceed the threshold values specified for this state.

Topics:
- “What is a policy?” on page 21
- “What is sensor data?” on page 23
- “What is a rule?” on page 24
- “What is an exception?” on page 28
- “What is an action?” on page 30
- “What is a directory entry?” on page 34
- “What is a notification list?” on page 34
- “Exporting and importing Policy Services objects” on page 36
- “Example policy evaluation process flow” on page 37
- “Example scenario for conditional reorganization” on page 40

What is a policy?

A policy is the expression, or definition, that is used by Policy Services to evaluate specific database states, such as the state of space utilization at a specific instance in time.

The policy definition is used to evaluate the database state, and specifies how Policy Services responds to any events that reach or exceed the threshold values specified for this state.

A policy definition consists of the following components:

- **One or more condition expressions (rules) that are used to evaluate the database statistics (sensor data) that are collected by the IMS Tools product**
  A condition is a Boolean expression that compares threshold values that are defined in the rule to the collected sensor data values (data elements) that represent the database statistics at an instance in time.

  The purpose of the rule is to detect an exception to the database state by using the rule condition.

- **A resulting exception when a condition threshold has been reached or exceeded**
  Each rule contains threshold values that specify the limits (numeric or percentage) for each data element that is being evaluated.

  The exception is defined in the condition and consists of an exception class (exception type), a severity level (warning, severe, critical), and the message text that describes the exception.

  The exception class identifies a type of database condition such as fragmented free space, too many split segments, or RAP overload.

  Each severity level is mapped to an action type (a message, a process, or both).

- **An action to perform when an exception for a specific severity level occurs**
  Actions consist of warning messages that are sent to members of one or more notification lists, and processes that can be implemented by the client application (such as database reorganization).

The following figure shows how a policy consists of a set of rules and a list of actions:
Policy templates are distributed by Policy Services. You can customize policies to detect exceptions to specific database states, or to change the action that the IMS Tools client takes in response to an exception. You can also create new custom policies for a specific database or group of databases in your environment.

There are two methods for creating and customizing policies:
- Create a new policy by using an existing policy as a model
  You must copy the existing policy, rename the copied version, then customize this copy.
- Create a completely new policy
  You must build the policy from a blank template.

Policies can be designed to apply to the following database combinations:
- A specific database type
- A subgroup of databases (for example, all HISAM database types)
- All database types

Policies are defined as applicable to one or more resource types. It is not logical, for example, to check for CI Splits in an OSAM data set. Resource types can include the following database types:
- HDAM
- HIDAM
- PHDAM
- PHIDAM
- HISAM
- SHISAM
- DEDB
- INDEX
- PSINDEX

To simplify the management of policy definitions, you can define policies that apply to many resource types, and you can define rules that test thresholds that might not apply to every resource.

**What is a policy template and a policy stream?**

Policy definitions exist in two forms:
• Policy templates
• Policy streams

Policy templates describe the contents of a policy and ultimately are transformed into policy streams when a policy lookup is requested by Policy Services. Policy streams are syntactically correct and functionally complete policy definitions. Policy streams represent the on demand updating (binding) of a policy template with the most recent rule, notification list, and action definitions that are provided by maintenance updates.

A policy stream is built from a policy template and all referenced rules (created as needed) when a policy lookup is requested by the Policy Services API client. The Policy Services ISPF user interface does not provide any means to define, modify, or save a policy stream. The policy stream is disposed of when it is no longer needed.

Advanced users can manually code and import a custom policy stream. These custom policy streams do not have a corresponding template.

Streams are not transformed to templates.

Policies are referred to only by name. Therefore, the policy templates and policy streams share the same name space.

Guidelines for editing a policy stream

You can export a policy template as a policy stream and then edit the policy stream, although this procedure is not recommended. The capability to edit a policy stream is available to those advanced users who need to modify sections of the policy that are not available through the user interface.

If this process is not handled correctly, an edited policy stream can fail during the evaluation of sensor data. The user is responsible for resolving and correcting such problems. The user is also responsible for ensuring that the modified policy stream is valid, and that it is the user's own process that performs the validation.

The following conditions apply to exporting a policy template as a policy stream and then editing the policy stream:

• Do not modify the ORIGINAL_NAME(IBM.policy_name) statement within the policy stream.
  This statement is required to refer to the origin of the policy.
• Modify the NAME(policy_name1) statement to have a new name NAME(policy_name99).
  This statement allows you to import the new policy stream.

If a policy template and a user-built policy stream have the same policy name, the policy template always replaces the policy stream in the repository. However, the user-built policy stream is never allowed to be imported to replace a policy template.

What is sensor data?

Sensor data is information captured at an instance in time that represents the condition, or state, of one or more databases. The data can be used for later analysis and policy evaluation.

Each policy consists of a set of rules that define threshold limits for specific types of database conditions. The policy service mechanism evaluates these threshold values against the sensor data that an IMS Tools product collects and stores in the IMS Tools Knowledge Base Sensor Data repository.

The sensor data is stored in the Sensor Data repository as a group (or a set) of records made up of data elements. A data element consists of a data element tag and a data element value pair. A policy and the required data elements are presented to the decision-making processing as a pair.

IMS Tools Knowledge Base provides a common information management service that allows the sharing of data that is generated by multiple tool products within a sysplex from a single, centralized interface.

The following figure shows the storage of sensor data elements in a repository:
As an example, the following categories of sensor data are collected by IMS Database Reorganization Expert:

- Database record statistics (per database or HALDB partition)
- Randomizer statistics (per HDAM or PHDAM partition)
- Volume and extents statistics (per data set)
- Data set space usage statistics (per data set)
- IMS space utilization statistics (per data set)
- HISAM and SHISAM statistics (for HISAM)

**What is a rule?**

A rule is made up of a simple or complex condition and a corresponding exception that is detected by this condition.

A rule compares the stored data element values to the predefined threshold values that specify the limits for that set of data element values.

For example, if database state information is being collected, a rule can set the boundary, or limit, for a specific type of database state. During a policy evaluation, the rule's conditional expression compares the sensor data that was collected for this state (a set of data element values) against the limit that was specified in the rule for this state (a set of threshold values).

Each IMS Tools product that participates in the Policy Services environment is responsible for capturing and storing data elements for the appropriate information that it is interested in evaluating.

The following outline illustrates the components of a rule:

- **Rule condition**
  - Conditional expression
    - The rule's conditional expression is the formula that compares stored data element values with the threshold values specified for this data.
    - The conditional expression uses one or more variables (for example &1, &2, &3) to represent the threshold value for that condition.
– Threshold sets
  A threshold set consists of the group of threshold variables (used in the conditional expression) with assigned threshold values.
  
  A threshold value specifies the boundary, or limit, for the specific database state being governed by this rule.
  
  Each threshold set in a rule template uses the same group of threshold variables. Each set is distinguished by its name.
  
  A rule template typically has at least three threshold sets predefined by IBM (HIGH, MED, LOW). Custom sets can also be created.

• Threshold exception
  – Exception class
  – Exception (severity) level (WARNING, SEVERE, or CRITICAL)
  – Exception message text

Policies depend on the condition and exception expressions provided by rules in order to evaluate the state of a database and identify the exception state. Policies can contain one or more rules.

You can customize the following features of a rule:

• Threshold values in each threshold set
• Exception message text
• Association of a severity level with a threshold set
• Add new (user-defined) threshold sets and values

The following figure shows the condition and exception components of a rule, and expands on the features of the condition:
**Data elements used by the rule condition**

A rule performs a comparison of a set of data element values to a set of threshold values. Each participating IMS Tools product collects and stores database state data as data element values.

Examples of database states and associated data elements include:

- **Percentage of CI or CA splits in a HISAM or SHISAM database**
  Data elements: DB_PCT_NUM_CI_SPLIT and DB_PCT_NUM_CA_SPLIT

- **IMS free space availability**
  Data elements: DB_BYTES_SEG, DB_PCT_BYTES_SEG, DB_BYTES_FREE_SPACE, and DB_PCT_BYTES_FREE_SPACE

- **Percentage of overflow data in an HDAM or PHDAM database**
  Data elements: DB_PCT_BYTES_OVFL

- **Number of database records**
  Data element: DB_NUM_ROOT

- **Imbalanced HDAM or PHDAM randomizing**
  Data elements: DB_PCT_NUM_UNUSED_RAP and DB_PCT_NUM_SYNONYM

**Threshold variables, values, and sets**

A rule specifies the boundary, or limit, for a particular database state as a set of threshold values. The policy service evaluates the set of threshold values against the set of values of the appropriate data elements for this database state that were collected and stored in the repository.

For example, the rule template that specifies the limits on IMS free space availability (IBM.FREE_SPACES.10) contains the following set of conditions and threshold variables:
• Threshold on the total bytes of segments in the data set (threshold variable &1)
• Threshold on the percentage of total segment data against the used space that is allocated for the data set (threshold variable &2)
• Threshold on the total bytes of free spaces remaining in the data set (threshold variable &3)
• Threshold on the percentage of total free spaces against the used space that is allocated for the data set (threshold variable &4)

The group of threshold variables with assigned threshold values is called a threshold set. For example:

| &1 | 8589934592 |
| &2 | 70 |
| &3 | 0 |
| &4 | 30 |

Each rule template contains at least three predefined IBM threshold sets with the following name designations: LOW, MED (MEDIUM), HIGH. However, some rule templates contain fewer threshold sets. For example, the rule template that checks the RECON IC NEEDED flag (IBM.IC_NEEDED) supports only one threshold set (&1=Y) that sets the data element value for DB_DBRC_IC_NEEDED to Y when the RECON IC NEEDED flag is ON.

Custom threshold sets with unique names (such as IMS2HIGH, IMS3LOW) can also be defined and included with the rule template.

Each threshold set typically has different threshold values. The goal is to create (and have available for policy evaluation) a range of different boundaries for the particular database state governed by the rule.

Multiple policies can use the same rule. Therefore, a wide range of thresholds allows you to configure multiple layers of exceptions and responses for different policies as they apply to the needs of different databases.

In the previous example, the conditions are evaluated with the logical OR, which means that the rule condition is said to be met (or TRUE) if one or more of these individual threshold comparisons are reached in one or more of the data sets that compose the database.

**Example: Rule threshold sets**

The following example shows a combination of predefined IBM and user-created threshold sets for the rule template that governs IMS free space availability:

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold variables and values</th>
</tr>
</thead>
</table>
| LOW (IBM predefined) | &1 = 8589934592  
&2 = 70  
&3 = 0  
&4 = 30 |
| MED (IBM predefined) | &1 = 8589934592  
&2 = 80  
&3 = 0  
&4 = 20 |
| HIGH (IBM predefined) | &1 = 8589934592  
&2 = 90  
&3 = 0  
&4 = 10 |
Table 1. Example threshold sets for the rule template IBM.FREE_SPACES.10 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold variables and values</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMS3LOW (user-created)</td>
<td>&amp;1 = 8589934592</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 60</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 0</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 40</td>
</tr>
<tr>
<td>IMS3HIGH (user-created)</td>
<td>&amp;1 = 8589934592</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 85</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 0</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 15</td>
</tr>
</tbody>
</table>

**Important:** The threshold value 8589934592 for the variable &1 and the threshold value 0 for the variable &3 represent the upper threshold value and the lower threshold value that are never reached. In this rule condition, these threshold values are used to disable the evaluation of the data element values that correspond to &1 and &3. Change these values only if you want to monitor these conditions.

The threshold sets for this rule template can be used by several policies. Each policy uses some combination of the threshold sets that are provided in the rule template (up to a maximum of three sets). For example:

- **POLICY1**
  - LOW, MED, IMS3HIGH
- **POLICY2**
  - IMS3LOW, MED, HIGH
- **POLICY3**
  - IMS3LOW, IMS3HIGH

When a policy evaluation determines that a set of threshold values satisfies the rule condition, Policy Services recognizes the condition as an exception at a specific exception severity level. An exception to a rule condition prompts the policy to respond with an action that is associated with the threshold set that contains the values that were exceeded.

**What is an exception?**

A rule is made up of a condition that specifies a threshold boundary for a particular database state and a corresponding exception that defines the response to any crossing of that boundary.

The rule exception has three components:

- Exception class
- Exception severity level
- Exception message

The following figure shows the condition and exception components of a rule, and expands on the features of the exception:
Exception class

The exception class represents the specific database state type that is being governed by the rule. The exception class is used to map the exception to a specific action in the policy. For example, the rule IBM.FRAGMENTATION.10 monitors free space fragmentation in a database. The exception class defined for this rule is:

FRAGMENTED_FREE_SPACES

Exception severity level

The exception severity level is a category that represents a degree of concern for the detected exception. There are three fixed exception severity levels:

- WARNING
- SEVERE
- CRITICAL

A policy is used to map threshold sets (LOW, MED, HIGH, custom) to exception severity levels to form a functional rule. Only one threshold set is mapped to each exception severity level.

You use the Policy Services ISPF user interface to configure this mapping for each rule template that is used in individual policies. The following table illustrates that threshold sets are mapped to severity levels:
Table 2. Rule threshold sets mapped in the policy to exception severity levels

<table>
<thead>
<tr>
<th>Threshold sets</th>
<th>&gt;&gt;MAP TO&gt;&gt;</th>
<th>Severity levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td></td>
<td>WARNING</td>
</tr>
<tr>
<td>MED</td>
<td></td>
<td>SEVERE</td>
</tr>
<tr>
<td>HIGH</td>
<td></td>
<td>CRITICAL</td>
</tr>
<tr>
<td>MYLOW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MYHIGH</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Although there is no predefined correlation between the threshold sets (LOW, MED, and HIGH) and severity levels (WARNING, SEVERE, and CRITICAL), each predefined IBM policy by default makes the following correlations:

- LOW with WARNING
- MED with SEVERE
- HIGH with CRITICAL

Each threshold set typically uses different threshold values. The goal is to create (and have available for policy evaluation) a range of different boundaries for the particular database state governed by the rule template.

Multiple policies can use the same rule template. Therefore, a wide range of thresholds allows you to configure multiple layers of exceptions and responses for different policies as they apply to the needs of different databases.

Exception message text

The exception message is the text that can be used by the resulting policy action to describe the database state that crossed a rule threshold set.

For example (for rule template IBM.FREE_SPACES.10):

```
IMS space utilization statistics of %RESOURCE% has reached or crossed a threshold.
```

You cannot use the Policy Services user interface to modify the text of the exception message for any rule template.

The variable %RESOURCE% is replaced by the DBD name or the HALDB partition name when the message is printed or sent.

What is an action?

A policy also defines the mapping of a rule exception and severity level to a resulting action.

A policy implements an action when a rule condition is reached or exceeded during a policy evaluation.

An action for each exception is actually an action recommendation. An action is determined by the action list defined in the policy. Three forms of an action are possible:

- **Send an exception message for each exception detected**
  
  The exception message is sent to the destinations that are contained in the notification list or lists that are associated with that exception class and severity level either specified by the Rule, or the Policy. For example (for rule IBM.FREE_SPACES.10):

  ```
  IMS space utilization statistics of %RESOURCE% has reached or crossed a threshold.
  ```
  
  The exception message text is contained in the rule template.

  Messages are typically sent to the client's SYSOUT and recorded in the Policy Services journal report.
• **Perform a process only** (for example, perform a database reorganization)

  Policy Services can recommend a specific process to the caller (client) of the Policy Services. The purpose of the recommended process is to remove the detected exception or lower the level of the exception.

• **Recommend a process and send an exception message for each exception that remains after the process**

  A process action can also be accompanied by the standard exception message that is associated with the rule.

  The process action is delegated to and handled by the IMS Tools client or some other external program. The associated exception message is handled by Policy Services.

The following figure shows the features of an action list entry for a policy:

![Figure 7. Policy action components](image_url)

**Example action process flow**

An exception message associated with a rule is sent only when at least one notification list is attached to the rule. If a notification list is not defined for the rule, the notification list that is defined by the policy for the summary notification is used.

The process action is not performed immediately and the exception message associated with the process action is not sent immediately. The resulting action or actions are determined by the set of process actions recommended by the policy evaluation.

For example, in the Smart Reorg utility of IMS Database Reorganization Expert, multiple reorganization processes, each of which was recommended for a different exception, result in a single reorganization action.

The reorganization is performed by the Smart Reorg utility only once, not multiple times. The exception message that was associated with an action is sent only when the exception still remains after the action has been performed.

At the end of a policy evaluation session, a message that summarizes the result of the policy evaluation is sent to the destinations contained in the notification list or lists associated with the policy if at least one exception was detected by a rule defined in the policy. The message is called the summary message for the policy evaluation session.
**Action selection: Exception-to-action mapping**

The form of action depends on how the specific rule exception was mapped in the policy. A rule threshold set is mapped to a severity level for the exception class that is associated with the rule. In turn, the severity level is mapped to an action.

The following table illustrates that threshold sets are mapped to severity levels that are mapped to an action type:

<table>
<thead>
<tr>
<th>Threshold sets</th>
<th>&gt;&gt;MAP TO&gt;&gt;</th>
<th>Severity levels</th>
<th>&gt;&gt;MAP TO&gt;&gt;</th>
<th>Policy Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>MED</td>
<td>HIGH</td>
<td>MYLOW</td>
<td>MYHIGH</td>
</tr>
<tr>
<td>WARNING</td>
<td>SEVERE</td>
<td>CRITICAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Message</td>
<td>Process</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For example, the custom threshold set MYLOW can be mapped to severity level WARNING, which in turn is mapped to the action of sending an exception message out to the notification list that is associated with this exception class and severity level.

In predefined policies provided by IBM, the severity-level-to-action mappings are fixed for each exception class and are not customizable through the Policy Services ISPF user interface:

- WARNING always maps to a message action
- SEVERE always maps to a message action
- CRITICAL maps to either a message action or a process action

The following topics contain a table for each policy that shows the exception class and severity level pairs that specifically result in a process action:

- Chapter 24, “Domain REORG policies,” on page 327
- Chapter 27, “Domain RECOVERY policies,” on page 391

**Exception message format**

Exception messages are sent to the target by the Policy Services Action Manager. Those exception messages are also returned to the Policy Services client IMS Tool, such as IMS Database Reorganization Expert, with information on the source of the exception detection.

The following example from the Diagnosis Report of IMS Database Reorganization Expert shows how an exception message from Policy Services can appear:

| The size of a database data set in BKDB has reached or exceeded a threshold |

**Message text**

- The message text that comes from the text contained in the rule template (indicating the resource affected; the database BKDB in this example)

  You cannot modify the message content.

**Class**

- The exception class name

**Level**

- The severity level (WARNING, SEVERE, CRITICAL)

**Rule**

- The rule template that detected this exception
Threshold Set

The name of the threshold set in this rule template that was used to detect this exception.

This threshold set was mapped to the severity level.

Additional information about message actions

Although reaching or exceeding a rule condition can trigger one of the three severity levels, the text of the exception message for each severity level is the same (shared among all severity levels). The text comes from the IMS Reorganization Expert report. The messages are distinguished by the return of the exception class and severity level type with the message.

For example:

```
The size of a database data set in BKDB has reached or exceeded a threshold
Class: DATA_SET_SIZE_GROWTH             Level: WARNING
Rule: R:IBM.DBDS_GROWTH.10      Threshold Set: MYLOW

The size of a database data set in BKDB has reached or exceeded a threshold
Class: DATA_SET_SIZE_GROWTH             Level: SEVERE
Rule: R:IBM.DBDS_GROWTH.10      Threshold Set: MED

The size of a database data set in BKDB has reached or exceeded a threshold
Class: DATA_SET_SIZE_GROWTH             Level: CRITICAL
Rule: R:IBM.DBDS_GROWTH.10      Threshold Set: MYHIGH
```

In the conditional reorganization scenario of Reorganization Expert, Policy Services uses the same exception class messages for both the phase 1 first evaluation and the phase 2 second evaluation that is made after the actions recommended in phase 1 have been performed.

In the policy evaluation that is performed by Autonomics Director, only the phase 1 policy evaluation is performed.

Additional information about the summary message

A set of summary messages are defined for the policy domain and they are specific to the domain and the resource type. The appropriate summary message is selected based on the combination of the results of phase 1 and phase 2 policy reevaluations.

In the conditional reorganization scenario of Reorganization Expert, the summary message is returned after phase 2 processing completes successfully and at the same time the standard exception message or messages are returned. If the phase 2 policy evaluation fails, a specific summary message is returned that indicates the reason. The appropriate summary message is selected based on the combination of the results of phase 1 processing, process action (such as REORG of the Database), and phase 2 policy reevaluations.

In Autonomics Director, the summary message is returned at the phase 1 policy evaluation.

Policy Services messages can direct you to the IMS Tool for which the summary message was issued, where more tool-specific explanation, system action, and user action information is available.

Additional information about process actions

The response to a recommendation to perform a process action is specific to the IMS Tools client product.

For example, the Smart Reorg utility in IMS Database Reorganization Expert can respond to a Policy Services recommendation and perform a reorganization process. In this example, the recommendation is returned to the tool's Conditional Reorganization Support Service, which internally calls Policy Services.

The recommendation for a process action can be accompanied by the standard exception message that is appropriate for the exception class and severity level. This exception message describes the rule condition that was reached or exceeded and that caused the recommendation for the process action.
**What is a directory entry?**

A directory entry is the mechanism used by Policy Services to define users who can receive exception notifications messages that are sent out to warn or report on results of policy evaluations.

A single directory entry defines a name of a user, the connection type (such as WTO or TSO), and all connection specifications that are required to deliver a message to that user. You use the Policy Services user interface to define directory entries.

Directory entries are used to populate one or more notification lists. Notification lists are used by a policy when a rule exception occurs and the resulting action requires a warning message to be sent to appropriate users, as defined by the notification list mechanism.

Policy Services supports two directory entry types:

- WTO
- User (TSO, EMAIL, or TEXTING)

The WTO directory entry contains the following information fields:

- Short name
- Long name
- Description
- Delivery type:
  - WTO

The User directory entry contains the following information fields:

- Short name
- Long name
- Description
- Delivery type:
  - TSO, EMAIL, or TEXTING

**What is a notification list?**

A notification list is a mechanism for grouping users into unique business categories, such as all DBAs, or all users who represent an installation application area or a set of databases associated with a given application or location.

The notification list is created by including the directory entry short names of the users who are appropriate for the required notification category. Notification lists can contain both directory entries and other notification lists.

The short name used in a notification list maps to the directory entry of that user. The directory entry contains the information (for example, TSO and WTO IDs) that are required to deliver messages. You use option 3 Notification lists, directory entries management on the Policy Services user interface to define lists that include one or more directory entries.

The following example shows how notification lists can include combinations of WTO consoles, TSO users, and other notification lists:

<table>
<thead>
<tr>
<th>Notification list A</th>
<th>Notification list B</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSOUSER1</td>
<td>TSOUSER1</td>
</tr>
<tr>
<td>TSOUSER2</td>
<td>TSOUSER4</td>
</tr>
</tbody>
</table>

*Table 4. Example notification lists*
Table 4. Example notification lists (continued)

<table>
<thead>
<tr>
<th>Notification list A</th>
<th>Notification list B</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSOUSER3</td>
<td>TSOUSER5</td>
</tr>
<tr>
<td>CONSOLE1</td>
<td>CONSOLE2</td>
</tr>
<tr>
<td>NOTLISTC</td>
<td></td>
</tr>
</tbody>
</table>

A policy and each rule in the policy can refer to one or more notification lists. The directory entries contain the information such as user name, destination type, destination address, and description. If an exception is raised by the evaluation of a policy, a message can be sent to all destinations (directory entries) listed in the notification lists that are specified by the rule.

Important: If a notification list is not specified by the rule, the notification list that is specified by the policy, the summary notification list, is used to send a message to all destinations if an exception is raised by the evaluation of a policy.

In a rule, notification lists are associated with a threshold set and severity level combination. For example:

Table 5. Example notification list associations

<table>
<thead>
<tr>
<th>Action</th>
<th>Severity level</th>
<th>Threshold set</th>
<th>Notification list</th>
</tr>
</thead>
<tbody>
<tr>
<td>MESSAGE</td>
<td>WARNING</td>
<td>LOW</td>
<td>Notification List A</td>
</tr>
<tr>
<td>MESSAGE</td>
<td>SEVERE</td>
<td>MED</td>
<td>Notification List A, Notification List B</td>
</tr>
<tr>
<td>REORG</td>
<td>CRITICAL</td>
<td>HIGH</td>
<td>Notification List A, Notification List C, Notification List E</td>
</tr>
</tbody>
</table>

The following figure shows the mapping of specific notification lists to specific severity level and threshold set combinations:
Notification lists can be associated with two notification message types:

- **Exception messages**
  
  Each exception class that is associated with a rule template can have three severity levels (WARNING, SEVERE, CRITICAL).
  
  You can associate one or more notification lists with each rule threshold set and severity level combination.

- **Summary messages**
  
  The summary message is sent after the second evaluation phase.
  
  This message provides information about the results of the policy reevaluation that takes place after action was taken in response to an exception during the first policy evaluation.
  
  The summary message is sent also when an exception was detected but no associated process action was designated, or the recommended process action was canceled for some reason.

**Exporting and importing Policy Services objects**

The installed policy and rule templates can be copied and customized, and then exported to and imported from another environment.

Directory entries and notification lists can also be exported and imported.

The initial package of predefined IBM policies and rules is installed from partition data sets (PDS). This package is installed into the IMS Tools Knowledge Base Input repository as a set of policy and rule templates.

Policy templates describe the contents of a policy and ultimately are transformed into policy streams when a policy lookup is requested by Policy Services.
You can use the export and import functions to:
- Move policy and rule templates to and from another environment
- Back up the policy and rule templates

The export process begins by preparing a selection list for export and by creating an export package with the selected objects. Exported packages are created as partition data sets (PDS).

Exported packages consist of one member with control information and other members for each exported object.

You can then use the import process to install exported packages in another environment in the same domain.

**Figure 9. Exporting and importing**

**Example policy evaluation process flow**

To illustrate a policy evaluation process flow, the following example is based on the conditional database reorganization capabilities of the IMS Database Reorganization Expert product.

IMS Database Reorganization Expert uses Policy Services to provide advanced functions that help IMS database administrators perform database reorganization tasks.

Database reorganization is one of the responsibilities of database administrators that involves complex analysis tasks. Generally, these are time-consuming tasks that require knowledge, expertise, and experience in IMS database space management. IMS Database Reorganization Expert can reduce the complexity of the database reorganization tasks for IMS full-function databases by helping you automate the analysis and response to specific database conditions.

The IMS Database Reorganization Expert Smart Reorg utility enables the conditional reorganization feature. This feature automates the database diagnosis process and, only when database reorganization
is deemed necessary, runs the reorganization job, all in a single job step. A Smart Reorg utility job that is run with the conditional reorganization feature is referred to as conditional reorganization job.

The following example process flow shows how various policy and rule components are used by Policy Services during a conditional reorganization job.

<table>
<thead>
<tr>
<th>Process flow</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>The conditional reorganization job is initialized.</td>
<td>IMS Database Reorganization Expert - Smart Reorg utility</td>
</tr>
<tr>
<td>The selected policy is read.</td>
<td>SYS.DBDTYPE.HDAM</td>
</tr>
<tr>
<td></td>
<td>The SYS. policy is a copied predefined IBM basic policy for HDAM full function databases.</td>
</tr>
<tr>
<td>An example rule from this policy evaluates the statistics of Free Space Elements (FSE) in HD database data sets.</td>
<td>IBM.FRAGMENTATION.10</td>
</tr>
<tr>
<td>The rule contains a condition expression for evaluating the statistics of Free Space Elements (FSE) in HDAM database data sets.</td>
<td>The condition expression for this rule specifies the threshold values that are evaluated:</td>
</tr>
<tr>
<td></td>
<td>• Threshold value &amp;1 - the average number of free space elements (FSEs) per block or CI in the data set</td>
</tr>
<tr>
<td></td>
<td>• Threshold value &amp;2 - the average number, per block or CI, of FSEs whose lengths are less than the length of smallest segment in the data set</td>
</tr>
<tr>
<td></td>
<td>• Threshold value &amp;3 - the number of FSEs in the data set</td>
</tr>
<tr>
<td></td>
<td>• Threshold value &amp;4 - the number of FSEs that can hold a smallest segment in the data set</td>
</tr>
<tr>
<td></td>
<td>• Threshold value &amp;5 - the number of FSEs that can hold a largest segment in the data set</td>
</tr>
<tr>
<td>Data element (sensor data) values are collected and evaluated against the value of each threshold in the condition expression.</td>
<td>DB_AVG_NUM_FSE for &amp;1</td>
</tr>
<tr>
<td></td>
<td>DB_AVG_NUM_NOREUSE_FSE for &amp;2</td>
</tr>
<tr>
<td></td>
<td>DB_NUM_FSE for &amp;3</td>
</tr>
<tr>
<td></td>
<td>DB_NUM_FSE_MIN for &amp;4</td>
</tr>
<tr>
<td></td>
<td>DB_NUM_FSE_MAX for &amp;5</td>
</tr>
</tbody>
</table>
Table 6. Example policy evaluation process flow (continued)

<table>
<thead>
<tr>
<th>Process flow</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>The rule contains threshold sets that define threshold values for varying</td>
<td>Threshold sets:</td>
</tr>
<tr>
<td>levels of the rule conditions.</td>
<td>LOW</td>
</tr>
<tr>
<td>The example rule contains the three default threshold sets (LOW, MED, HIGH)</td>
<td>&amp;1 = 5</td>
</tr>
<tr>
<td>and two custom threshold sets (IMS3LOW, IMS3HIGH).</td>
<td>&amp;2 = 5</td>
</tr>
<tr>
<td>The rule compares threshold values (expressed in the rule as variables) to</td>
<td>&amp;3 = 2147483648</td>
</tr>
<tr>
<td>stored data element values:</td>
<td>&amp;4 = 2147483648</td>
</tr>
<tr>
<td>&amp;1 = DB_AVG_NUM_FSE</td>
<td>&amp;5 = 2147483648</td>
</tr>
<tr>
<td>&amp;2 = DB_AVG_NUM_NOREUSE_FSE</td>
<td>MED</td>
</tr>
<tr>
<td>&amp;3 = DB_NUM_FSE</td>
<td>&amp;1 = 10</td>
</tr>
<tr>
<td>&amp;4 = DB_NUM_FSE_MIN</td>
<td>&amp;2 = 10</td>
</tr>
<tr>
<td>&amp;5 = DB_NUM_FSE_MAX</td>
<td>&amp;3 = 2147483648</td>
</tr>
<tr>
<td>The value 2147483648 is the never-to-be-reached maximum threshold value. If</td>
<td>&amp;4 = 2147483648</td>
</tr>
<tr>
<td>this (default) value is specified, you can disable the evaluation of the</td>
<td>&amp;5 = 2147483648</td>
</tr>
<tr>
<td>corresponding data element value.</td>
<td>HIGH</td>
</tr>
<tr>
<td>&amp;1 = 20</td>
<td>&amp;1 = 20</td>
</tr>
<tr>
<td>&amp;2 = 20</td>
<td>&amp;2 = 20</td>
</tr>
<tr>
<td>&amp;3 = 2147483648</td>
<td>&amp;3 = 2147483648</td>
</tr>
<tr>
<td>&amp;4 = 2147483648</td>
<td>&amp;4 = 2147483648</td>
</tr>
<tr>
<td>&amp;5 = 2147483648</td>
<td>IMS3LOW</td>
</tr>
<tr>
<td>&amp;1 = 8</td>
<td>&amp;1 = 8</td>
</tr>
<tr>
<td>&amp;2 = 8</td>
<td>&amp;2 = 8</td>
</tr>
<tr>
<td>&amp;3 = 2147483648</td>
<td>&amp;3 = 2147483648</td>
</tr>
<tr>
<td>&amp;4 = 2147483648</td>
<td>&amp;4 = 2147483648</td>
</tr>
<tr>
<td>&amp;5 = 2147483648</td>
<td>IMS3HIGH</td>
</tr>
<tr>
<td>&amp;1 = 25</td>
<td>&amp;1 = 25</td>
</tr>
<tr>
<td>&amp;2 = 25</td>
<td>&amp;2 = 25</td>
</tr>
<tr>
<td>&amp;3 = 2147483648</td>
<td>&amp;3 = 2147483648</td>
</tr>
<tr>
<td>&amp;4 = 2147483648</td>
<td>&amp;4 = 2147483648</td>
</tr>
<tr>
<td>&amp;5 = 2147483648</td>
<td>LOW =&gt; WARNING</td>
</tr>
<tr>
<td>Rule threshold sets are mapped to a maximum of three exception severity</td>
<td>MED =&gt; SEVERE</td>
</tr>
<tr>
<td>levels. Only the selected (mapped) threshold are used in a policy evaluation.</td>
<td>IMS3HIGH =&gt; CRITICAL</td>
</tr>
<tr>
<td>Policy evaluation detects that the threshold set IMS3HIGH was crossed, which</td>
<td>Exception class for ruleIBM.FRAGMENTATION.10 is:</td>
</tr>
<tr>
<td>eventually generates the defined exception in the CRITICAL severity level.</td>
<td>FRAGMENTED_FREE_SPACES</td>
</tr>
</tbody>
</table>
Policy actions are defined for the exception class FRAGMENTED_FREE_SPACES at the policy severity level CRITICAL. The actions include a REORG process and an exception message.

The REORG action recommends to the Smart Reorg utility of IMS Database Reorganization Expert to perform a reorganization (unloading and reloading without DBD change) of the database.

The action process (REORG) is handled by the client tool's function (the parallel reorganization function of the Smart Reorg utility).

The message process (send out exception message to the notification lists specified for the CRITICAL severity level of this rule) is handled by Policy Services.

Once the REORG action completes, the IMS Tool product performs phase two. Based on the results of the REORG process, a summary message is issued that clarifies the results of the REORG. The summary message indicates the degree of improvement that resulted from the REORG action.

Phase 2 policy evaluation for the status of the reorganized database detects no crossing of any threshold set of any rule. Therefore, no exception is returned.

The summary message is sent after the second evaluation phase.

Example scenario for conditional reorganization

Policy Services can monitor a specific database state by evaluating statistical data that is collected by an IMS Tools product, and providing a response to any conditions that exceed the threshold limits specified for this state.

Policy Services provides policy-based database management for members of the IMS Tools product family that are enabled to participate in an autonomic environment. All information is stored in and managed by central repositories that are controlled by IMS Tools Knowledge Base.

IMS Database Reorganization Expert, together with Policy Services, can assist the duties of database administration by providing policy-based conditional database reorganization for the databases that are important to the business.

The conditional reorganization job is similar to a standard IMS Database Reorganization Expert job. The main difference is that the conditional reorganization job, based on user configuration, decides whether to reorganize the database.

With IMS Database Reorganization Expert, you are relieved from researching stored statistics to determine the need for a reorganization. However, you still must request that the conditional reorganization evaluate the appropriate databases within the correct time frame. You must also prioritize the database reorganizations for any limited maintenance windows.

The exception messages for the exceptions detected in the first phase evaluation are suppressed and not sent.

Since no exception is observed after the reorganization action, the following summary message is sent and returned to the Smart Reorg utility:

BBE2900I resource_name IN RECONID=recon_id HAS BEEN REORGANIZED, AND NO EXCEPTIONS WERE DETECTED AFTER THE REORG.
IMS Database Reorganization Expert uses its Smart Reorg utility to coordinate the evaluation of reorganization policies, and to implement an appropriate response to the reaching or exceeding of thresholds that are specified for the sensor data that is collected by the tool.

**Phase 1 sensor data collection, analysis, and evaluation**

1. The Database Administrator submits a Smart Reorg driver job with the option CONDREORG=YES.
2. The driver initializes the conditional reorganization environment.
3. A selected conditional reorganization policy definition is read from the IMS Tools Knowledge Base Input repository.
4. Database statistics (sensor data) that was previously collected by the DB Sensor of IMS Database Reorganization Expert are analyzed.
   
   Database statistics are stored as a set of sensor data records in the IMS Tools Knowledge Base sensor data repository.
   
   The collected statistics are evaluated against the rules that are defined in the policy to detect any exceptions and to determine appropriate actions.

**Action processing (notification and reorganization)**

1. The policy evaluation determines any required action.
   
   Actions can take the form of an exception message sent to the appropriate notification lists, an actual implementation of a process (database reorganization), or both.
   
   The actual notifications are sent in the Report phase.
2. If a database reorganization action (REORG) is required by the policy evaluation, the driver gets a GO signal.
   
   The database is reorganized only when a condition for reorganization is met during policy evaluation.
3. Additional statistics (sensor data) are collected and stored during the reorganization reload.
   
   At this stage, the evaluation of the new data is not performed yet. So you cannot know whether any exception remains or any new exception is detected.

**Phase 2 sensor data analysis and reevaluation**

In this phase, the exceptions that remain even after the reorganization action are detected by the phase 2 evaluation and are notified to the Smart Reorg utility (the client program), but not to you (the user).

**Report phase**

1. In this phase, each of the exceptions that were detected in Phase 2 result in messages sent to the destinations in the notification lists that are related, in the policy, to the rule that generated the exception.
2. The summarized results are delivered to the appropriate notification list as a summary notification message.
3. The summarized results are also stored in the IMS Tools Knowledge Base Output repository as a diagnosis report.
   
   The report contains the result of policy evaluation and provides a comparison of statistics before and after the reorganization.

Refer to the *IMS Database Reorganization Expert for z/OS User’s Guide* for full details on how this IMS Tools product uses Policy Services to perform conditional database reorganization.
Chapter 5. Domains, locales, and environments

Policy Services uses a key sequence of domains, locales, and environment levels to track, retrieve, and process policies, rules, directory entries, and notification lists.

Topics:
- “Domains” on page 43
- “Locales” on page 43
- “Maintenance and operation environments” on page 45
- “Maintenance and operation connections” on page 46
- “Maintenance, operation, and history levels” on page 47
- “Special conditions and best practices for environments” on page 48

Domains

A domain is a descriptive term used by Policy Services to represent one or more IMS Tools products that share the same set of policies and rules that result in performing the same action type.

Every policy belongs to a policy domain. For example, all policies and rules that are used by the Smart Reorg utility of IMS Database Reorganization Expert belong to the REORG policy domain.

A policy domain is not specific to a particular IMS Tools product. Rather, the domain is associated with a specific system management function (such as reorganization, backup, recovery, performance). Currently the REORG and RECOVERY domains are the policy domains that are supported.

Locales

Locale is a descriptive term used to define the IMS environments in which Policy Services is used. The locale designation is used as part of the internal naming of policies, rules, and notification lists.

A Policy Services locale represents an IMSplex that contains one or more IMS systems. A Policy Services locale can also be viewed as a single IMS system that is not defined as an IMSplex.

For each IMS Tools product, the locale definition mechanism can vary. For example, the locale as used and defined by IMS Database Reorganization Expert is defined as a RECON ID, which represents the name of an IMSplex or a DBRC group in an IMSplex.

In the example of IMS Database Reorganization Expert, the RECON data sets for each IMSplex or each DBRC group in each IMSplex are defined to IMS Tools Knowledge Base through the user interface and are stored in the repository.

An internal ID is generated by IMS Tools Knowledge Base for each user-defined external ID. The external ID is the locale used by the ISPF user interfaces for the IMS Tools product and Policy Services.

The locale (external ID) can be changed using the IMS Tools Knowledge Base user interface. However, the locale’s internal ID always remains the same.

Global locale

A global Policy Services locale definition (BSNGLOBL) is also automatically defined by IMS Tools Knowledge Base and becomes the default locale for Policy Services.

BSNGLOBL is the generic locale value that works for all IMSplex-specific locales if a policy that is requested does not exist for the locale the IMS Tools product is requesting.
All policies and rules are initially installed at the BSNGLOBL locale and therefore become valid for any IMSplex-specific locale with the following conditions:

- BSNGLOBL policies can only contain rules templates and notification lists from the global locale.
- Locale-specific policies can contain rule templates and notification lists from both the same locale-specific locale and the global locale.

For example, a policy for locale RECONA can reference rules and notification lists from RECONA and/or BSNGLOBL, but not from any other locale such as RECONB.

**Policy evaluation and locales**

The locale name is part of a key sequence (along with domain and environment level) used by Policy Services to retrieve policies, rules, directory entries, and notification lists. For example:

```
DOMAIN.ENVIRONMENT-LEVEL.LOCALE.POLICY-NAME
DOMAIN.ENVIRONMENT-LEVEL.LOCALE.RULE-NAME
DOMAIN.ENVIRONMENT-LEVEL.LOCALE.RULE-NAME/THRESHOLD
ENVIRONMENT-LEVEL.LOCALE.NOTIFICATION-LIST-NAME
ENVIRONMENT-LEVEL.LOCALE.DIRECTORY-NAME/DESTINATION-TYPE
```

When an IMS Tools product requires a policy to perform an evaluation, a request goes out for a policy template or stream (for example, POLICY1). Policy Services supplies the remaining information using the following key sequence:

- Domain (for example, REORG)
- Environment level (for example, 00000002)
- Locale (for example, MYRECON1)

For POLICY1 example, the first request occurs for the following key sequence:

```
REORG.00000002.MYRECON1.POLICY1
```

If the locale-specific policy is not found, a second attempt is made to retrieve it from the global locale:

```
REORG.00000002.BSNGLOBL.POLICY1
```

If that policy does not exist, then there is no policy (POLICY1) available (defined) to be used by IMS Database Reorganization Expert for locale MYRECON1 and operation Environment 00000002.

**Usage notes for locales**

- Policy templates are defined and maintained for specific or global locales.
  - Policy templates can be copied from one locale to the other.
  - Policy streams can be exported and imported into and out of the specific or global locale.
  - User policy templates can be imported into the specific or global locale.
  - IBM distributed policy templates (IBM.*) can only be imported into the global locale. The user can then copy the policies to other locales when required.
- Rule templates are defined and maintained in specific or global locales.
  - Rule templates can be copied from one locale to the other.
  - Rule templates can be imported and exported into and out of the specific or global locale.
  - IBM distributed rule templates can only be imported into the global locale. The user can then copy the rules to other locales when required.
- Notification lists are defined and maintained in specific or global locales.
  - Notification lists can be imported and exported into and out of specific or global locales.
  - Notification lists are defined and maintained in specific or global locales.
Maintenance and operation environments

There are two type of environments supported by Policy Services: maintenance and operation.

Maintenance updates and import actions can have broad impacts on the policy environment because the environment is destabilized until all customizations are completed.

To prevent impacting the operation environment where policy evaluations take place, disruptive changes to the Policy Services configuration should be performed in a maintenance environment. Changes that are made to the maintenance environment have no impact on the current operation environment.

This approach allows you to complete the changes in an isolated environment. When the changed environment is validated, the changed maintenance environment can be promoted to become the new operation environment.

The operation environment is available to any participating IMS Tools product to perform the evaluation of sensor data for a given policy request made by the IMS Tools product.

The multi-environment approach allows some degree of deployment control, allows backing out capabilities, and allows you to regress to any past saved (history) operation environment.

Maintenance environment

The maintenance environment is available through the Policy Services ISPF user interface and provides Policy Services clients with the following service functions to manage policies and rules:

- Create:
  - Policies
  - Notification lists
- View:
  - Policies
  - Rules
  - Notification lists
- Update:
  - Policies
  - Rules
  - Notification lists
- Export Policy Services objects
- Import Policy Services objects

Operation environment

The operation environment is available through the Policy Services ISPF user interface and provides Policy Services clients with the following service functions to manage policies and rules:

- Create:
  - Policies
  - Notification lists
- View:
  - Policies
  - Rules
  - Notification lists
- Update:
Policies
Rules
Notification lists
- Export Policy Services objects
- Import:
  - Policy streams
  - Notification lists

The operation environment is the only environment that is available to the IMS Tools product through the Policy Services API to provide policy evaluation functions.

### Maintenance and operation connections

There are three types of connections that can be made between Policy Services and Policy Services clients.

#### IMS Tools client to Policy Services operation environment connection

The non-TSO operation environment connection type (from the IMS Tool Policy Services client to Policy Services itself) provides the Policy Services client with the following capabilities:
- Evaluate the rules defined in the policy name that is passed to Policy Services by the client
- Use the sensor data that is passed to Policy Services by the client

#### Policy Services operation environment connection

The TSO operation environment connection type (ISPF user interface) has the following capabilities:
- Connect a user to an existing operation environment
- Connect a new user to an existing operation environment

The TSO operation environment connection type (ISPF user interface) can perform the following functions to the operation environment level:
- View Policy Services operation environment level items in the repository
- Create policies and notification lists
- Update Policy Services operation environment level items in the repository for immediate use
- Export from the Policy Services operation environment level items from the repository
- Import into the Policy Services operation environment level policy streams into the repository for immediate use
- Import into the Policy Services operation environment level policy notification lists into the repository for immediate use
- Promote a maintenance environment to an operation environment
- Promote a history level to an operation environment

#### Policy Services maintenance environment connection

The TSO maintenance environment connection type (ISPF user interface) has the following capabilities:
- Connect a user to an existing maintenance environment
- Connect a new user to an existing maintenance environment

The TSO maintenance environment connection (ISPF user interface) type can perform the following functions to the maintenance environment level:
- Perform the initial installation of predefined IBM policies and rules
• Create and view policies and notification lists
• Apply predefined IBM policies and rule maintenance
• Update Policy Services maintenance level items in the repository
• Export from the Policy Services maintenance level items from the repository
• Import into the Policy Services maintenance level items into the repository for future use
• Promote a maintenance environment to an operation environment

**Maintenance, operation, and history levels**

Policy Services objects in the repository belong to one of three different levels: maintenance, operation, and history.

**Maintenance level**

Only one maintenance environment level can exist at any time for all domains that are supported by Policy Services. There can be multiple logons to this maintenance environment.

The purpose of the maintenance environment level is to store Policy Services objects while providing the following functions:

• Initial installation of predefined IBM rules and policies
• Installation of IBM service to existing rules and/or policies
• Installation of IBM service to add new rules and/or policies
• Deletion of rules and/or policies using the installation of IBM service
• User updates to existing rules and/or polices
• User addition of customer defined policies
• User creation of notification lists
• User updates to existing notification lists

**Operation level**

Only one operation environment level can exist at any time for each domain that is supported by Policy Services. There can be multiple logons to this operation environment.

The purpose of the operation environment level is to provide the following functions:

• Evaluation function to IMS Tools
• User updates to existing rules and/or polices
• User creation of customer defined policies
• User creation of notification lists
• User updates to existing notification lists
• User Imports of policy streams and/or notification lists

**History levels**

History levels are previous operation environment levels that have been archived after being replaced by a promoted maintenance environment.

0 to n history levels can exist at any time for each domain that is supported by Policy Services.

Each history level is created by the following sequence:

1. An existing maintenance environment (level 0000001) is promoted to an operation environment (level 0000002)
2. A new maintenance environment (level 0000003) is created
3. The new maintenance environment (level 0000003) is promoted to an operation environment (level 0000004)
4. The former operation environment (level 0000002) is now made to be a history level (level 0000002)
Any history level can be promoted to an operation environment for the following reasons:
• Return to some prior history level to determine how a particular policy worked
• Back up to the most recent history level (which would have been the previous operation level) because of an error occurring in the current operation level

### Special conditions and best practices for environments

The following topics describe special conditions and best practices for managing maintenance and operation environments.

Only one operation environment per domain and one maintenance environment for all domains can exist at a time.

#### Initial conditions for a newly installed system

In an initial installation of a Policy Services system, there are no existing environments.

The following sequence describes the actions taken for an initial installation of a Policy Services system:
• From an IMS Tools connection such as IMS Reorganization Expert, all calls fail.
• From a TSO connection, the ISPF setup dialog forces you to create an initial maintenance environment:
  1. Select a policy domain from the list of supported domains.
  2. Select the option to create a new maintenance environment (which is an empty or null maintenance environment) for the selected domain.
  3. Install the policies and rules.
  4. The IBM policies are copied to SYS policies automatically as part of the maintenance installation process.
  5. Create appropriate notification lists to receive messages of conditions met.
  6. Update the policies and rules as necessary.
  7. Add any new policies.
• This initial maintenance environment for the selected domain can now be promoted to create the first operation environment.

#### Selecting the operation environment

The operation environment always comes from the promotion of a maintenance environment or a history level (if no maintenance environment exists).

The following special conditions apply when you select the operation environment from the Policy Services user interface:

**An operation environment does not exist, and a maintenance environment does not exist**

You must create an initial maintenance environment.

This initial maintenance environment can then be promoted to create the first operation environment.

**An operation environment exists, and a maintenance environment exists**

Any changes that you make to Policy Services items in this operation environment is not reflected in the maintenance environment.

Because the maintenance environment can be promoted to a new operation environment, it can be advantageous for the maintenance environment to be based on the current operation environment.
Always ensure that any changes made to Policy Services items in the operation environment are also made to the maintenance environment.

**An operation environment exists, and a maintenance environment does not exist**

If a maintenance environment is created from this operation environment before you have completed making changes to the operation environment, the remaining changes are not reflected in the newly created maintenance environment.

Because the maintenance environment can be promoted to a new operation environment, it can be advantageous for the maintenance environment to be based on the current operation environment.

Always ensure that any changes made to Policy Services items in the operation environment are also made to the maintenance environment.

**Creating a null maintenance environment**

The following special conditions apply when you create a new null maintenance environment:

- A null maintenance environment contains no objects in the repository.
- You must create a null environment for the initial installation of Policy Services.
- You might want to create a null environment into which you would import a copy of a newly created operation environment from a central location.

**Creating a maintenance environment from operation**

The following special conditions apply when you create a new maintenance environment from an operation environment:

- If a maintenance environment is created from the operation environment, ensure that any updates being made to the operation environment are completed before creating the new maintenance environment.
- Because the maintenance environment can be promoted to a new operation environment, it can be advantageous for the maintenance environment to be based on the current operation environment.

**Creating a maintenance environment from a history level**

The following special conditions apply when you create a new maintenance environment from a history level:

- All updates to policies and rules that occurred between a history level and the current operation environment are not captured.
- All notification lists required by the history level and operation environment are merged to reflect the most current notification list.

**Promoting a maintenance environment to operation**

The Promote action converts the maintenance environment into a new operation environment, replacing the current operation environment. The operation environment being replaced becomes archived as a history level.

The Promote action can be made from either an operation environment or a maintenance environment.

**The Promote action is made from the maintenance environment**

Ensure that all changes to the maintenance environment are completed before you promote the maintenance environment.

When the maintenance environment (level 0000000n) is successfully promoted, your connection is changed from the maintenance environment (level 0000000n) to the new operation environment (level 0000000n+1).
The Promote action is made from the operation environment

Ensure that all changes to the maintenance environment are completed before you promote the maintenance environment.

When the maintenance environment (level 0000000n) is successfully promoted, your connection remains in an operation environment. However, your current operation environment level (level 0000000r) is changed to a new operation environment level (level 0000000n+1).

- Prior to the Promote action, all changes to Policy Services items are stored in the operation environment you are working in (level 0000000r).
- After the Promote action, that operation environment is archived as a history level (level 0000000r).
- If the changes made to the operation environment (level 0000000r) are not also made in the maintenance environment (level 0000000n), the new operation environment (level 0000000n+1) does not contain those changes.

Always ensure that any changes made to Policy Services items in the operation environment are also made to the maintenance environment.

Promoting a history level environment

The action of promoting a history level to an operation environment is only valid when the Promote action is requested from an operation environment connection, and no maintenance environment exists.

When the history environment (level 0000000n) is successfully promoted, your connection remains in an operation environment. However, your current operation environment level (level 0000000r) is changed to a new operation environment level (level 0000000n).

Prior to the Promote action, all changes to Policy Services items are stored in the operation level you are working in (level 0000000r).

After the Promote action, that operation environment is archived as a history level (level 0000000r).

Changes made to the former operation environment (level 0000000r) are not reflected in the new operation environment (level 0000000n).

Additional changes to Policy Services items are reflected only in the new current operation environment (level 0000000n).
Part 2. Configuring Policy Services

Information about configuring Policy Services and other IBM Tools Base components for IMS is provided in IBM Tools Base for z/OS Configuration for IMS.

You can also download a PDF version of this information from the IMS Tools Product Documentation page.
Part 3. Using Policy Services

The topics in this section provide detailed information on using Policy Services.

Note: The TSO split screen is not supported by Policy Services.

Topics:

- Chapter 6, “Starting the Policy Services user interface,” on page 55
- Chapter 7, “Copying rules,” on page 57
- Chapter 8, “Customizing BSNGLOBL or locale-specific rules,” on page 61
- Chapter 9, “Modifying rule thresholds,” on page 65
- Chapter 10, “Defining custom rule threshold values for individual databases,” on page 69
- Chapter 11, “Managing notification lists and directory entries,” on page 75
- Chapter 12, “Modifying policy actions,” on page 91
- Chapter 13, “Creating a new policy from executable BSNGLOBL policy and copying to a new locale,” on page 95
- Chapter 14, “Creating a new policy,” on page 97
- Chapter 15, “Promoting a maintenance environment to an operation environment,” on page 101
- Chapter 16, “Creating a new maintenance environment,” on page 105
- Chapter 17, “Guidelines for exporting and importing,” on page 109
Chapter 6. Starting the Policy Services user interface

To perform an initial installation of a domain, you must first start the Policy Services user interface.

**Procedure**

1. In the ISPF Primary Option Menu panel, select option 6 (Command).

   The ISPF Command Shell is displayed.

2. Invoke the Policy Services client interface by using one of the following methods:
   - To access Policy Services from the Tools Base for z/OS main menu, enter the following command:

     ```
     EX 'hlq.SHKTCEXE(HKTAPPL)' 'HLQ(hlq)'
     ```

     Substitute the `hlq` variable with the installation data set high level qualifier.

     After you submit the command, the Tools Base for z/OS main menu appears. Select option 2 **Policy Services** and press Enter.
   - To access Policy Services directly, enter the following command:

     ```
     EX 'hlq.SHKTCEXE(BSNZPRIM)' 'HLQ(hlq)'
     ```

     Substitute the `hlq` variable with the installation data set high level qualifier.

     The Policy Services user interface starts, and the Policy Services Setup: Select XCF Group Name panel is displayed.

     ![Image of Policy Services Setup: Select XCF Group Name panel]

     **Figure 10. Policy Services Setup: Select XCF Group Name panel**
Chapter 7. Copying rules

You can copy IBM. rules to your own locale.

About this task
You can copy IBM. and optionally customize the rules to apply appropriately to your environment. The copy and customize tasks can be performed as part of the initial Policy Services setup, or the tasks can be performed at a later time.

The rule threshold values can be modified.

The Manage Rules panel lists all IBM. rules and all locale-specific rules (copied from the BSNGLOBL rule template).

Because rules can be copied and modified, you must be aware of the following possible copy and modify combinations:

Scenario 1: Modify an IBM. rule now, and then copy the rule to a new locale (or locales)
In this scenario, you can modify the IBM. version of the rule threshold values.

You then copy this modified version to one or more locales.

This is generally the most logical scenario to follow.

From the Manage Rules panel, you perform the following row actions in this order:
1. S - Select rule to customize
2. C - Copy IBM.xxxxx rule (to another locale)

Scenario 2: Copy an IBM. rule to a new locale (or locales), and then modify the copied rule now
In this scenario, you copy the IBM. rule from BSNGLOBL to one or more locales and then modify the copied version of the rule threshold values.

The danger of this scenario is that the rule template remaining in the BSNGLOBL locale is now different from the modified version of the rule in the new locale.

From the Manage Rules panel, you perform the following row actions in this order:
1. C - Copy IBM. xxxx rule (to another locale)
2. S - Select rule to customize

Scenario 3: Copy an IBM. rule to a new locale (or locales) now, and modify the copied rule later or not at all
In this scenario, you copy the IBM. rule from BSNGLOBL to one or more locales, but you modify the copied version of the rule at a later date, or not at all.

From the Manage Rules panel, you perform the following row action:
1. C - Copy IBM.xxxxx rule (to another locale)

Scenario 4: Modify the original IBM. version of the rule now, and do not copy the rule to any locale (or locales)
In this scenario, you modify the IBM. rule in the BSNGLOBL locale, but you do not copy the rule to a new locale (or locales). The rule template is now modified and ready for copying at a later time.

From the Manage Rules panel, you perform the following row action:
1. S - Select rule to customize

Scenario 5: Copy the IBM. rule to a new locale (or locales) later, and modify the copied rule later
In this scenario, you copy the IBM. rule in the BSNGLOBL locale at a later date. Additionally, you modify the copied rule at a later date.
**Remember:** All Policy Services user interface panels provide field-specific and panel-specific help information when you press Help (PF1).

**Procedure**

To modify an IBM rule now, and then copy the rule to a new locale (scenario 1), complete the following steps:

1. In the Policy Services Main Menu: Maintenance panel, select option 6 - Maintenance management, and press Enter.
   
The Maintenance Management panel is displayed.

2. Select option 2 - Customize rule templates, and press Enter.
   
The Customize Rule Template panel is displayed.

```
Figure 11. Customize Rule Template panel
```

3. Type the **S** row action (Select rule to customize) on the rule that you want to modify (for example, IBM.AVG_DBREC_LEN.10), and press Enter.

   The View/Update Rule panel is displayed.

```
Help
-----------------------------------------------
REORG/MAINTENANCE    Customize Rule Template    Row 1 to 3 of 3
-----------------------------------------------
Command =>

Type a row action, then press Enter.
A: Row Action: C - Copy IBM. rule
    F - Mark as customized
    L - List policies for rule
    M - View rule in maint env.
    O - View rule in orig. env.
    R - List of cloned rules
    S - Select rule to customize
    V - View maintenance info

A Rule Name          Installed   Customized   Copied
IBM.AVG_DBREC_LEN.10 INSTALLED
IBM.CICA_SPLITS.10   INSTALLED
IBM.DBDS_EXTENTS.10  INSTALLED
IBM.DBDS_GROWTH.10   INSTALLED
IBM.DBDS_GROWTH.20   INSTALLED
IBM.DBDS_GROWTH.30   INSTALLED
IBM.DEDB_DBREC_IO.10 INSTALLED
IBM.DEDB_DBREC_IO.20 INSTALLED
IBM.DEDB_DBREC_CNT.10 INSTALLED
IBM.DEDB_FS.10       INSTALLED
IBM.DEDB_FS.20       INSTALLED

```

```
Figure 11. Customize Rule Template panel
```

4. Type the **U** row action (Update) on a threshold set row (for example, LOW), and press Enter.

   The Update/Add Threshold Value Set panel is displayed.
5. Note in the Description column the valid range allowed for the threshold you want to change. Type the new threshold value, and press Enter.

6. When you have completed all modifications to this rule, press Enter.

A Confirmation window is displayed.

Confirmation

Confirm you want to commit the changes.

Do you want to commit all changes for rule: IBM.AVG_DBREC_LEN.10

Y (Y/N)

7. Type Y (Yes) to commit all changes that you made to this rule, and press Enter.

The Manage Rules panel is displayed.

8. Type the C row action (Copy IBM. rule) on the row of the first rule you want to copy (for example, IBM.AVG_DBREC_LEN.10), and press Enter.

The Locales in Current Environment panel is displayed.

Figure 12. Locales in Current Environment panel

All listed locales were established during the Policy Services post-installation process using the IMS Tools Knowledge Base user/administration interface.

9. Type the S row action (Select locale) on the row of the appropriate locale (or locales), and press Enter.

You can also type ALL in the command line to select all listed locales.

The Customize Rule Template panel is displayed again.

The Copied column is updated to indicate that the rule has been copied to your locale (COPIED).
A message is also displayed to indicate the success of the task:

```
Rule IBM.AVG_DBREC_LEN.10 copied to new locale(s)
```

<table>
<thead>
<tr>
<th>Rule Name</th>
<th>Installed</th>
<th>Customized</th>
<th>Copied</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>INSTALLED</td>
<td></td>
<td>COPIED</td>
</tr>
<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>INSTALLED</td>
<td></td>
<td>COPIED</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>INSTALLED</td>
<td></td>
<td>COPIED</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.10</td>
<td>INSTALLED</td>
<td></td>
<td>COPIED</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>INSTALLED</td>
<td></td>
<td>COPIED</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>INSTALLED</td>
<td></td>
<td>COPIED</td>
</tr>
<tr>
<td>IBM.DEDB_DBREC_IO.10</td>
<td>INSTALLED</td>
<td></td>
<td>COPIED</td>
</tr>
<tr>
<td>IBM.DEDB_DBREC_IO.20</td>
<td>INSTALLED</td>
<td></td>
<td>COPIED</td>
</tr>
<tr>
<td>IBM.DEDB_DBRECCNT.10</td>
<td>INSTALLED</td>
<td></td>
<td>COPIED</td>
</tr>
<tr>
<td>IBM.DEDB_FS.10</td>
<td>INSTALLED</td>
<td></td>
<td>COPIED</td>
</tr>
<tr>
<td>IBM.DEDB_FS.20</td>
<td>INSTALLED</td>
<td></td>
<td>COPIED</td>
</tr>
</tbody>
</table>

**Figure 13. Customize Rule Template panel**

10. Repeat the copy procedure for each remaining rule you want to copy. You can only perform this task one rule at a time.

11. Press End (PF3).

   The Maintenance Management is displayed.

12. Press End (PF3).

   The Policy Services Main Menu: Maintenance is displayed.
Chapter 8. Customizing BSNGLOB or locale-specific rules

You can modify and copy IBM. rules to your own locale.

**About this task**

You can copy IBM. rules and customize the rules to apply appropriately to your environment. The copy and customize tasks can be performed now as part of the Policy Services setup, or the tasks can be performed at a later time.

The following rule threshold values can be modified.

The Manage Rules panel lists all IBM. rules and all locale-specific rules (copied from the BSNGLOB rule template).

Because rules can be copied and modified, you must be aware of the following copy and modify combinations:

**Scenario 1: Modify an IBM. rule now, and then copy the rule to a new locale (or locales)**

In this scenario, you can modify the IBM. rule threshold values in BSNGLOB.

You then copy this modified version to one or more locales.

This is generally the most logical scenario to follow.

From the Manage Rules panel, you perform the following row actions in this order:

1. S - Select rule to customize
2. C - Copy IBM. xxxx rule (to another locale)

**Scenario 2: Copy an IBM. rule to a new locale (or locales), and then modify the copied rule now**

In this scenario, you copy the IBM. rule from BSNGLOB to one or more locales and then modify the copied version of the rule threshold values.

The danger of this scenario is that the rule template remaining in the BSNGLOB locale is now different from the modified version of the rule in the new locale.

From the Manage Rules panel, you perform the following row actions in this order:

1. C - Copy IBM. xxxx rule (to another locale)
2. S - Select rule to customize

**Scenario 3: Copy an IBM. rule to a new locale (or locales) now, and modify the copied rule later or not at all**

In this scenario, you copy the IBM. rule from BSNGLOB to one ore more locales, but you modify the copied version of the rule at a later date, or not at all.

From the Manage Rules panel, you perform the following row action:

1. C - Copy IBM. xxxx rule (to another locale)

**Scenario 4: Modify the original IBM. version of the rule now, and do not copy the rule to any locale (or locales)**

In this scenario, you modify the IBM. rule in the BSNGLOB locale, but you do not copy the rule to a new locale (or locales). The rule template is now modified and ready for copying at a later time.

From the Manage Rules panel, you perform the following row action:

1. S - Select rule to customize
**Scenario 5: Copy the IBM. rule to a new locale (or locales) later, and modify the copied rule later**

In this scenario, you copy the IBM. rule in the BSNGLOBL locale at a later date. Additionally, you modify the copied rule at a later date.

**Remember:** All Policy Services user interface panels provide field-specific and panel-specific help information when you press Help (PF1).

**Procedure**

To modify a BSNGLOBL or locale-specific IBM. rule now, complete the following steps:

1. In the Policy Services Main Menu: Maintenance panel, select option 2 - Rules management, and press Enter.

   The Manage Rules panel is displayed.

   **Figure 14. Manage Rules panel**

2. Type the V row action (View rule details and optionally update them) on the rule you want to modify, and press Enter.

   The View/Update Rule panel is displayed.

   **Figure 15. View/Update Rule panel**
3. You can modify the rule thresholds, one at a time, by typing the U row action (Update) on the threshold row.

   You can exit this panel without saving changes by pressing PF3 and responding to the Confirmation prompt.

4. To save all changes made to this rule, press Enter.

   A Confirmation window is displayed.

   ![Confirmation window]

   **Figure 16. Confirmation window**

5. Type Y (Yes) and press Enter.

   The Manage Rules panel is displayed.

6. Press PF3 to return to the Policy Services Main Menu: Maintenance panel.
Chapter 9. Modifying rule thresholds

You can modify the numerical values for the LOW, MED, HIGH threshold sets.

About this task

Policies depend on the condition and exception expressions provided by rules in order to evaluate the state of a database. The condition expression refers to one or more threshold values that indicate the boundary, or limit, for the database state.

The following rule attributes can be modified:

- Rule threshold values

Remember: All Policy Services user interface panels provide field-specific and panel-specific help information when you press Help (PF1).

Procedure

To modify threshold range settings, complete the following steps:

1. In the Policy Services Main Menu: Maintenance panel, select option 2 - Rules management, and press Enter.

   The Manage Rules panel is displayed.

   Figure 17. Manage Rules panel

   2. Type the V row action (View rule details and optionally update them) on the rule you want to modify, and press Enter.

      The View/Update Rule panel is displayed.
View rule details and optionally update threshold settings. Press End to exit.

locale . . . : BSNGLOBL  rule name . . : IBM.AVG_DBREC_LEN.10
description : simple rule on the average length of database records
average length of database records

resource types:
HDAM HIDAM PHDAM PHIDAM HISAM SHISAM
message: the average length of database records in %resource% has reached
or exceeded a threshold

threshold value set.
A: row Actions: V - display  U - update  D - delete  A - add  F - view formula
A threshold
- low
- med
- high
- mylow
- mymed
- myhigh

Figure 18. View/Update Rule panel
3. Type the F row action (view formula) on a threshold set row (for example, LOW) to view the condition description for this rule, and press enter.

The Evaluation Formula Description (Rule Condition Description) panel is displayed.

rule name . . . . . : IBM.RANDOMIZING.10   locale . . : MYRECON3
value set for threshold : LOW
&1=20, &2=20,

evaluation formula description
specify thresholds on the percentage of unused root anchor points (DB_PCT_NUM_UNUSED_RAP) and the percentage of root segments on synonym chains (DB_PCT_NUM_SYNONYM).
- DB_PCT_NUM_UNUSED_RAP: &1(20)
- DB_PCT_NUM_SYNONYM : &2(20)

An exception is issued if both of these thresholds are reached or exceeded. This condition indicates imbalanced randomizing.

You can apply this rule to an HDAM database or a PHDAM partition.

Figure 19. Evaluation Formula Description (Rule Condition Description) panel
4. Press End (PF3) to return to the View/Update Rule panel.
5. Type the U row action (update) on a threshold set row (for example, LOW), and press enter.

The Update/Add Threshold Value Set panel is displayed.
Update the threshold values and press Enter to commit the updates. Acceptable range for each threshold value is shown in the Description field. Press Cancel to remove all updates and exit. Use the Commands menu to display the rule evaluation formula.

Locale : MYRECON3  Rule name : IBM.RANDOMIZING.10
Value set for threshold : LOW
ID#     Value                             Description
&1  20            Numeric, range: 0 to 100
Data element name: DB_PCT_NUM_UNUSED_RAP
The percentage of unused root anchor points compared to the total root anchor points.
&2  20            Numeric, range: 0 to 100
Data element name: DB_PCT_NUM_SYNONYM
The percentage of synonyms compared to the total number of root segment occurrences.

Figure 20. Update/Add Threshold Value Set panel
6. Note in the Description column the valid range allowed for the threshold you want to change. Type the new threshold value, and press Enter.

A Confirmation window is displayed.

Command ===> Confirm you want to commit the changes.

Do you want to commit all changes for rule: IBM.RANDOMIZING.10

Y (Y/N)

Figure 21. Confirmation window
7. Type Y (Yes) to commit all changes made to this rule, and press Enter.

The Manage Rules panel is displayed.

8. Press End (PF3).

The Policy Services Main Menu: Maintenance is displayed.
Chapter 10. Defining custom rule threshold values for individual databases

In an environment of multiple databases, you can create a separate policy for each database, and then assign unique custom threshold values for a rule that is shared by those policies.

About this task
To specify custom threshold values for a rule that is used by multiple database policies:
1. Create separate policies for each database.
2. Create separate unique threshold values for the rule.
3. For each policy, specify the threshold values from the shared rule that are appropriate for that database.

You can add up to 20 threshold values for each rule.

The following figure shows how policies can use different threshold values from the same rule:

![Figure 22. Specifying custom rule threshold values](image)

Procedure
To specify different threshold values for each database, complete the following steps:
1. From the Policy Services Main Menu, select option 2 (Rules management), and press Enter.
   
   The Manage Rules panel is displayed.

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2. Type the V (View) row action to select a rule that you want to add new thresholds to, and press Enter.

   The View/Update Rule panel is displayed.

3. Type the A (Add) row action to add a new threshold, and press Enter.

   The Select new threshold name window is displayed.

4. Type a new threshold name (up to 12 characters), and press Enter.

   The Update/Add Threshold Value Set panel is displayed.

   The valid range allowed for the threshold you want to change is shown in the Description column.

5. Type the new threshold value, and press Enter.

   You return to the View/Update Rule panel.

6. Confirm that the new threshold is added to the Threshold value set field.
Figure 25. View/Update Rule panel

7. Repeat step 3 to step 6 until all required thresholds are created.

Figure 26. View/Update Rule panel

8. When you have completed adding thresholds to this rule, press Enter.

The Confirmation window is displayed.
Figure 27. Confirmation panel

9. Type Y (Yes) to commit all changes that you made to this rule, and press Enter.

   The Manage Rules panel is displayed.

10. Press End (PF3) to return to the Policy Services Main Menu.

11. Select option 1 - Policies management, and press Enter.

   The Policies Management panel is displayed.

12. Refer to one of the following topics to create a new policy that uses the new thresholds created in the previous steps

   - Chapter 13, “Creating a new policy from executable BSNGLOBL policy and copying to a new locale,” on page 95

     Specify the new thresholds in step “9” on page 96.

   - Chapter 14, “Creating a new policy,” on page 97

     Specify the new thresholds in step “10” on page 98.
Select a threshold and press Enter to be prompted to choose an action-level to be used when the rule condition evaluates to true. When finished press Enter to choose rule-threshold notification lists. Press End to eliminate all threshold selections.

Locale: BSNGLOBL  Policy name: NEW.HDAM1  
Locale: BSNGLOBL  Rule name: IBM.HDAM_OVERFLOW.10  
Description: Percent of segment data overflow

A: Row Actions: S - Select Threshold   U - Unselect  
Status: S - Selected   O - Part of original policy. (Update only)

<table>
<thead>
<tr>
<th>Threshold</th>
<th>Action</th>
<th>Level</th>
<th>Onmissing</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIGH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S NEW1</td>
<td>MESSAGE</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>S NEW2</td>
<td>MESSAGE</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>S NEW3</td>
<td>MESSAGE</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

Figure 28. Select Thresholds and Actions panel
Chapter 11. Managing notification lists and directory entries

Directory entries and notification lists are used by Policy Services to define users who can receive exception notifications and summary messages that are sent out to warn or report on results of policy evaluations.

Topics:
- “Notification lists and directory entries overview” on page 75
- “Creating directory entries” on page 76
- “Modifying directory entries” on page 82
- “Creating notification lists” on page 83
- “Modifying notification lists” on page 85
- “Viewing and modifying the SMTP variables for email and texting” on page 86
- “Notifying users of phase 1 exception messages” on page 88

Notification lists and directory entries overview

Directory entries and notification lists are used by Policy Services to define users who can receive exception notifications and summary messages that are sent out to warn or report on results of policy evaluations.

About directory entries

A single directory entry defines a name of a user, the connection type (such as WTO or TSO), and all connection specifications that are required to deliver a message to that user. You use the Policy Services user interface to define directory entries.

Directory entries are used to populate one or more notification lists. Notification lists are used by a policy when a rule exception occurs and the resulting action requires that a warning message or a summary message be sent to appropriate users, as defined by the notification list mechanism.

Policy Services supports two directory entry types:
- WTO
- USER

The WTO directory entry contains the following information fields:
- Short name
- Long name
- Description
- Delivery type:
  - WTO

The USER directory entry contains the following information fields:
- Short name
- Long name
- Description
- Delivery type:
  - TSO
About notification lists

A notification list is a mechanism for grouping users into a list that represents a unique business category, such as all DBAs, or all users who represent an installation application area or a set of databases associated with a given application or location.

The notification list is created by including the directory entry short names of the users who are appropriate for the required notification category. Notification lists can contain both directory entries and other notification lists.

The short name used in a notification list maps to the directory entry of that user. The directory entry contains the information (for example, TSO or email address) necessary to deliver messages. You use the Policy Services user interface to define lists that include one or more directory entries.

A policy and each rule in the policy can refer to one or more notification lists. The directory entries contain the information such as user name, destination type, destination address, and description.

It is important that you follow a logical naming convention that distinguishes directory entries from notifications lists. This naming convention should allow ease of use and maintenance. All directory entry names and notification list names must be unique.

Creating directory entries

Directory entries and notification lists are used by Policy Services to define users who can receive exception notifications and summary messages that are sent out to warn or report on results of policy evaluations.

In this topic:

• “Creating a WTO directory entry” on page 76
• “Creating a USER directory entry” on page 79

Creating a WTO directory entry

You can create a WTO directory entry that defines the name of a user, the connection type (WTO), and all connection specifications that are required to deliver a message to that user.

Procedure

To create a WTO directory entry:

1. From the Policy Services Main Menu: Maintenance panel, select option 3 - Notification lists, directory entries management, and press Enter.

The Notification Lists, Directory Entries Management panel is displayed.
Select an option, and press Enter.

1 - Create directory entry
2 - Manage directory entries
3 - Create a new notification list
4 - Manage notification lists
5 - View/Update SMTP variables for e-mail/texting
6 - View/Update TSO JCL job card for TSO-send

Figure 29. Notification Lists, Directory Entries Management panel

2. Select option 1 - Create directory entry, and press Enter.

The Choose Directory Entry Type panel is displayed.

Choose Directory Entry Type panel
Option ===>
Select a Directory entry type.
1 - Create directory entry of type WTO
2 - Create directory entry of type USER

Figure 30. Choose Directory Entry Type panel

3. Select option 1 - Create directory entry of type WTO and press Enter.

The Create a WTO Directory Entry panel is displayed.

Create a WTO Directory Entry panel
Command ===>
Select short and long name. Press Enter to commit the entries. Press End to cancel all entries.
Short name . . user1
Long name . . user1

The following entry is optional:
Description
DBA

Figure 31. Create a WTO Directory Entry panel

4. Specify a short name, long name, and description (optional) and press Enter.

The Create WTO Delivery Type panel is displayed.
5. Optional: Specify the WTO delivery type options and press Enter.

CONSID/CONSNAME
Specify the console ID (CONSID) or console name (CONSNAME) used to route messages. Console IDs must be 4 characters. Characters are alphanumeric only; no special characters allowed. Console names must be from two to eight characters and cannot start with a digit. Characters are alphanumeric and can also include the characters #, $, and @.

WTO delivery options

Routing Codes
The routing codes determine which console or consoles receive the message. Each code represents a predetermined subset of the consoles that are attached to the system, and that are able to display the message.

The installation must define to the system which routing codes are being received by each console.

The appropriate routing codes delivery option must then be set for the defined destination entry if the WTO is to be routed to additional devices.

- Routing1: Provide location routing code (optional)
- Routing2: Provide location routing code (optional)

Descriptor code (default=5) (optional)
Use descriptor code 5, rather than MCSFLAG, to indicate a command response.

Key (optional)
For the convenience of the operator, you can associate messages with individual key names.

A key name consists of one to eight alphanumeric characters, and it accompanies the message on the console.

The key name can be used as an operand in the DISPLAY R console command, which operators can issue at the console.

WTO address type
Specify the address type to route messages to:

- 1. Consid - Route messages by console ID.
- 2. Consname - Route messages by console name.

If the CONSID or CONSNAME is specified and the routing codes are specified, the message or messages are sent to all the consoles that are specified by both sets of parameters.

6. Press PF3 until you return to the Policy Services Main Menu: Maintenance panel.
Creating a USER directory entry

You can create a USER directory entry that defines the name of a user, the connection type (email, text message, or TSO), and all connection specifications that are required to deliver a message to that user.

Procedure

To create a USER directory entry:

1. From the Policy Services Main Menu: Maintenance panel, select option 3 - Notification lists, directory entries management, and press Enter.

   The Notification Lists, Directory Entries Management panel is displayed.

   Figure 33. Notification Lists, Directory Entries Management panel

   2. Select option 1 - Create directory entry, and press Enter.

      The Choose Directory Entry Type panel is displayed.

      Figure 34. Choose Directory Entry Type panel

   3. Select option 2 - Create directory entry of type USER and press Enter.

      The Create Directory Entry panel is displayed.
Select short and long names. Then select delivery types. Press Enter to commit the entries. Press End to cancel all entries.

Short name ...
Long name ...
Description (optional)

Active (A/N/R) A Delegate ... (Optional)
Delegate delivery type ... ... TSO or E-MAIL or TEXTING or WTO

Create the delivery types for this directory entry.
A: Row Actions: S - Select S : Status: S - Selected
A S Delivery type
TSO
E-MAIL
TEXTING

Figure 35. Create Directory Entry panel

Short name
The unique name that is used in a notification list to identify the directory entry for this user.

Long name
The name used to identify the user to the Policy Services system.

Description
(Optional) The description of the user's responsibilities.

Active (A/N/R)
The status of the user. Values are:

A
User is active on the system, and messages are not rerouted. This is the default.

N
User is not active on the system, and messages are not rerouted.

R
User is not active on the system, but messages are rerouted to the specified delegate.

Delegate
The short name used to identify an alternate user to which a message can be rerouted. Message rerouting to a delegate is valid only when Active=R.

Delegate delivery type
(Optional) The delivery type for messages sent to the specified delegate: Values are:

• TSO
• E-MAIL
• TEXTING

Delivery type
The delivery type for messages sent to the user. Values are:

• TSO
• E-MAIL
• TEXTING

4. Specify the USER directory type information and press Enter.

The TSO, E-MAIL, and TEXTING Delivery Type panels are shown.
Help
-----------------------------------------------
REORG/MAINTENANCE  Create TSO Delivery Type
Command ===>
Short name  . : USER4
Long name . . : user4
Description

Enter TSO destination address and select options. Press Enter to continue. Press End to exit.

TSO destination . . usertso
Delivery options
1  1. Now                             2  1. Wait
2. Logon                              2. Nowait
3. Save

Figure 36. Create TSO Delivery Type panel

TSO destination
The 1- to 7-byte TSO user ID of the recipient.

Important: Policy Services supports only 1- to 7-byte TSO user IDs.

Delivery options
Message send options:

• 1. Now - Specifies that the message is sent immediately. This is the default.
• 2. Logon - Specifies that the message is sent now (if the user is currently logged on) or saved in the broadcast data set until the specified user logs on.
• 3. Save - Specifies that the message is saved in the broadcast data set and not immediately sent.

Message receive options:

• 1. Wait - Specifies that the sender waits for logged-on users to receive the message.
• 2. Nowait - Specifies that the sender does not wait for logged-on users to receive the message. This is the default.

Help
-----------------------------------------------
REORG/MAINTENANCE  Create E-mail Delivery Type
Command ===>
Short name  . : USER4
Long name . . : user4
Description

Enter E-mail address.
localaddress@hostaddress

Figure 37. Create E-mail Delivery Type panel

Enter E-mail address
The 1-255 byte email address of the recipient. Where localaddress@hostaddress:

localaddress
The local-part of the email address. A maximum of 64 characters are allowed. Valid characters for the local part of the address are: upper and lowercase letters, numbers, and characters (! # $ % & * + - / = ? _ ` { | } ~ .).

hostaddress
The domain part of the email address. Valid characters are: upper and lowercase letters, numbers, dash, and period.

The @ symbol is required between the local and host portions of the address.
For example:

SamSmith@us.mybank.com

REORG/MAINTENANCE   Create Texting Delivery Type
Command ===>

Short name . : USER4
Long name . . : user4
Description

Enter the text address where the text message is to be sent. phonenumber@hostaddress

Figure 38. Create Texting Delivery Type panel

Enter the text address where the text message is to be sent
The 1 - 76 byte text messaging address of the recipient. Where phonenumber@hostaddress:

phonenumber
The phone number. Only numerical characters are allowed. Parentheses () and dashes are not allowed within the number.

hostaddress
The SMS-gateway. Valid characters are upper and lowercase letters, numbers, dashes, and periods. Consult your wireless carrier to determine the specific address.

The @ symbol is required between the phone number and the host portions of the address.
For example:

1234567890@messaging.phonecompany.com

5. Specify the TSO, E-MAIL, and TEXTING options as required and press Enter.
6. Press PF3 until you return to the Policy Services Main Menu: Maintenance panel.

Modifying directory entries

You can modify existing directory entries.

Procedure
To manage directory entries:
1. From the Policy Services Main Menu: Maintenance panel, select option 3 - Notification lists, directory entries management, and press Enter.

The Notification Lists, Directory Entries Management panel is displayed.
Select an option, and press Enter.

1 - Create directory entry
2 - Manage directory entries
3 - Create a new notification list
4 - Manage notification lists
5 - View/Update SMTP variables for e-mail/texting
6 - View/Update TSO JCL job card for TSO-send

**Figure 39. Notification Lists, Directory Entries Management panel**

2. Select option 2 - Manage directory entries, and press Enter.

   The Manage Directory Entry panel is displayed.

   **Figure 40. Manage Directory Entry panel**

   3. Select the row action for the directory entry and press Enter.

   4. Press PF3 until you return to the Policy Services Main Menu: Maintenance panel.

**Creating notification lists**

Notification lists are used by Policy Services to define users who can receive exception notifications and summary messages that are sent out to warn or report on results of policy evaluations.

**Procedure**

1. From the Policy Services Main Menu: Maintenance panel, select option 3 - Notification lists, directory entries management, and press Enter.

   The Notification Lists, Directory Entries Management panel is displayed.
2. From the Notification Lists, Directory Entries Management panel, select option 3 - Create a new notification list, and press Enter.

The Create Notification List panel is displayed.

3. Enter the required information to create a new notification list, and press Enter to continue.

The Create Notification List panel is displayed.

Tip: Column "L" indicates which locale the notification list belongs to.

G The BSNGLOBL locale.
Same locale as the notification list being created.

4. Select the directory entries and notification lists (from the member name column) for this new notification list. Then press Enter.

The Notification Lists, Directory Entries Management panel is displayed with a message indicating the creation of the new notification list.

5. From the Notification Lists, Directory Entries Management panel, select option 4 - Manage notification lists to manage your notification lists.

The Manage Notification List panel is displayed.

6. Press PF3 until you return to the Policy Services Main Menu: Maintenance panel.

**Modifying notification lists**

You can modify existing notification list entries.

**Procedure**

To manage notification lists:

1. From the Policy Services Main Menu: Maintenance panel, select option 3 - Notification lists, directory entries management, and press Enter.

The Notification Lists, Directory Entries Management panel is displayed.

2. Select option 4 - Manage notification lists, and press Enter.

The Manage Notification Lists panel is displayed.
3. Select the row action and press Enter.
4. Press PF3 until you return to the Policy Services Main Menu: Maintenance panel.

**Viewing and modifying the SMTP variables for email and texting**

You can view and modify existing SMTP variable settings for email and texting.

**Procedure**

To view and update the SMTP variables for email and texting:

1. From the Policy Services Main Menu: Maintenance panel, select option 3 - Notification lists, directory entries management, and press Enter.

   The Notification Lists, Directory Entries Management panel is displayed.

2. Select option 5 - View/Update SMTP variables for e-mail/texting, and press Enter.

   The Locale Selection panel is displayed.

3. Select one and only one locale. Press Enter to exit.

   XCF Group Name . . . . : FPQSRVT4

   A: Row Actions: S - Select

   A Locale name Locale Description

   BSNGLOBL Policy Services Global Locale

   **Figure 48. Locale Selection panel**
3. Select the Locale and press Enter.

The View/Update EMAIL SMTP Variables panel is displayed.

```
Help
-----------------------------------------------
REORG/MAINTENANCE       View/Update EMAIL SMTP Variables
Command ===>
View/Update EMAIL SMTP variables. To exit View: End, Update: ENTER.
Locale: . : BSNGLOBL
SMTP address space name . . . SMTP        SYSOUT class . . . B
MVS system name . . . . . . . IMSMVS
From: . . . IMS_Tools@COMPANY.COM
Subject: IMS Tools Autonomics Policy Notification
Greeting: Data Base Team
Closing: Thanks
JOB CARD
//EMAIL    JOB 'EMAIL',MSGCLASS=H,MSGLEVEL=(1,1),CLASS=A,
//     TIME=1440,REGION=1M
```

Figure 49. View/Update EMAIL SMTP Variables panel

4. Modify the EMAIL SMTP variables and press Enter.

The View/Update TEXTING SMTP Variables panel is displayed.

```
Help
-----------------------------------------------
REORG/MAINTENANCE       View/Update TEXTING SMTP Variables
Command ===>
View/Update TEXTING SMTP variables. To exit View press End, to exit Update
press Enter.
Locale: . : BSNGLOBL
SMTP address space name . . . SMTP        SYSOUT class . . . B
MVS system name . . . . . . . IMSMVS
From: . . . IMS_Tools@COMPANY.COM
Subject: IMS Tools Autonomics Policy Notification
Greeting: Data Base Team
Closing: Thanks
JOB CARD
//EMAIL    JOB 'TEXTING',MSGCLASS=H,MSGLEVEL=(1,1),CLASS=A,
//     TIME=1440,REGION=1M
```

Figure 50. View/Update TEXTING SMTP Variables panel

5. Modify the TEXTING SMTP variables and press Enter.

6. Press PF3 until you return to the Policy Services Main Menu: Maintenance panel.
Notifying users of phase 1 exception messages

Policy Services can notify users of the exception messages that are generated during phase 1 of a policy evaluation.

About this task

During phase 1 of a policy evaluation, Policy Services determines whether a specific process action, such as a reorganization, is required. Phase 1 exception messages are available to the IMS Tools product that issues the policy evaluation, and the IMS Tools product controls whether phase 1 exception messages appear in any report.

By default, phase 1 exception messages are not sent to the notification directory entries of the specified notification list.

**Important:** The default is different for Autonomics Director. Phase 1 exception messages from policy evaluations issued by Autonomics Director are always sent to the users in the specified notification list.

If there is a phase 2 of a policy evaluation, the phase 2 exception messages are always sent to the notification directory entries of the specified notification list.

If you want Policy Services to send the phase 1 exception messages to the users that you have identified in a specified notification list, you can enable these notifications with the following procedure.

Procedure

To notify users of phase 1 exception messages:

1. Access the Policy Services user interface.

   The Policy Services Setup: Select XCF Group Name panel is displayed.

   ![Policy Services Setup: Select XCF Group Name panel](image)

   1. Access the Policy Services user interface.

   2. Enter Y in response to the question, "Do you want to get the exception messages at phase 1 of policy evaluation?"

   The following values are possible responses to this question:

   **Y**

   Exception messages generated during phase 1 of a policy evaluation are sent to the notification directory entries that are defined in the notification list.

   **N**

   Exception messages generated during phase 1 of a policy evaluation are not sent to the notification directory entries that are defined in the notification list. N is the default.
The current setting remains unchanged. If the option has not been set, it defaults to N.
Chapter 12. Modifying policy actions

You can modify the actions implemented by policies.

About this task

Policies define the mapping of both a rule exception and a severity level to a resulting action. For more information about actions, see "What is an action?"

The resulting action for each rule exception can be modified. Different actions are acceptable for different rules.

Remember: All Policy Services user interface panels provide field-specific and panel-specific help information when you press Help (PF1).

Procedure

To modify actions related to rules, complete the following steps:

1. In the Policy Services Main Menu: Maintenance panel, select option 1 - Policies management, and press Enter.
   The Policies Management panel is displayed.
2. In the Policies Management panel, select option 1 - Manage policies, and press Enter.
   The Manage Policies panel is displayed.
3. Type the U row action (Update) to select a policy that you want to modify actions for, and press Enter.
   The Policy Resource Types Selection panel is displayed.
4. Press Enter.
   If you have already created notification lists, the Policy Notification Lists Selection panel is displayed.
   Otherwise, the Policy Rules Selection panel is displayed; go to step “6” on page 91.
5. Press Enter.
   The Policy Rules Selection panel is displayed.
6. Type the S row action (Select) on a rule that is related to the actions you want to modify, and press Enter.
   The Select Thresholds And Actions panel is displayed, as shown in the following example.

```
Commands   Help
------------------------------------------------------------------------------
REORG/OPERATION      Select Thresholds And Action Row 1 to 3 of 3
                                    
Select a threshold and press Enter to be prompted to choose an action-level to be used when the rule condition evaluates to true. When finished press Enter to choose rule-threshold notification lists. Press End to eliminate all threshold selections.
Locale    : BSNGLOBL  Policy name  : SYS.DBDTYPE.FFDBALL
Locale    : BSNGLOBL  Rule name   : IBM.IX_CICA_SPLIT.10
Description: CI or CA splits in an index primary data set
A: Row Actions: S - Select Threshold   U - Unselect
   Status:      S - Selected   O - Part of original policy. (Update only)
   A   S  Threshold      Action        Level         Onmissing
_   O  LOW            MESSAGE       WARNING       SKIPEVAL
_   O  MED            MESSAGE       SEVERE        SKIPEVAL
_   O  HIGH           INDEXBLD      CRITICAL      SKIPEVAL
******************************* Bottom of data ********************************
```

Figure 52. Select Thresholds And Actions panel
In this example, the action for LOW threshold and the action for MED threshold are the same: MESSAGE.

The action for HIGH threshold is INDEXBLD.

The following steps describe the procedure to modify the action for HIGH threshold from INDEXBLD to REORG.

7. Type the S row action (Select Threshold) on a threshold that you want to modify actions for, and press Enter.

The Action-Level Pairs Selection pop-up window is displayed.

8. Type the S row action (Select) on a threshold that you want to modify actions for, and type a new action name in the Action field. Acceptable actions depend on the rule.


The Select Thresholds And Actions panel is displayed.

Confirm that the action for the selected threshold has been updated.
Select a threshold and press Enter to be prompted to choose an action-level to be used when the rule condition evaluates to true. When finished press Enter to choose rule-threshold notification lists. Press End to eliminate all threshold selections.

Locale . . : BSNGLOBL Policy name . . : SYS.DBDTYPE.FFDBALL
Locale . . : BSNGLOBL Rule name . . . : IBM.IX_CICA_SPLIT.10
Description : CI or CA splits in an index primary data set

A: Row Actions: S - Select Threshold   U - Unselect
Status:      S - Selected   O - Part of original policy. (Update only)

<table>
<thead>
<tr>
<th>Threshold</th>
<th>Action</th>
<th>Level</th>
<th>OnMissing</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>MESSAGE</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>MED</td>
<td>MESSAGE</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>HIGH</td>
<td>REORG</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

Figure 56. Select Thresholds And Actions panel (Action for HIGH threshold is updated)

10. Press Enter.

The Select Rule Notification Lists panel is displayed.

11. Press Enter.

The Policy Rules Selection panel is displayed.

12. When you have completed all modifications to rules, press Enter.

The Confirmation pop-up window is displayed.

Figure 57. Confirmation pop-up window

13. To commit all changes, type Y (Yes) and press Enter.

The Policies Management panel is displayed.

14. Press PF3 to return to the Policy Services Main Menu: Maintenance panel.

What to do next

Each rule has an exception class, and some rules have the same exception class. For example, rule IBM.IX_CICA_SPLIT.10 and rule IBM.IX_CICA_SPLIT.11 have the same exception class of EXCESSIVE_INDEX_CI_OR_CA_SPLITS.

If a policy selects rules that have the same exception class, these rules must have the same actions defined for each exception level. Therefore, if you modify an action for a rule, all other selected rules that have the same exception class must be modified similarly to synchronize the action.

Otherwise, when committing the changes (step “13” on page 93), an error message is issued and the commit is suspended until the rules of the same exception class have the same actions defined.

For more information about rules and their exception classes, see the following pages:

For REORG domain: “Domain REORG exceptions"
For RECOVERY domain: “Domain RECOVERY exceptions"
Chapter 13. Creating a new policy from executable BSNGLOBL policy and copying to a new locale

You can create and customize a new policy modeled after an executable SYS. policy, and copy the policy from the generic global locale (BSNGLOBL) to a new locale.

About this task

To provide policies for your own locale, you must create policies modeled after the SYS policy templates that were created from the IBM policy templates provided by IBM.

To customize a policy for your own locale, you must copy the SYS policy template to the new locale and rename the policy.

Procedure

To create and customize a new policy modeled after an executable SYS. policy, and copy the policy from the generic global locale (BSNGLOBL) to a new locale, complete the following steps:

1. In the Policy Services Main Menu: Maintenance panel, select option 1 - Policies management, and press Enter.

   The Policies Management panel is displayed.

2. In the Policies Management panel, select option 1 (Manage policies), and press Enter.

   The Manage Policies panel is displayed.

   Figure 58. Manage Policies panel

3. Type the N row action (Create new policy modeled after policy in selected row) in the row of an executable SYS. policy (for this example, SYS.DBDTYPE.FFDB), and press Enter.

   The Policy Resource Types Selection panel is displayed.

4. In the Policy name field, type in the new policy name (for example, LOC1.DBDTYPE.FFDB).

5. In the Description field, type in the description for the new policy.

6. Change the Resource Type selection if necessary.

7. Clear the Locale name field, and press Enter.

   The Locale Selection panel is displayed.
8. Type the S row action (Select) to select a locale (for example, MYRECON2), and press Enter.
   The Policy Notification Lists Selection panel is displayed.
9. Type the S row action (Select) to select one or more notification lists for this policy, and press Enter.
   The Policy Rules Selection panel is displayed.
   Rules that have been associated with the original template policy are marked with an O status (Pre-selected from original policy).
   You can select (S row action) one of these pre-selected rules, press Enter, and change the association of threshold sets to severity levels. Press Enter again to associate notification lists to each threshold set.
   You can also select (S row action) a new rule that you want to add to the new policy. When you press Enter, you can then change the association of threshold sets to severity levels. Press Enter again to associate notification lists to each threshold set.
10. After all modifications to rules have been made, press Enter.
   The Confirmation window is displayed.

```
Command ==> Confirmation

Confirm you want to commit the changes. End to exit.

Do you want to commit the changes for policy: LOC1.DBDTYPE.FFDB
   Y (Y/N)
```

**Figure 60. Confirmation window**

11. To commit all changes, type Y (Yes) and press Enter.
    The Manage Policies panel is displayed.
12. Press PF3 until you return to the Policy Services Main Menu: Maintenance panel.
Chapter 14. Creating a new policy

You can create new policies not based on an existing template.

About this task
The following summary outlines the sequence of steps required to build a new policy:

1. Enter new policy name.
2. Enter policy description.
3. Select supported resource types.
4. Select locales where this policy applies.
5. Select notification lists that represent the destinations that the summary and exception messages are sent to.
   Important: If you select notification lists for a rule in step “6” on page 97, the exception messages are sent to those destinations instead.
6. Select rules that apply to this policy.
   • Associate threshold sets with action-level pairs.
   • If the notification lists for the exception messages are different than the notification lists for the policy summary messages defined in step “5” on page 97, select notification lists at the action-level-threshold set that represent the destinations that the exception messages are sent to.
     Important: If you specify lists at the action-level-threshold sets, you must provide all required lists, including the notification list specified for the summary notification, if applicable.
     For example, if notification LIST01 contains BOB, LARRY, and MARY; and notification LIST06 contains SAM, BETTY, LADBA, SFDBA and GUS:
       – If you define LIST01 in step “5” on page 97 and you only want that list to apply to all rules, do not specify any notification lists in step “6” on page 97. The resulting summary message is sent to BOB, LARRY and MARY.
       – If you define LIST06 for a given rule and do not include LIST01, the entries in LIST01 are not included when sending the rule exception message for that rule. The resulting exception message is sent to SAM, BETTY, LADBA, SFDBA and GUS.
       – If you want to include the entries in LIST01 along with LIST06 for a given rule, include LIST01 along with LIST06 in step “6” on page 97. If one or more lists are specified on the rule, the rule exception message is sent to the entries in these lists only. The resulting exception message is sent to BOB, LARRY, MARY, SAM, BETTY, LADBA, SFDBA and GUS.
       – If no lists are specified or if LIST01 is specified in step “6” on page 97 for the rule, the rule exception message is sent to the entries in the notification list specified in step “5” on page 97. The resulting exception message is sent to BOB, LARRY, and MARY.
7. Optionally view/update selected rules to change the rule threshold values
8. Confirm all changes for this new policy

Procedure
To create a new policy, complete the following steps:

1. In the Policy Services Main Menu: Maintenance panel, select option 1 - Policies management, and press Enter.
   The Policies Management panel is displayed.
2. In the Policies Management panel, select option 2 (Create a new policy), and press Enter.
   The Policy Resource Types Selection panel is displayed.
3. In the **Policy name** field, type in the new policy name (for example, LOC1.DBDTYPE.FFDB).
4. In the **Description** field, type in the description for the new policy.
5. Change the Resource Type selection if necessary.
6. Clear the **Locale name** field, and press Enter.

The Locale Selection panel is displayed.

```
Command ===>
Choose a valid locale.
Select one and only one locale. Press Enter to exit.
XCF Group Name . . . . : PSSSPLEX
```

```
A: Row Actions: S - Select
A Locale name Locale Description
BSNGLOBL    BSNGLOBL
MYRECON1    MYRECON1
MYRECON2    MYRECON2
MYRECON3    MYRECON3
MYRECON4    MYRECON4
MYRECON5    MYRECON5
```

---

**Figure 61. Locale Selection panel**

7. Type the S row action (Select) to select a locale (for example, MYRECON1), and press Enter.

The Policy Notification Lists Selection panel is displayed.

8. Type the S row action (Select) to select one or more notification lists for this policy and all rule thresholds, and press Enter.

The Policy Rules Selection panel is displayed.

For a new policy, there are no rules that have been preselected from an existing template.

9. Type the S row action (Select) on a rule that you want to add to this new policy, and press Enter.

The Select Thresholds And Actions panel is displayed.

10. Associate specific threshold sets with action-level pairs.

11. After associating threshold sets with action-level pairs, press Enter. The Select Rule Notification Lists panel is displayed. Associate notification lists with the rule if notifications other than those specified in step “8” on page 98 are required.

The Select Rule Notification Lists panel is displayed.

12. Associate notification lists with the action-level-threshold sets.

For example:
REORG/MAINTENANCE

Select Rule Notification list Row 1 to 5 of 5

This is an optional step.
Select thresholds to be assigned notification lists. Then press Enter.
When finished press Enter to go back to the Rule Selection panel.
Pressing End will eliminate all notification lists selection.
Locale . . : MYRECON1 Policy name . . : NEW.HIDAM.POLICY
 Locale . . : MYRECON1 Rule name . . : IBM.AVG_DBREC_LEN.10
Description : Average length of database records

A: Row Actions: S - Select  U - Unselect
S: Status:        S - Selected.
                      O - Pre-selected from original policy. (Update only).

<table>
<thead>
<tr>
<th>A</th>
<th>S</th>
<th>Threshold</th>
<th>Action</th>
<th>Level</th>
<th>LC Notification List</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S</td>
<td>LOW</td>
<td>MESSAGE</td>
<td>WARNING</td>
<td>G: SANJOSE</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>MED</td>
<td>MESSAGE</td>
<td>SEVERE</td>
<td>G: OMAHADBA</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>HIGH</td>
<td>MESSAGE</td>
<td>CRITICAL</td>
<td>G: LISTDBA,G: OMAHADBA,G: SANJOSE</td>
</tr>
</tbody>
</table>

Figure 62. Select Rule Notification Lists panel

13. Press Enter when complete with the notification list task.

The Policy Rules Selection panel is displayed.

14. Continue with the same sequence of steps to add more rules to the new policy.

15. Optionally view/update selected rules to change rule exception message text and/or threshold values.

16. After all modifications to rules have been made, press Enter.

The Confirmation window is displayed.

Figure 63. Confirmation window

17. To commit all changes, type Y (Yes) and press Enter.

The Policies Management panel is displayed.

18. Press PF3 to return to the Policy Services Main Menu: Maintenance panel.
Chapter 15. Promoting a maintenance environment to an operation environment

In this task, you promote the selected Repository Level (Maintenance or History) to become the active Operation Level for all new connections by Policy Services clients.

About this task
By using the Promote function, you can:

- Promote a maintenance environment level to an operation level, where you might have done one or more of the following items:
  - Applied IBM maintenance service (APARs) and/or
  - Imported Policy Services items that had been previously exported, and/or
  - Applied custom updates or additions
- Promote a history level to an operation level.
  This type of promote action allows you to return to a previous operation level if the current operation level is faulty or experiencing problems

Procedure
To promote a maintenance environment to an operation environment, complete the following steps:

1. In the Policy Services Main Menu: Maintenance panel, select option 7 - Domain and environment management, and press Enter.
   The Domain and Environment Management panel is displayed.

   ![Domain and Environment Management panel]

   Figure 64. Domain and Environment Management panel

2. Type the P row action (Promote Maintenance environment to Operation) in the REORG row, and press Enter.
   The Promote Environment window is displayed.
3. Type Y (Yes) and press Enter.

The Promote Maintenance to Operation panel is displayed.

4. Enter a description for the new operation environment, and press Enter.

The Domain and Environment Management panel is displayed.

5. You can type the L row action (List domain environments) on the domain row, and press Enter.

The List Domain Environments panel is displayed.

6. In the List Domain Environments panel, type the V row action (View environment), and press Enter.
The View Environment Information panel is displayed.

Figure 68. View Environment Information panel
7. Press End (PF3) until you return to the Policy Services Main Menu.

The Policy Services Main Menu has now become the main menu for the operation environment (Policy Services Main Menu: Operation).
Chapter 16. Creating a new maintenance environment

If a new maintenance package that contains new policies and rules is provided by an APAR, you need to install the new package from a maintenance environment.

You can create a new maintenance environment after promoting the former maintenance environment to the current operation environment.

There are two methods to create a maintenance environment. Whichever method you use, you can create one of the following three types of maintenance environment:

• Null maintenance environment
• Maintenance environment created from the current operation environment
• Maintenance environment created from a history level

Topics:
• “Method 1: Creating a maintenance environment by using the Select Environment panel” on page 105
• “Method 2: Creating a maintenance environment by using the Domain and Environment Management panel” on page 106

Method 1: Creating a maintenance environment by using the Select Environment panel

You can create a new maintenance environment from the Select Environment panel.

Procedure
1. Invoke the Policy Services client interface.
2. Type the XCF group name, select a domain, and press Enter.
   For details, see Chapter 6, “Starting the Policy Services user interface,” on page 55.
3. In the Policy Services Setup: Select Environment panel, select option 1 - Maintenance, and press Enter.
   The Create Maintenance Environment panel is displayed.

   Help
   --------------------------------------------------------------------------–---
   REORG/MAINTENANCE     Create Maintenance Environment           Row 1 to 2 of 2
   Type an environment description, and an environment name 
   and either (a) select an existing 
   environment to be copied into the new maintenance environment and
   press Enter, or (b) press Enter without a row action to create a new
   empty maintenance environment.

   Enter a name and description for the new maintenance environment:
   Environment name    ________
   Description . . . .
   ________________________________________________________________

   A: Row Action: S - Select environment to be copied

   A    Env-name Status   Created    Last Update  Description
   ENV1  HISTORY  2019/01/10  2019/01/10  TEST
   ENV2  OPERATION  2019/01/10  2019/01/10  TEST

   ****************************************************************************** Bottom of data ****************************
4. Type the environment name and the description for the new maintenance environment. The environment name must be unique in a domain.

5. Take one of the following actions:
   - If you want to create a new maintenance environment from the current operation environment, type the S row action (Select environment to be copied) on the environment whose status is OPERATION, and press Enter.
   - If you want to create a new maintenance environment from a history level, type the S row action (Select environment to be copied) on the environment whose status is HISTORY, and press Enter.
   - If you want to create a null maintenance environment, just press Enter. Then, when a confirmation window is displayed, type Y (Yes) and press Enter.

<table>
<thead>
<tr>
<th>Create Maintenance Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>An empty maintenance is about to be created. Do you intend to create an empty maintenance environment?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Please make a choice below.</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Do you wish to continue? . . . . . . Y (Y/N)</td>
</tr>
</tbody>
</table>

If you selected to create a new maintenance environment from the current operation environment or a history level, the following message is displayed:

Environment env_name successfully created.

If you selected to create a null maintenance environment, the following message is displayed:

Environment env_name successfully created. This environment is empty.

6. Press Enter to go to the Policy Services main menu.
   You are in the new maintenance environment.

**Method 2: Creating a maintenance environment by using the Domain and Environment Management panel**

You can create a new maintenance environment from the Domain and Environment Management panel.

**Procedure**

1. Invoke the Policy Services client interface.
2. Type the XCF group name, select a domain, and press Enter.
   For details, see Chapter 6, “Starting the Policy Services user interface,” on page 55.
3. In the Policy Services Setup: Select Environment panel, select option 2 - Operation, and press Enter.
4. In the Locale Selection panel, type the S row action (Select) on the row of the appropriate locale, and press Enter.
5. In the Policy Services Main Menu, select option 7 - Domain and environment management, and press Enter.
   The Domain and Environment Management panel is displayed.
6. Type the C row action (Create new Maintenance environment) on the row of the operation environment.

A confirmation window is displayed.

Create Maintenance Environment

If a Maintenance environment is created from the Operation environment, ensure that any updates being made to the Operation environment are completed before creating the new Maintenance environment.

7. Press Enter to continue.

The Create Maintenance Environment panel is displayed.

8. Type the environment name and the description for the new maintenance environment. The environment name must be unique in a domain.

9. Take one of the following actions:

- If you want to create a new maintenance environment from the current operation environment, type the S row action (Select environment to be copied) on the environment whose status is OPERATION, and press Enter.
- If you want to create a new maintenance environment from a history level, type the S row action (Select environment to be copied) on the environment whose status is HISTORY, and press Enter.
- If you want to create a null maintenance environment, just press Enter. Then, when a confirmation window is displayed, type Y (Yes) and press Enter.
Create Maintenance Environment

An empty maintenance is about to be created. Do you intend to create an empty maintenance environment?

Please make a choice below.

* Do you wish to continue? . . . . . . Y (Y/N)

If you selected to create a new maintenance environment from the current operation environment or a history level, the following message is displayed:

Environment env_name successfully created.

If you selected to create a null maintenance environment, the following message is displayed:

Environment env_name successfully created. This environment is empty.

10. Press Enter to go back to the Domain and Environment Management panel.
11. Press End (PF3).

The Confirm Maintenance Environment window is displayed.

Confirm Maintenance Environment

Domain . . . . . . . . . . . . . . . . . . : REORG
Current maintenance environment . . . . : ENV3
Description:
TEST

Select to continue with the current Maintenance environment, or to delete it and create a new Maintenance environment. Then press Enter.

* Select . . 1. Continue with current Maintenance environment
  2. Delete current and create new Maintenance environment

12. Select option 1 - Continue with current Maintenance environment, and press Enter to go to Policy Services main menu.

You are in the new maintenance environment.
Chapter 17. Guidelines for exporting and importing

The following guidelines are important to understand before you perform export and import tasks.

**Exporting BSNGLOBL policies**

If the policies being exported contain only BSNGLOBL policies, only BSNGLOBL rules and notification lists ever apply to these BSNGLOBL policies (that is, BSNGLOBL policies can only reference BSNGLOBL rules and notification lists).

If the import of a BSNGLOBL member is selectable, you can perform the following tasks:

- Import all the BSNGLOBL rules as BSNGLOBL rules
- Import all the BSNGLOBL policies as BSNGLOBL policies
- Import all the BSNGLOBL notification lists as BSNGLOBL notification lists
- Import all directory entries
- Re-import the BSNGLOBL rules, policies and notification lists from BSNGLOBL to locale-specific policies, rules, and notification lists

BSNGLOBL rules must be exported:

- With the BSNGLOBL policy package, or
- Must be in another package that is to be imported at the same time, or
- Must exist in the locale that you import the BSNGLOBL policies to.

BSNGLOBL notification lists must be exported:

- With the BSNGLOBL policy package, or
- Must be in another package that is to be imported at the same time, or
- Must exist in the locale that you import the BSNGLOBL policies to.

The directory entries that are included in a notification list are not automatically exported with the policy. It is recommended that all directory entries be exported if you are exporting all or selected notification lists.

Even though directory entries are not locale-specific, the notification lists are only valid if you export the directory entries:

- With the BSNGLOBL policy package, or
- Must be in another package that is to be imported at the same time, or
- Must exist in the locale that you import the BSNGLOBL policies to.

**Exporting locale-specific policies**

If the policies being exported contain locale-specific policies, both BSNGLOBL and the same locale-specific rules and notification lists can apply to these locale-specific policies (that is, locale-specific policies can reference BSNGLOBL and/or the same locale-specific rules and notification lists).

Locale-specific and/or BSNGLOBL rules must be exported:

- With the locale-specific policy package, or
- Must be in another package that is to be imported at the same time, or
- Must exist in the locale that you import the locale-specific policies to.

Locale-specific and/or BSNGLOBL notification lists must be exported:

- With the locale-specific policy package, or
- Must be in another package that is to be imported at the same time, or
- Must exist in the locale that you import the locale-specific policies to.
• Must exist in the locale that you import the locale-specific policies to.

The directory entries that are included in a notification list are not automatically exported with the policy. It is recommended that all directory entries be exported if you are exporting all or selected notification lists.

Even though the directory entries are not locale-specific, the notification lists are only valid if you export the directory entries:
• With the locale-specific policy package, or
• Must be in another package that is to be imported at the same time, or
• Must exist in the locale that you import the locale-specific policies to.

Notes about the selectable option

Another consideration at export time is to decide if the selective option should be set or not:

• If the changes for all policy templates, rules templates, rule thresholds, notification lists, and directory entries have been made for each locale (locale-specific and/or BSNGLOBL) and the export package is a single locale package, then set the selectable option to NO to force the complete package to be imported at the importing locale.

• If the changes for all policy templates, rules templates, rule thresholds, notification lists, and directory entries have been made for all locales (locale-specific and/or BSNGLOBL) and the export package is to be used at all locales, then set the selectable option to YES to allow the locations the ability to select non-locale-specific (BSNGLOBL and directory entries) items as well as locale-specific items from the package to be imported at each of the unique importing locales.

When exporting, you might want to export with the selectable option set until you are familiar with the export and import process. This option allows you to selectively import the items.
Part 4. Using Policy Services utilities

Policy Services provides useful utilities called the Sensor Data Extractor, the Statistics Data Import Utility, and the History Data Summarization Utility.

**Topics:**
- Chapter 18, “Sensor Data Extractor,” on page 113
- Chapter 19, “Statistics Data Import Utility,” on page 133
- Chapter 20, “History Data Summarization Utility,” on page 151
Chapter 18. Sensor Data Extractor

The Sensor Data Extractor extracts sensor data from the IMS Tools Knowledge Base (IMS Tools KB) Sensor Data repository, the historical sensor data set, or both, and generates various types of reports.

Topics:
• “Sensor Data Extractor overview” on page 113
• “Running the Sensor Data Extractor” on page 114
• “EXEC and DD statements for the Sensor Data Extractor” on page 115
• “Control statements for the Sensor Data Extractor” on page 116
• “Output from the Sensor Data Extractor” on page 122
• “JCL examples for the Sensor Data Extractor” on page 129

Sensor Data Extractor overview

The Sensor Data Extractor extracts sensor data from the IMS Tools KB Sensor Data repository, the historical sensor data set, or both, and generates various types of reports.

The Sensor Data Extractor can read not only the latest sensor data but also old sensor data for the specified database, partition, or area. It then generates the Sensor Data History report in three formats: long, short, and CSV.

The Sensor Data Extractor supports sensor data of both REORG and RECOVERY domains and of all database types.
Running the Sensor Data Extractor

The Sensor Data Extractor runs as a standard z/OS batch job. To extract sensor data from the IMS Tools KB Sensor Data repository and to report the extracted sensor data, code the Sensor Data Extractor JCL and run the job.

Procedure

1. Write the EXEC and DD statements.
   
   For the format of the EXEC statement and the list of DD statements, see “EXEC and DD statements for the Sensor Data Extractor” on page 115.

2. Code the control statements in the BSNSYSIN data set.
   
   For the syntax of the control statements, see “Control statements for the Sensor Data Extractor” on page 116.

The following figure shows a JCL example for the Sensor Data Extractor:
EXEC and DD statements for the Sensor Data Extractor

You must specify an EXEC statement and DD statements that define the input and output data sets in your JCL.

In this topic:

- “EXEC statement” on page 115
- “Summary of DD statements” on page 115
- “DD statements for input” on page 116
- “DD statements for output” on page 116

EXEC statement

The EXEC statement must be in the following format:

```
//STEP EXEC PGM=BSNUTIL0,PARM='FUNC=EXTRACT_SENSOR'
```

The EXEC statement in the batch JCL contains one keyword specification in the PARM field: FUNC=.

**FUNC**

Identifies which Policy Services utility is to be invoked.

To invoke the Sensor Data Extractor, specify either 'FUNC=EXTRACT_SENSOR' or 'FUNC=EXTS'.

Summary of DD statements

DD statements of the Sensor Data Extractor determine the input and output data sets and specify how to run the Sensor Data Extractor.

The following table summarizes the DD statements for the Sensor Data Extractor.

<table>
<thead>
<tr>
<th>DD name</th>
<th>Use</th>
<th>Format</th>
<th>Can be dynamically allocated?</th>
<th>Required or optional?</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEPLIB</td>
<td>Input</td>
<td>RECFM=U</td>
<td>No</td>
<td>Required</td>
</tr>
<tr>
<td>BSN SYSIN</td>
<td>Input</td>
<td>RECFM=FB,LRECL=80</td>
<td>No</td>
<td>Required</td>
</tr>
<tr>
<td>BSN UJRNL</td>
<td>Output</td>
<td>RECFM=FBA,LRECL=133</td>
<td>Yes</td>
<td>Optional</td>
</tr>
</tbody>
</table>

Figure 70. JCL example for the Sensor Data Extractor

3. Run the Sensor Data Extractor job step to generate a report. Ensure that the return code is 0.

For examples of the Sensor Data History report, see “Sensor Data History report (Short type)” on page 122, “Sensor Data History report (Long type)” on page 125, and “Sensor Data History report (CSV type)” on page 127.
DD statements for input

The following input DD statements are used for the Sensor Data Extractor.

**STEPLIB**
This DD statement is required. It specifies the load module library of IMS Tools Base (SHKTLOAD).

**BSNSYSIN**
This DD statement is required. It specifies the input control statement that controls the Sensor Data Extractor functions.

The BSNSYSIN DD statement can be coded as a standard SYSIN file, a sequential data set, or a PDS member. LRECL=80 is required for the DCB of this data set.

For details about coding the BSNSYSIN DD statement, see “Control statements for the Sensor Data Extractor” on page 116.

DD statements for output

The following output DD statements are used for the Sensor Data Extractor.

**BSNUJRL**
This DD statement is optional. It specifies the processing log output data set, which stores processing messages that are issued by the Sensor Data Extractor.

If you do not specify this DD statement, the Sensor Data Extractor dynamically allocates the data set by using SYSOUT=*.

**BSNURPRT**
This DD statement is required if you specify REPORT_TYPE(SHORT) in the control statement. This DD statement specifies the Sensor Data History report for REPORT_TYPE(SHORT).

If you specify REPORT_TYPE(SHORT) and do not specify this DD statement, the Sensor Data Extractor dynamically allocates the data set by using SYSOUT=*.

Control statements for the Sensor Data Extractor

The control statement for the Sensor Data Extractor controls the functions of the Sensor Data Extractor.

The control statement must be specified in the BSNSYSIN data set. This control statement data set generally resides in the input stream. However, it can also be defined as a sequential data set or as a member of a partitioned data set. It must contain 80-byte, fixed-length records. The block size, if coded, must be a multiple of 80.

The control statement must be coded in columns 1 - 72. Columns 73 - 80 are regarded as comments and ignored.

In this topic:
- “Format of the control statement” on page 117
- “Summary of keywords” on page 117
- “Description of keywords” on page 118

<table>
<thead>
<tr>
<th>DD name</th>
<th>Use</th>
<th>Format</th>
<th>Can be dynamically allocated?</th>
<th>Required or optional?</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSNURPRT</td>
<td>Output</td>
<td>RECFM=FBA,LRECL=133</td>
<td>Yes</td>
<td>Optional</td>
</tr>
</tbody>
</table>
Format of the control statement
The control statement includes a set of keywords, parameters, and comments that are specified in the BSNSYSIN data set.

Keywords
A keyword defines an option for the Sensor Data Extractor. Keywords can be specified in any order, and any two adjacent keywords must be separated by a blank or a comma. Each keyword has one or more associated parameters.

Parameters
A parameter defines a value for the associated keyword. Some keywords require only one parameter and others require one or more parameters. Parameters must be character or numeric values.

A keyword and the associated parameters are separated by parentheses. If two or more parameters are specified, any two adjacent parameters must be separated by a blank or a comma. For example,

```
keyword(parameter)
keyword(parameter1, parameter2, parameter3)
keyword(parameter1 parameter2 parameter3)
```

Comments
You can include comments in the BSNSYSIN data set by marking a line with an asterisk (*) in column 1.

The Sensor Data Extractor ignores the comment line when analyzing the control statement in the BSNSYSIN data set.

Summary of keywords
The following table summarizes the keywords of the control statement for the Sensor Data Extractor.

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Required or optional?</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AREANAME</td>
<td>Required if the database is a DEDB</td>
<td>n/a</td>
<td>Specifies an area name if the database is a DEDB.</td>
</tr>
<tr>
<td>CAGRP</td>
<td>Required if the DBDNAME keyword is not specified</td>
<td>n/a</td>
<td>Specifies a change accumulation (CA) group name.</td>
</tr>
<tr>
<td>DATAFROM</td>
<td>Optional</td>
<td>REPOSITORY</td>
<td>Specifies where to extract sensor data from.</td>
</tr>
<tr>
<td>DBDNAME</td>
<td>Required if the CAGRP keyword is not specified</td>
<td>n/a</td>
<td>Specifies a database name.</td>
</tr>
<tr>
<td>DOMAIN</td>
<td>Required</td>
<td>n/a</td>
<td>Specifies a policy domain.</td>
</tr>
<tr>
<td>DSN_CSV</td>
<td>Required if REPORT_TYPE(CSV) is specified</td>
<td>n/a</td>
<td>Specifies a data set name for a CSV report.</td>
</tr>
<tr>
<td>DSN_LONG</td>
<td>Required if REPORT_TYPE(LONG) is specified</td>
<td>n/a</td>
<td>Specifies a data set name for a LONG report.</td>
</tr>
<tr>
<td>GENERATION</td>
<td>Optional</td>
<td>5</td>
<td>Specifies how many generations of sensor data are to be extracted.</td>
</tr>
<tr>
<td>HISTORY</td>
<td>Optional</td>
<td>YES</td>
<td>Specifies whether to extract historical sensor data.</td>
</tr>
<tr>
<td>ITKBSRVR</td>
<td>Required</td>
<td>n/a</td>
<td>Specifies a name of the IMS Tools KB server.</td>
</tr>
</tbody>
</table>
Table 8. Keywords for the Sensor Data Extractor (continued)

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Required or optional?</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LASTDATE</td>
<td>Optional</td>
<td>n/a</td>
<td>Specifies the last date of historical sensor data to be extracted.</td>
</tr>
<tr>
<td>PARTNAME</td>
<td>Required if the database is a HALDB</td>
<td>n/a</td>
<td>Specifies a partition name if the database is a HALDB.</td>
</tr>
<tr>
<td>RECONID</td>
<td>Required</td>
<td>n/a</td>
<td>Specifies a RECON ID.</td>
</tr>
<tr>
<td>REPORT_TYPE</td>
<td>Optional</td>
<td>SHORT</td>
<td>Specifies report types to be generated.</td>
</tr>
</tbody>
</table>

Description of keywords

The following keywords are available for the control statement.

AREANAME

This keyword specifies a DEDB area name. The sensor data of the specified DEDB area is extracted.

AREANAME is a required keyword if the database specified by the DBDNAME keyword is a DEDB.

Format:

.areaname(area_name)

.area_name
Specify a 1- to 8-character DEDB area name. There is no default.

CAGRP

This keyword specifies a CA group name. The sensor data of the specified CA group is extracted.

CAGRP is a required keyword if you do not specify the DBDNAME keyword.

The CAGRP keyword can be specified only if you specify DOMAIN(RECOVERY) and do not specify the DBDNAME keyword.

Format:

.cagrp(CA_group_name)

.CA_group_name
Specify a 1- to 8-character CA group name. There is no default.

DATAFROM

This keyword specifies where to extract sensor data from.

DATAFROM is an optional keyword.

Format:

.datafrom(REPOSITORY HISTORY ALL)

REPOSITORY
Extracts sensor data from the IMS Tools KB sensor data repository. This is the default.

HISTORY
Extracts sensor data from the historical sensor data sets.
**DBDNAME**
This keyword specifies a database name. The sensor data of the specified database is extracted.

DBDNAME is a required keyword if you do not specify the CAGRP keyword. The DBDNAME keyword cannot be specified with the CAGRP keyword.

Format:

```plaintext
DBDNAME( dbd_name )
```

*dbd_name*
Specify a 1- to 8-character DBD name. There is no default.

**DOMAIN**
This keyword specifies a policy domain. It represents which type of sensor data is to be extracted.

DOMAIN is a required keyword.

Format:

```plaintext
DOMAIN( ALL, REORG, RECOVERY )
```

**REORG**
Extracts sensor data that is associated with the REORG domain. The sensor data is collected by the DB Sensor of IMS Database Solution Pack for z/OS, IMS Database Utility Solution for z/OS, or IMS Fast Path Solution Pack for z/OS.

**RECOVERY**
Extracts sensor data that is associated with the RECOVERY domain. The sensor data is collected by the DB Sensor of IMS Recovery Solution Pack for z/OS.

**ALL**
Extracts sensor data that is associated with all policy domains.

There is no default.

**DSN_CSV**
This keyword specifies the name of the data set in which the Sensor Data History Report of CSV type is to be generated.

The data set is dynamically allocated with DISP=NEW, RECFM=VB, LRECL=32756, and BLKSIZE=32760. You cannot specify an existing data set.

DSN_CSV is a required keyword if you specify REPORT_TYPE(CSV).

Format:

```plaintext
DSN_CSV( data_set_name )
```

*data_set_name*
Specify a 1- to 44-character data set name. There is no default.

**DSN_LONG**
This keyword specifies the name of the data set in which a Sensor Data History report of Long type is to be generated.
The data set is dynamically allocated with DISP=NEW, RECFM=VBA, LRECL=32756, and BLKSIZE=32760. You cannot specify an existing data set.

DSN_LONG is a required keyword if you specify REPORT_TYPE(LONG).

Format:

```plaintext
DSN_LONG( data_set_name )
```

**data_set_name**
Specify a 1- to 44-character data set name. There is no default.

**GENERATION**
This keyword specifies how many generations of sensor data are to be extracted.

This keyword is optional. The GENERATION keyword cannot be specified with the LASTDATE keyword.

Format:

```plaintext
GENERATION( value )
```

**value**
Specify a value in the range of 1 to 999. If you specify GENERATION(3), sensor data of the three most recent generations is to be extracted and reported. The default is GENERATION(5).

**HISTORY**
This keyword specifies whether to extract not only the latest sensor data but also old sensor data.

This keyword is optional.

Format:

```plaintext
HISTORY( NO )
```

**YES**
Extracts not only the latest sensor data but also old sensor data. This is the default.

**NO**
Extracts the latest sensor data only. If you specify HISTORY(NO), GENERATION and LASTDATE keywords will be ignored.

**ITKBSRVR**
This keyword specifies the name of the IMS Tools KB server. The sensor data is extracted from the IMS Tools KB sensor data repository, which is managed by the IMS Tools KB server.

This keyword is required.

Format:

```plaintext
ITKBSRVR( server_name )
```

**server_name**
Specify a 1- to 8-character IMS Tools KB server name. There is no default.

**LASTDATE**
This keyword specifies the last date of sensor data that is to be extracted and reported by the Sensor Data Extractor.

This keyword is optional.

The LASTDATE keyword cannot be specified with the GENERATION keyword.
Format:

LASTDATE(yyyymmddhhmmss)

**yyyymmddhhmmss**
Specify a value that represents the last date.
If you specify LASTDATE(20200401123000), the last date will be April 1, 2020, 12:30:00.
If you specify LASTDATE(20191231), the last date will be December 31, 2019, 00:00:00.
There is no default.

**PARTNAME**
This keyword specifies a HALDB partition name. The sensor data of the specified HALDB partition is extracted.
PARTNAME is a required keyword if the database specified by the DBDNAME keyword is a HALDB.
Format:

PARTNAME( partition_name )

**partition_name**
Specify a 1- to 7-character HALDB partition name. There is no default.

**RECONID**
This keyword specifies a RECON ID that is associated with the RECON1 data set name in the IMS Tools KB repository.
RECONID is a required keyword.
Format:

RECONID( recon_id )

**recon_id**
Specify a 1- to 8-character RECON ID. There is no default.

**REPORT_TYPE**
This keyword specifies which formats of reports you want to generate.
This keyword can specify up to three parameters. If you specify multiple parameters for this keyword, the Sensor Data Extractor generates multiple formats of reports.
REPORT_TYPE is an optional keyword.
Format:

REPORT_TYPE( SHORT, LONG, CSV )

**SHORT**
Generates a Sensor Data History report of up to five generations of sensor data. The report is written in the BSNURPRT data set or the SYSOUT stream. This is the default.

**LONG**
Generates a Sensor Data History report of up to 999 generations of sensor data. The report is written in the data set specified by the DSN_LONG keyword.
CSV
Generates a Sensor Data History Report of up to 999 generations of sensor data. The report is written in CSV format in the data set specified by the DSN_CSV keyword.

If you specify the CSV parameter, DOMAIN(ALL) or multiple parameters for the DOMAIN keyword cannot be specified.

Output from the Sensor Data Extractor

The Sensor Data Extractor generates a Journal Messages report and three types of Sensor Data History reports.

Topics:

- “Journal Messages report” on page 122
- “Sensor Data History report (Short type)” on page 122
- “Sensor Data History report (Long type)” on page 125
- “Sensor Data History report (CSV type)” on page 127

Journal Messages report

The Journal Messages report contains processing messages about the Sensor Data Extractor job. This report is generated in the BSNUJRNL data set.

Sample report

The following figure shows an example of the Journal Messages report:

![Sample Journal Messages report](image)

Figure 71. Journal Messages report

Sensor Data History report (Short type)

The Sensor Data History Report of Short type contains data element values of sensor data with their collected dates. This report is generated in the BSNURPRT data set.

This report contains the data element names, their values, and their collected dates. For the definitions of these data elements, see Chapter 21, “Data elements,” on page 161. The URL in the report header indicates the link to this topic on the web.

This report can contain up to five generations of sensor data. If more than five generations are extracted, only the five most recent generations are shown.

Sample report

The following figure shows an example of the Sensor Data History report of Short type. In this example, four generations of sensor data are reported.
**Database Statistics (DBD: HDAMVSAM, DB Type: HDAM)**

**Data elements related to root segments**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_ROOT</td>
<td>212,242</td>
<td>208,080</td>
<td>204,000</td>
<td>200,000</td>
</tr>
<tr>
<td>DB_NUM_SYNONYM</td>
<td>87,755</td>
<td>83,576</td>
<td>79,596</td>
<td>75,805</td>
</tr>
<tr>
<td>DB_PCT_NUM_SYNONYM</td>
<td>41%</td>
<td>40%</td>
<td>39%</td>
<td>37%</td>
</tr>
<tr>
<td>DB_NUM_ROOT_NOMHOME</td>
<td>15,573</td>
<td>14,831</td>
<td>14,124</td>
<td>13,451</td>
</tr>
<tr>
<td>DB_PCT_NUM_ROOT_NOMHOME</td>
<td>7%</td>
<td>7%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>DB_NUM_ROOT_OVFL</td>
<td>3,000</td>
<td>2,000</td>
<td>1,000</td>
<td>0</td>
</tr>
<tr>
<td>DB_PCT_NUM_ROOT_OVFL</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>DB_FLAG_SENSOR_HOME</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>DB_FLAG_SENSOR_DBINFO</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>DB_AVG_LEN_SYNONYM_CHAIN</td>
<td>2.73</td>
<td>2.70</td>
<td>2.65</td>
<td>2.65</td>
</tr>
</tbody>
</table>

**Data elements related to randomizing parameter**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_BYTES_SEG_RAA</td>
<td>73,624,950</td>
<td>70,119,000</td>
<td>66,780,000</td>
<td>63,600,000</td>
</tr>
<tr>
<td>DB_PCT_BYTES_OVFL</td>
<td>9%</td>
<td>6%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>DB_NUM_RAP</td>
<td>192,000</td>
<td>192,000</td>
<td>192,000</td>
<td>192,000</td>
</tr>
<tr>
<td>DB_NUM_UNUSED_RAP</td>
<td>58,136</td>
<td>61,195</td>
<td>64,415</td>
<td>67,805</td>
</tr>
<tr>
<td>DB_PCT_NUM_UNUSED_RAP</td>
<td>30%</td>
<td>31%</td>
<td>33%</td>
<td>35%</td>
</tr>
</tbody>
</table>

**Data elements related to database records**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_AVG_DBREC_LENGTH</td>
<td>1,751.78</td>
<td>1,701.28</td>
<td>1,650.78</td>
<td>1,600.28</td>
</tr>
<tr>
<td>DB_ESTIMATED_DBREC_IO</td>
<td>4.57</td>
<td>4.48</td>
<td>4.39</td>
<td>4.30</td>
</tr>
<tr>
<td>DB_ESTIMATED_ROOT_IO</td>
<td>1.16</td>
<td>1.14</td>
<td>1.12</td>
<td>1.10</td>
</tr>
</tbody>
</table>

**Data elements related to event dates**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_DAYS_SINCE_LAST_REORG</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>
### Data Set Statistics (DBD: HDAMVSAM, DB Type: HDAM, DSG: 01, DD name: HDAMVSD1)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_FLAG_SMS</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>DB_MAX_EXT_DS</td>
<td>251</td>
<td>251</td>
<td>251</td>
<td>251</td>
</tr>
<tr>
<td>DB_MAX_EXT_VOL</td>
<td>123</td>
<td>123</td>
<td>123</td>
<td>123</td>
</tr>
<tr>
<td>DB_AVAIL_EXT_LIMIT</td>
<td>VOL_FREE_EXTENTS</td>
<td>VOL_FREE_EXTENTS</td>
<td>VOL_FREE_EXTENTS</td>
<td>VOL_FREE_EXTENTS</td>
</tr>
<tr>
<td>DB_NUM_AVAI_EXT</td>
<td>85</td>
<td>86</td>
<td>87</td>
<td>88</td>
</tr>
<tr>
<td>DB_NUM_EXT</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>DB_RBA_HIGH_ALLOC</td>
<td>217,785,680</td>
<td>209,328,338</td>
<td>201,277,440</td>
<td>193,536,000</td>
</tr>
<tr>
<td>DB_NUM_VOL</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>DB_NUM_UNUSED_VOL</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DB_NUM_UNUSED_VOL</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DB_NUM_VLSEG_SPLIT</td>
<td>55</td>
<td>52</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>DB_NUM_BLOCKS</td>
<td>2,048</td>
<td>2,048</td>
<td>2,048</td>
<td>2,048</td>
</tr>
</tbody>
</table>

---

### Data elements related to database set space

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_DBDS_BLOCKS</td>
<td>55,570</td>
<td>52,923</td>
<td>50,402</td>
<td>48,001</td>
</tr>
<tr>
<td>DB_MAX_DS_SIZE</td>
<td>4G</td>
<td>4G</td>
<td>4G</td>
<td>4G</td>
</tr>
<tr>
<td>DB_UNUSED_BYTES</td>
<td>89,629,670</td>
<td>91,458,846</td>
<td>93,325,353</td>
<td>95,229,952</td>
</tr>
<tr>
<td>DB_NUM_SEC_SPACE</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>DB_NUM_PRI_SPACE</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>DB_NUM_UNUSED_VOL</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DB_NUM_UNUSED_VOL</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DB_RBA_HIGH_ALLOC</td>
<td>217,701,680</td>
<td>209,328,538</td>
<td>201,277,440</td>
<td>193,536,000</td>
</tr>
<tr>
<td>DB_NUM_EXT</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>DB_MAX_EXT_VOL</td>
<td>56</td>
<td>46</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>DB_NUM_PTR</td>
<td>87,956</td>
<td>83,576</td>
<td>79,596</td>
<td>75,865</td>
</tr>
<tr>
<td>DB_NUM_PTR_DIFF_BLK</td>
<td>17,525</td>
<td>14,604</td>
<td>12,170</td>
<td>10,141</td>
</tr>
<tr>
<td>DB_NUM.Ptr_Diff_BLK</td>
<td>175</td>
<td>164</td>
<td>150</td>
<td>133</td>
</tr>
</tbody>
</table>

---

### Data elements related to pointers in a data set group

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_SEG</td>
<td>6,655</td>
<td>6,050</td>
<td>5,580</td>
<td>5,000</td>
</tr>
<tr>
<td>DB_NUM_VLSEG_SPLIT</td>
<td>73,424,958</td>
<td>70,119,000</td>
<td>66,780,000</td>
<td>63,600,000</td>
</tr>
<tr>
<td>DB_PCT_BYTES_SEG</td>
<td>68%</td>
<td>66%</td>
<td>64%</td>
<td>62%</td>
</tr>
<tr>
<td>DB_NUM_VLSEG</td>
<td>6,655</td>
<td>6,050</td>
<td>5,580</td>
<td>5,000</td>
</tr>
<tr>
<td>DB_NUM_VLSEG_SPLIT</td>
<td>66,780,000</td>
<td>63,600,000</td>
<td>60,480,000</td>
<td>57,360,000</td>
</tr>
<tr>
<td>DB_NUM_VLSEG_SPLIT</td>
<td>63,600,000</td>
<td>60,480,000</td>
<td>57,360,000</td>
<td>54,240,000</td>
</tr>
<tr>
<td>DB_NUM_BLOCKS</td>
<td>2,048</td>
<td>2,048</td>
<td>2,048</td>
<td>2,048</td>
</tr>
</tbody>
</table>

---

### Data elements related to free space in a data set group

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_FSE_MIN</td>
<td>32,899</td>
<td>29,586</td>
<td>26,554</td>
<td>23,954</td>
</tr>
<tr>
<td>DB_NUM_FSE_MAX</td>
<td>62,397</td>
<td>47,997</td>
<td>37,997</td>
<td>29,997</td>
</tr>
<tr>
<td>DB_AVG_NUM_FSE</td>
<td>19%</td>
<td>12%</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>DB_NUM_FSE</td>
<td>62,397</td>
<td>47,997</td>
<td>37,997</td>
<td>29,997</td>
</tr>
<tr>
<td>DB_NUM_NOREUSE_FSE</td>
<td>29,954</td>
<td>23,997</td>
<td>19,997</td>
<td>15,997</td>
</tr>
<tr>
<td>DB_NUM_FSE_MIN</td>
<td>19%</td>
<td>12%</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>DB_NUM_FSE_MAX</td>
<td>62,397</td>
<td>47,997</td>
<td>37,997</td>
<td>29,997</td>
</tr>
<tr>
<td>DB_AVG_NUM_FSE</td>
<td>19%</td>
<td>12%</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>DB_NUM_FSE_MIN</td>
<td>19%</td>
<td>12%</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>DB_NUM_FSE_MAX</td>
<td>62,397</td>
<td>47,997</td>
<td>37,997</td>
<td>29,997</td>
</tr>
</tbody>
</table>

---

**Figure 73. Sensor Data History report (Short type) - Part 2 of 2**

### Report field descriptions

The Sensor Data History report (Short type) shows the following fields:

- **Description of each data element can be referred to from the following URL:**
  - This URL links to the web version of the topic in Chapter 21, “Data elements,” on page 161. You can refer to the description of each data element from the subtopics of this page.

### Database Statistics | Partition Statistics | Area Statistics

This part shows a list of sensor data elements of the non-HALDB database level, HALDB partition level, or DEDB area level.

- **DBD**
  - Shows the name of the database.

- **Partition**
  - Shows the name of the HALDB partition. This field is displayed only for HALDB.
Area
Shows the name of the DEDB area. This field is displayed only for DEDB.

DB type
Shows the type of the database.

Data Set Statistics
This part shows a list of sensor data elements of the data set group level.

DBD
Shows the name of the database.

Partition
Shows the name of the HALDB partition. This field is displayed only for HALDB.

Area
Shows the name of the DEDB area. This field is displayed only for DEDB.

DB type
Shows the type of the database.

DSG
Shows the ID of the data set group.

DD name
Shows the DD name of the data set.

Data elements related to ...
This title is enclosed by double lines and shows a classification of the listed data elements. The title corresponds to the reference topic title of this guide.

Data Element Name
This column shows the names of data elements.

yyyy-mm-dd hh:mm:ss
The date and time indicates when the data elements were stored in the IMS Tools KB Sensor Data repository by DB Sensor. The date and time is shown in local time.

This column shows the value of each data element at the indicated point of time. If a certain data element is not stored in the repository, ‘n/a’ is shown.

Sensor Data History report (Long type)
The Sensor Data History report of Long type contains data element values of sensor data with their collected dates. This report is generated in the data set that is specified by the DSN_LONG keyword.

This report contains the data element names, their values, and their collected dates. For the definitions of these data elements, see Chapter 21, “Data elements,” on page 161. The URL in the report header indicates the link to this topic on the web.

This report can contain up to 999 generations of sensor data. If more than 999 generations are extracted, only the 999 most recent generations are shown.

Sample report
The following figure shows an example of the Sensor Data History report of Long type. In this example, six generations of sensor data are reported.
### Data Elements Related to Area Statistics

<table>
<thead>
<tr>
<th>Data Element Name</th>
<th>2019-03-31 00:00:00</th>
<th>2019-03-24 00:00:00</th>
<th>2019-03-17 00:00:00</th>
<th>2019-03-10 00:00:00</th>
<th>2019-03-03 00:00:00</th>
<th>Data Element Name</th>
<th>2019-02-24 00:00:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_AREADEF_ROOT2</td>
<td>1,100</td>
<td>1,100</td>
<td>1,100</td>
<td>1,100</td>
<td>1,100</td>
<td>DB_AREADEF_ROOT2</td>
<td>1,100</td>
</tr>
<tr>
<td>DB_AREADEF_UOW1</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>DB_AREADEF_UOW1</td>
<td>24</td>
</tr>
<tr>
<td>DB_MAX_NUM_DOVFCI_BY_UOW</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>DB_MAX_NUM_DOVFCI_BY_UOW</td>
<td>8</td>
</tr>
<tr>
<td>DB_AVG_NUM_DOVFCI_BY_UOW</td>
<td>0.60</td>
<td>0.55</td>
<td>0.50</td>
<td>0.45</td>
<td>0.40</td>
<td>DB_AVG_NUM_DOVFCI_BY_UOW</td>
<td>0.40</td>
</tr>
</tbody>
</table>

### Data Elements Related to Overflow in an Area

<table>
<thead>
<tr>
<th>Data Element Name</th>
<th>2019-03-31 00:00:00</th>
<th>2019-03-24 00:00:00</th>
<th>2019-03-17 00:00:00</th>
<th>2019-03-10 00:00:00</th>
<th>2019-03-03 00:00:00</th>
<th>Data Element Name</th>
<th>2019-02-24 00:00:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_PCT_BYTES_FS_SDEP</td>
<td>99%</td>
<td>99%</td>
<td>99%</td>
<td>99%</td>
<td>99%</td>
<td>DB_PCT_BYTES_FS_SDEP</td>
<td>99%</td>
</tr>
<tr>
<td>DB_PCT_BYTES_FS_RAA</td>
<td>64%</td>
<td>64%</td>
<td>64%</td>
<td>64%</td>
<td>64%</td>
<td>DB_PCT_BYTES_FS_RAA</td>
<td>64%</td>
</tr>
</tbody>
</table>

### Data Elements Related to Free Space in an Area

<table>
<thead>
<tr>
<th>Data Element Name</th>
<th>2019-03-31 00:00:00</th>
<th>2019-03-24 00:00:00</th>
<th>2019-03-17 00:00:00</th>
<th>2019-03-10 00:00:00</th>
<th>2019-03-03 00:00:00</th>
<th>Data Element Name</th>
<th>2019-02-24 00:00:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_UOW_USE_IOVF</td>
<td>72</td>
<td>66</td>
<td>60</td>
<td>54</td>
<td>48</td>
<td>DB_NUM_UOW_USE_IOVF</td>
<td>48</td>
</tr>
</tbody>
</table>

---

**Description of each data element can be referred from following URL:**

Tools Base Policy Services - V1R6 > Sensor Data History Report

This part shows a list of sensor data elements of the non-HALDB database level, HALDB partition level, or DEED area level.

---

**Figure 74. Sensor Data History report (Long type)**

**Report field descriptions**

The Sensor Data History report (Long type) shows the following fields:

**Description of each data element can be referred to from the following URL:**

This URL links to the web version of the topic in Chapter 21, “Data elements,” on page 161. You can refer to the description of each data element from the subtopics of this page.

**Database Statistics | Partition Statistics | Area Statistics**

This part shows a list of sensor data elements of the non-HALDB database level, HALDB partition level, or DEED area level.

---


---

126
**DBD**
Shows the name of the database.

**Partition**
Shows the name of the HALDB partition. This field is displayed only for HALDB.

**Area**
Shows the name of the DEDB area. This field is displayed only for DEDB.

**DB type**
Shows the type of the database.

**Data Set Statistics**
This part shows a list of sensor data elements of the data set group level.

**DBD**
Shows the name of the database.

**Partition**
Shows the name of the HALDB partition. This field is displayed only for HALDB.

**Area**
Shows the name of the DEDB area. This field is displayed only for DEDB.

**DB type**
Shows the type of the database.

**DSG**
Shows the ID of the data set group.

**DD name**
Shows the DD name of the data set.

**Data elements related to ...**
This title is enclosed by double lines and shows a classification of the listed data elements. The title corresponds to the reference topic title of this guide.

**Data element name**
This column shows the names of data elements.

For readability, this column is repeated after every five generations (every five yyyy-mm-dd hh:mm:ss columns) of sensor data.

**yyyy-mm-dd hh:mm:ss**
The date and time indicates when the data elements were stored in the IMS Tools KB Sensor Data repository by DB Sensor. The date and time is shown in local time.

This column shows the value of each data element at the indicated point of time. If a certain data element is not stored in the repository, ‘n/a’ is shown.

**Sensor Data History report (CSV type)**
The Sensor Data History report of CSV type contains a list of data element values of sensor data with their collected dates. This report is in CSV (comma-separated values) format and generated in the data set that is specified by the DSN_CSV keyword.

This report contains data element names, their values, and their collected dates. For the definitions of these data elements, see Chapter 21, “Data elements,” on page 161.

This report can contain up to 999 generations of sensor data. If more than 999 generations are extracted, only the 999 most recent generations are shown.

**Sample report**
The following figure shows an example of the Sensor Data History report of CSV type. In this example, four generations of sensor data are reported.
Figure 75. Sensor Data History report (CSV type)

Report field descriptions

The Sensor Data History report (CSV type) shows the following fields:

#number=data_element_name

This record indicates an ID that is assigned to each data element name in this report.

number

Shows the ID of the data element. This four-digit ID is used in the header record of the data records table to identify each data element.

data_element_name

Shows the name of the data element associated with the ID.

#Timestamp, DBD, PARTAREA, DSG, number_1, number_2, number_3, ....

This record is the header record of the data records list. This record shows the meaning of each field in the data records.

number_n shows the ID of the data element that is associated with the data element name.

yyyy-mm-ddThh:mm:ss±hh:mm, dbdname, partarea, dsg_number, value_1, value_2, value_3, ....

This record is a data record for each sensor data record of a specific generation.

yyyy-mm-ddThh:mm:ss±hh:mm

Shows the date and time that the sensor data was collected and stored in the IMS Tools KB repository. The format is shown in the ISO 8601 format.

dbdname

Shows the name of the database.

partarea

If the database is a HALDB, partarea shows the name of the HALDB partition.

If the database is a DEDB, partarea shows the name of the DEDB area.

dsg_number

If the data record is for sensor data of a database or an area level, dsg_number shows '0'.

If the data record is for sensor data of a data set group level, dsg_number shows the DSG number.

value_n

Shows the data element value of number_n that is indicated in the header record. If value_n shows nothing, it means that the data element number_n is not applicable for the sensor data record or that the data element for the sensor data record is not stored in the IMS Tools KB repository.
JCL examples for the Sensor Data Extractor

Use these JCL examples to code JCL statements for the Sensor Data Extractor.

In this topic:

- “Example 1: Extracting latest sensor data from all domains to generate a Short type report” on page 129
- “Example 2: Extracting sensor data of multiple generations to generate a Short type report” on page 129
- “Example 3: Extracting sensor data of a specific date and later to generate a Long type report” on page 130
- “Example 4: Generating all types of reports” on page 130

Example 1: Extracting latest sensor data from all domains to generate a Short type report

The following figure shows example JCL for extracting the latest non-HALDB sensor data from all policy domains.

```
//PGM1 EXEC PGM=BSNUTIL0,PARM='FUNC=EXTRACT_SENSOR'
//STEPLIB DD DISP=SHR,DSN=ITB.SHKTLOAD
//BSNUJRNL DD SYSOUT=*  
//BSNURPRT DD SYSOUT=*  
//BSNSYSIN DD *  
ITKBSRVR(FPQSRV01)  
RECONID(RECON1)  
DOMAIN(ALL)  
DBDNAME(HDAMVSAM)  
HISTORY(NO)  
/*
```

*Figure 76. Example 1: Extracting latest sensor data from all domains*

In this example, sensor data of both REORG and RECOVERY domains are extracted and reported because DOMAIN(ALL) is specified.

The latest sensor data is extracted and reported because HISTORY(NO) is specified.

The Sensor Data History report of Short type is generated in the BSNURPRT data set because REPORT_TYPE(SHORT) (default value) is assumed.

Example 2: Extracting sensor data of multiple generations to generate a Short type report

The following figure shows example JCL for extracting three generations of HALDB sensor data.

```
//PGM1 EXEC PGM=BSNUTIL0,PARM='FUNC=EXTRACT_SENSOR'
//STEPLIB DD DISP=SHR,DSN=ITB.SHKTLOAD
//BSNUJRNL DD SYSOUT=*  
//BSNURPRT DD SYSOUT=*  
//BSNSYSIN DD *  
ITKBSRVR(FPQSRV01)  
RECONID(RECON1)  
DOMAIN(REORG)  
DBDNAME(PHI06100)  
PARTNAME(PHI001A)  
GENERATION(3)  
/*
```

*Figure 77. Example 2: Extracting multiple generations of sensor data*

In this example, sensor data of REORG domain is extracted and reported because DOMAIN(REORG) is specified.

The sensor data of three most recent generations is extracted and reported because HISTORY(YES) (default) is assumed and GENERATION(3) is specified.
The Sensor Data History report of Short type is generated in the BSNURPRT data set because REPORT_TYPE(SHORT) (default value) is assumed.

Example 3: Extracting sensor data of a specific date and later to generate a Long type report

The following figure shows example JCL for extracting DEDB sensor data of a specific date and later to generate a Sensor Data History Report of Long type.

```
//PGM1     EXEC PGM=BSNUTIL0,PARM='FUNC=EXTRACT_SENSOR'
//STEPLIB  DD DISP=SHR,DSN=ITB.SHKTLOAD
//BSNUJRNL DD SYSOUT=* 
//BSNSYSIN DD *
ITKBSRVR(FPQSRV01)
RECONID(RECON1)
DOMAIN(REORG)
DBDNAME(DEDBJN24)
AREAENAME(DB2AAR0)
LASTDATE(20200101)
REPORT_TYPE(LONG)
DSN_LONG(ITB.REPORT.LONG)
/*
```

Figure 78. Example 3: Extracting sensor data of a specific date and later to generate a Long type report

In this example, sensor data of REORG domain is extracted and reported because DOMAIN(REORG) is specified.

Sensor data of all generations, which was collected on January 1st, 2020 and later, is extracted and reported because HISTORY(YES) (default) is assumed and LASTDATE(20200101) is specified.

A Sensor Data History report of Long type is generated in the data set named ITB.REPORT.LONG because REPORT_TYPE(LONG) and DSN_LONG(ITB.REPORT.LONG) are specified.

Example 4: Generating all types of reports

The following figure shows example JCL for extracting non-HALDB sensor data and generating all types of Sensor Data History reports.

```
//PGM1     EXEC PGM=BSNUTIL0,PARM='FUNC=EXTRACT_SENSOR'
//STEPLIB  DD DISP=SHR,DSN=ITB.SHKTLOAD
//BSNUJRNL DD SYSOUT=* 
//BSNURPRT DD SYSOUT=* 
//BSNSYSIN DD *
ITKBSRVR(FPQSRV01)
RECONID(RECON1)
DOMAIN(REORG)
DBDNAME(HDAMVSAM)
GENERATION(999)
REPORT_TYPE(SHORT,LONG,CSV)
DSN_LONG(ITB.REPORT.LONG)
DSN_CSV(ITB_REPORT.CSV)
/*
```

Figure 79. Example 4: Generating all types of reports

In this example, sensor data of REORG domain is extracted and reported because DOMAIN(REORG) is specified.

Sensor data of 999 generations (or all generations if less than 999 generations are stored in the repository) is extracted and reported because HISTORY(YES) (default) is assumed and GENERATION(999) is specified.

Short, Long, and CSV types of Sensor Data History reports are generated because REPORT_TYPE(SHORT,LONG,CSV) is specified.

A Sensor Data History Report of Long type is generated in the data set named ITB.REPORT.LONG because DSN_LONG(ITB.REPORT.LONG) is specified.
A Sensor Data History Report of CSV type is generated in the data set named ITB.REPORT.CSV because DSN_LONG(ITB.REPORT.CSV) is specified.
Chapter 19. Statistics Data Import Utility

The Statistics Data Import Utility imports sensor data from CSV-formatted files and stores the imported data in a sequential data set called the historical sensor data set. The Statistics Data Import Utility also stores the import information in the IMS Tools Knowledge Base (IMS Tools KB) Sensor Data repository.

Topics:

• “Statistics Data Import Utility overview” on page 133
• “Running the Statistics Data Import Utility” on page 134
• “EXEC and DD statements for the Statistics Data Import Utility” on page 135
• “Control statements for the Statistics Data Import Utility” on page 136
• “Input CSV-formatted data sets for the Statistics Data Import Utility” on page 140
• “Alias definition table for the Statistics Data Import Utility” on page 143
• “Output from the Statistics Data Import Utility” on page 143
• “JCL examples for the Statistics Data Import Utility” on page 148

Statistics Data Import Utility overview

The Statistics Data Import Utility imports sensor data from CSV-formatted files and stores the imported data in a sequential data set called the historical sensor data set. The Statistics Data Import Utility also stores catalog information about the imported sensor data (utility history data) in the IMS Tools Knowledge Base (IMS Tools KB) Sensor Data repository.

Before importing sensor data, you need to prepare CSV files that contain information about the database sensor data that you want to import.

The imported sensor data can be referred to by the IMS Tools products that support imported sensor data.
Running the Statistics Data Import Utility

The Statistics Data Import Utility runs as a standard z/OS batch job. To import sensor data to a historical sensor data set, prepare CSV-formatted data sets to be imported, code the Statistics Data Import Utility JCL, and run the job.

Procedure

1. Prepare CSV-formatted data sets that contain information about sensor data for a database, a partition, an area, or a database data set.

   For the format of the CSV data set, see “Input CSV-formatted data sets for the Statistics Data Import Utility” on page 140.

2. Write the JCL EXEC and DD statements.

   For the format of the EXEC statement and the list of DD statements, see “EXEC and DD statements for the Statistics Data Import Utility” on page 135.

3. Code the control statements in the BSNSYSIN data set.

   For the syntax of the control statements, see “Control statements for the Statistics Data Import Utility” on page 136.

The following figure shows a JCL example for the Statistics Data Import Utility:
EXEC and DD statements for the Statistics Data Import Utility

You must specify an EXEC statement and DD statements that define the input and output data sets in your JCL.

In this topic:

- “EXEC statement” on page 135
- “Summary of DD statements” on page 135
- “DD statements for input” on page 136
- “DD statements for output” on page 136

EXEC statement

The EXEC statement must be in the following format:

```
//STEP EXEC PGM=BSNUTIL0,PARM='FUNC=IMPORT_STATS'
```

The EXEC statement in the batch JCL contains one keyword specification in the PARM field: FUNC=.

**FUNC**

Identifies which Policy Services utility is to be invoked.

To invoke the Statistics Data Import Utility, specify either 'FUNC=IMPORT_STATS' or 'FUNC=IMPS'.

Summary of DD statements

DD statements for the Statistics Data Import Utility determine the input and output data sets and specify how to run the Statistics Data Import Utility.

The following table summarizes the DD statements for the Statistics Data Import Utility.

<table>
<thead>
<tr>
<th>DD name</th>
<th>Use</th>
<th>Format</th>
<th>Can be dynamically allocated?</th>
<th>Required or optional?</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEPLIB</td>
<td>Input</td>
<td>RECFM=U</td>
<td>No</td>
<td>Required</td>
</tr>
<tr>
<td>IMS</td>
<td>Input</td>
<td>RECFM=U</td>
<td>No</td>
<td>Required</td>
</tr>
</tbody>
</table>

Chapter 19. Statistics Data Import Utility 135
### Table 9. DD statements for the Statistics Data Import Utility (continued)

<table>
<thead>
<tr>
<th>DD name</th>
<th>Use</th>
<th>Format</th>
<th>Can be dynamically allocated?</th>
<th>Required or optional?</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSNSYSIN</td>
<td>Input</td>
<td>RECFM=FB,LRECL=80</td>
<td>No</td>
<td>Required</td>
</tr>
<tr>
<td>BSNUJRNL</td>
<td>Output</td>
<td>RECFM=FBA,LRECL=133</td>
<td>Yes</td>
<td>Optional</td>
</tr>
<tr>
<td>BSNURPRT</td>
<td>Output</td>
<td>RECFM=FBA,LRECL=133</td>
<td>Yes</td>
<td>Optional</td>
</tr>
</tbody>
</table>

### DD statements for input

The following input DD statements are used for the Statistics Data Import Utility.

**STEPLIB**

This DD statement is required. It specifies the load module library of IMS Tools Base (SHKTLOAD).

**IMS**

This DD statement is required. It specifies the library that contains the DBD. The DBD name is described in the input CSV data set.

**BSNSYSIN**

This DD statement is required. It specifies the input control statement that controls the Statistics Data Import Utility functions.

The BSNSYSIN DD statement can be coded as a standard SYSIN file, a sequential data set, or a PDS member. LRECL=80 is required for the DCB of this data set.

For details about coding the BSNSYSIN DD statement, see “Control statements for the Statistics Data Import Utility” on page 136.

### DD statements for output

The following output DD statements are used for the Statistics Data Import Utility.

**BSNUJRNL**

This DD statement is optional. It specifies the processing log output data set, which stores processing messages that are issued by the Statistics Data Import Utility.

If you do not specify this DD statement, the Statistics Data Import Utility dynamically allocates the data set by using SYSOUT=*.

**BSNURPRT**

This DD statement is optional. It specifies the report output data set, which stores the Imported Sensor Data report.

If you do not specify this DD statement, the Statistics Data Import Utility dynamically allocates the data set by using SYSOUT=*.

---

### Control statements for the Statistics Data Import Utility

The control statement for the Statistics Data Import Utility controls the functions of the Statistics Data Import Utility.

The control statement must be specified in the BSNSYSIN data set. This control statement data set generally resides in the input stream. However, it can also be defined as a sequential data set or as a member of a partitioned data set. It must contain 80-byte, fixed-length records. The block size, if coded, must be a multiple of 80.

The control statement must be coded in columns 1 - 72. Columns 73 - 80 are regarded as comments and ignored.

In this topic:
Format of the control statement

The control statement includes a set of keywords, parameters, and comments that are specified in the BSNSYSIN data set.

Keywords

A keyword defines an option for the Statistics Data Import Utility. Keywords can be specified in any order, and any two adjacent keywords must be separated by a blank or a comma. Each keyword has one or more associated parameters.

Parameters

A parameter defines a value for the associated keyword. Some keywords require only one parameter and others require one or more parameters. Parameters must be character or numeric values.

A keyword and the associated parameters are separated by parentheses. If two or more parameters are specified, any two adjacent parameters must be separated by a blank or a comma. For example,

```
keyword(parameter)
keyword(parameter1, parameter2, parameter3)
keyword parameter1 parameter2 parameter3
```

Comments

You can include comments in the BSNSYSIN data set by marking a line with an asterisk (*) in column 1.

The Statistics Data Import Utility ignores the comment line when analyzing the control statement in the BSNSYSIN data set.

Summary of keywords

The following table summarizes the keywords of the control statement for the Statistics Data Import Utility.

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Required or optional?</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSV_AREA</td>
<td>Optional</td>
<td>n/a</td>
<td>Specifies the name of a data set that contains CSV-formatted sensor data for a DEDB area.</td>
</tr>
<tr>
<td>CSV_DB</td>
<td>Optional</td>
<td>n/a</td>
<td>Specifies the name of a data set that contains CSV-formatted sensor data for a database.</td>
</tr>
<tr>
<td>CSV_DSG</td>
<td>Optional</td>
<td>n/a</td>
<td>Specifies the names of the data sets that contain CSV-formatted sensor data for database data sets.</td>
</tr>
<tr>
<td>DSN_ALIASDEF</td>
<td>Optional</td>
<td>n/a</td>
<td>Specifies the name of a data set that contains the alias definition table.</td>
</tr>
<tr>
<td>HLQ_CSVSET</td>
<td>Optional</td>
<td>n/a</td>
<td>Specifies the data set high level qualifier for a set of CSV-formatted sensor data sets for one or more databases, partitions, and areas.</td>
</tr>
</tbody>
</table>
Table 10. Keywords for the Statistics Data Import Utility (continued)

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Required or optional?</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLQ_HISTORY</td>
<td>Required</td>
<td>n/a</td>
<td>Specifies the data set high level qualifier for the historical sensor data set.</td>
</tr>
<tr>
<td>INPUT_FORMAT</td>
<td>Optional</td>
<td>CSV</td>
<td>Specifies the format of the input sensor data to be imported.</td>
</tr>
<tr>
<td>ITKBSRVR</td>
<td>Required</td>
<td>n/a</td>
<td>Specifies the name of the IMS Tools KB server.</td>
</tr>
<tr>
<td>RECONID</td>
<td>Required</td>
<td>n/a</td>
<td>Specifies a RECON ID.</td>
</tr>
</tbody>
</table>

Description of keywords

The following keywords are available for the control statement.

**Note:** For the format of the input CSV-formatted sensor data, see “Input CSV-formatted data sets for the Statistics Data Import Utility” on page 140.

**CSV_AREA**

This keyword specifies the name of a data set that contains CSV-formatted sensor data for a DEDB area. You can specify only one data set name.

CSV_AREA is an optional keyword. The CSV_AREA keyword cannot be specified with either the CSV_DB keyword or the CSV_DSG keyword.

Format:

```plaintext
  ➪ CSV_AREA( data_set_name ) ➪
```

*data_set_name*

Specify a 1- to 44-character data set name. There is no default.

**CSV_DB**

This keyword specifies the name of a data set that contains CSV-formatted sensor data for a full-function database. You can specify only one data set name.

CSV_DB is an optional keyword. The CSV_DB keyword cannot be specified with the CSV_AREA keyword.

Format:

```plaintext
  ➪ CSV_DB( data_set_name ) ➪
```

*data_set_name*

Specify a 1- to 44-character data set name. There is no default.

**CSV_DSG**

This keyword specifies the names of the data sets that contain CSV-formatted sensor data for database data sets.

You can specify up to 10 data sets. Each data set must contain sensor data for a different database data set.

CSV_DSG is an optional keyword. The CSV_DSG keyword cannot be specified with the CSV_AREA keyword.

Format:
**data_set_name**

Specify a 1- to 44-character data set name. There is no default.

You can specify up to 10 data set names. Each data set must contain sensor data for a different database data set.

**DSN_ALIASDEF**

This keyword specifies the name of a data set that contains the alias definition table. By defining aliases of data element names in the alias definition table, you can use those aliases as column names in the input CSV-formatted data sets.

For the format of the alias definition table, see “Alias definition table for the Statistics Data Import Utility” on page 143.

DSN_ALIASDEF is an optional keyword.

Format:

```
DSN_ALIASDEF(data_set_name)
```

**data_set_name**

Specify a 1- to 44-character data set name. There is no default.

**HLQ_CSVSET**

This keyword specifies the data set high level qualifier for a set of CSV-formatted sensor data sets for one or more databases, partitions, or areas.

HLQ_CSVSET is an optional keyword. The HLQ_CSVSET keyword cannot be specified with the CSV_DB keyword, the CSV_DSG keyword, or the CSV_AREA keyword.

By using the HLQ_CSVSET keyword, you can import multiple databases, HALDB partitions, and DEDB areas in a single job step.

Format:

```
HLQ_CSVSET(data_set_high_level_qualifier)
```

**data_set_high_level_qualifier**

Specify a 1- to 17-character high level qualifier of the CSV-formatted sensor data sets. There is no default.

The names of the CSV-formatted data sets must follow the following rule:

<table>
<thead>
<tr>
<th>Database type</th>
<th>Sensor data for a database or an area</th>
<th>Sensor data for a database data set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-function database (non-HALDB)</td>
<td>hlq.dbdname</td>
<td>hlq.dbdname.string</td>
</tr>
<tr>
<td>Full-function database (HALDB)</td>
<td>hlq.dbdname.partname</td>
<td>hlq.dbdname.partname.string</td>
</tr>
<tr>
<td>Fast Path database (DEDB)</td>
<td>hlq.dbdname.areaname</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Where:

- `hlq` is the high level qualifier specified by the HLQ_CSVSET keyword.
- `dbdname` is the DBD name.
- `partname` is the HALDB partition name.
- `areaname` is the DEDB area name.
- `string` is any qualifier.
If the DBD member specified by the `dbdname` qualifier does not exist in the DBD library, the relevant CSV-formatted data set is not processed.

**HLQ_HISTORY**
This keyword specifies the data set high level qualifier of the historical sensor data set.
HLQ_HISTORY is a required keyword.
Format:
```plaintext
HLQ_HISTORY(data_set_high_level_qualifier)
```

*data_set_high_level_qualifier*
Specify a 1- to 17-character high level qualifier of the output (historical) sensor data set. There is no default.

The Statistics Data Import Utility determines the name of the historical sensor data set by using the high level qualifier specified by the HLQ_HISTORY keyword and the name of the DBD, the partition, or the area to be imported.

**INPUT_FORMAT**
This keyword specifies the format of input sensor data.
INPUT_FORMAT is an optional keyword.
Format:
```plaintext
INPUT_FORMAT(CSV)
```

*CSV*
Indicates that the input sensor data is a CSV-formatted data set. This is the default.

**ITKBSRVR**
This keyword specifies the name of the IMS Tools KB server. The Statistics Data Import Utility stores catalog information about the imported sensor data (utility history data) in the IMS Tools KB Sensor Data repository, which is managed by the IMS Tools KB server.
ITKBSRVR is a required keyword.
Format:
```plaintext
ITKBSRVR(server_name)
```

*server_name*
Specify a 1- to 8-character IMS Tools KB server name. There is no default.

**RECONID**
This keyword specifies the RECON ID that is associated with the RECON1 data set name in the IMS Tools KB repository.
RECONID is a required keyword.
Format:
```plaintext
RECONID(recon_id)
```

*recon_id*
Specify a 1- to 8-character RECON ID. There is no default.

---

**Input CSV-formatted data sets for the Statistics Data Import Utility**
The Statistics Data Import Utility obtains sensor data to be imported from CSV-formatted data sets. The CSV-formatted data sets must follow the following rules:
• The data set organization is physical sequential (PS), and the record format (RECFM) is VB.
• Each data value is separated by a comma.
• The first line is must be a header that includes a list of column names. There is no rule on the order of the columns. Column names are case-insensitive.
• Sensor data values of specific dates (Run Date) are placed under the header, starting from the second line. The data must be sorted in descending order of the Run Date column.

The following figure shows an example of a CSV-formatted data set.

| DBD Name, Partition Name, DSG ID, Run Date, Request Type, Executions, DB_NUM_EXT, DB_RBA_HIGH_USED, ...
| HDAMDB1, , 1, 2019/8/31, D, 1, 5, 107421674, 217701680, 4, 5, 231525, 115763, 6655, 5
| HDAMDB1, , 1, 2019/8/15, D, 1, 4, 104292887, 209328538, 4, 4, 220500, 110250, 6050, 5
| HDAMDB1, , 1, 2019/8/2, D, 1, 2, 98306048, 193536048, 193536000, 4, 4, 200000, 100000, 5000, 5

Summary of column names

Column names of a CSV-formatted data set determine the types of data values that are included in each column.

The following table summarizes the column names of a CSV-formatted data set.

<p>| Table 11. Column names of a CSV-formatted data set |</p>
<table>
<thead>
<tr>
<th>Column name</th>
<th>Required or optional?</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBD Name</td>
<td>Required</td>
<td>Specifies a database name.</td>
</tr>
<tr>
<td>Area Name</td>
<td>Required if the database is a DEDB</td>
<td>Specifies a DEDB area name.</td>
</tr>
<tr>
<td>Partition Name</td>
<td>Required if the database is a HALDB</td>
<td>Specifies a HALDB partition name.</td>
</tr>
<tr>
<td>DSG ID</td>
<td>Required if the sensor data is for a data set</td>
<td>Specifies a data set group ID.</td>
</tr>
<tr>
<td>Run Date</td>
<td>Required</td>
<td>Specifies the date when sensor data was collected.</td>
</tr>
<tr>
<td>Request Type</td>
<td>Optional</td>
<td>Specifies a request summary type.</td>
</tr>
<tr>
<td>Executions</td>
<td>Optional</td>
<td>Specifies the number of executions.</td>
</tr>
<tr>
<td>(data element name)</td>
<td>Required</td>
<td>Specifies a data element name. At least one data element is required.</td>
</tr>
</tbody>
</table>

Description of column names

The following column names are available for a CSV-formatted data set.

**DBD Name**

The DBD Name column specifies a database name.

The DBD Name column is required.

The database names in the DBD Name column must be the same on all lines and in all input CSV-formatted data sets.

**Area Name**

The Area Name column specifies a DEDB area name. The Area Name is required if the database is a DEDB.

If the value in the Area Name column is blank or null, the database is considered as a non-DEDB.
The area names in the Area Name column must be the same on all lines and in all input CSV-formatted data sets.

**Partition Name**
The Partition Name column specifies a HALDB partition name. The Partition Name is required if the database is a HALDB.

If the value in the Partition Name column is blank or null, the database is considered as a non-HALDB.

The partition names in the Partition Name column must be the same on all lines and in all input CSV-formatted data sets.

**DSG ID**
The DSG ID column specifies a data set group ID. Specify a data set group ID in the range of 1 to 10.

The DSG ID column is required if the CSV-formatted data set contains sensor data for a database data set specified by the CSV_DSG keyword.

If the DSG ID column is not defined, or if the value in the DSG ID column is 0, blank, or null, the Statistics Data Import Utility assumes that the sensor data in the CSV-formatted data set has been collected from a database or a DEDB area.

The values in the DSG ID column must be the same on all lines and in all input CSV-formatted data sets specified by the CSV_DSG keyword.

**Run Date**
The Run Date column specifies the date when the sensor data was collected. The Run Date column is required.

The format of the date is either yyyy/mm/dd (year/month/day) or yyyy/mm (year/month). The format must be the same on all lines and in all input CSV-formatted data sets. The dates in the Run Date column must be sorted in descending order.

If the Request Type column is not defined, or if the value of the Request Type column is D, the format of the date must be yyyy/mm/dd.

If the value of the Request Type column is M, the format of the date must be yyyy/mm.

**Request Type**
The Request Type column specifies the request summary type of the sensor data. The Request Type column is optional.

If the sensor data is a summary of a single day, specify D. If the sensor data is a summary of a single month, specify M.

If the sensor data is not a summary of multiple sensor job runs, do not define the Request Type column, or leave the column blank or null.

The values in the Request Type column must be the same on all lines and in all input CSV-formatted data sets.

**Executions**
The Executions column specifies the number of database sensor jobs that were run to collect sensor data if the sensor data was summarized. The Executions column is optional.

This column is applicable only if the Request Type column is either D or M.

**(data element name)**
This column specifies the data element name on the first line and the individual sensor data on subsequent lines. At least one data element name is required.

Individual sensor data is the data element value that was collected on the date specified by the Run Date column.

If 'null' is specified for the data element value, the value is considered as missing and is not imported to the historical sensor data set.
**Alias definition table for the Statistics Data Import Utility**

By creating the alias definition table, you can optionally use aliases for data element column names in the CSV-formatted sensor data set.

After creating the alias definition table, you need to specify the data set that contains the table by using the DSN_ALIASDEF keyword in the utility control statement.

An alias definition table must be created in a sequential data set. The DCB for the data set must indicate 80-byte, fixed-length records (RECFM=FB,LRECL=80). The block size, if coded, must be a multiple of 80.

Alias definitions must be coded in columns 1 - 72. Columns 73 - 80 are regarded as comments and ignored.

The following figure shows an example of an alias definition table:

```
*    Aliases of data elements for HDAM database
* DB_NUM_ROOT        , Number of Root Segments
  DB_NUM_SYNONYM     , Synonyms
  DB_AVG_DBREC_LENGTH, Average Record Length
```

Each line must be in the following format:

```
data_element_name , alias_name
```

Specify a data element name, followed by a comma and the alias. Any number of blanks are allowed before and after the comma. Each alias must be unique within the alias definition table.

You can include comments in the alias definition table by marking a line with an asterisk (*) or a number sign (#) in column 1.

The following figure shows an example of using aliases for data element column names in a CSV-formatted data set:

```
DBD Name,Run Date,Request Type,Executions,Number of Root Segments,Synonyms,Average Record Length
HDAMDB1,2019/8/15,D,1,208,16,36.66
HDAMDB1,2019/8/5,D,1,112,5,16.21
HDAMDB1,2019/8/1,D,1,54,2,13.28
```

**Output from the Statistics Data Import Utility**


**Topics:**

- “Journal Messages report” on page 143
- “Process Summary report” on page 144
- “Data Element List report” on page 145
- “Imported Sensor Data report” on page 145

**Journal Messages report**

The Journal Messages report contains processing messages about the Statistics Data Import Utility job. This report is generated in the BSNUJRNL data set.

**Sample report**

The following figure shows an example of the Journal Messages report:
Process Summary report

The Process Summary report contains the summary of import processing by the Statistics Data Import Utility. This report is generated in the BSNURPRT data set only if the HLQ_CSVSET keyword was specified.

Sample report

The following figure shows an example of the Process Summary report:

Report field descriptions

The Process Summary report shows the following fields:

DBD name

Shows the name of the database whose sensor data was imported.

Partname

Shows the name of the HALDB partition or the name of the DEDB area whose sensor data was imported. This field is blank if the database is neither a HALDB nor a DEDB.

CSV file names

Shows the names of the input CSV-formatted data sets that contain sensor data of the associated database, partition, or area.

Historical sensor data set name

Shows the name of the historical sensor data set in which the imported sensor data is stored.

Result

Shows the processing result for the database, the partition, or the area.

Success

Indicates that the import processing completed successfully.

Failure

Indicates that the import processing failed.

Skip

Indicates that the import processing was skipped due to a previous error.

Detail page

Shows the page number of the page in the Imported Sensor Data report that contains detailed information about this database, partition, or area.
Data Element List report

The Data Element List report contains a list of data elements for all databases, partitions, and DEDB areas that were imported by the Statistics Data Import Utility. This report is generated in the BSNURPRT data set only if the HLQ_CSVSET keyword was specified.

Sample report

The following figure shows an example of the Data Element List report:

Figure 84. Data Element List report

<table>
<thead>
<tr>
<th>Report field descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Data Element List report shows the following fields:</td>
</tr>
<tr>
<td><strong>The following historical sensor data was imported as data elements:</strong></td>
</tr>
<tr>
<td>This part shows a list of the data elements for all databases, partitions, and DEDB areas that were imported.</td>
</tr>
<tr>
<td><strong>Column name in CSV file</strong></td>
</tr>
<tr>
<td>Shows the column name used in the input CSV-formatted sensor data set.</td>
</tr>
<tr>
<td><strong>Data element name</strong></td>
</tr>
<tr>
<td>Shows the data element name in the historical sensor data set. The data element name is the same as, or related to, the column name in the CSV-formatted sensor data set that was imported.</td>
</tr>
<tr>
<td><strong>Description of data element</strong></td>
</tr>
<tr>
<td>Shows a description of the imported data element.</td>
</tr>
</tbody>
</table>

Imported Sensor Data report

The Imported Sensor Data report contains the summary of input data sets and output (imported) sensor data sets, and a list of the data elements that were imported. This report is generated for each database, HALDB partition, or DEDB area, and is stored in the BSNURPRT data set.

Sample report

The following figures show examples of the Imported Sensor Data report. The contents of the report vary depending on whether the HLQ_CSVSET keyword was specified.
**Summary of input data sets:**

<table>
<thead>
<tr>
<th>Category</th>
<th>Data set name</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB</td>
<td>ITB.CSV.HDAMDB1.DB</td>
<td>CSV</td>
</tr>
<tr>
<td>DSG 01</td>
<td>ITB.CSV.HDAMDB1.DSG01</td>
<td>CSV</td>
</tr>
<tr>
<td>DSG 02</td>
<td>ITB.CSV.HDAMDB1.DSG02</td>
<td>CSV</td>
</tr>
</tbody>
</table>

**Summary of historical sensor data:**

- **Data set name**: ITB.HISTORY.HDAMDB1.H0000001
- **DBD name**: HDAMDB1
- **Database type**: HDAM
- **Request type**: DAILY
- **Number of data points**: 33
- **Period**: 2018-11-04 to 2018-12-03

IMS Tools uses data element names to process historical sensor data. After historical sensor data is imported, aliases (column names in CSV files) are no longer used; only data element names will be used.

**Description of each data element can be referred to from the following URL:**
https://www.ibm.com/support/knowledgecenter/SSS8US_1.6.0/aiips/topics/aiips_policy-dataelement.htm

**Imported data elements for database:**

<table>
<thead>
<tr>
<th>Column name in CSV file</th>
<th>Data element name</th>
<th>Description of data element</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_DATABASE_TYPE</td>
<td>DB_DATABASE_TYPE</td>
<td>The type of database organization.</td>
</tr>
<tr>
<td>DB_NUM_ROOT</td>
<td>DB_NUM_ROOT</td>
<td>The number of root segment occurrences in the database, the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>partition, or the area.</td>
</tr>
<tr>
<td>DB_FLAG_SENSOR_DBINFO</td>
<td>DB_FLAG_SENSOR_DBINFO</td>
<td>The indicator that shows whether the SENSOR_DBINFO option of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Database Sensor is specified or not.</td>
</tr>
<tr>
<td>DB_AVG_DBREC_LENGTH</td>
<td>DB_AVG_DBREC_LENGTH</td>
<td>The average length of database records in the database, the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>partition, or the area.</td>
</tr>
<tr>
<td>DB_ESTIMATED_DBREC_IO</td>
<td>DB_ESTIMATED_DBREC_IO</td>
<td>The estimated number of I/Os that are required to retrieve an</td>
</tr>
<tr>
<td></td>
<td></td>
<td>entire database record.</td>
</tr>
</tbody>
</table>

**Imported data elements for data sets:**

<table>
<thead>
<tr>
<th>Column name in CSV file</th>
<th>Data element name</th>
<th>Description of data element</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_VOL</td>
<td>DB_NUM_VOL</td>
<td>The number of DASD volumes that are used by the data set.</td>
</tr>
<tr>
<td>DB_RBA_HIGH_USED</td>
<td>DB_RBA_HIGH_USED</td>
<td>The highest value of the relative byte address that is used by</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the data set. This value is shown in decimal format.</td>
</tr>
<tr>
<td>DB_NUM_ALLOCATED_BLOCKS</td>
<td>DB_NUM_ALLOCATED_BLOCKS</td>
<td>The number of blocks or CIs that are allocated for the data set.</td>
</tr>
<tr>
<td>DB_NUM_BLOCKS</td>
<td>DB_NUM_BLOCKS</td>
<td>The number of blocks or CIs that are used for the data set.</td>
</tr>
<tr>
<td>DB_PCT_NUM_CI_SPLIT</td>
<td>DB_PCT_NUM_CI_SPLIT</td>
<td>The percentage of split CIs against the total number of CIs.</td>
</tr>
<tr>
<td>DB_PCT_NUM_CA_SPLIT</td>
<td>DB_PCT_NUM_CA_SPLIT</td>
<td>The percentage of split CAs against the total number of CAs.</td>
</tr>
<tr>
<td>DB_PCT_CI_SPLIT</td>
<td>DB_PCT_CI_SPLIT</td>
<td>The number of split CIs (VSAM control interval) of VSAM KSDS.</td>
</tr>
<tr>
<td>DB_PCT_CA_SPLIT</td>
<td>DB_PCT_CA_SPLIT</td>
<td>The number of split CAs (VSAM control area) of VSAM KSDS.</td>
</tr>
<tr>
<td>DB_NUM_SEG</td>
<td>DB_NUM_SEG</td>
<td>The number of segment occurrences in the data set.</td>
</tr>
<tr>
<td>DB_NUM_AVAIL_EXT</td>
<td>DB_NUM_AVAIL_EXT</td>
<td>The estimated number of remaining extents for the data set.</td>
</tr>
<tr>
<td>DB_PCT_BYTES_FREE_SPACE</td>
<td>DB_PCT_BYTES_FREE_SPACE</td>
<td>The percentage of the bytes of total free spaces against the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>total used bytes for the data set.</td>
</tr>
</tbody>
</table>

---

**Figure 85. Imported Sensor Data report (If the HLQ_CSVSET keyword is not specified)**
Summary of input data sets:

<table>
<thead>
<tr>
<th>Category</th>
<th>Data set name</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB</td>
<td>ITB.CSV.HDAMDB1.DB</td>
<td>CSV</td>
</tr>
<tr>
<td>DSG 01</td>
<td>ITB.CSV.HDAMDB1.DSG01</td>
<td>CSV</td>
</tr>
<tr>
<td>DSG 02</td>
<td>ITB.CSV.HDAMDB1.DSG02</td>
<td>CSV</td>
</tr>
</tbody>
</table>

Summary of historical sensor data:

<table>
<thead>
<tr>
<th>Data set name</th>
<th>ITB.HISTORY.HDAMDB1.H0000001</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBD name</td>
<td>HDAMDB1</td>
</tr>
<tr>
<td>Database type</td>
<td>HDAM</td>
</tr>
<tr>
<td>Request type</td>
<td>DAILY</td>
</tr>
<tr>
<td>Number of data points</td>
<td>33</td>
</tr>
<tr>
<td>Period</td>
<td>2018-11-04 to 2018-12-03</td>
</tr>
</tbody>
</table>

For this database, the following columns in the input CSV files have been imported:

- DB_DATABASE_TYPE
- DB_NUM_ROOT
- DB_FLAG_SENSOR_DBINFO
- DB_AVG_DBREC_LENGTH
- DB_ESTIMATED_DBREC_IO
- DB_FLAG_SENSOR_DBINFO

For the associated data sets, the following columns in the input CSV files have been imported:

Figure 86. Imported Sensor Data report (If the HLQ_CSVSET keyword is specified)

Report field descriptions

The Imported Sensor Data report shows the following fields:

**Summary of input data sets:**
This part shows the summary of input sensor data sets that were imported.

**Category**
Shows the type of sensor data that is stored in the input data set. 'DB' means that the input data set contains sensor data for a database. 'AREA' means that the input data set contains sensor data for a DEDB area. 'DSG nn' means that the input data set contains sensor data for data set group nn.

**Data set name**
Shows the name of the input data set.

**Format**
Shows the format of the input data set.

**Summary of historical sensor data:**
This part shows the summary of the historical sensor data set.

**Data set name**
Shows the name of the historical sensor data set.

**DBD name**
Shows the name of the database whose sensor data was imported.

**Partition name**
Shows the name of the HALDB partition whose sensor data was imported. This field is displayed only when the database is a HALDB.

**Area name**
Shows the name of the DEDB area whose sensor data was imported. This field is displayed only when the database is a DEDB.

**Database type**
Shows the type of the database.

**Request type**
Shows the summary type of the sensor data.

**Number of generations**
Shows the number of generations of the sensor data that was imported.

**Period**
Shows the first date and the last date of the historical sensor data.
Imported data element for database:
Imported data element for data sets:
These parts show a list of the data elements for a database, a HALDB partition, or a DEDB area that were imported. These parts are displayed only if the HLQ_CSVSET keyword is not specified.

Column name in CSV file
Shows the column name in the CSV-formatted sensor data set.

Data element name
Shows the data element name in the historical sensor data set. The data element name is the same as, or related to, the column name in the CSV file that was imported.

Description of data element
Shows a description of the imported data element.

For this database, the following columns in the input CSV files have been imported:
For the associated data sets, the following columns in the input CSV files have been imported:
These parts show a list of the column names in the CSV-formatted sensor data sets for a database, a HALDB partition, or a DEDB area that were imported. These parts are displayed only if the HLQ_CSVSET keyword is specified.

For the data element names that are associated with these column names, see “Data Element List report” on page 145.

JCL examples for the Statistics Data Import Utility

Use these JCL examples to code JCL statements for the Statistics Data Import Utility.

In this topic:
• “Example 1: Importing sensor data from a database data set” on page 148
• “Example 2: Importing sensor data from a database and its data sets” on page 148
• “Example 3: Importing sensor data from multiple databases” on page 149

Example 1: Importing sensor data from a database data set
The following figure shows example JCL for importing sensor data of a database data set:

```jcl
//BSNUTIL0 JOB CLASS=A
//PGM1 EXEC PGM=BSNUTIL0,PARM='FUNC=IMPORT_STATS'
//STEPLIB DD DISP=SHR,DSN=ITB.SHKTLOAD
//IMS DD DISP=SHR,DSN=IMS.DBDLIB
//BSNUJRNL DD SYSOUT=*  
//BSNURPRT DD SYSOUT=*  
//BSNSYSIN DD *
ITKBSRVR(FPQSRV01)
RECONID(RECON1)
INPUT_FORMAT(CSV)
CSV_DSG(ITB.CSV.HDAMDB1.DSG01)
HLQ_HISTORY(ITB.HISTORY)
/*
```

Figure 87. Example 1: Importing sensor data of a database data set

In this example, the sensor data for a database data set, which is written in the CSV-formatted data set ITB.CSV.HDAMDB1.DSG01, is imported.

The Statistics Data Import Utility generates the historical sensor data set. The high level qualifier of the data set name is ITB.HISTORY, and the low level qualifier is determined from the name of the database to be imported.

Example 2: Importing sensor data from a database and its data sets
The following figure shows example JCL for importing sensor data from a database and three data sets of the database.
Figure 88. Example 2: Importing sensor data from a database and data sets

In this example, the following sensor data is imported.

- The sensor data for a database, which is written in the CSV-formatted data set ITB.CSV.HDAMDB1.DB.
- The sensor data for a database data set, which is written in the CSV-formatted data set ITB.CSV.HDAMDB1.DSG01.
- The sensor data for a database data set, which is written in the CSV-formatted data set ITB.CSV.HDAMDB1.DSG02.
- The sensor data for a database data set, which is written in the CSV-formatted data set ITB.CSV.HDAMDB1.DSG03.

The Statistics Data Import Utility generates the historical sensor data set. The high level qualifier of the data set name is ITB.HISTORY, and the low level qualifier is determined from the name of the database to be imported.

Example 3: Importing sensor data from multiple databases

In this example, sensor data of an HDAM database and PHIDAM partitions is imported in a single job step. This example assumes that the following data sets are created before the JCL is run.

<table>
<thead>
<tr>
<th>Data set name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITB.ALIASDEF</td>
<td>Alias definition table</td>
</tr>
<tr>
<td>ITB.CSV.HDAMDB1</td>
<td>CSV-formatted sensor data set for an HDAM database (DBD name = HDAMDB1)</td>
</tr>
<tr>
<td>ITB.CSV.HDAMDB1.DSG01</td>
<td>CSV-formatted sensor data set for a database data set (DSG ID = 1) of an HDAM database (DBD name = HDAMDB1)</td>
</tr>
<tr>
<td>ITB.CSV.HDAMDB1.DSG02</td>
<td>CSV-formatted sensor data set for a database data set (DSG ID = 2) of an HDAM database (DBD name = HDAMDB1)</td>
</tr>
<tr>
<td>ITB.CSV.HDAMDB1.DSG03</td>
<td>CSV-formatted sensor data set for a database data set (DSG ID = 3) of an HDAM database (DBD name = HDAMDB1)</td>
</tr>
<tr>
<td>ITB.CSV.PHIDAM1.PARTA</td>
<td>CSV-formatted sensor data set for a PHIDAM database (DBD name = PHIDAM1, partition name = PARTA)</td>
</tr>
<tr>
<td>ITB.CSV.PHIDAM1.PARTA.DSG01</td>
<td>CSV-formatted sensor data set for a database data set (DSG ID = 1) of a PHIDAM database (DBD name = PHIDAM1, partition name = PARTA)</td>
</tr>
<tr>
<td>ITB.CSV.PHIDAM1.PARTA.DSG02</td>
<td>CSV-formatted sensor data set for a database data set (DSG ID = 2) of a PHIDAM database (DBD name = PHIDAM1, partition name = PARTA)</td>
</tr>
</tbody>
</table>
### Table: Sensor Data Sets and Descriptions

<table>
<thead>
<tr>
<th>Data set name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITB.CSV.PHIDAM1.PARTB</td>
<td>CSV-formatted sensor data set for a PHIDAM database (DBD name = PHIDAM1, partition name = PARTB)</td>
</tr>
<tr>
<td>ITB.CSV.PHIDAM1.PARTB.DSG01</td>
<td>CSV-formatted sensor data set for a database data set (DSG ID = 1) of a PHIDAM database (DBD name = PHIDAM1, partition name = PARTB)</td>
</tr>
<tr>
<td>ITB.CSV.PHIDAM1.PARTB.DSG02</td>
<td>CSV-formatted sensor data set for a database data set (DSG ID = 2) of a PHIDAM database (DBD name = PHIDAM1, partition name = PARTB)</td>
</tr>
</tbody>
</table>

In the following example JCL, the alias definition table is specified to use aliases for the data element names in the CSV-formatted sensor data set.

```jcl
//BSNUTIL0 JOB   CLASS=A
//PGM1 EXEC PGM=BSNUTIL0,PARM='FUNC=IMPORT_STATS'
//STEPLIB DD DISP=SHR,DSN=ITB.SHKTLOAD
//IMS DD DISP=SHR,DSN=IMS.DBDLIB
//BSNUJRNL DD SYSOUT=*;
//BSNURPRT DD SYSOUT=*;
//BSNSYSIN DD *
ITKBSRVR(FPQSRV01)
RECONID(RECON1)
DSN_ALIASDEF(ITB.ALIASDEF)
HLQ_CSVSET(ITB.CSV)
HLQ_HISTORY(ITB.HISTORY)
/*
```

**Figure 89. Example 3: Importing sensor data from multiple databases**

In this example, all the CSV-formatted sensor data sets that match the naming convention specified by the HLQ_CSVSET keyword are imported.

Aliases of data element names are applied to all CSV-formatted sensor data sets because the alias definition table is specified by the DSN_ALIASDEF keyword.

The Statistics Data Import Utility generates historical sensor data sets for an HDAM database (DBD name = HDAMDB1) and PHIDAM partitions (DBD name = PHIDAM1, partition names = PARTA and PARTB). The high level qualifier of the data set names is ITB.HISTORY, and the low level qualifiers are determined from the name of the database to be imported.
Chapter 20. History Data Summarization Utility

The History Data Summarization Utility reads the catalog information about the imported sensor data (utility history data) from the IMS Tools Knowledge Base (IMS Tools KB) Sensor Data repository and reports the resources (databases, partitions, and areas) whose sensor data was imported to historical sensor data sets.

Topics:

- “History Data Summarization Utility overview” on page 151
- “Running the History Data Summarization Utility” on page 152
- “EXEC and DD statements for the History Data Summarization Utility” on page 153
- “Control statements for the History Data Summarization Utility” on page 154
- “Output from the History Data Summarization Utility” on page 156
- “JCL example for the History Data Summarization Utility” on page 157

History Data Summarization Utility overview

The History Data Summarization Utility reads the catalog information about the imported sensor data (utility history data) from the IMS Tools Knowledge Base (IMS Tools KB) Sensor Data repository. It then generates the History Data Summary report that contains a list of databases, partitions, and areas whose sensor data was imported to historical sensor data sets.

The History Data Summarization Utility does not read the contents of historical sensor data sets. If you want a report on data element values of a particular database, partition, or area in a historical sensor data set, run the Sensor Data Extractor with the DATAFROM(HISTORY) option. For more information about the DATAFROM keyword, see “Control statements for the Sensor Data Extractor” on page 116.

The following figure depicts how you can use the History Data Summarization Utility and the Sensor Data Extractor to obtain information about imported sensor data.
Running the History Data Summarization Utility

The History Data Summarization Utility runs as a standard z/OS batch job. To generate a History Data Summary report, which contains a list of databases, partitions, and areas whose sensor data was imported to historical sensor data sets, code the History Data Summarization Utility JCL and run the job.

Procedure

1. Write the EXEC and DD statements.
   
   For the format of the EXEC statement and the list of DD statements, see “EXEC and DD statements for the History Data Summarization Utility” on page 153.

2. Code the control statements in the BSNSYSIN data set.
   
   For the syntax of the control statements, see “Control statements for the History Data Summarization Utility” on page 154.

   The following figure shows a JCL example for the History Data Summarization Utility:
3. Run the History Data Summarization Utility job step to generate a History Data Summary report. Ensure that the return code is 0.

For an example of the History Data Summary report, see “History Data Summary report” on page 156.

EXEC and DD statements for the History Data Summarization Utility

You must specify an EXEC statement and DD statements that define the input and output data sets in your JCL.

In this topic:
- “EXEC statement” on page 153
- “Summary of DD statements” on page 153
- “DD statements for input” on page 154
- “DD statements for output” on page 154

EXEC statement

The EXEC statement must be in the following format:

```
//STEP EXEC PGM=BSNUTIL0,PARM='FUNC=SUMMARIZE_HISTORY'
```

The EXEC statement in the batch JCL contains one keyword specification in the PARM field: FUNC=.

FUNC

Identifies which Policy Services utility is to be invoked.

To invoke the History Data Summarization Utility, specify either 'FUNC=SUMMARIZE_HISTORY' or 'FUNC=SUMH'.

Summary of DD statements

DD statements for the History Data Summarization Utility determine the input and output data sets and specify how to run the History Data Summarization Utility.

The following table summarizes the DD statements for the History Data Summarization Utility.

<table>
<thead>
<tr>
<th>DD name</th>
<th>Use</th>
<th>Format</th>
<th>Can be dynamically allocated?</th>
<th>Required or optional?</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEPLIB</td>
<td>Input</td>
<td>RECFM=U</td>
<td>No</td>
<td>Required</td>
</tr>
<tr>
<td>BSNSYSIN</td>
<td>Input</td>
<td>RECFM=FB,LRECL=80</td>
<td>No</td>
<td>Required</td>
</tr>
<tr>
<td>BSNUJRNL</td>
<td>Output</td>
<td>RECFM=FBA,LRECL=133</td>
<td>Yes</td>
<td>Optional</td>
</tr>
<tr>
<td>BSNURPRT</td>
<td>Output</td>
<td>RECFM=FBA,LRECL=133</td>
<td>Yes</td>
<td>Optional</td>
</tr>
</tbody>
</table>
DD statements for input
The following input DD statements are used for the History Data Summarization Utility.

STEPLIB
This DD statement is required. It specifies the load module library of IMS Tools Base (SHKTLOAD).

BSNSYSIN
This DD statement is required. It specifies the input control statement that controls the History Data Summarization Utility functions.

The BSNSYSIN DD statement can be coded as a standard SYSIN file, a sequential data set, or a PDS member. LRECL=80 is required for the DCB of this data set.

For details about coding the BSNSYSIN DD statement, see “Control statements for the History Data Summarization Utility” on page 154.

DD statements for output
The following output DD statements are used for the History Data Summarization Utility.

BSNUJRNL
This DD statement is optional. It specifies the processing log output data set, which stores processing messages that are issued by the History Data Summarization Utility.

If you do not specify this DD statement, the History Data Summarization Utility dynamically allocates the data set by using SYSOUT=*.

BSNURPRT
This DD statement is optional. It specifies the report output data set, which stores the History Data Summary report.

If you do not specify this DD statement, the History Data Summarization Utility dynamically allocates the data set by using SYSOUT=*.

Control statements for the History Data Summarization Utility
The control statement for the History Data Summarization Utility controls the functions of the History Data Summarization Utility.

The control statement must be specified in the BSNSYSIN data set. This control statement data set generally resides in the input stream. However, it can also be defined as a sequential data set or as a member of a partitioned data set. It must contain 80-byte, fixed-length records. The block size, if coded, must be a multiple of 80.

The control statement must be coded in columns 1 - 72. Columns 73 - 80 are regarded as comments and ignored.

In this topic:
• “Format of the control statement” on page 154
• “Summary of keywords” on page 155
• “Description of keywords” on page 155

Format of the control statement
The control statement includes a set of keywords, parameters, and comments that are specified in the BSNSYSIN data set.

Keywords
A keyword defines an option for the History Data Summarization Utility. Keywords can be specified in any order, and any two adjacent keywords must be separated by a blank or a comma. Each keyword has one or more associated parameters.
Parameters
A parameter defines a value for the associated keyword. Some keywords require only one parameter and others require one or more parameters. Parameters must be character or numeric values.

A keyword and the associated parameters are separated by parentheses. If two or more parameters are specified, any two adjacent parameters must be separated by a blank or a comma. For example,

```
keyword(parameter)
keyword(parameter1, parameter2, parameter3)
keyword(parameter1 parameter2 parameter3)
```

Comments
You can include comments in the BSNSYSIN data set by marking a line with an asterisk (*) in column 1.

The History Data Summarization Utility ignores the comment line when analyzing the control statement in the BSNSYSIN data set.

Summary of keywords
The following table summarizes the keywords of the control statement for the History Data Summarization Utility.

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Required or optional?</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBDNAME</td>
<td>Optional</td>
<td>*</td>
<td>Specifies a database name.</td>
</tr>
<tr>
<td>ITKBSRVR</td>
<td>Required</td>
<td>n/a</td>
<td>Specifies the name of the IMS Tools KB server.</td>
</tr>
<tr>
<td>RECONID</td>
<td>Required</td>
<td>n/a</td>
<td>Specifies a RECON ID.</td>
</tr>
</tbody>
</table>

Description of keywords
The following keywords are available for the control statement.

**DBDNAME**
This keyword specifies a database name. Sensor data information about the specified database is reported in the History Summary Data report.

DBDNAME is an optional keyword.

Format:

```
DBDNAME( * dbd_name )
```

*dbd_name*
Specify a 1- to 8-character DBD name.

You can use wildcard characters. An asterisk (*) matches zero or more characters, and a percent sign (%) matches any single character. Any number or combination of wildcard characters can be used.

If you specify wildcard characters, the History Data Summarization Utility reads all the databases that match the specified wildcard pattern.

The default is DBDNAME(*). This means that all databases are specified.

**ITKBSRVR**
This keyword specifies the name of the IMS Tools KB server. The utility reads the catalog information about the imported sensor data (utility history data) in the IMS Tools KB Sensor Data repository, which is managed by the IMS Tools KB server.
Output from the History Data Summarization Utility

The History Data Summarization Utility generates a Journal Messages report and an History Data Summary report.

Topics:
- “Journal Messages report” on page 156
- “History Data Summary report” on page 156

Journal Messages report

The Journal Messages report contains processing messages about the History Data Summarization Utility job. This report is generated in the BSNUJRNL data set.

Sample report

The following figure shows an example of the Journal Messages report:

```
Figure 92. Journal Messages report
```

History Data Summary report

The History Data Summary report contains a summary of imported historical sensor data for each database, partition, and area. This report is generated in the BSNURPRT data set.

Sample report

The following figure shows an example of the History Data Summary report:
Figure 93. History Data Summary report

Report field descriptions

The History Data Summary report shows the following fields:

**DBD name**
Shows the name of the database whose historical sensor data was imported.

**Part/Area**
Shows the name of the HALDB partition or the DEDB area whose historical sensor data was imported. This field is displayed only when the database is a HALDB or a DEDB.

**DB type**
Shows the type of the database.

**Historical sensor data set name**
Shows the name of the historical sensor data set.

**Start**
Shows the oldest sensor data collection date in the historical sensor data set.

**End**
Shows the latest sensor data collection date in the historical sensor data set.

**Summary type**
Shows the summary type of the sensor data.

JCL example for the History Data Summarization Utility

Use the following JCL example to code JCL statements for the History Data Summarization Utility.

**Example: Summarizing information about imported historical sensor data for all databases**

The following figure shows a JCL example for summarizing information about imported historical sensor data for all the databases:

```jcl
//BSNUTIL0 JOB CLASS=A
//PGM1 EXEC PGM=BSNUTIL0,PARM='FUNC=SUMMARIZE_HISTORY'
//STEPLIB DD DISP=SHR,DSN=ITB.SHKTLOAD
//BSNUJRNL DD SYSOUT=*  
//BSNURPRT DD SYSOUT=*  
//BSNSYSIN DD *

ITKBSRVR(FPQSRV01)
RECONID(RECON1)
DBDNAME(*)
```

Figure 94. Example: Summarizing information about imported historical sensor data for all databases

In this example, the DBDNAME keyword specifies an asterisk (*), which requests to report on all databases. Information about imported historical sensor data is collected for all the databases in the IMS Tools Knowledge Base server FPQSRV01 and the RECON ID RECON1 and written to the History Data Summary report.
Part 5. Reference: Policy Services

The topics in this section provide you with supplemental technical references for Policy Services.

Topics:

- Chapter 21, “Data elements,” on page 161
- Chapter 22, “Journal reports,” on page 189
Chapter 21. Data elements

The data element information provided in the following reference topics can help you analyze the state of a database.

Topics:
- “Data elements related to database attribute” on page 162
- “Data elements related to root segments” on page 162
- “Data elements related to randomizing parameter” on page 164
- “Data element related to database records” on page 164
- “Data elements related to index” on page 165
- “Data elements related to database data set space” on page 166
- “Data elements related to data set CI/CA splits” on page 171
- “Data elements related to segments in a data set group” on page 172
- “Data elements related to pointers in a data set group” on page 173
- “Data elements related to free space in a data set group” on page 174
- “Data elements related to free space in an area” on page 176
- “Data elements related to overflow in an area” on page 176
- “Data element related to segment occurrences in an area” on page 177
- “Data elements related to database records in an area” on page 177
- “Data elements related to synonym in an area” on page 178
- “Data elements related to physical I/O in an area” on page 178
- “Data elements related to AREA definition” on page 179
- “Data element related to UOW statistics information” on page 179
- “Data elements related to repository group information” on page 180
- “Data elements related to free space in a UOW” on page 180
- “Data elements related to free space in a UOW group” on page 181
- “Data elements related to overflow in a UOW” on page 182
- “Data elements related to overflow in a UOW group” on page 182
- “Data elements related to database records in a UOW” on page 183
- “Data elements related to database records in a UOW group” on page 183
- “Data elements related to synonym in a UOW” on page 184
- “Data elements related to synonym in a UOW group” on page 184
- “Data elements related to physical I/O in a UOW” on page 185
- “Data elements related to physical I/O in a UOW group” on page 185
- “Data elements related to RBASEFS or RDOVFSS conditions” on page 186
- “Data elements related to event dates” on page 186
- “Data elements related to data set backup status” on page 187
- “Data elements related to database recovery” on page 187
- “Data elements related to database backout” on page 187
- “Data elements related to change accumulation groups” on page 188
Data elements related to database attribute

This reference topic provides information about data elements that are related to database attribute.

The following table summarizes the data element that is related to attribute.

Table 14. Data elements related to database attribute

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_DATABASE_TYPE</td>
<td>The type of database organization.</td>
</tr>
</tbody>
</table>

Data elements related to root segments

This reference topic provides information about data elements that are related to root segments.

The following table summarizes the data elements that are related to root segments.

Table 15. Data elements related to root segments

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_ROOT</td>
<td>The number of root segment occurrences in the database or the partition.</td>
</tr>
<tr>
<td>DB_NUM_SYNONYM</td>
<td>The number of synonyms that are root segment occurrences not assigned to a unique root anchor point (RAP).</td>
</tr>
<tr>
<td>DB_PCT_NUM_SYNONYM</td>
<td>The percentage of synonyms compared to the total number of root segment occurrences. This value is calculated by the following formula: $DB_PCT_NUM_SYNONYM,(%) = \frac{DB_NUM_SYNONYM}{DB_NUM_ROOT} \times 100$</td>
</tr>
<tr>
<td>Data element name</td>
<td>H H H S P P T</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>DB_NUM_ROOT_NOHOME</td>
<td>Y - - - Y - DB</td>
</tr>
<tr>
<td>DB_PCT_NUM_ROOT_NOHOME</td>
<td>Y - - - Y - DB</td>
</tr>
<tr>
<td>DB_NUM_ROOT_OVFL</td>
<td>Y - - - Y - DB</td>
</tr>
<tr>
<td>DB_PCT_NUM_ROOT_OVFL</td>
<td>Y - - - Y - DB</td>
</tr>
<tr>
<td>DB_FLAGSENSOR_HOME</td>
<td>Y - - - Y - DB</td>
</tr>
<tr>
<td>DB_FLAGSENSOR_DBINFO</td>
<td>Y Y Y Y Y DB</td>
</tr>
<tr>
<td>DB_AVG_LEN_SYNONYM_CHAIN</td>
<td>Y - - - Y - DB</td>
</tr>
</tbody>
</table>
Data elements related to randomizing parameter

This reference topic provides information about data elements that are related to the randomizing parameter.

The following table summarizes the data elements that are related to the randomizing parameter.

Table 16. Data elements related to the randomizing parameter

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_BYTES_SEG_RAA</td>
<td>The total bytes of segment occurrences that are found in a root addressable area (RAA).</td>
</tr>
</tbody>
</table>
| DB_PCT_BYTES_OVFL             | The percentage of the total bytes of segment occurrences that are found in an overflow area. This value is calculated by the following formula:  

\[
DB\_PCT\_BYTES\_OVFL\ (\%) = \frac{(Total \ bytes \ of \ segment \ occurrences \ in \ an \ overflow \ area)}{(Total \ bytes \ of \ segment \ occurrences \ in \ DSG1)} \times 100
\]

Data Set Group 1 (DSG1) refers to the database data set that contains root segment occurrences.

| DB_NUM_RAP                    | The total number of root anchor points (RAPs) in the database. |
| DB_NUM_UNUSED_RAP             | The number of unused root anchor points. |
| DB_PCT_NUM_UNUSED_RAP         | The usage rate of RAPs. This value shows the percentage of "unused root anchor points" compared to "the total root anchor points". This value is calculated by the following formula:  

\[
DB\_PCT\_NUM\_UNUSED\_RAP\ (\%) = \frac{(DB\_NUM\_UNUSED\_RAP)}{(DB\_NUM\_RAP)} \times 100
\]

Data element related to database records

This reference topic provides information about data element that is related to database records.

The following table summarizes the data element that is related to database records.
### Table 17. Data elements related to database records

<table>
<thead>
<tr>
<th>Data element name</th>
<th>H H H S P P T</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D I I H H H y</td>
<td>The average length of database records. This value is calculated by &quot;the total bytes of segment occurrences in the database&quot; divided by &quot;the number of root segment occurrences&quot;. This value is calculated by the following formula:</td>
</tr>
<tr>
<td>DB_AVG_DBREC_LENGTH</td>
<td>M A A S A D e</td>
<td>$DB_AVG_DBREC_LENGTH = \frac{\text{Total bytes of segment occurrences}}{DB_NUM_ROOT}$</td>
</tr>
<tr>
<td></td>
<td>M M M M M</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Y Y Y Y Y Y</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_ESTIMATED_DBREC_IO</td>
<td>Y Y Y - - Y Y</td>
<td>The estimated number of I/Os that are required to retrieve an entire database record.</td>
</tr>
<tr>
<td>DB_ESTIMATED_ROOT_IO</td>
<td>Y - - - - Y -</td>
<td>The estimated number of I/Os that are required to reach a root segment from RAP by following the synonym chain.</td>
</tr>
</tbody>
</table>

### Data elements related to index

This reference topic provides information about data element that is related to index.

The following table summarizes the data element that is related to index.

### Table 18. Data elements related to index

<table>
<thead>
<tr>
<th>Data element name</th>
<th>P S P P T</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I I H S y</td>
<td>The number of index pointer segments (IPS) in the index database.</td>
</tr>
<tr>
<td></td>
<td>N N I I p</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D D D N e</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E E A D</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X X M E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Y Y Y Y Y</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBX_NUM_IPS</td>
<td>Y Y Y Y Y</td>
<td>The number of index pointer segments (IPS) in the index database.</td>
</tr>
<tr>
<td>DBX_NUM_IPS_OVFL</td>
<td>- Y - - -</td>
<td>The number of index pointer segments (IPS) in the overflow data set. The number is the same as the number of duplicated keys.</td>
</tr>
<tr>
<td>DBX_PCT_IPS_OVFL</td>
<td>- Y - - -</td>
<td>The percentage of index pointer segments (IPS) in the overflow data set compared to the total number of IPS segments.</td>
</tr>
</tbody>
</table>
Data elements related to database data set space

This reference topic provides information about data elements that are related to database data set space.

The following table summarizes the data elements that are related to database data set space. These data elements are collected for each database data set.

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Description</th>
</tr>
</thead>
</table>
| DB_FLAG_SMS            | The indicator that shows whether DFSMSdss was active or not when collecting the statistics for data elements. The value is either Y or N.  
                          | Y: DFSMSdss is active. N: DFSMSdss is not active.                          |
| DB_MAX_EXT_DS          | The maximum number of extents for the data set which is limited by an access method. This number is as follows:  
                          | • VSAM data set: 251  
                          | • OSAM data set:  
                          |  - 62 for IMS V13 or earlier  
                          |  - 120 for IMS V14 or later  
                          | Notes:  
                          | 1. Whether VSAM extent constraint removal is specified or not is not taken into consideration when this value is calculated. Even if a VSAM file has extent constraint removal specified, DB Sensor ignores the feature and regards the file as extent constraint removal not specified.  
                          | 2. A multivolume VSAM file has 255-extent limit due to its access method. However, DB Sensor assumes the extent limit as 251 because four extents might be used by the access method. |
| DB_MAX_EXT_VOL         | The maximum number of extents that can be allocated on one DASD volume.     |
                          | VSAM data set  
                          | 123 extents per volume  
                          | OSAM data set  
<pre><code>                      | 16 extents per volume  |
</code></pre>
<table>
<thead>
<tr>
<th>Data element name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_AVAIL_EXT_LESS_100</td>
<td>The indicator that shows whether the number of remaining extents to be allocated for the data set is less than 100 or not. The value is either Y or N. The remaining extents is less than 100. N The remaining extents is equal to or greater than 100.</td>
</tr>
<tr>
<td>DB_AVAIL_EXT_LIMIT</td>
<td>The reason the remaining extents are less than 100. Use this information to determine an action for expanding space. The reason is shown when DB_AVAIL_EXT_LESS_100 is &quot;Y&quot;. The reason shows one of the following texts:</td>
</tr>
<tr>
<td></td>
<td>• OSAM_MAXIMUM or VSAM_MAXIMUM The number of remaining extents that is displayed in DB_NUM_AVAIL_EXT shows the allowable number of remaining extents that is calculated based on the OSAM or VSAM extent limit. If the number of remaining extents is low, you must increase the primary and secondary allocation size of the data set definition and re-create the OSAM data set.</td>
</tr>
<tr>
<td></td>
<td>• VOL_FREE_EXTENTS The number of remaining extents that is displayed in DB_NUM_AVAIL_EXT shows the allowable number for extending the data set on the DASD volume. This value is calculated based on the free space that is available on the DASD volume. If the number of remaining extents is low, you must increase the free space on the DASD volume for allocation, increase the number of DASD volumes for allocation, or re-create the data set on a DASD volume that has a larger free space. The number of remaining extents is calculated for the volumes that have volume serial numbers assigned. For candidate volumes without volume serial numbers, the number of remaining extents cannot be estimated. For those candidate volumes, DB Sensor assumes that the number of remaining extents is zero. The number of remaining extents is calculated based on the space utilization of the DASD volume at the time when DB Sensor is run. After this value is calculated, the size of free space on the volume might change due to some file operations, such as files being created or deleted. For this reason, the number of remaining extents might be different from the actual number of remaining extents.</td>
</tr>
<tr>
<td>Data element name</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>H H P T</td>
<td>Description</td>
</tr>
<tr>
<td>D I I H I H S y</td>
<td>H I M I H S A D I I p</td>
</tr>
<tr>
<td>M A A S D D A D N e</td>
<td>M M A E E M A D M X X M E X</td>
</tr>
</tbody>
</table>
|                  | The estimated number of remaining extents for the data set. This value is collected when DB_AVAIL_EXT_LESS_100 is "Y". **Notes:**
<p>|                  | 1. This value is estimated from the amount of free space left on the DASD volume at the time when the statistics were collected. Because other files are created or deleted, the estimated value might not be the same as the actual number of remaining extents. |
|                  | 2. In estimating this value, VSAM extent constraint removal and guaranteed space attributes defined in SMS are not taken into consideration. Thus, this value might be smaller than the actual number of remaining extent operations. |
|                  | 3. In estimating this value, VSAM extent consolidation is not taken into consideration. Thus, this value might be smaller than the actual number of extent operations. |
|                  | The number of extents that currently exist in the data set. |
|                  | The highest value of the relative byte address that is used by the data set. This value is shown in decimal format. |
|                  | The highest value of the relative byte address that is allocated for the data set. This value is shown in decimal format. |
|                  | The number of DASD volumes that are used by the data set. |
|                  | The number of unused DASD volumes. This value is calculated by the following formula: |
|                  | DB_NUM_UNUSED_VOL= |
|                  | The number of volumes defined to data set - DB_NUM_VOL |
|                  | The number of unused DASD volumes whose volume serial numbers are already assigned. This value is calculated by the following formula: |
|                  | DB_NUM_UNUSED_VOL_SER= |
|                  | DB_NUM_UNUSED_VOL - DB_NUM_UNUSED_VOL_CAND |</p>
<table>
<thead>
<tr>
<th>Data element name</th>
<th>H H H S P P P T</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_UNUSED_VOL_CAND</td>
<td>Y Y Y Y - Y Y -</td>
<td>The number of unused DASD volumes whose volume serial numbers are not assigned. These are the candidate volumes. This value is calculated by the following formula: ( DB_NUM_UNUSED_VOL_CAND = DB_NUM_UNUSED_VOL - DB_NUM_UNUSED_VOL_SER )</td>
</tr>
<tr>
<td>DB_FLAG_SPACE_TYPE</td>
<td>Y Y Y Y - Y Y -</td>
<td>The primary and secondary space unit type for allocating the data set. The value is Cylinder, Track, or Bytes.</td>
</tr>
<tr>
<td>DB_NUM_PRI_SPACE</td>
<td>Y Y Y Y - Y Y -</td>
<td>The size of the primary allocation.</td>
</tr>
<tr>
<td>DB_NUM_SEC_SPACE</td>
<td>Y Y Y Y - Y Y -</td>
<td>The size of the secondary allocation.</td>
</tr>
<tr>
<td>DB_UNUSED_BYTES</td>
<td>Y Y Y Y - Y Y -</td>
<td>The size of free space in the database data set. Free space refers to areas that are not used by IMS.</td>
</tr>
<tr>
<td>DB_PCT_UNUSED_BYTES</td>
<td>Y Y Y Y - Y Y -</td>
<td>The percentage of free space in the database data set. Free space refers to areas that are not used by IMS.</td>
</tr>
<tr>
<td>DB_MAX_DS_SIZE</td>
<td>Y Y Y Y - Y Y -</td>
<td>The maximum size of the data set. 4 GB or 8 GB. For HDAM and HIDAM databases: • If the data set is VSAM, the maximum size is 4 GB. • If the data set is OSAM and block size is even, the maximum size is 8 GB. • If the data set is OSAM and block size is odd, the maximum size is 4 GB. For HISAM and SHISAM databases, the maximum size is 4 GB. For PHDAM and PHIDAM databases: • If the data set is OSAM and OSAM8G is specified in the RECON data sets, the maximum size is 8 GB. • Otherwise, the maximum size is 4 GB.</td>
</tr>
<tr>
<td>DB_PCT_OF_MAX_DS_SIZE</td>
<td>Y Y Y Y - Y Y -</td>
<td>The percentage of allocated bytes (bytes for High Allocated RBA) compared to the maximum size (4 GB or 8 GB). This value is calculated by the following formula: ( DB_PCT_OF_MAX_DS_SIZE ( (%) = \frac{(DB_MAX_DS_SIZE - DB_RBA_HIGH_ALLOC)}{DB_MAX_DS_SIZE} \times 100 )</td>
</tr>
<tr>
<td>DB_NUM_DBDS_BLOCKS</td>
<td>Y Y Y Y - Y Y -</td>
<td>The number of blocks or CIs that are used for the data set. High Used RBA is on the highest block or CI.</td>
</tr>
<tr>
<td>DB_NUM_ALLOCATED_BLOCKS</td>
<td>Y Y Y Y - Y Y -</td>
<td>The number of blocks or CIs that are allocated for the data set.</td>
</tr>
<tr>
<td>DB_BLOCK_SIZE</td>
<td>Y Y Y Y - Y Y -</td>
<td>The CI size of VSAM or the block size of OSAM.</td>
</tr>
<tr>
<td>Data element name</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>DB_LRECL_SIZE</td>
<td>The logical record length of VSAM. This data is collected only for VSAM.</td>
<td></td>
</tr>
<tr>
<td>DBX_FLAG_SMS</td>
<td>The indicator that shows whether SMS is active in the system in which the index database data set exists.</td>
<td></td>
</tr>
<tr>
<td>DBX_MAX_EXT_DS</td>
<td>The maximum number of extents that can be allocated for the index database data set due to the VSAM file limitation.</td>
<td></td>
</tr>
<tr>
<td>DBX_MAX_EXT_VOL</td>
<td>The maximum number of extents that can be allocated on each DASD volume for the index database data set.</td>
<td></td>
</tr>
<tr>
<td>DBX_AVAIL_EXT_LESS_100</td>
<td>The indicator that shows whether the remaining extents to be allocated for the index DB data set are less than 100.</td>
<td></td>
</tr>
<tr>
<td>DBX_AVAIL_EXT_LIMIT</td>
<td>The reason the remaining extents are less than 100 for the index database data set. Use this to determine how to expand space.</td>
<td></td>
</tr>
<tr>
<td>DBX_NUM_AVAIL_EXT</td>
<td>The estimated number of remaining extents for the index database data set. This is collected when DBX_AVAIL_EXT_LESS_100 is Y.</td>
<td></td>
</tr>
<tr>
<td>DBX_NUM_EXT</td>
<td>The number of extents of the index database data set.</td>
<td></td>
</tr>
<tr>
<td>DBX_RBA_HIGH_USED</td>
<td>The highest value of relative byte address that is used by the index database data set. This value is in decimal format.</td>
<td></td>
</tr>
<tr>
<td>DBX_RBA_HIGH_ALLOC</td>
<td>The highest value of relative byte address that is allocated for the index database data set. This value is in decimal format.</td>
<td></td>
</tr>
<tr>
<td>DBX_NUM_VOL</td>
<td>The number of DASD volumes that are used by the index database data set.</td>
<td></td>
</tr>
<tr>
<td>DBX_NUM_UNUSED_VOL</td>
<td>The number of unused DASD volumes that are defined for use by the index database data set, but have not been used.</td>
<td></td>
</tr>
<tr>
<td>DBX_NUM_UNUSED_VOL_SER</td>
<td>The number of unused DASD volumes for the index database data set that have volume serial numbers assigned.</td>
<td></td>
</tr>
<tr>
<td>DBX_NUM_UNUSED_VOL_CAND</td>
<td>The number of candidate DASD volumes for the index database data set that do not have volume serial numbers assigned.</td>
<td></td>
</tr>
<tr>
<td>DBX_FLAG_SPACE_TYPE</td>
<td>The space unit type for allocating the index database data set. The value is Cylinder, Track, or Bytes.</td>
<td></td>
</tr>
<tr>
<td>DBX_NUM_PRI_SPACE</td>
<td>The size of the primary allocation that is defined for the index database data set.</td>
<td></td>
</tr>
<tr>
<td>DBX_NUM_SEC_SPACE</td>
<td>The size of the secondary allocation that is defined for the index database data set.</td>
<td></td>
</tr>
</tbody>
</table>
Table 19. Data elements related to database data set space (continued)

<table>
<thead>
<tr>
<th>Data element name</th>
<th>H H H S P S P P T H D I I H I I H H S y A D S I N N D I I p M A A S D D D A D N e M M A E E M A D M X X M E X</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBX_UNUSED_BYTES</td>
<td>- - - - Y Y - Y Y DS</td>
<td>The size of free space in the index database data set. Free space refers to areas that are not used (not formatted) by IMS.</td>
</tr>
<tr>
<td>DBX_PCT_UNUSED_BYTES</td>
<td>- - - - Y Y - Y Y DS</td>
<td>The percentage of free space in the index database data set. Free space refers to areas that are not used (not formatted) by IMS.</td>
</tr>
<tr>
<td>DBX_MAX_DS_SIZE</td>
<td>- - - - Y Y - Y Y DS</td>
<td>The maximum size of the index database data set (4 GB).</td>
</tr>
<tr>
<td>DBX_PCT_OF_MAX_DS_SIZE</td>
<td>- - - - Y Y - Y Y DS</td>
<td>The percentage of allocated bytes (bytes for High Allocated RBA) in the maximum size (4 GB) of the index database data set.</td>
</tr>
<tr>
<td>DBX_NUM_DBDS_BLOCKS</td>
<td>- - - - Y Y - Y Y DS</td>
<td>The number of CIs that are used for the index database data set.</td>
</tr>
<tr>
<td>DBX_BLOCK_SIZE</td>
<td>- - - - Y Y - Y Y DS</td>
<td>The CI size of the index database data set.</td>
</tr>
<tr>
<td>DBX_LRECL_SIZE</td>
<td>- - - - Y Y - Y Y DS</td>
<td>The logical record length of the index database data set.</td>
</tr>
</tbody>
</table>

Data elements related to data set CI/CA splits

This reference topic provides information about data elements that are related to data set CI/CA splits. The following table summarizes the data elements that are related to data set CI/CA splits.

Table 20. Data elements related to data set CI/CA splits

<table>
<thead>
<tr>
<th>Data element name</th>
<th>H H H S P S P P T H D I I H I I H H S y A D S I N N D I I p M A A S D D D A D N e M M A E E M A D M X X M E X</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_CI_SPLIT</td>
<td>- - Y Y - - - - DS</td>
<td>The number of control interval splits that have occurred for VSAM KSDS.</td>
</tr>
<tr>
<td>DB_PCT_NUM_CI_SPLIT</td>
<td>- - Y Y - - - - DS</td>
<td>The percentage of split CIs compared to the total number of CIs.</td>
</tr>
<tr>
<td>DB_NUM_CA_SPLIT</td>
<td>- - Y Y - - - - DS</td>
<td>The number of control area splits that have occurred for VSAM KSDS.</td>
</tr>
<tr>
<td>DB_PCT_NUM_CA_SPLIT</td>
<td>- - Y Y - - - - DS</td>
<td>The percentage of split CAs compared to the total number of CAs.</td>
</tr>
<tr>
<td>DBX_NUM_CI_SPLIT</td>
<td>- - - - Y Y - Y Y DS</td>
<td>The number of split CIs (VSAM control interval) in the index database data set.</td>
</tr>
</tbody>
</table>
### Table 20. Data elements related to data set CI/CA splits (continued)

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBX_PCT_NUM_CI_SPLIT</td>
<td>The percentage of split CIs compared to the total number of CIs in the index database data set.</td>
</tr>
<tr>
<td>DBX_NUM_CA_SPLIT</td>
<td>The number of split CAs (VSAM control area) in the index database data set.</td>
</tr>
<tr>
<td>DBX_PCT_NUM_CA_SPLIT</td>
<td>The percentage of split CAs compared to the total number of CAs in the index database data set.</td>
</tr>
</tbody>
</table>

### Data elements related to segments in a data set group

This reference topic provides information about data elements that are related to segments in a data set group.

The following table summarizes the data elements that are related to segments in a data set group.

### Table 21. Data elements related to segments in a data set group

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_SEG</td>
<td>The number of segment occurrences in the data set.</td>
</tr>
<tr>
<td>DB_NUM_VLSEG</td>
<td>The number of variable-length segment occurrences in the data set.</td>
</tr>
<tr>
<td>DB_NUM_VLSEG_SPLIT</td>
<td>The number of split segment occurrences in the data set.</td>
</tr>
</tbody>
</table>

The split segments are split into a prefix portion and a data portion. A variable length segment can be in this status if the segment length is made longer and there is not enough space to store the changed segment in the block or CI.
### Table 21. Data elements related to segments in a data set group (continued)

<table>
<thead>
<tr>
<th>Data element name</th>
<th>H H H S P P T</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D I I H H y A D S I D I p M A A S A D e M M A M A M</td>
<td>The percentage of the split variable-segment occurrences compared to the total number of variable-segment occurrences in the data set. This value is calculated by the following formula:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DB_PCT_NUM_VLSEG_SPLIT (%) = (DB_NUM_VLSEG_SPLIT / DB_NUM_VLSEG) * 100</td>
</tr>
<tr>
<td>DB_NUM_DELSEG</td>
<td>- - Y - - - DS</td>
<td>The number of deleted segment occurrences in the data set. A deleted segment occurrence refers to a segment occurrence whose delete byte is marked as deleted.</td>
</tr>
<tr>
<td>DB_BYTES_SEG</td>
<td>Y Y Y Y Y Y DS</td>
<td>The total bytes of segment occurrences in the data set.</td>
</tr>
<tr>
<td>DB_PCT_BYTES_SEG</td>
<td>Y Y Y Y Y Y DS</td>
<td>The percentage of segment occurrences compared to the total bytes of used blocks in the data set. This value is calculated by the following formula:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DB_PCT_BYTES_SEG (%) = (DB_BYTES_SEG / (DB_NUM_DBDS_BLOCKS * DB_BLOCK_SIZE)) * 100</td>
</tr>
<tr>
<td>DB_PCT_NUM_DELSEG</td>
<td>- - Y - - - DS</td>
<td>The percentage of deleted segment occurrences compared to the total bytes of used blocks in the data set. This value is calculated by the following formula:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DB_PCT_NUM_DELSEG (%) = (DB_NUM_DELSEG / (DB_NUM_DBDS_BLOCKS * DB_BLOCK_SIZE)) * 100</td>
</tr>
</tbody>
</table>

### Data elements related to pointers in a data set group

This reference topic provides information about data elements that are related to pointers in a data set group.

The following table summarizes the data elements that are related to pointers in a data set group.
### Table 22. Data elements related to pointers in a data set group

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_PTR</td>
<td>The number of used physical pointers that point to target segments within the data set. A used physical pointer indicates a physical pointer with nonzero value. Physical pointers are PTF, PTB, PCF, PCB, HF, HB, and VLS pointers. VLS pointer refers to a pointer that points from the prefix portion of split segment to the data portion.</td>
</tr>
<tr>
<td>DB_NUM_PTR_DIFF_BLK</td>
<td>The number of physical pointers that point to the target segments on a different block or CI within the data set.</td>
</tr>
</tbody>
</table>
| DB_PCT_NUM_PTR_DIFF_BLK    | The percentage of physical pointers that point to a different block or CI compared to the used physical pointers. This value is calculated by the following formula:  

\[
DB_{\text{PCT\_NUM\_PTR\_DIFF\_BLK}}(\%) = \left( \frac{DB_{\text{NUM\_PTR\_DIFF\_BLK}}}{DB_{\text{NUM\_PTR}}} \right) \times 100
\]  |

### Data elements related to free space in a data set group

This reference topic provides information about data elements that are related to free space in a data set group.

The following table summarizes the data elements that are related to free space in a data set group.

### Table 23. Data elements related to free space in a data set group

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_FSE</td>
<td>The number of free space elements in the data set. For HISAM and SHISAM databases, the number of unused areas in logical records.</td>
</tr>
<tr>
<td>DB_NUM_FSE_MIN</td>
<td>The number of free space elements that can hold the smallest segment in the data set.</td>
</tr>
<tr>
<td>DB_NUM_FSE_MAX</td>
<td>The number of free space elements that can hold the largest segment in the data set.</td>
</tr>
</tbody>
</table>
### Table 23. Data elements related to free space in a data set group (continued)

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_AVG_NUM_FSE</td>
<td>The average number of free space elements, per block or CI, in the data set.</td>
</tr>
<tr>
<td></td>
<td>This value is calculated by the following formula:</td>
</tr>
<tr>
<td></td>
<td>[ DB_{\text{AVG}<em>\text{NUM}</em>\text{FSE}} = \frac{\text{DB}<em>{\text{NUM}</em>\text{FSE}}}{\text{DB}<em>{\text{NUM}</em>\text{DBDS}_\text{BLOCKS}}} ]</td>
</tr>
<tr>
<td>DB_AVG_NUM_NOREUSE_FSE</td>
<td>The average number, per block or CI, of free space elements whose lengths are less than the smallest segment in the data set.</td>
</tr>
<tr>
<td></td>
<td>This value is calculated by the following formula:</td>
</tr>
<tr>
<td></td>
<td>[ DB_{\text{AVG}<em>\text{NUM}</em>\text{NOREUSE}<em>\text{FSE}} = \frac{\text{DB}</em>{\text{NUM}<em>\text{FSE}} - \text{DB}</em>{\text{NUM}<em>\text{FSE}</em>\text{MIN}}}{\text{DB}<em>{\text{NUM}</em>\text{DBDS}_\text{BLOCKS}}} ]</td>
</tr>
<tr>
<td>DB_PCT_NUM_NOREUSE_FSE</td>
<td>The percentage of free space elements that cannot hold the smallest segment in the data set.</td>
</tr>
<tr>
<td>DB_BYTES_FREE_SPACE</td>
<td>The total bytes of free spaces.</td>
</tr>
<tr>
<td>DB_PCT_BYTES_FREE_SPACE</td>
<td>The percentage of bytes of total free spaces to the total used bytes for the data set.</td>
</tr>
<tr>
<td></td>
<td>This value is calculated by the following formula:</td>
</tr>
<tr>
<td></td>
<td>[ DB_{\text{PCT}<em>\text{BYTES}</em>\text{FREE}<em>\text{SPACE}}(%) = \frac{\text{DB}</em>{\text{BYTES}<em>\text{FREE}</em>\text{SPACE}}}{\left( \frac{\text{DB}<em>{\text{NUM}</em>\text{DBDS}<em>\text{BLOCKS}} \times \text{DB}</em>{\text{BLOCK}_\text{SIZE}}} \right)} \times 100 ]</td>
</tr>
<tr>
<td>DB_BYTES_UNIDENTIFIED</td>
<td>The number of slack byte areas in the data set. These areas consist of 7 or fewer slack bytes and cannot hold IMS data.</td>
</tr>
<tr>
<td>DB_NUM_UNIDENTIFIED</td>
<td>The total slack bytes in the data set. A slack byte is a byte of disk space that cannot hold IMS data.</td>
</tr>
<tr>
<td>DB_AVG_NUM_UNIDENTIFIED</td>
<td>The average number of slack byte areas, per block or CI, in the data set. Slack byte areas cannot hold IMS data.</td>
</tr>
<tr>
<td></td>
<td>This value is calculated by the following formula:</td>
</tr>
<tr>
<td></td>
<td>[ DB_{\text{AVG}<em>\text{NUM}</em>\text{UNIDENTIFIED}} = \frac{\text{DB}<em>{\text{NUM}</em>\text{UNIDENTIFIED}}}{\text{DB}<em>{\text{NUM}</em>\text{DBDS}_\text{BLOCKS}}} ]</td>
</tr>
<tr>
<td>DB_PCT_NUM_FRAGD_FSE</td>
<td>The percentage of free space elements that cannot hold the largest segment in the data set.</td>
</tr>
</tbody>
</table>
### Table 23. Data elements related to free space in a data set group (continued)

<table>
<thead>
<tr>
<th>Data element name</th>
<th>H</th>
<th>H</th>
<th>H</th>
<th>S</th>
<th>P</th>
<th>P</th>
<th>T</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_AVG_NUM_FRAGD_FSE</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>DS</td>
<td>The average number of free space elements, per block or CI (VSAM control interval), that cannot hold the largest segment.</td>
<td></td>
</tr>
</tbody>
</table>

### Data elements related to free space in an area

This reference topic provides information about data elements that are related to free space in an area.

The following list summarizes the data elements that are related to free space in an area.

**Table 24. Data elements related to free space in an area**

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_PCT_BYTES_FS_RAA</td>
<td>AREA</td>
<td>The percentage of free space in the RAA BASE (in bytes) compared to the total RAA BASE in the data set (in bytes).</td>
</tr>
<tr>
<td>DB_PCT_BYTES_FS_DOVF</td>
<td>AREA</td>
<td>The percentage of free space in the DOVF (in bytes) compared to the total DOVF in the data set (in bytes).</td>
</tr>
<tr>
<td>DB_PCT_BYTES_FS_IOVF</td>
<td>AREA</td>
<td>The percentage of free space in the IOVF (in bytes) compared to the total IOVF in the data set (in bytes).</td>
</tr>
<tr>
<td>DB_PCT_BYTES_FS_SDEP</td>
<td>AREA</td>
<td>The percentage of free space in the SDEP (in bytes) compared to the total SDEP in the data set (in bytes).</td>
</tr>
</tbody>
</table>

### Data elements related to overflow in an area

This reference topic provides information about data elements that are related to overflow in an area.

The following list summarizes the data elements that are related to overflow in an area.

**Table 25. Data elements related to overflow in an area**

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_PCT_NUM_UOW_USE_DOVF</td>
<td>AREA</td>
<td>The percentage of UOWs that use DOVF CIs compared to the total number of UOWs in the data set.</td>
</tr>
<tr>
<td>DB_AVG_NUM_DOVFCI_BY_UOW</td>
<td>AREA</td>
<td>The average number of DOVF CIs that are used by a UOW in the data set. UOWs that do not use DOVF CIs are excluded.</td>
</tr>
<tr>
<td>DB_MAX_NUM_DOVFCI_BY_UOW</td>
<td>AREA</td>
<td>The maximum number of DOVF CIs that are used by a UOW in the data set.</td>
</tr>
</tbody>
</table>
### Table 25. Data elements related to overflow in an area (continued)

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_PCT_NUM_UOW_USE_IOVF</td>
<td>Y</td>
<td>AREA</td>
<td>The percentage of UOWs that use IOVF CIs compared to the total number of UOWs in the data set.</td>
</tr>
<tr>
<td>DB_NUM_UOW_USE_IOVF</td>
<td>Y</td>
<td>AREA</td>
<td>The number of UOWs that use IOVF CIs in the data set.</td>
</tr>
<tr>
<td>DB_AVG_NUM_IOVFCI_BY_UOW</td>
<td>Y</td>
<td>AREA</td>
<td>The average number of IOVF CIs that are used by a UOW in the data set. UOWs that do not use IOVF CIs are excluded.</td>
</tr>
<tr>
<td>DB_MAX_NUM_IOVFCI_BY_UOW</td>
<td>Y</td>
<td>AREA</td>
<td>The maximum number of IOVF CIs that are used by a UOW in the data set.</td>
</tr>
<tr>
<td>DB_MIN_NUM_IOVFCI_BY_UOW</td>
<td>Y</td>
<td>AREA</td>
<td>The minimum number of IOVF CIs that are used by a UOW in the data set.</td>
</tr>
<tr>
<td>DB_PCT_NUM_IOVFCI_USED</td>
<td>Y</td>
<td>AREA</td>
<td>The percentage of used IOVF CIs compared to the total IOVF CIs (bitmaps excluded) in the data set.</td>
</tr>
<tr>
<td>DB_PCT_NUM_RAPCI_OVFL</td>
<td>Y</td>
<td>AREA</td>
<td>The percentage of RAP CIs that use overflow CIs compared to the total number of used RAP CIs in the data set.</td>
</tr>
</tbody>
</table>

### Data element related to segment occurrences in an area

This reference topic provides information about data elements that are related to segment occurrences in an area.

The following list summarizes the data elements that are related to segment occurrences in an area.

### Table 26. Data element related to segment occurrences in an area

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_SEG</td>
<td>Y</td>
<td>AREA</td>
<td>The number of segment occurrences in the data set.</td>
</tr>
</tbody>
</table>

### Data elements related to database records in an area

This reference topic provides information about data elements that are related to database records in an area.

The following list summarizes the data elements that are related to database records in an area.
Table 27. Data elements related to database records in an area

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_ROOT</td>
<td>Y</td>
<td>AREA</td>
<td>The number of root segment occurrences in the database, the partition, or the area.</td>
</tr>
<tr>
<td>DB_AVG_DBREC_LENGTH</td>
<td>Y</td>
<td>AREA</td>
<td>The average length of database records in the database, the partition, or the area.</td>
</tr>
<tr>
<td>DB_MAX_DBREC_LENGTH</td>
<td>Y</td>
<td>AREA</td>
<td>The length of the longest database record in the data set.</td>
</tr>
<tr>
<td>DB_MIN_DBREC_LENGTH</td>
<td>Y</td>
<td>AREA</td>
<td>The length of the shortest database record in the data set.</td>
</tr>
<tr>
<td>DB_PCT_NUM_DBREC_IOVF</td>
<td>Y</td>
<td>AREA</td>
<td>The percentage of DB records using IOVF CIs compared to the total DB records in the data set.</td>
</tr>
</tbody>
</table>

Data elements related to synonym in an area

This reference topic provides information about data elements that are related to synonym in an area.

The following list summarizes the data elements that are related to synonym in an area.

Table 28. Data elements related to synonym in an area

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_AVG_LEN_SYNONYM_CHAIN</td>
<td>Y</td>
<td>AREA</td>
<td>The average length of all synonym chains in the data set that have a length greater than or equal to 2.</td>
</tr>
<tr>
<td>DB_MAX_LEN_SYNONYM_CHAIN</td>
<td>Y</td>
<td>AREA</td>
<td>The length of the longest synonym chain in the data set.</td>
</tr>
</tbody>
</table>

Data elements related to physical I/O in an area

This reference topic provides information about data elements that are related to physical I/O in an area.

The following list summarizes the data elements that are related to physical I/O in an area.

Table 29. Data elements related to physical I/O in an area

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_AVG_DBREC_IO</td>
<td>Y</td>
<td>AREA</td>
<td>The average number of physical I/Os required to retrieve an entire DB record in the data set.</td>
</tr>
<tr>
<td>DB_ESTIMATED_DBREC_IO</td>
<td>Y</td>
<td>AREA</td>
<td>The estimated number of I/Os that are required to retrieve an entire database record.</td>
</tr>
</tbody>
</table>
### Data elements related to physical I/O in an area (continued)

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_MAX_DBREC_IO</td>
<td>Y</td>
<td>AREA</td>
<td>The maximum number of physical I/Os required to retrieve an entire DB record in the data set.</td>
</tr>
<tr>
<td>DB_AVG_ROOT_IO</td>
<td>Y</td>
<td>AREA</td>
<td>The average number of physical I/Os required to retrieve a root segment in the data set.</td>
</tr>
<tr>
<td>DB_ESTIMATED_ROOT_IO</td>
<td>Y</td>
<td>AREA</td>
<td>The estimated number of I/Os that are required to reach a root segment from RAP by following the synonym chain.</td>
</tr>
<tr>
<td>DB_MAX_ROOT_IO</td>
<td>Y</td>
<td>AREA</td>
<td>The maximum number of physical I/Os required to retrieve a root segment in the data set.</td>
</tr>
</tbody>
</table>

### Data elements related to AREA definition

This reference topic provides information about data elements that are related to AREA definition.

The following list summarizes the data elements that are related to AREA definition.

### Table 30. Data elements related to AREA definition

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_AREADEF_CISIZE</td>
<td>Y</td>
<td>AREA</td>
<td>The size of the VSAM CI for the area.</td>
</tr>
<tr>
<td>DB_AREADEF_UOW1</td>
<td>Y</td>
<td>AREA</td>
<td>The number of VSAM CIs in a UOW for the area.</td>
</tr>
<tr>
<td>DB_AREADEF_UOW2</td>
<td>Y</td>
<td>AREA</td>
<td>The number of VSAM CIs in the overflow section of a UOW for the area.</td>
</tr>
<tr>
<td>DB_AREADEF_ROOT1</td>
<td>Y</td>
<td>AREA</td>
<td>The total space allocated to the root addressable part of the area and to the area reserved for the IOVF part.</td>
</tr>
<tr>
<td>DB_AREADEF_ROOT2</td>
<td>Y</td>
<td>AREA</td>
<td>The space reserved for the IOVF part in terms of UOWs.</td>
</tr>
<tr>
<td>DB_AREADEF_NUM_SDEP_CIS</td>
<td>Y</td>
<td>AREA</td>
<td>The total number of CIs that are allocated for the SDEP part.</td>
</tr>
</tbody>
</table>

### Data elements related to UOW statistics information

This reference topic provides information about data elements that are related to UOW statistics information.

The following list summarizes the data elements that are related to UOW statistics information.
Table 31. Data elements related to UOW statistics information

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_FLAG_UOW_DATA</td>
<td>Y</td>
<td>AREA</td>
<td>The indicator that shows whether the data elements are collected for each UOW.</td>
</tr>
<tr>
<td>DB_FLAG_UOW_GROUP_DATA</td>
<td>Y</td>
<td>AREA</td>
<td>The indicator that shows whether the data elements are collected for each group of UOWs.</td>
</tr>
<tr>
<td>DB_NUM_UOW_GROUPS</td>
<td>Y</td>
<td>AREA</td>
<td>The number of UOW groups that are defined.</td>
</tr>
</tbody>
</table>

Data element related to repository group information

This reference topic provides information about data elements that are related to repository group information.

The following list summarizes the data elements that are related to repository group information.

Table 32. Data element related to repository group information

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_SENSOR_DATA_GROUP_ID</td>
<td>Y</td>
<td>AREA</td>
<td>The name of the repository group.</td>
</tr>
</tbody>
</table>

Data elements related to free space in a UOW

This reference topic provides information about data elements that are related to free space in a UOW.

The following list summarizes the data elements that are related to free space in a UOW.

Table 33. Data elements related to free space in a UOW

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBU_PCT_BYTES_FS_RAA</td>
<td>Y</td>
<td>UOW</td>
<td>The percentage of free space in the RAA BASE (in bytes) compared to the total RAA BASE in the UOW (in bytes).</td>
</tr>
<tr>
<td>DBU_PCT_BYTES_FS_DOVF</td>
<td>Y</td>
<td>UOW</td>
<td>The percentage of free space in the DOVF (in bytes) compared to the total DOVF in the UOW (in bytes).</td>
</tr>
<tr>
<td>DBU_PCT_BYTES_FS_IOVF</td>
<td>Y</td>
<td>UOW</td>
<td>The percentage of free space in the IOVFs that are used by the UOW compared to the total bytes of those IOVFs.</td>
</tr>
<tr>
<td>DBU_PCT_USABLE_RAAFS</td>
<td>Y</td>
<td>UOW</td>
<td>The percentage of usable free space in the RAA BASE (in bytes) compared to the total RAA BASE in the UOW (in bytes).</td>
</tr>
<tr>
<td>DBU_PCT_USABLE_DOVFFS</td>
<td>Y</td>
<td>UOW</td>
<td>The percentage of usable free space in the DOVF (in bytes) compared to the total DOVF in the UOW (in bytes).</td>
</tr>
</tbody>
</table>
### Table 33. Data elements related to free space in a UOW (continued)

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBU_PCT_USABLE_IOVFFS</td>
<td>Y</td>
<td>UOW</td>
<td>The percentage of usable free space in the IOVFs that are used by the UOW compared to the total bytes of those IOVFs.</td>
</tr>
<tr>
<td>DBU_PCT_RAP_ROOTSZFS</td>
<td>Y</td>
<td>UOW</td>
<td>The percentage of RAP CIs that have free space to insert a root segment compared to the total used RAP CIs in the UOW.</td>
</tr>
<tr>
<td>DBU_MAX_PCT_BYTES_RAPFS</td>
<td>Y</td>
<td>UOW</td>
<td>The maximum percentage of free space in a RAP CI that uses overflow CIs (bytes) compared to a RAP CI in the UOW (bytes).</td>
</tr>
<tr>
<td>DBU_FLAG_UOW_USING_OVFL</td>
<td>Y</td>
<td>UOW</td>
<td>The indicator that shows whether at least one overflow CI is used by the UOW.</td>
</tr>
<tr>
<td>DBU_FLAG_UOW_USING_IOVF</td>
<td>Y</td>
<td>UOW</td>
<td>The indicator that shows whether at least one IOVF CI is used by the UOW.</td>
</tr>
</tbody>
</table>

### Data elements related to free space in a UOW group

This reference topic provides information about data elements that are related to free space in a UOW group.

The following list summarizes the data elements that are related to free space in a UOW group.

### Table 34. Data elements related to free space in a UOW group

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBUG_PCT_BYTES_FS_RAA</td>
<td>Y</td>
<td>UOGW</td>
<td>The percentage of free space in the RAA BASE (in bytes) compared to the total RAA BASE in the group of UOWs (in bytes).</td>
</tr>
<tr>
<td>DBUG_PCT_BYTES_FS_DOVF</td>
<td>Y</td>
<td>UOGW</td>
<td>The percentage of free space in the DOVF (in bytes) compared to the total DOVF in the group of UOWs (in bytes).</td>
</tr>
<tr>
<td>DBUG_PCT_BYTES_FS_IOVF</td>
<td>Y</td>
<td>UOGW</td>
<td>The percentage of free space in the IOVFs that are used by the UOW group compared to the total bytes of those IOVFs.</td>
</tr>
<tr>
<td>DBUG_PCT_USABLE_RAAFS</td>
<td>Y</td>
<td>UOGW</td>
<td>The percentage of usable free space in the RAA BASE compared to the total RAA BASE in the group of UOWs (in bytes).</td>
</tr>
<tr>
<td>DBUG_PCT_USABLE_DOVFFFS</td>
<td>Y</td>
<td>UOGW</td>
<td>The percentage of usable free space in the DOVF (in bytes) compared to the total DOVF in the group of UOWs (in bytes).</td>
</tr>
<tr>
<td>DBUG_PCT_USABLE_IOVFFS</td>
<td>Y</td>
<td>UOGW</td>
<td>The percentage of usable free space in the IOVFs that are used by the UOW group compared to the total bytes of the IOVFs.</td>
</tr>
</tbody>
</table>
### Table 34. Data elements related to free space in a UOW group (continued)

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEEB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBUG_PCT_RAP_ROOTSZFS</td>
<td>Y</td>
<td>UOGW</td>
<td>The percentage of RAP CIs that have free space to insert a root segment compared to the total used RAP CIs in UOW group.</td>
</tr>
</tbody>
</table>

### Data elements related to overflow in a UOW

This reference topic provides information about data elements that are related to overflow in a UOW. The following list summarizes the data elements that are related to overflow in a UOW.

### Table 35. Data elements related to overflow in a UOW

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEEB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBU_NUM_DOVFCI_BY_UOW</td>
<td>Y</td>
<td>UOW</td>
<td>The number of DOVF CIs that are used by the UOW.</td>
</tr>
<tr>
<td>DBU_NUM_IOVFCI_BY_UOW</td>
<td>Y</td>
<td>UOW</td>
<td>The number of IOVF CIs that are used by the UOW.</td>
</tr>
<tr>
<td>DBUG_PCT_NUM_RAPCI_OVFL</td>
<td>Y</td>
<td>UOW</td>
<td>The percentage of RAP CIs that use overflow CIs compared to the total number of used RAP CIs in the UOW.</td>
</tr>
</tbody>
</table>

### Data elements related to overflow in a UOW group

This reference topic provides information about data elements that are related to overflow in a UOW group. The following list summarizes the data elements that are related to overflow in a UOW group.

### Table 36. Data elements related to overflow in a UOW group

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEEB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBUG_PCT_NUM_UOW_DOVF</td>
<td>Y</td>
<td>UOWG</td>
<td>The percentage of UOWs that use DOVF CIs compared to the total number of UOWs in the group of UOWs.</td>
</tr>
<tr>
<td>DBUG_AVG_NUM_DOVFCI</td>
<td>Y</td>
<td>UOWG</td>
<td>The average number of DOVF CIs that are used by a UOW in the group of UOWs. UOWs that do not use DOVF CIs are excluded.</td>
</tr>
<tr>
<td>DBUG_MAX_NUM_DOVFCI</td>
<td>Y</td>
<td>UOWG</td>
<td>The maximum number of DOVF CIs that are used by a UOW in the group of UOWs.</td>
</tr>
<tr>
<td>DBUG_PCT_NUM_UOW_IOVF</td>
<td>Y</td>
<td>UOWG</td>
<td>The percentage of UOWs that use IOVF CIs compared to the total number of UOWs in the group of UOWs.</td>
</tr>
</tbody>
</table>
Table 36. Data elements related to overflow in a UOW group (continued)

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBUG_AVG_NUM_IOVF CI</td>
<td>Y</td>
<td>UOWG</td>
<td>The average number of IOVF CIs that are used by a UOW in the group of UOWs. UOWs that do not use IOVF CIs are excluded.</td>
</tr>
<tr>
<td>DBUG_MAX_NUM_IOVF CI</td>
<td>Y</td>
<td>UOWG</td>
<td>The maximum number of IOVF CIs that are used by a UOW in the group of UOWs.</td>
</tr>
<tr>
<td>DBUG_PCT_NUM_RAPCI_OVFL</td>
<td>Y</td>
<td>UOWG</td>
<td>The percentage of RAP CIs that use overflow CIs compared to the total number of used RAP CIs in the group of UOWs.</td>
</tr>
</tbody>
</table>

Data elements related to database records in a UOW

This reference topic provides information about data elements that are related to database records in a UOW.

The following list summarizes the data elements that are related to database records in a UOW.

Table 37. Data elements related to database records in a UOW

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBU_NUM_ROOT</td>
<td>Y</td>
<td>UOW</td>
<td>The number of root segment occurrences in the UOW.</td>
</tr>
<tr>
<td>DBU_AVG_DBREC_LENGTH</td>
<td>Y</td>
<td>UOW</td>
<td>The average length of database records in the UOW.</td>
</tr>
<tr>
<td>DBU_MAX_DBREC_LENGTH</td>
<td>Y</td>
<td>UOW</td>
<td>The length of the longest database record in the UOW.</td>
</tr>
<tr>
<td>DBU_MIN_DBREC_LENGTH</td>
<td>Y</td>
<td>UOW</td>
<td>The length of the shortest database record in the UOW.</td>
</tr>
<tr>
<td>DBU_PCT_NUM_DBREC_IOVF</td>
<td>Y</td>
<td>UOW</td>
<td>The percentage of DB records using IOVF CIs compared to the total DB records in the UOW.</td>
</tr>
</tbody>
</table>

Data elements related to database records in a UOW group

This reference topic provides information about data elements that are related to database records in a UOW group.

The following list summarizes the data elements that are related to database records in a UOW group.

Table 38. Data elements related to database records in a UOW group

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBUG_NUM_ROOT</td>
<td>Y</td>
<td>UOWG</td>
<td>The number of root segment occurrences in the group of UOWs.</td>
</tr>
</tbody>
</table>
Table 38. Data elements related to database records in a UOW group (continued)

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBUG_AVG_DBREC_LENGTH</td>
<td>Y</td>
<td>UOWG</td>
<td>The average length of database records in the group of UOWs.</td>
</tr>
<tr>
<td>DBUG_MAX_DBREC_LENGTH</td>
<td>Y</td>
<td>UOWG</td>
<td>The length of the longest database record in the group of UOWs.</td>
</tr>
<tr>
<td>DBUG_MIN_DBREC_LENGTH</td>
<td>Y</td>
<td>UOWG</td>
<td>The length of the shortest database record in the group of UOWs.</td>
</tr>
<tr>
<td>DBUG_PCT_NUM_DBREC_IOVF</td>
<td></td>
<td></td>
<td>The percentage of DB records using IOVF CIs compared to the total DB records in the group of UOWs.</td>
</tr>
</tbody>
</table>

Data elements related to synonym in a UOW

This reference topic provides information about data elements that are related to synonym in a UOW.

The following list summarizes the data elements that are related to synonym in a UOW.

Table 39. Data elements related to synonym in a UOW

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBU_AVG_LEN_SYN_CHAIN</td>
<td>Y</td>
<td>UOW</td>
<td>The average length of all synonym chains in the UOW that have a length greater than or equal to 2.</td>
</tr>
<tr>
<td>DBU_MAX_LEN_SYN_CHAIN</td>
<td>Y</td>
<td>UOW</td>
<td>The length of the longest synonym chain in the UOW.</td>
</tr>
</tbody>
</table>

Data elements related to synonym in a UOW group

This reference topic provides information about data elements that are related to synonym in a UOW group.

The following list summarizes the data elements that are related to synonym in a UOW group.

Table 40. Data elements related to synonym in a UOW group

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBUG_AVG_LEN_SYN_CHAIN</td>
<td>Y</td>
<td>UOWG</td>
<td>The average length of all synonym chains in the group of UOWs that have a length greater than or equal to 2.</td>
</tr>
<tr>
<td>DBUG_MAX_LEN_SYN_CHAIN</td>
<td>Y</td>
<td>UOWG</td>
<td>The length of the longest synonym chain in the group of UOWs.</td>
</tr>
</tbody>
</table>
Data elements related to physical I/O in a UOW

This reference topic provides information about data elements that are related to physical I/O in a UOW. The following list summarizes the data elements that are related to physical I/O in a UOW.

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBU_AVG_DBREC_IO</td>
<td>Y</td>
<td>UOW</td>
<td>The average number of physical I/Os required to retrieve an entire DB record in the UOW.</td>
</tr>
<tr>
<td>DBU_MAX_DBREC_IO</td>
<td>Y</td>
<td>UOW</td>
<td>The maximum number of physical I/Os required to retrieve an entire DB record in the UOW.</td>
</tr>
<tr>
<td>DBU_AVG_ROOT_IO</td>
<td>Y</td>
<td>UOW</td>
<td>The average number of physical I/Os required to retrieve a root segment in the UOW.</td>
</tr>
<tr>
<td>DBU_MAX_ROOT_IO</td>
<td>Y</td>
<td>UOW</td>
<td>The maximum number of physical I/Os required to retrieve a root segment in the UOW.</td>
</tr>
</tbody>
</table>

Data elements related to physical I/O in a UOW group

This reference topic provides information about data elements that are related to physical I/O in a UOW group. The following list summarizes the data elements that are related to physical I/O in a UOW group.

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DEDB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBUG_AVG_DBREC_IO</td>
<td>Y</td>
<td>UOWG</td>
<td>The average number of physical I/Os required to retrieve an entire DB record in the group of UOWs.</td>
</tr>
<tr>
<td>DBUG_MAX_DBREC_IO</td>
<td>Y</td>
<td>UOWG</td>
<td>The maximum number of physical I/Os required to retrieve an entire DB record in the group of UOWs.</td>
</tr>
<tr>
<td>DBUG_AVG_ROOT_IO</td>
<td>Y</td>
<td>UOWG</td>
<td>The average number of physical I/Os required to retrieve a root segment in the group of UOWs.</td>
</tr>
<tr>
<td>DBUG_MAX_ROOT_IO</td>
<td>Y</td>
<td>UOWG</td>
<td>The maximum number of physical I/Os required to retrieve a root segment in the group of UOWs.</td>
</tr>
</tbody>
</table>
Data elements related to RBASEFS or RDOVFFS conditions

This reference topic provides information about data elements that are related to the RBASEFS or RDOVFFS conditions.

The following list summarizes the data elements that are related to RBASEFS or RDOVFFS conditions.

Table 43. Data elements related to RBASEFS or RDOVFFS conditions

<table>
<thead>
<tr>
<th>Data element name</th>
<th>DE DB</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_UOW_RFS_COND</td>
<td>Y</td>
<td>AREA</td>
<td>The number of UOWs that match the RBASEFS condition or the RDOVFFS condition.</td>
</tr>
<tr>
<td>DB_PCT_NUM_UOW_RFS_COND</td>
<td>Y</td>
<td>AREA</td>
<td>The percentage of UOWs that match the RBASEFS condition or the RDOVFFS condition compared to the total number of UOWs.</td>
</tr>
<tr>
<td>DB_THRESHOLD_RBASEFS</td>
<td>Y</td>
<td>AREA</td>
<td>The threshold value that is specified by the RBASEFS or the EXC_RBASEFS keyword for selecting UOWs to reorganize.</td>
</tr>
<tr>
<td>DB_THRESHOLD_RDOVFFS</td>
<td>Y</td>
<td>AREA</td>
<td>The threshold value that is specified by the RDOVFFS or the EXC_RDOVFFS keyword for selecting UOWs to reorganize.</td>
</tr>
</tbody>
</table>

Data elements related to event dates

This reference topic provides information about data elements that are related to the date that an event occurred.

The following table summarizes the data elements that are related to event dates.

Table 44. Data elements related to event dates

<table>
<thead>
<tr>
<th>Data element name</th>
<th>H H H S P P I P D</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_DAYS_SINCE_LAST_REORG</td>
<td>Y Y Y Y Y Y Y - DB</td>
<td>- - - - - -</td>
<td>The number of days that elapsed since the last reorganization. Elapsed days are calculated based on the number of 24-hour periods since the last reorganization (rather than the number of calendar days).</td>
</tr>
</tbody>
</table>
Data elements related to data set backup status

This reference topic provides information about data elements that are related to the status of data set backup.

The following table summarizes the data elements that are related to the status of data set backup.

Table 45. Data elements related to data set backup status

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_DBRC_IC_NEEDED</td>
<td>DS</td>
<td>The image copy needed flag from RECON for a database data set or a DEDB area.</td>
</tr>
<tr>
<td>DB_DBRC_IC_RECOMMENDED</td>
<td>DS</td>
<td>The image copy recommended flag from RECON for a database data set or a DEDB area.</td>
</tr>
<tr>
<td>DB_HOURS_SINCE_LASTIC</td>
<td>DS</td>
<td>The number of hours since the last image copy was taken for a database data set or a DEDB area.</td>
</tr>
<tr>
<td>DB_IS_IN_A_DBRC_CAGRP</td>
<td>DS</td>
<td>The flag indicating whether a database data set or a DEDB area belongs to a RECON change accumulation group.</td>
</tr>
</tbody>
</table>

Data elements related to database recovery

This reference topic provides information about data elements that are related to database recovery.

The following table summarizes the data elements that are related to database recovery.

Table 46. Data elements related to database recovery

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_DBRC_EEQE_COUNT</td>
<td>DS</td>
<td>The number of Extended Error Queue Elements created for write errors for a data set or a DEDB area.</td>
</tr>
<tr>
<td>DB_DBRC_RECOV_NEEDED</td>
<td>DS</td>
<td>The recovery needed flag from the RECON for a database data set.</td>
</tr>
<tr>
<td>DB_DBRC_RECOVERABLE</td>
<td>DB</td>
<td>An indication of whether a database, a HALDB partition, or a DEDB area is recoverable or nonrecoverable.</td>
</tr>
</tbody>
</table>

Data elements related to database backout

This reference topic provides information about data elements that are related to database backout.

The following table summarizes the data elements that are related to database backout.
Table 47. Data elements related to database backout

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_DBRC_BACKOUT_NEEDED</td>
<td>DB</td>
<td>The database backout needed flag from RECON for a database, a HALDB partition, or a DEDB area.</td>
</tr>
</tbody>
</table>

Data elements related to change accumulation groups

This reference topic provides information about data elements that are related to change accumulation groups.

The following table summarizes the data elements that are related to change accumulation groups.

Table 48. Data elements related to change accumulation groups

<table>
<thead>
<tr>
<th>Data element name</th>
<th>Sensor data record type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_HOURS_SINCE_LASTCA</td>
<td>CAGR</td>
<td>The number of hours since the last change accumulation occurred for a RECON CAGRP.</td>
</tr>
</tbody>
</table>
Chapter 22. Journal reports

Policy Services writes journal records that are useful to IBM Software Support for problem resolution.

Topics:

• “Journal report overview” on page 189
• “Notification List and Directory Entry List report” on page 190
• “Notification List Delete report” on page 191
• “Notification List and Directory Entry Import report” on page 192
• “Notification List Update report” on page 193
• “Directory Entry Update report” on page 194
• “Policy Decision Making report” on page 194
• “Policy Environment Service Environment Create report” on page 196
• “Policy Environment Service Environment Delete report” on page 197
• “Policy Environment Service Environment Select and Validate report” on page 198
• “Policy Environment Service Worklist Maintenance Process report” on page 200
• “Policy Rule Template and Stream List report” on page 201
• “Policy Stream Delete report” on page 202
• “Policy Stream Import report” on page 203
• “Policy Template Delete report” on page 203
• “Policy Template Import report” on page 204
• “Policy Template Update report” on page 205
• “Rule Template Import report” on page 207

Journal report overview

Journal records are written to reflect the status of policy template, policy streams, rule templates, notification list, and directory entry processing, the creating and promoting of environments, policy validation, and evaluation of policy and sensor data during certain processing.

The data set that is used for journaling is a GDG, to allow for copies to be retained, or can specify that the journal output be sent to a SYSOUT device.

You can copy the sample job BSNGDG in the hlq.SHKTSAMP library to one of your own libraries. Modify the job as shown in the documentation within the BSNGDG job.

The following reports are written to the journal:

• Notification List List report
• Notification List Delete report
• Notification List Import report
• Notification List Update report
• Policy Decision Making report
• Policy Environment Service Environment Create report
• Policy Environment Service Environment Delete report
• Policy Environment Service Environment Select and Validate report
• Policy Environment Service Worklist Maintenance Process report
• Policy Environment Service Worklist Maintenance Process report
• Policy Rule Template and Stream List report
• Policy Stream Delete report
• Policy Stream Import report
• Policy Template Delete report
• Policy Template Import report
• Policy Template Update report
• Rule Template Import report

You can review these records to determine the following information:

• Policy templates, and rule templates were installed during a maintenance install
• Policy templates, and rule thresholds that have been modified
• Policy templates that have been created, using an existing policy template as a model
• Policy templates that have been created, without using an existing policy template as a model
• Creating notification lists and/or directory entries
• Importing of policy templates, policy streams, rule templates, notification lists and directory entries
• Creation of a maintenance environment
• Promoting a maintenance environment
• Other

IBM Software Support can also use these journal records to assist in problem determination. If a problem is reported, you should send these Journal records to IBM Software Support to be used in the assistance in problem resolution.

Policy Services requires that a journal data set DD statement be included in the JCL of the IMS tool that is using Policy Services. For example:

```
//BSNJM01  DD  DSN=BSNJM01.BSN(+1),
//        SPACE=(TRK,(50,50)),UNIT=3390,
//        VOL=SER=222222,
//        DCB=(LRECL=134,BLKSIZE=134,RECFM=FBA),
//        DISP=(NEW,CATLG)
```

You can also specify the following statement, which allows the journal output to be sent to a SYSOUT device.

```
//BSNJM01  DD  SYSOUT=A
```

**Notification List and Directory Entry List report**

The Notification List and Directory Entry List report lists all notification lists or directory entries of a specific environment that are in the repository.

The following example shows a list of notification lists from a sample Notification List and Directory Entry List report:
Figure 95. Example: List of notification lists

The following example shows a directory entry list from a sample Notification List and Directory Entry List report:

Figure 96. Example: Directory entry list

Notification List Delete report

The Notification List Delete report shows you the notification list that was deleted from the repository.

All policies of the specific environment in the repository are scanned to ensure that the notification list to be deleted is not being referenced by any one of the policies. If a referencing policy exists, the report shows that the delete notification list request is rejected.

The following example shows the summary notification lists and threshold notification lists being referenced by a policy:
Figure 97. Example of Policy summary notification lists and threshold notification lists

**Notification List and Directory Entry Import report**

The Notification List and Directory Entry Import report shows the notification list or directory entry template that was imported into the repository during installation or maintenance.

The following example shows the notification list template from a sample Notification List and Directory Entry Import report:
*** NOTIFICATION LIST IMPORT PROCESS STARTED
********************************************************************************
2020-04-21 20:01:333@NLDS: BSN5211I LEVEL=00000001, RECON=MYRECON1
2020-04-21 20:01:333@NLDS: BSN5211I NOTIFICATION LIST IMPORT STARTED
********************************************************************************
**** NOTIFICATION LIST TEMPLATE FOR IMPORT
************************************************************************************
@BEGIN{NL_VERSION}
1
@END
@BEGIN{NL_NAME}
LIST23
@END
@BEGIN{NL_DESC}
Notification list description
@END
@BEGIN{NL_CREATED}
2019-09-08 07:15:30
@END
@BEGIN{NL_LAST_UPDATE}
2019-09-11 12:20:31
@END
@BEGIN{NL_LAST_UPDATER}
SHIOMIT
@END
@BEGIN{NL_DESTINATIONS}
USER1; 1; STLMVS1.USER1; Primary DBA; NOW NOWAIT;
USER2; 1; STLMVS1.USER2; Secondary DBA; NOW NOWAIT;
USER3; 1; STLMVS1.USER3; Secondary DBA; NOW NOWAIT; AGTMOD11
SHIOMIT; 2; STLMVS1.SHIOMIT; Backup DBA; 3 11 13 KEY001 1;
DEST_01; 1; Other destinations;
@END
2020-04-21 20:01:333@NLDS: BSN5201I NLDS BSNNLPD0 GET CONTROL WITH FUNCTION NLDSCHCK RC=00000000,RSN=ENTRY
2020-04-21 20:01:333@NLDS: BSN5201I NLDS BSNNLPD0 GET CONTROL WITH FUNCTION NLDSCHCK RC=00000000,RSN=EXIT
2020-04-21 20:01:333@NLDS: BSN5201I NLDS BSNNLDP0 GET CONTROL WITH FUNCTION NLDSIMPT RC=00000000,RSN=EXIT
********************************************************************************
*** NOTIFICATION LIST IMPORT PROCESS ENDED
********************************************************************************
2020-04-21 20:01:333@NLDS: BSN5212I LEVEL=00000001, RECON=MYRECON1, NOTIFICATION LIST=LIST23
2020-04-21 20:01:333@NLDS: BSN5212I NOTIFICATION LIST IMPORT ENDED RC=00000000,RSN=00000000

Figure 98. Example of notification list template

The following example shows the directory entry template from a sample Notification List and Directory Entry Import report:

*******************************************************************************
**** NOTIFICATION LIST TEMPLATE FOR IMPORT
*******************************************************************************
@BEGIN{NL_VERSION}
1
@END
@BEGIN{NL_DELEGATE}
A; ;
@END
@BEGIN{NL_NAME}
JERRY
@END
@BEGIN{NL_DESC}
Jerry Hughes
@END
@BEGIN{NL_CREATED}
2020-01-27
@END
@BEGIN{NL_LAST_UPDATE}
2020-01-27 22:28:12
@END
@BEGIN{NL_LAST_UPDATER}
USRT004
@END
@BEGIN{NL_DESTINATIONS}
Jerry Hughes        ; !
02; USRT004
; NOW NOWAIT
@END
2020-04-21 20:01:333@NLDS: BSN5211I LEVEL=00000001, RECON=MYRECON1, NOTIFICATION LIST=LIST23
2020-04-21 20:01:333@NLDS: BSN5211I NOTIFICATION LIST IMPORT STARTED

Figure 99. Example of directory entry template

Notification List Update report

The Notification List Update report shows the notification list that was updated.

A notification list can contain both directory entries and nested notification lists. You can see the final valid directory entries expanded from the notification list in this report.

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The following example shows the expanded valid directory entries and updated notification list definition from a sample Notification List Update report:

```
NOTIFICATION LIST BSNGLOBL LIST02 INCLUDES G:LIST01
```

**Figure 100. Example of notification lists nesting information**

```
BOUND NOTIFICATION DIRECTORY ENTRIES

DIR3 TSO
DIR1 TSO
DIR2 WTO
```

**Figure 101. Example of notification list expanded valid directory entries**

```
NOTIFICATION LIST ENTRY DESCRIPTION: LIST02 Description

DIR3 TSO
G:LIST01 NESTED NOTIFICATION LIST
DIR1 TSO
```

**Figure 102. Example of notification list definition**

### Directory Entry Update report

The Directory Entry Update report shows the directory entry that was updated. The following example shows an updated directory entry definition:

```
NOTIFICATION DIRECTORY ENTRY

DIRECTORY ENTRY NAME: DIR1 LONG NAME: directory entry 1
STATUS: A DELEGATE: OPTION:
DESCRIPTION: Directory Entry 1 Description
TSO DESTINATION
ADDRESS:USER02
PARAMETER: NOW NOWAIT
```

**Figure 103. Example of directory entry definition**

### Policy Decision Making report

The Policy Decision Making report includes the policy stream and the rule streams that are in the repository. The report also lists all the conditions and exceptions that were met for each rule.

The report provides a detailed summary of how IMS Policy Services is configured. You can use the decision making report to see the specified variables for rule streams and policy streams. Also, the end of the report shows any exceptions that were generated and the actions that were completed for each exception.

The following example shows the resource type that was defined:

```
***** POLICY TEMPLATE GET CLAUSE RAW DATA

HDAM
```

**Figure 104. An example clause from a Policy Decision Making report.**

The Policy Decision Making report shows each rule stream for each threshold. The following example shows the high threshold for one rule stream.
Figure 105. An example of the high threshold for one rule stream in a Policy Decision Making report.

In the example, the rule stream is defined to monitor the number of database records. The high threshold has been set to 4294967295. When the number of database records reaches this threshold, an exception is generated that generates a warning message.

The policy stream build includes the specified policy actions, the policy stream, and all the exceptions that were generated. The policy stream repeat all the rule streams. The exceptions are listed as BSN messages, and you can find more information about these messages in the reference part of this user's guide.

The following example shows the actions that are taken when rules with the specified exception class reach a specified exception level. For example, if rules that contain the exception class DATA_SET_SIZE_GROWTH reach an exception level of CRITICAL, IMS Policy Services initiates a reorganization of the database.

Figure 106. An example of the policy stream build from a sample Policy Decision Making report

The following example show a rule from the policy stream build.
POLICY(  
  VERSION(1)  
  DOMAIN_REF(REORG)  
  NAME(SYS.DBDTYPE.HDAM)  
  ORIGINAL_NAME(IBM.DBDTYPE.HDAM)  
  ANNOTATION(IBM basic policy for HDAM databases)  
  ACTION(ACTION_REF(REORG)  
    EXCEPTION_CLASS(DATA_SET_SIZE_GROWTH)  
    EXCEPTION_LEVEL(CRITICAL))  
  ACTION(ACTION_REF(REORG)  
    EXCEPTION_CLASS(FRAGMENTED_FREE_SPACES)  
    EXCEPTION_LEVEL(CRITICAL))  
  ACTION(ACTION_REF(REORG)  
    EXCEPTION_CLASS(EXCESSIVE_SLACK_BYTES)  
    EXCEPTION_LEVEL(CRITICAL))  
  ACTION(ACTION_REF(REORG)  
    EXCEPTION_CLASS(EXCESSIVE_VL_SPLIT_SEGMENTS)  
    EXCEPTION_LEVEL(CRITICAL))  
  ACTION(ACTION_REF(MESSAGE)  
    EXCEPTION_CLASS(*)  
    EXCEPTION_LEVEL(*))  
  NTFYLIST_REF(G:LIST03)  
  NTFYLIST_REF(G:LIST05)  
  RESOURCE_REF(HDAM)RULE(  
    RULE_EXP(  
      VERSION(1)  
      NAME(G:IBM.NUM_DBRECORDS.10/HIGH)  
      ANNOTATION(Simple rule on the number of database records)  
      RESOURCE_REF(HDAM)  
      RESOURCE_REF(HIDAM)  
      RESOURCE_REF(PHDAM)  
      RESOURCE_REF(PHIDAM)  
      RESOURCE_REF(HISAM)  
      CONDITION(  
        OR(  
          IF(DB_NUM_ROOT,GE,  
            4294967295  
          )  
        )  
      )  
    )  
    EXCEPTION(  
      EXCEPTION_CLASS(NUMBER_OF_DB_RECORDS)  
      EXCEPTION_LEVEL(WARNING)  
      EXCEPTION_MESSAGE(  
        Threshold on the number of DB records is reached/exceeded in %RESOURCE%  
      )  
    )  
    NTFYLIST_REF(G:LIST03)  
    NTFYLIST_REF(G:LIST02)  
    ONMISSING(*,SKIP_EVAL)  
  )

Figure 107. An example of the policy stream build from a sample Policy Decision Making report

Policy Environment Service Environment Create report

The Policy Environment Service Create report shows you the policy domain and level of a maintenance environment that was created.

The origin environment level is valid only when the created environment is copied from an existing one.

The following example shows an example of creating an empty maintenance environment report:
Policy Environment Service Environment Delete report

The Policy Environment Service Delete report shows you the environment level that was deleted and its policy domain.

The following example shows an example of deleting environment report:

Figure 108. Example of creating an empty maintenance environment report
Policy Environment Service Environment Select and Validate report

The Policy Environment Service Environment Select and Validation report shows the process of promoting a history environment to an operational environment, or the information for validating a maintenance environment.

Any policy that failed to pass the validation would show in the report with the cause of the failure.

The following example shows the policy environment select process:

Figure 109. Example of deleting environment report
Figure 110. Example of the policy environment select process
Policy Environment Service Worklist Maintenance Process report

The Policy Environment Service Worklist Maintenance Process report shows the status of the policy objects in an installation or maintenance process.

The report includes maintenance activities conducted towards each policy objects, and related APAR and package information.

The Policy Environment Service Worklist Maintenance Process report contains worklist objects information and related APAR and package information as shown in the following example:

Figure 111. Example of the policy environment validation process

Figure 112. Example of imported worklist objects in the sample Policy Environment Service Worklist Maintenance Process report
### Policy Rule Template and Stream List report

The Policy Rule Template and Stream List report lists all rule templates, rule streams, and policy templates that are in the repository.

Use the Policy Rule Template and Rule Stream List report to quickly scan through all the templates and stream that are currently in the repository. By reading the descriptions, you can also understand the function of each template or stream.

The following example shows a rule template list from a sample Policy Rule Template and Rule Stream List report.

```
00000002 MYRECON1 CI_CA_SPLITS_HISAM               DLDB - OUT OF SPACE CONDITION
00000002 MYRECON1 IBM.AVG_DBREC_LEN.10             Simple rule on the average database record length
```

**Figure 114. Example rule template list**

The following example shows a rule stream list from a sample Policy Rule Template and Rule Stream List report.

```
00000002 MYRECON1 CI_CA_SPLITS_HISAM/HIGH           DLDB - OUT OF SPACE CONDITION
00000002 MYRECON1 CI_CA_SPLITS_HISAM/LOW           DLDB - OUT OF SPACE CONDITION
00000002 MYRECON1 CI_CA_SPLITS_HISAM/MED           DLDB - OUT OF SPACE CONDITION
00000002 MYRECON1 IBM.AVG_DBREC_LEN.10/HIGH       Simple rule on the average database record length
00000002 MYRECON1 IBM.AVG_DBREC_LEN.10/LOW         Simple rule on the average database record length
00000002 MYRECON1 IBM.AVG_DBREC_LEN.10/MED         Simple rule on the average database record length
```

**Figure 115. Example rule stream list**

The following table describes the different fields in the rule template and stream list.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECONID</td>
<td>The RECONID in which the rule template or stream is located.</td>
</tr>
</tbody>
</table>
Table 49. Rule Template and stream list field descriptions (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RULE NAME</td>
<td>The name of the rule template or stream.</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>A description of the rule.</td>
</tr>
</tbody>
</table>

The following example shows a policy template list from a sample Policy Rule Template and Rule Stream List report.

```
*** POLICY TEMPLATE/STREAM LIST
********************************************************************************
DOMAIN NAME  LEVEL    RECONID  POLICY NAME          DESCRIPTION
********************************************************************************
REORG        00000002 MYRECON1 IBM.DBDTYPE.HDAM     IBM basic policy for HDAM databases
REORG        00000002 MYRECON1 IBM.DBDTYPE.HDDB     IBM basic policy for IMS HD databases
REORG        00000002 MYRECON1 IBM.DBDTYPE.HIDAM    IBM basic policy for HIDAM databases
REORG        00000002 MYRECON1 IBM.DBDTYPE.PHDAM    IBM basic policy for PHDAM partitions
REORG        00000002 MYRECON1 IBM.DBDTYPE.PHIDAM   IBM basic policy for PHIDAM partitions
REORG        00000002 MYRECON1 SYS.DBDTYPE.HDAM     IBM basic policy for HDAM databases
REORG        00000002 MYRECON1 SYS.DBDTYPE.HDDB     IBM basic policy for IMS HD databases
REORG        00000002 MYRECON1 SYS.DBDTYPE.HIDAM    IBM basic policy for HIDAM databases
REORG        00000002 MYRECON1 SYS.DBDTYPE.PHDAM    IBM basic policy for PHDAM partitions
REORG        00000002 MYRECON1 SYS.DBDTYPE.PHIDAM   IBM basic policy for PHIDAM partitions
```

Figure 116. Example policy template list

The following table describes the different fields in the policy template and stream list.

Table 50. Policy Rule Template Import report field descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOMAIN NAME</td>
<td>The name of the policy domain to which the template or stream belongs</td>
</tr>
<tr>
<td>LEVEL</td>
<td>Domain environment level</td>
</tr>
<tr>
<td>RECONID</td>
<td>The RECONID in which the policy template or stream is located</td>
</tr>
<tr>
<td>POLICY NAME</td>
<td>The name of the policy template or stream</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>A description of the policy</td>
</tr>
</tbody>
</table>

Policy Stream Delete report

The Policy Stream Delete report shows you the policy stream that was deleted from the repository.

The following example shows a sample Policy Stream Delete report:

```
*** POLICY STREAM DELETE   PROCESS STARTED
********************************************************************************
2020-04-28 01:12:469@PDS : BSN7011I DOMAIN=REORG, LEVEL=00006677, RECON=BBBRECON,
RECONID=00000002, POLICY=DEFAULT_BASIC_POLICY
2020-04-28 01:12:469@PDS : BSN7011I POLICY STREAM DELETE   PROCESS STARTED
********************************************************************************
*** POLICY STREAM DELETE   PROCESS ENDED
********************************************************************************
2020-04-28 01:12:469@PDS : BSN7012I DOMAIN=REORG, LEVEL=00006677, RECON=BBBRECON,
RECONID=00000002, POLICY=DEFAULT_BASIC_POLICY
2020-04-28 01:12:469@PDS : BSN7012I POLICY STREAM IMPORT   PROCESS ENDED RC=00000000, RSN=00000000
```

Figure 117. Example of Policy Stream Delete report
Policy Stream Import report

The Policy Stream Import report shows the policy stream that was imported into the repository during installation or maintenance. Because a policy stream contains all the rules streams that are active in the repository, you can use this report to view a list of all the rule streams comprising a policy stream.

The Policy Stream Import report contains detailed information such as the policy version, the policy name, rule names, and rule conditions as shown in the following example.

```
POLICY(VERSION(1)
    DOMAIN_REF(REORG)
    NAME(BAD_STREAM_POLIC)
    ORIGINAL_NAME(IBM.DBDTYPE.HDAM)
    ANNOTATION(IBM basic policy for HDAM databases)
    ACTION(ACTION_REF(REORG)
        EXCEPTION_CLASS(DATA_SET_SIZE_GROWTH)
        EXCEPTION_LEVEL(CRITICAL))
    ACTION(ACTION_REF(REORG)
        EXCEPTION_CLASS(FRAGMENTED_FREE_SPACES)
        EXCEPTION_LEVEL(CRITICAL))
    ACTION(ACTION_REF(REORG)
        EXCEPTION_CLASS(EXCESSIVE_SLACK_BYTES)
        EXCEPTION_LEVEL(CRITICAL))
    ACTION(ACTION_REF(REORG)
        EXCEPTION_CLASS(EXCESSIVE_VL_SPLIT_SEGMENTS)
        EXCEPTION_LEVEL(CRITICAL))
    ACTION(ACTION_REF(MESSAGE)
        EXCEPTION_CLASS(*)
        EXCEPTION_LEVEL(*))
    NTIFYLIST_REF(G:LIST03)
    NTIFYLIST_REF(G:LIST05)
    RESOURCE_REF(HDAM)
)
RULE(VERSION(1)
    NAME(G:IBM.NUM_DBRECORDS.10/HIGH)
    ANNOTATION(Simple rule on the number of database records)
    RESOURCE_REF(HDAM)
    RESOURCE_REF(HIDAM)
    RESOURCE_REF(PHDAM)
    RESOURCE_REF(PHIDAM)
    RESOURCE_REF(HISAM)
    CONDITION(OR
        IF(DB_NUM_ROOT,GE,
        4294967295
        )
    )
    EXCEPTION(EXCEPTION_CLASS(NUMBER_OF_DB_RECORDS)
        EXCEPTION_LEVEL(WARNING)
        EXCEPTION_MESSAGE(
            Threshold on the number of DB records is reached/exceeded in %RESOURCE
        )
    )
    NTIFYLIST_REF(G:LIST02)
    ONMISSING(*,SKIPEVAL)
)
```

Figure 118. An example of the Policy Stream Import report

The example shows the actions that are taken when rules with the specified exception class reach a specified exception level. For example, if rules that contain the exception class DATA_SET_SIZE_GROWTH reach an exception level of CRITICAL, IMS Policy Services initiates a reorganization of the database.

The example also shows a rule that is defined to monitor the number of database records. The high threshold has been set to 4294967295. When the number of database records reaches this threshold, an exception is generated that generates a warning message.

Policy Template Delete report

The Policy Template Delete report shows you the policy template that was deleted from the repository.

The following example shows a sample Policy Template Delete report:
### Policy Template Import report

The Policy Template Import report shows you the policy template, the rule streams that are read from the repository, and the policy stream that is built from the rule streams. You can use this report to ensure that the policy templates has been imported and built correctly.

The following example shows information about a policy template that was imported. For example, the template shows the policy name, conditions for a database reorganization, and a list of rules that are imported.

```plaintext
+++ POLICY TEMPLATE FOR IMPORT

#***********************************************************************
#* LICENSED MATERIALS - PROPERTY OF IBM                               *
#* 5655-S35                                                            *
#* COPYRIGHT IBM CORP. 2009 ALL RIGHTS RESERVED.                       *
#* US GOVERNMENT USERS RESTRICTED RIGHTS - USE,                       *
#* DUPLICATION OR DISCLOSURE RESTRICTED BY GSA ADP                     *
#* SCHEDULE CONTRACT WITH IBM CORP.                                    *
#***********************************************************************
@BEGIN{POLICY_TEMPLATE_VERSION} 1 @END
@BEGIN{MAINTENANCE_MESSAGES} @END
@BEGIN{TEMPLATE_ORIGINAL_NAME} IBM.DBDTYPE.HDAM @END
@BEGIN{POLICY_DOMAIN} REORG @END
@BEGIN{POLICY_TEMPLATE_TYPE} BASIC @END
@BEGIN{POLICY_NAME} IBM.DBDTYPE.HDAM @END
@BEGIN{POLICY_DESC} IBM basic policy for HDAM databases @END
@BEGIN{ACTION_DESC}
REORG DATA_SET_SIZE_GROWTH CRITICAL
REORG FRAGMENTED_FREE_SPACES CRITICAL
REORG EXCESSIVE_BLACK_BYTES CRITICAL
REORG EXCESSIVE_VR_SPLIT_SEGMENTS CRITICAL
MESSAGE *
@end
@BEGIN{NOTIFY_REF_LIST} G:LIST03; G:LIST05; @END
@BEGIN{RESOURCE_TYPE_LIST} HDAM @END
@BEGIN{RULE_LIST} G:IBM.NUM_DBRECORDS.10; HIGH; CRITICAL; SKIPEVAL; G:LIST03; G:LIST02; @END
```

**Figure 120. Example policy template from the Policy Template Import report**

The following example shows that the rule for the high threshold for the number of database records was read from the repository. Only the rules listed in the policy template rule list are read.
**** RULE STREAM READ FROM REPOSITORY

RULE:
  RULE_EXP(
    VERSION(1)
    NAME(G:IBM.NUM_DBRECORDS.10/HIGH)
    ANNOTATION(Simple rule on the number of database records)
    RESOURCE_REF(HDAM)
    RESOURCE_REF(HIDAM)
    RESOURCE_REF(PHIDAM)
    RESOURCE_REF(PHIDAM)
    RESOURCE_REF(HISAM)
    CONDITION(
      OR(
        IF(DB_NUM_ROOT,GE, 4294967295)
      )
    )
    EXCEPTION(
      EXCEPTION_CLASS(NUMBER_OF_DB_RECORDS)
      EXCEPTION_LEVEL(WARNING)
      EXCEPTION_MESSAGE(Threshold on the number of DB records is reached/exceeded in %RESOURCE)
    )
  )

Figure 121. Example of a rule stream for the number of database records

Once all rules have been read, the policy stream is built. The policy stream build reflects all conditions specified in the policy template, as shown in the following example.

**** POLICY STREAM BUILD FROM RULE STREAM

POLICY:
  VERSION(1)
  DOMAIN_REF(REORG)
  NAME(IBM.DBDTYPE.HDAM)
  ORIGINAL_NAME(IBM.DBDTYPE.HDAM)
  ACTION(ACTION_REF(REORG)
    EXCEPTION_CLASS(DATA_SET_SIZE_GROWTH)
    EXCEPTION_LEVEL(CRITICAL)
  )
  ACTION(ACTION_REF(REORG)
    EXCEPTION_CLASS(FRAGMENTED_FREE_SPACES)
    EXCEPTION_LEVEL(CRITICAL)
  )
  ACTION(ACTION_REF(REORG)
    EXCEPTION_CLASS(EXCESSIVE_SLACK_BYTES)
    EXCEPTION_LEVEL(CRITICAL)
  )
  ACTION(ACTION_REF(REORG)
    EXCEPTION_CLASS(EXCESSIVE_VL_SPLIT_SEGMENTS)
    EXCEPTION_LEVEL(CRITICAL)
  )
  ACTION(ACTION_REF(MESSAGE)
    EXCEPTION_CLASS(*)
    EXCEPTION_LEVEL(*)
  )
  NTFYLIST_REF(G:LIST03)
  NTFYLIST_REF(G:LIST05)
  RESOURCE_REF(HDAM)
  RULE:
    RULE_EXP(
      VERSION(1)
      NAME(G:IBM.NUM_DBRECORDS.10/HIGH)
      ANNOTATION(Simple rule on the number of database records)
      RESOURCE_REF(HDAM)
      RESOURCE_REF(HIDAM)
      RESOURCE_REF(PHIDAM)
      RESOURCE_REF(PHIDAM)
      RESOURCE_REF(HISAM)
      CONDITION(
        OR(
          IF(DB_NUM_ROOT,GE, 4294967295)
        )
      )
      EXCEPTION(
        EXCEPTION_CLASS(NUMBER_OF_DB_RECORDS)
        EXCEPTION_LEVEL(WARNING)
        EXCEPTION_MESSAGE(Threshold on the number of DB records is reached/exceeded in %RESOURCE)
      )
    )

Figure 122. Example of a policy stream build

Policy Template Update report

The Policy Template Update report shows updates made to a rule, policy, or notification list.

The following example shows all the clause data in an updated policy:

Policy Template Update report

The Policy Template Update report shows updates made to a rule, policy, or notification list.

The following example shows all the clause data in an updated policy:

Chapter 22. Journal reports 205
The following table describes the different fields for each clause list.

Table 51. Clause list field descriptions

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOTIFICATION LIST NAME</td>
<td>The name of a policy-level and rule-level notification list</td>
</tr>
<tr>
<td>RESOURCE TYPE LIST NAME</td>
<td>The name of the resource type list</td>
</tr>
<tr>
<td>ACTION NAME</td>
<td>The name of the action that is carried out if the conditions are met</td>
</tr>
<tr>
<td>EXCEPTION CLASS</td>
<td>The name of an exception class</td>
</tr>
<tr>
<td>The name must be defined in the Policy Domain as a valid exception class name.</td>
<td></td>
</tr>
<tr>
<td>EXCEPTION LEVEL</td>
<td>The name of an exception level</td>
</tr>
<tr>
<td>The name must be defined in the Policy Domain as a valid exception level name.</td>
<td></td>
</tr>
<tr>
<td>RULE TEMPLATE NAME</td>
<td>The name of the rule template</td>
</tr>
<tr>
<td>THRESHOLD</td>
<td>The name of the threshold set in the rule template</td>
</tr>
<tr>
<td>EXCEPTION</td>
<td>An exception level</td>
</tr>
<tr>
<td>Allowed values are WARNING, SEVERE, and CRITICAL</td>
<td></td>
</tr>
<tr>
<td>MISSING DATA</td>
<td>Rule evaluation behavior on missing data</td>
</tr>
<tr>
<td>Optional, allowed values are EVALUATE, SKIPEVAL, and EXCEPTION</td>
<td></td>
</tr>
<tr>
<td>NOTIFICATION LIST</td>
<td>The name of a rule-level notification list, if specified</td>
</tr>
</tbody>
</table>
The maintenance message indicates the policy template that will be updated by the current maintenance, as shown in the following example:

```
**** POLICY TEMPLATE UPDATE MAINTENANCE MESSAGE

THE POLICY TEMPLATE 'DEFAULT_BASIC_POLICY'
WILL BE UPDATED BY THIS MAINTENANCE.
* PLEASE BE CAUTIONS IF YOU HAVE UPDATED THE TEMPLATE *
```

**Figure 124. Example maintenance message**

Following example shows the updated policy template saved in the repository:

```
CHEDULE [Policy_Template_Version]

@begin(Policy_Domain)
REORG
@end
@begin(Policy_Template_Type)
BASIC
@end
@begin(Template_Original_Name)
DEFAULT_BASIC_POLICY
@end
@begin(Policy_Name)
DEFAULT_BASIC_POLICY
@end
@begin(Policy_Desc)
SYSTEM DEFAULT BASIC POLICY FOR FULL-FUNCTION DATABASES
@end
@begin(Action_Desc)
REORG HD_DB_SPACE_UTILIZATION CRITICAL
REORG HISAM_CI_CA_SPLITS CRITICAL
MESSAGE DLIDB_OUT_OF_SPACE *
MESSAGE RAP_OVERLOAD *
@end
@begin(Notify_Ref_List)
R:LIST01
G:LIST02
@end
@begin(Resource_Type_List)
HDAM
PHDAM
PHIDAM
HISAM
@end
@begin(Rule_List)
CI_CA_SPLITS_HISAM; HIGH; CRITICAL; *
CI_CA_SPLITS_HISAM; MED; SEVERE; *
CI_CA_SPLITS_HISAM; LOW; WARNING; *
@end
```

**Figure 125. Example policy template**

**Rule Template Import report**

The Rule Template Import report shows you the rule templates and the corresponding rule threshold streams that were imported into the repository. You can use this report to ensure that all rule templates have been imported with the specified thresholds and the specified descriptions.

The following example shows you a rule template for monitoring the number of database records with the low, medium, and high thresholds set to 4294967295.
Figure 126. Example rule template from the Rule Template Import report

From the rule template, three rule streams are generated and imported into the repository. In the following example, a rule stream for the low threshold is shown that was generated from the number of database records rule template.
RULE
RULE_EXP(
  VERSION(1)
  NAME('IBM.NUM.DBRECORDS.10/LOW')
  ANNTOATION('Simple rule on the number of database records')
  RESOURCE_REF(HDAM)
  RESOURCE_REF(HIDAM)
  RESOURCE_REF(PHIDAM)
  RESOURCE_REF(PHIDAM)
  RESOURCE_REF(HISAM)
  CONDITION(
    OR(
      IF(DB_NUM_ROOT,GE, 4294967295
      )
    )
  )
  EXCEPTION(
    EXCEPTION_CLASS(NUMBER_OF_DB_RECORDS)
    EXCEPTION_LEVEL(WARNING)
    EXCEPTION_MESSAGE('Threshold on the number of DB records is reached/exceeded in %RESOURCE E%')
  )
)
Part 6. Reference: Domain REORG

The topics in this section provide you with supplemental technical references for the Policy Services REORG domain.

Topics:

- Chapter 23, “Domain REORG rules,” on page 213
- Chapter 24, “Domain REORG policies,” on page 327
- Chapter 25, “Domain REORG exceptions,” on page 369
Chapter 23. Domain REORG rules

The domain REORG rules are used to compare the stored data element values against the predefined threshold values that specify the limits for a set of data element values.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

A descriptive message within the rule that describes the maintenance history information for this rule.

The initial maintenance message is blank because at initial product installation no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

Defines the domain for which this rule is intended to be used.

For IMS Database Reorganization Expert, the domain name is REORG.

**Rule template type**

 Defines the rule template type.

Currently, there is only one type: Standard

**Rule template name**

The name of this rule template.

**Rule description**

Defines in words what database functionality this rule evaluates.

**Resource types supported**

The resource types are all IMS-supported Hierarchical Direct Access Methods.

**Exception class**

The exception class represents the type of exception that can be raised by this rule.

**Rule condition expression**

The actual condition expression that is applied to the list of data elements for this rule.

**Rule condition description**

Describes in words what the rule condition expression is doing.

**Rule exception expression**

The rule exception expression consists of the following items:

- Exception class
- Exception level
- Exception message

These lines in the rule template file are used only as the template for building rule definition streams that are included in various policy definition streams. The actual exception severity level for a rule is determined by the enclosing individual policy stream. The EXCEPTION_LEVEL(WARNING) statement is then overridden by the actual exception severity level that the policy creator (IBM or a user) assigned for a threshold level.
**Rule message template**
Defines the actual message that is sent to the notification list when the condition is met.
The following condition applies to the default exception messages that are shown in the rule message template section of each rule topic: %RESOURCE% is the IMS database that encountered the exception.

**Data elements being evaluated for this rule**
The data element is the smallest named unit of information having predefined attributes.

**Rule threshold sets**
The set of threshold values that are initially set by IBM. There are two sets of threshold values:
- Original values set by IBM that cannot be changed
- Original values initially set by IBM that can be modified

**Rule: IBM.AVG_DBREC_LEN.10**
IBM.AVG_DBREC_LEN.10 is a simple rule for evaluating the average length of database records.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.AVG_DBREC_LEN.10

**Rule description**
Average length of database records.

**Resource types supported**
The following resource types are supported by this rule.
- HDAM
- HIDAM
- PHDAM
- PHIDAM
- HISAM
- SHISAM
Exception class
AVERAGE_DB_RECORD_LENGTH

Rule condition expression

\[
\text{OR}(
  \text{IF}(\text{DB\_AVG\_DBREC\_LENGTH}, \geq, \&1)
)\]

Rule condition description

Specify a threshold on the average database record length.

DB\_AVG\_DBREC\_LENGTH: \&1

An exception is issued if the threshold is reached or exceeded.

You can apply this rule to a non-partitioned database or a HALDB partition, with the exception of an index or PSINDEX partition.

Rule exception expression

- EXCEPTION CLASS(AVERAGE_DB_RECORD_LENGTH)
- EXCEPTION LEVEL(WARNING)
- EXCEPTION MESSAGE

Rule message template

The average length of database records in %RESOURCE% has reached or exceeded a threshold.

Data elements being evaluated for this rule

DB\_AVG\_DBREC\_LENGTH &1

The variable \&1 specifies a threshold for the data element value DB\_AVG\_DBREC\_LENGTH of the database or the HALDB partition.

Rule condition description

The average database record length has reached or exceeded the following threshold:

\&1

Rule threshold sets

Table 52. Rule threshold sets for IBM.AVG\_DBREC\_LEN.10

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 85899345920</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 85899345920</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 85899345920</td>
</tr>
</tbody>
</table>

Each of the default threshold values is never reached nor exceeded.
It is expected that you change these threshold values to suite your environment only if you want to activate this rule.

**Rule: IBM.CICA_SPLITS.10**

IBM.CICA_SPLITS.10 is a simple rule for evaluating the percentage of CI or CA splits in a HISAM or SHISAM database.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.CICA_SPLITS.10

**Rule description**
KSDS CI or CA splits in HISAM and SHISAM.

**Resource types supported**
The following resource types are supported by this rule.
- HISAM
- SHISAM

**Exception class**
EXCESSIVE_CI_OR_CA_SPLITS

**Rule condition expression**

```plaintext
OR(
  IF(DB_PCT_NUM_CI_SPLIT.1,GE,
     &1
   )
  IF(DB_PCT_NUM_CA_SPLIT.1,GE,
     &2
   )
)
```
Rule condition description

Specify thresholds on the percentage of the number of CI splits (DB_PCT_NUM_CI_SPLIT) and the percentage of the number of CA splits (DB_PCT_NUM_CA_SPLIT) of the primary data set of a HISAM or SHISAM database.

| DB_PCT_NUM_CI_SPLIT: &1  
| DB_PCT_NUM_CA_SPLIT: &2 |

An exception is issued if one of these thresholds is reached or exceeded.

Rule exception expression

- EXCEPTION_CLASS(EXCESSIVE_CI_OR_CA_SPLITS)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template

The number of CI/CA splits of database %RESOURCE% has increased

Data elements being evaluated for this rule

| DB_PCT_NUM_CI_SPLIT &1  
| DB_PCT_NUM_CA_SPLIT &2 |

The variable &1 specifies a threshold for the data element value of DB_PCT_NUM_CI_SPLIT of the primary data set.

The variable &2 specifies a threshold for the data element value of DB_PCT_NUM_CA_SPLIT of the primary data set.

Rule threshold sets

<table>
<thead>
<tr>
<th>Table 53. Rule threshold sets for IBM.CICA_SPLITS.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold set name</td>
</tr>
</tbody>
</table>
| LOW                | &1 = 20  
|                    | &2 = 20  |
| MED                | &1 = 30  
|                    | &2 = 30  |
| HIGH               | &1 = 40  
|                    | &2 = 40  |

Rule: IBM.DBDS_EXTENTS.10

IBM.DBDS_EXTENTS.10 is a simple rule for evaluating the limited availability of data set extents.

Rule template version

The rule template version is indicated by a four-byte integer value.

Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.DBDS_EXTENTS.10

**Rule description**

Availability of data set extents

**Resource types supported**

The following resource types are supported by this rule.

- HDAM
- HIDAM
- PHDAM
- PHIDAM
- HISAM
- SHISAM

**Exception class**

DATA_SET_EXTENTS_AVAILABILITY

**Rule condition expression**

```
OR(
  OR(
    AND(
      IF(DB_FLAG_SMS, IS, N)
      IF(DB_AVAIL_EXT_LESS_100, IS, Y)
      IF(DB_NUM_AVAIL_EXT, LE, &1)
    )
    AND(
      IF(DB_FLAG_SMS, IS, Y)
      IF(DB_NUM_UNUSED_VOL_CAND, LE, &2)
      IF(DB_AVAIL_EXT_LESS_100, IS, Y)
      IF(DB_NUM_AVAIL_EXT, LE, &3)
    )
  )
)
```

**Rule condition description**

Specify a threshold on the estimated number of extents that can be allocated for a database data set (DB_NUM_AVAIL_EXT). The threshold must be less than 100. For an SMS-managed data set, also specify a threshold on the number of candidate volumes (DB_NUM_UNUSED_VOL_CAND).
1. For a non-SMS-managed data set, an exception is issued if DB_NUM_AVAIL_EXT of one of database data sets is less than or equal to the following threshold:

   \[ \&1 \]

2. For an SMS-managed data set, an exception is issued if DB_NUM_UNUSED_VOL_CAND is less than or equal to:

   \[ \&2 \]

   and DB_NUM_AVAIL_EXT is less than or equal to:

   \[ \&3 \]

   for one of database data sets.

You can apply this rule to a non-partitioned database or a HALDB partition, with the exception of an index or PSINDEX partition.

**Rule exception expression**

- EXCEPTION_CLASS(DATA_SET_EXTENTS_AVAILABILITY)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**

The number of available extents for a data set of %RESOURCE% is small

**Data elements being evaluated for this rule**

<table>
<thead>
<tr>
<th>Data element</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_AVAIL_EXT</td>
<td>&amp;1</td>
</tr>
<tr>
<td>DB_NUM_UNUSED_VOL_CAND</td>
<td>&amp;2</td>
</tr>
<tr>
<td>DB_NUM_AVAIL_EXT</td>
<td>&amp;3</td>
</tr>
</tbody>
</table>

The following data element values are evaluated for each data set that composes the database or the HALDB partition:

- The variable \&1 specifies a threshold for the data element value of DB_NUM_AVAIL_EXT for the data set on non-SMS-managed volumes.
- The variable \&2 specifies a threshold for the data element value of DB_NUM_UNUSED_VOL_CAND for the data set on SMS-managed volumes.
- The variable \&3 specifies a threshold for the data element value of DB_NUM_AVAIL_EXT for the data set on SMS-managed volumes.

The values of the data elements DB_FLAG_SMS and DB_AVAIL_EXT_LESS_100 are also referred to in this rule template.

**Rule threshold sets**

*Table 54. Rule threshold sets for IBM.DBDS_EXTENTS.10*

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 5</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 0</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 5</td>
</tr>
</tbody>
</table>
Table 54. Rule threshold sets for IBM.DBDS_EXTENTS.10 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>MED</td>
<td>&amp;1 = 3, &amp;2 = 0, &amp;3 = 3</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 1, &amp;2 = 0, &amp;3 = 1</td>
</tr>
</tbody>
</table>

**Rule: IBM.DBDS_GROWTH.10**

IBM.DBDS_GROWTH.10 is a simple rule for evaluating the size of database data sets.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.DBDS_GROWTH.10

**Rule description**
Growth data set size.

**Important:** This rule is not included in any of the IBM-supplied REORG Domain policies. You can use this rule in any of the following ways:
- Replace a similar rule in an existing REORG Domain policy
- Add this rule to one of the existing REORG Domain policies
- Create a REORG Domain policy and add this rule along with other rules

**Resource types supported**
The following resource types are supported by this rule.
- HDAM
- HIDAM
- PHDAM
- PHIDAM
Exception class
DATA_SET_SIZE_GROWTH

Rule condition expression

\[
\text{OR} (\text{AOR} (\text{IF} (\text{DB\_NUM\_DBDS\_BLOCKS}, \geq, \&1) \text{IF} (\text{DB\_PCT\_OF\_MAX\_DS\_SIZE}, \geq, \&2) \text{IF} (\text{DB\_RBA\_HIGH\_ALLOC}, \geq, \&3) \text{IF} (\text{DB\_RBA\_HIGH\_USED}, \geq, \&4)))
\]

Rule condition description
Specify thresholds on the database data set size.
The following thresholds can be used in this rule:

1. Number of database data set blocks:
   \[
   \text{DB\_NUM\_DBDS\_BLOCKS} \ : \ &1
   \]

2. Percentage of maximum data set size:
   \[
   \text{DB\_PCT\_OF\_MAX\_DS\_SIZE} \ : \ &2
   \]

3. High-Allocated RBA:
   \[
   \text{DB\_RBA\_HIGH\_ALLOC} \ : \ &3
   \]

4. High-Used RBA:
   \[
   \text{DB\_RBA\_HIGH\_USED} \ : \ &4
   \]

An exception is issued if one or more of these thresholds are reached or exceeded in one of the data sets.
You can apply this rule to a non-partitioned database or a HALDB partition, with the exception of an index or PSINDEX partition.

Tip: Use rules IBM.DBDS_GROWTH.20 and IBM.DBDS_GROWTH.30 because these rules measure the total amount of free space and evaluate the potential benefits of reorganizing free space.

Rule exception expression

- EXCEPTION_CLASS(DATA_SET_SIZE_GROWTH)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The size of a database data set in %RESOURCE% has reached or exceeded a threshold
Data elements being evaluated for this rule

<table>
<thead>
<tr>
<th>Data element</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUM_DBDS_BLOCKS</td>
<td>&amp;1</td>
</tr>
<tr>
<td>DB_PCT_OF_MAX_DS_SIZE</td>
<td>&amp;2</td>
</tr>
<tr>
<td>DB_RBA_HIGH_ALLOC</td>
<td>&amp;3</td>
</tr>
<tr>
<td>DB_RBA_HIGH_USED</td>
<td>&amp;4</td>
</tr>
</tbody>
</table>

The following data element values are evaluated for each data set that composes the database or the HALDB partition:

- The variable &1 specifies a threshold for the data element value of DB_NUM_DBDS_BLOCKS for the data set.
- The variable &2 specifies a threshold for the data element value of DB_PCT_OF_MAX_DS_SIZE for the data set.
- The variable &3 specifies a threshold for the data element value of DB_RBA_HIGH_ALLOC for the data set.
- The variable &4 specifies a threshold for the data element value of DB_RBA_HIGH_USED for the data set.

Rule threshold sets

Table 55. Rule threshold sets for IBM.DBDS_GROWTH.10

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 16777216</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 60</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 8589934592</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 8589934592</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 16777216</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 80</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 8589934592</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 8589934592</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 16777216</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 90</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 8589934592</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 8589934592</td>
</tr>
</tbody>
</table>

The default threshold values for the variables &1, &2, and &4 are never reached nor exceeded.

It is expected that each of these threshold values be changed only if you want to monitor the data element value that correspond to the variable.

Rule: IBM.DBDS_GROWTH.20

IBM.DBDS_GROWTH.20 is a simple rule for evaluating the size of data sets that have certain amount of free space.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.DBDS_GROWTH.20

**Rule description**

Percentage growth data set and free space

**Resource types supported**

The following resource types are supported by this rule.

- HDAM
- HIDAM
- PHDAM
- PHIDAM
- HISAM
- SHISAM

**Exception class**

GROWING_DBDS_WITH_FREE_SPACES

**Rule condition expression**

```
OR(
    AND(
        IF(DB_PCT_OF_MAX_DS_SIZE, GE, &1
        )
        IF(DB_PCT_BYTES_FREE_SPACE, GE, &2
        )
    
)
```

**Rule condition description**

Specify a threshold on the percentage of the maximum data set size (DB_PCT_OF_MAX_DS_SIZE) and a threshold on the percentage of the free space in formatted database blocks (DB_PCT_BYTES_FREE_SPACE):

```
DB_PCT_OF_MAX_DS_SIZE: &1
DB_PCT_BYTES_FREE_SPACE: &2
```

An exception is issued if both of these thresholds are reached or exceeded in any of the database data sets. An exception indicates that a high percentage of unusable free space elements might have caused the growth in data set size.

You can apply this rule to a non-partitioned database or a HALDB partition, with the exception of an index or PSINDEX partition.
Rule exception expression
- EXCEPTION_CLASS(GROWING_DBDS_WITH_FREE_SPACES)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The size of a data set in %RESOURCE%, which still has a certain amount of free space, has increased

Data elements being evaluated for this rule

<table>
<thead>
<tr>
<th>Data element</th>
<th>Threshold</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_PCT_OF_MAX_DS_SIZE</td>
<td>&amp;1</td>
<td></td>
</tr>
<tr>
<td>DB_PCT_BYTES_FREE_SPACE</td>
<td>&amp;2</td>
<td></td>
</tr>
</tbody>
</table>

The following data element values are evaluated for each data set that composes the database or the HALDB partition:

- The variable &1 specifies a threshold for the data element value of DB_PCT_OF_MAX_DS_SIZE for the data set.
- The variable &2 specifies a threshold for the data element value of DB_PCT_BYTES_FREE_SPACE for the data set.

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 75</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 20</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 85</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 20</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 90</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 20</td>
</tr>
</tbody>
</table>

Rule: IBM.DBDS_GROWTH.30

IBM.DBDS_GROWTH.30 is a simple rule for evaluating the size of a data set that is full of segment data.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG
Rule template type
STANDARD

Rule template name
IBM.DBDS_GROWTH.30

Rule description
Growth data set size full of segment data

Resource types supported
The following resource types are supported by this rule.
• HDAM
• HIDAM
• PHDAM
• PHIDAM
• HISAM
• SHISAM

Exception class
GROWING_DBDS_WITH_DATA_FULL

Rule condition expression
OR(
  AND(
    IF(DB_PCT_OF_MAX_DS_SIZE, GE, &1)
    IF(DB_PCT_BYTES_SEG, GE, &2)
    IF(DB_PCT_UNUSED_BYTES, LE, &3)
  )
)

Rule condition description
Specify a threshold on the percentage of the maximum data set size (DB_PCT_OF_MAX_DS_SIZE), a threshold on the percentage of segment data in the formatted database blocks (DB_PCT_BYTES_SEG), and a threshold on the percentage of the unused bytes in the allocated data set (DB_PCTUNUSED_BYTES):

| DB_PCT_OF_MAX_DS_SIZE: &1 |
| DB_PCT_BYTES_SEG: &2    |
| DB_PCTUNUSED_BYTES: &3   |

An exception is issued if the first two thresholds are reached or exceeded and the percentage of the unused bytes is less than or equal to the third threshold for one of the database data sets.

You can apply this rule to a non-partitioned database or a HALDB partition, with the exception of an index or PSINDEX partition.

Rule exception expression
• EXCEPTION_CLASS(GROWING_DBDS_WITH_DATA_FULL)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template
The size of a data set in %RESOURCE%, which is full of data and is approaching its size limit, has increased

Data elements being evaluated for this rule

<table>
<thead>
<tr>
<th>Data element</th>
<th>Threshold</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_PCT_OF_MAX_DS_SIZE</td>
<td>&amp;1</td>
<td>specifies a threshold for the data element value of DB_PCT_OF_MAX_DS_SIZE for the data set.</td>
</tr>
<tr>
<td>DB_PCT_BYTES_SEG</td>
<td>&amp;2</td>
<td>specifies a threshold for the data element value of DB_PCTgetBytes_SEG for the data set.</td>
</tr>
<tr>
<td>DB_PCT UNUSED_BYTES</td>
<td>&amp;3</td>
<td>specifies a threshold for the data element value of DB_PCTUNUSED_BYTES for the data set.</td>
</tr>
</tbody>
</table>

Rule threshold sets

Table 57. Rule threshold sets for IBM.DBDS_GROWTH.30

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 75</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 90</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 10</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 85</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 90</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 10</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 90</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 90</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 10</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB_DBREC_IO.10

IBM.DEDB_DBREC_IO.10 is a simple rule for evaluating the average number of I/Os per database record.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.
Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.DEDB_DBREC_IO.10

Rule description
Average number of I/Os per database record

Resource types supported
DEDB

Exception class
DEDB_EXCESSIVE_AVG_NUM_RECORD_IO

Rule condition expression
\begin{verbatim}
OR(
  \text{IF}(\text{DB_AVG_DBREC_IO}, \text{GT}, &1)
)
\end{verbatim}

Rule condition description
Specify a threshold on the average number of I/Os that are required to read a database record in a DEDB area.

\begin{verbatim}
DB_AVG_DBREC_IO: &1
\end{verbatim}
An exception is issued if the threshold is exceeded.

Rule exception expression
- EXCEPTION_CLASS(DEDB_EXCESSIVE_AVG_NUM_RECORD_IO)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The average number of I/Os per DB record exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule
\begin{verbatim}
DB_AVG_DBREC_IO &1
\end{verbatim}
**Rule threshold sets**

*Table 58. Rule threshold sets for IBM.DEDB_DBREC_IO.10*

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 1.5</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 2.0</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 2.5</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB_DBREC_IO.20**

IBM.DEDB_DBREC_IO.20 is a simple rule for evaluating the maximum number of I/Os per database record.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.DEDB_DBREC_IO.20

**Rule description**

Maximum number of I/Os per database record

**Resource types supported**

DEDB

**Exception class**

DEDB_DBRECORD_WITH_EXCESSIVE_IO

**Rule condition expression**

```
OR(
  IF(DB_MAX_DBREC_IO, GT, &1
)
)```
Rule condition description
Specify a threshold on the maximum number of I/Os that are required to read a database record in a DEDB area.

\[
\text{DB\_MAX\_DBREC\_IO: } &1
\]

An exception is issued if the threshold is exceeded.

Rule exception expression
• EXCEPTION_CLASS(DEDB\_DBRECORD\_WITH\_EXCESSIVE\_IO)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template
The maximum number of I/Os per DB record exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule
\[
\text{DB\_MAX\_DBREC\_IO } &1
\]

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 6.0</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 7.0</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 8.0</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB\_DBRECCNT.10
IBM.DEDB\_DBRECCNT.10 is a simple rule for calculating the number of database records in a DEDB area.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD
**Rule template name**
IBM.DEDB_DBRECCNT.10

**Rule description**
Number of database records in a DEDB area

**Resource types supported**
DEDB

**Exception class**
NUMBER_OF_DB_RECORDS

**Rule condition expression**

```
OR(
  IF(DB_NUM_ROOT,GE, &1 )
)
```

**Rule condition description**
Specify a threshold on the number of root segment occurrences in a DEDB area.

```
DB_NUM_ROOT: &1
```

An exception is issued if the threshold is reached or exceeded. Use this threshold to measure the growth of database records in an area.

Because the default threshold value is a dummy high value, the threshold is never exceeded. You must modify the threshold value to a non-dummy value to enable this rule.

**Rule exception expression**
- EXCEPTION_CLASS(NUMBER_OF_DB_RECORDS)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**
The number of database records in area %RESOURCE% has reached or exceeded a threshold.

**Data elements being evaluated for this rule**

```
DB_NUM_ROOT &1
```

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 4294967295</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 4294967295</td>
</tr>
</tbody>
</table>
Table 60. Rule threshold sets for IBM.DEDB_DBRECCNT.10 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>&amp;1 = 4294967295</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB_FS.10**

IBM.DEDB_DEDB_FS.10 is a simple rule for evaluating the percentage of free space in AREA RAA BASE.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.DEDB_DEDB_FS.10

**Rule description**

Percent of free space in AREA RAA BASE

**Resource types supported**

DEDB

**Exception class**

DEDB_FREE_SPACE_AVAIL_IN_RAA

**Rule condition expression**

```
OR(
  IF(DB_PCT_BYTES_FS_RAA,LT,
     &1
    ),
)
```

**Rule condition description**

Specify a threshold on the percentage of free space in the RAA BASE section of a DEDB area.

```
DB_PCT_BYTES_FS_RAA: &1
```

An exception is issued if the percentage falls below the threshold.
Rule exception expression
- EXCEPTION_CLASS(DEDB_FREE_SPACE_AVAIL_IN_RAA)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The percentage of free space in RAA BASE fell below a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

| DB_PCT_BYTES_FS_RAA &1 |

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 30</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 20</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 10</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB_FS.20
IBM.DEDB_DEDB_FS.20 is a simple rule for evaluating the percentage of free space in AREA DOVF.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.DEDB_DEDB_FS.20

Rule description
Percent of free space in AREA DOVF
Resource types supported
DEDB

Exception class
DEDB_FREE_SPACE_AVAIL_IN_DOVF

Rule condition expression

\[ \text{OR}(\text{IF(DB\_PCT\_BYTES\_FS\_DOVF, LT, } &1 \text{ )}) \]

Rule condition description
Specify a threshold on the percentage of free space in the DOVF section of a DEDB area.

\[ \text{DB\_PCT\_BYTES\_FS\_DOVF: } &1 \]

An exception is issued if the percentage falls below the threshold.

Rule exception expression

- EXCEPTION\_CLASS(DEDB\_FREE\_SPACE\_AVAIL\_IN\_DOVF)
- EXCEPTION\_LEVEL(WARNING)
- EXCEPTION\_MESSAGE

Rule message template
The percentage of free space in DOVF fell below a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

\[ \text{DB\_PCT\_BYTES\_FS\_DOVF: } &1 \]

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 50</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 30</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 20</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB_FS.30

IBM.DEDB_DEDB_FS.30 is a simple rule for evaluating the percentage of free space in AREA IOVF.

Rule template version

The rule template version is indicated by a four-byte integer value.
**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.DEDB_DEDB_FS.30

**Rule description**
Percent of free space in AREA IOVF

**Resource types supported**
DEDB

**Exception class**
DEDB_FREE_SPACE_AVAIL_IN_IOVF

**Rule condition expression**
```
OR(
   IF(DB_PCT_BYTES_FS_IOVF,LT,&1
)
)
```

**Rule condition description**
Specify a threshold on the percentage of free space in the IOVF section of a DEDB area.

DB_PCT_BYTES_FS_IOVF: &1

An exception is issued if the percentage falls below the threshold.

**Rule exception expression**
- EXCEPTION_CLASS(DEDB_FREE_SPACE_AVAIL_IN_IOVF)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**
The percentage of free space in IOVF fell below a threshold in area %RESOURCE%.

**Data elements being evaluated for this rule**

DB_PCT_BYTES_FS_IOVF &1
Rule threshold sets

Table 63. Rule threshold sets for IBM.DEDB_DEDB_FS.30

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 80</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 50</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 30</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB_FS.31**

IBM.DEDB_FS.31 is a simple rule for evaluating the percentage of free space in the independent overflow (IOVF) portion of a DEDB area.

**Rule template version**

The rule template version is indicated by a 4-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.DEDB_FS.31

**Rule description**

Percentage of free space in the IOVF portion of a DEDB area. This rule can also trigger an action (such as an IOVF extension of the subject area).

**Important:** This rule is not included in any of the IBM-supplied REORG Domain policies. You can use this rule in any of the following ways:

- Replace a similar rule in an existing REORG Domain policy
- Add this rule to one of the existing REORG Domain policies
- Create a REORG Domain policy and add this rule along with other rules

**Resource types supported**

DEDB

**Exception class**

DEDB_IOVF_NEEDS_TO_BE_EXTENDED
Rule condition expression

OR(
  IF(DB_PCT_BYTES_FS_IOVF,LT,
     &1
   )
)

Rule condition description
Specify a threshold on the percentage of free space in the IOVF portion of a DEDB area.

DB_PCT_BYTES_FS_IOVF: &1

An exception is issued if the percentage falls below the threshold.

Important: If you want to trigger a utility action to extend the IOVF section of the subject area, use this rule instead of IBM.DEDB_FS.30.

Rule exception expression

- EXCEPTION_CLASS(DEDB_IOVF_NEEDS_TO_BE_EXTENDED)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The percentage of free space in the IOVF section fell below a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

DB_PCT_BYTES_FS_IOVF &1

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 90</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 60</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 40</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB_FS.40

IBM.DEDB_DEDB_FS.40 is a simple rule for calculating the amount of free spaces in AREA RAA BASE and DOVF.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.DEDB_DEDB_FS.40

**Rule description**
Free spaces in AREA RAA BASE and DOVF

**Resource types supported**
DEDB

**Exception class**
DEDB_FREE_SPACE_IN_RAA_VS_DOVF

**Rule condition expression**

```plaintext
AND(
  IF(DB_PCT_BYTES_FS_RAA,GT,&1)
  IF(DB_PCT_BYTES_FS_DOVF,LT,&2)
)
```

**Rule condition description**
Specify thresholds on the percentage of free spaces in the RAA BASE section (DB_PCT_BYTES_FS_RAA) and in the DOVF section (DB_PCT_BYTES_FS_DOVF) of a DEDB area.

DB_PCT_BYTES_FS_RAA : &1
DB_PCT_BYTES_FS_DOVF: &2

An exception is issued if the first threshold is exceeded and the second threshold has fallen below the defined percentage.

**Rule exception expression**

- EXCEPTION_CLASS(DEDB_FREE_SPACE_IN_RAA_VS_DOVF)
- EXCEPTION_LEVEL(WARNING)

**Rule message template**
Free spaces in RAA BASE and DOVF are used inefficiently in area %RESOURCE%. 
Data elements being evaluated for this rule

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_PCT_BYTES_FS_RAA</td>
<td>&amp;1</td>
</tr>
<tr>
<td>DB_PCT_BYTES_FS_DOVF</td>
<td>&amp;2</td>
</tr>
</tbody>
</table>

Rule threshold sets

Table 65. Rule threshold sets for IBM.DEDB_DEDB_FS.40

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 20, &amp;2 = 50</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 20, &amp;2 = 30</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 20, &amp;2 = 20</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB_FS.50

IBM.DEDB_DEDB_FS.50 is a simple rule for calculating free spaces in AREA RAA and IOVF.

Rule template version

The rule template version is indicated by a four-byte integer value.

Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain

REORG

Rule template type

STANDARD

Rule template name

IBM.DEDB_DEDB_FS.50

Rule description

Free spaces in AREA RAA and IOVF

Resource types supported

DEDB

Exception class

DEDB_FREE_SPACE_IN_RAA_VS_IOVF
Rule condition expression

\[
\text{AND}(\text{IF(DB\_PCT\_BYTES\_FS\_RAA,GT,} \\
\quad \&1 \\
\quad \text{)} \text{IF(DB\_PCT\_BYTES\_FS\_IOVF,LT,} \\
\quad \&2 \\
\quad ))
\]

Rule condition description

Specify thresholds on the percentage of free spaces in the RAA BASE section (DB\_PCT\_BYTES\_FS\_RAA) and in the IOVF section (DB\_PCT\_BYTES\_FS\_IOVF) of a DEDB area.

\[
\text{DB\_PCT\_BYTES\_FS\_RAA : } \&1 \\
\text{DB\_PCT\_BYTES\_FS\_IOVF : } \&2
\]

An exception is issued if the first threshold is exceeded and the second threshold has fallen below the defined percentage.

Rule exception expression

- EXCEPTION\_CLASS(DEDB\_FREE\_SPACE\_IN\_RAA\_VS\_IOVF)
- EXCEPTION\_LEVEL(WARNING)
- EXCEPTION\_MESSAGE

Rule message template

Free spaces in RAA BASE and IOVF are used inefficiently in area %RESOURCE%.

Data elements being evaluated for this rule

\[
\text{DB\_PCT\_BYTES\_FS\_RAA : } \&1 \\
\text{DB\_PCT\_BYTES\_FS\_IOVF : } \&2
\]

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 20, &amp;2 = 80</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 20, &amp;2 = 50</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 20, &amp;2 = 30</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB\_FS.60

IBM.DEDB\_DEDB\_FS.60 is a simple rule for calculating free spaces in DOVF and IOVF of an AREA.

Rule template version

The rule template version is indicated by a four-byte integer value.
**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.DEDB_DEDB_FS.60

**Rule description**
Free spaces in DOVF and IOVF of an AREA

**Resource types supported**
DEDB

**Exception class**
DEDB_FREE_SPACE_AVAIL_IN_OVFLOW

**Rule condition expression**

```
AND(
    IF(DB_PCT_BYTES_FS_DOVF,GT,&1)
    IF(DB_PCT_BYTES_FS_IOVF,LT,&2)
)
```

**Rule condition description**
Specify thresholds on the percentage of free spaces in the DOVF section (DB_PCT_BYTES_FS_DOVF) and in the IOVF section (DB_PCT_BYTES_FS_IOVF) of a DEDB area.

| DB_PCT_BYTES_FS_DOVF: &1 |
| DB_PCT_BYTES_FS_IOVF: &2 |

An exception is issued if the first threshold is exceeded and the second threshold has fallen below the defined percentage.

**Rule exception expression**
- EXCEPTION_CLASS(DEDB_FREE_SPACE_AVAIL_IN_OVFLOW)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**
Free spaces in DOVF and IOVF are used inefficiently in area %RESOURCE%.
Data elements being evaluated for this rule

| DB_PCT_BYTES_FS_DOVF &1 |
| DB_PCT_BYTES_FS_IOVF &2 |

Rule threshold sets

Table 67. Rule threshold sets for IBM.DEDB_DEDB_FS.60

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 30, &amp;2 = 50</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 30, &amp;2 = 30</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 30, &amp;2 = 20</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB_FS.70**

IBM.DEDB_DEDB_FS.70 is a simple rule for calculating free spaces in RAA, DOVF, and IOVF.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.DEDB_DEDB_FS.70

**Rule description**
Free spaces in RAA, DOVF, and IOVF

**Resource types supported**
DEDB

**Exception class**
DEDB_FREE_SPACE_IN_RAA_VS_OVFLOW
Rule condition expression

\[
\text{AND(}
  \text{IF(DB\_PCT\_BYTES\_FS\_RAA, GT,} \\
  \&1 \\
  )
\text{OR(} \\
  \text{IF(DB\_PCT\_BYTES\_FS\_DOVF, LT,} \\
  \&2 \\
  ) \\
  \text{IF(DB\_PCT\_BYTES\_FS\_IOVF, LT,} \\
  \&3 \\
  ))
\text{)}
\]

Rule condition description

Specify thresholds on the percentage of free spaces in the RAA BASE section (DB\_PCT\_BYTES\_FS\_RAA), in the DOVF section (DB\_PCT\_BYTES\_FS\_DOVF), and in the IOVF section (DB\_PCT\_BYTES\_FS\_IOVF) of a DEDB area.

DB\_PCT\_BYTES\_FS\_RAA : \&1
DB\_PCT\_BYTES\_FS\_DOVF : \&2
DB\_PCT\_BYTES\_FS\_IOVF : \&3

An exception is issued if the first threshold is exceeded and either the second or third threshold has fallen below the defined percentage.

Rule exception expression

• EXCEPTION\_CLASS(DEDB\_FREE\_SPACE\_IN\_RAA\_VS\_OVFLOW)
• EXCEPTION\_LEVEL(WARNING)
• EXCEPTION\_MESSAGE

Rule message template

Free spaces in RAA, DOVF, and IOVF are used inefficiently in area %RESOURCE%.

Data elements being evaluated for this rule

DB\_PCT\_BYTES\_FS\_RAA \&1
DB\_PCT\_BYTES\_FS\_DOVF \&2
DB\_PCT\_BYTES\_FS\_IOVF \&3

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 20, &amp;2 = 30, &amp;3 = 80</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 20, &amp;2 = 20, &amp;3 = 80</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 20, &amp;2 = 10, &amp;3 = 50</td>
</tr>
</tbody>
</table>
**Rule: IBM.DEDB_FS.80**

IBM.DEDB_DEDB_FS.80 is a simple rule for calculating the percentage of free space in SDEP part.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.DEDB_DEDB_FS.80

**Rule description**
Percent of free space in SDEP part

**Resource types supported**
DEDB

**Exception class**
DEDB_FREE_SPACE_AVAIL_IN_SDEP

**Rule condition expression**

```
OR(
    IF(DB_PCT_BYTES_FS_SDEP,LT,
        &1
    )
)
```

**Rule condition description**
Specify a threshold on the percentage of free space in the sequential dependent segment (SDEP) part of a DEDB area.

```
DB_PCT_BYTES_FS_SDEP: &1
```

An exception is issued if the percentage falls below the threshold.
If the SDEP is not defined for the database, this rule is ignored.

**Rule exception expression**
- EXCEPTION_CLASS(DEDB_FREE_SPACE_AVAIL_IN_SDEP)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template
The percentage of free space in the SDEP fell below a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

| DB_PCT_BYTES_FS_SDEP &1 |

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 75</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 50</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 40</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB_FS.81

IBM.DEDB_FS.81 is a simple rule for evaluating the percentage of free space in the sequential dependent (SDEP) portion of a DEDB area.

Rule template version
The rule template version is indicated by a 4-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.DEDB_FS.81

Rule description
Percentage of free space in the sequential dependent (SDEP) portion of a DEDB area. This rule can also trigger an action (such as an SDEP extension of the subject area).

Important: This rule is not included in any of the IBM-supplied REORG Domain policies. You can use this rule in any of the following ways:
• Replace a similar rule in an existing REORG Domain policy
• Add this rule to one of the existing REORG Domain policies
• Create a REORG Domain policy and add this rule along with other rules

**Resource types supported**
- DEDB

**Exception class**
- DEDB_SDEP_NEEDS_TO_BE_EXTENDED

**Rule condition expression**
```
OR(
  IF(DB_PCT_BYTES_FS_SDEP,LT,
     &1
  )
)
```

**Rule condition description**
Specify a threshold on the percentage of free space in the sequential dependent segment (SDEP) portion of a DEDB area.

```plaintext
DB_PCT_BYTES_FS_SDEP: &1
```

An exception is issued if the percentage falls below the threshold.

**Important:** If you want to trigger a utility action to extend the SDEP section of the subject area, use this rule instead of IBM.DEDB_FS.80.

**Rule exception expression**
- EXCEPTION_CLASS(DEDB_SDEP_NEEDS_TO_BE_EXTENDED)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**
The percentage of free space in the SDEP section fell below a threshold in area %RESOURCE%.

**Data elements being evaluated for this rule**
- DB_PCT_BYTES_FS_SDEP &1

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 75</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 50</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 40</td>
</tr>
</tbody>
</table>
Rule: IBM.DEDB_OVERFLOW.10

IBM.DEDB_OVERFLOW.10 is a simple rule for calculating the percentage of UOWs that are using DOVF CIs.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.DEDB_OVERFLOW.10

**Rule description**
Percent of UOWs that are using DOVF CIs

**Resource types supported**
DEDB

**Exception class**
DEDB_EXCESS_PCT_UOWS_USING_DOVF

**Rule condition expression**

```
OR(
   IF(DB_PCT_NUM_UOW_USE_DOVF,GT,&1
       )
)
```

**Rule condition description**
Specify a threshold on the percentage of the number of UOWs that are using CIs in the DOVF section of a DEDB area.

```
DB_PCT_NUM_UOW_USE_DOVF: &1
```

An exception is issued if the threshold is exceeded.

**Rule exception expression**

- EXCEPTION_CLASS(DEDB_EXCESS_PCT_UOWS_USING_DOVF)
Exception level (Warning)
Exception message

Rule message template
The percentage of UOWs that are using DOVF exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

| DB_PCT_NUM_UOW_USE_DOVF &1 |

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 20</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 30</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 40</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB_OVERFLOW.20

IBM.DEDB_OVERFLOW.20 is a simple rule for calculating the percentage of UOWs that are using IOVF CIs.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.DEDB_OVERFLOW.20

Rule description
Percent of UOWs that are using IOVF CIs
Resource types supported
DEDB

Exception class
DEDB_EXCESS_PCT_UOWS_USING IOVF

Rule condition expression
```
OR(
   IF(DB_PCT_NUM_UOW_USE_IOVF,GT,&1)
)
```

Rule condition description
Specify a threshold on the percentage of the number of UOWs that are using CIs in the IOVF section of a DEDB area.

DB_PCT_NUM_UOW_USE_IOVF: &1

An exception is issued if the threshold is exceeded.

Rule exception expression
- EXCEPTION_CLASS(DEDB_EXCESS_PCT_UOWS_USING IOVF)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The percentage of UOWs that are using IOVF exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule
DB_PCT_NUM_UOW_USE_IOVF &1

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 10</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 20</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 30</td>
</tr>
</tbody>
</table>

IBM.DEDB_OVERFLOW.30 is a simple rule for calculating the number of UOWs using IOVF CIs.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.DEDB_OVERFLOW.30

**Rule description**
Number of UOWs using IOVF CIs

**Resource types supported**
DEDB

**Exception class**
DEDB_EXCESS_NUM_UOWS_USING_IOVF

**Rule condition expression**
```
OR(
  IF(DB_NUM_UOW_USE_IOVF, GT, &1
)
)
```

**Rule condition description**
Specify a threshold on the number of UOWs that are using at least one CI in the IOVF section of a DEDB area.
```
DB_NUM_UOW_USE_IOVF: &1
```
An exception is issued if the threshold is exceeded.
Because the default threshold value is a dummy high value, the threshold is never exceeded. You must modify the threshold value to a non-dummy value to effectively enable this rule.
Rule exception expression

- EXCEPTION_CLASS(DEDB_EXCESS_NUM_UOWS_USING_IOVF)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template

The number of UOWs using IOVF CIs exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

| DB_NUM_UOW_USE_IOVF &1 |

Rule threshold sets

Table 73. Rule threshold sets for IBM.DEDB_OVERFLOW.30

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 32766</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 32766</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 32766</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB_OVERFLOW.40

IBM.DEDB_OVERFLOW.40 is a simple rule for calculating the average use of IOVF CIs per UOW.

Rule template version

The rule template version is indicated by a four-byte integer value.

Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain

REORG

Rule template type

STANDARD

Rule template name

IBM.DEDB_OVERFLOW.40

Rule description

Average use of IOVF CIs per UOW
Resource types supported
DEDB

Exception class
DEDB_EXCESS_AVG_IOVF_CI_PER_UOW

Rule condition expression

\[
\text{OR(} \quad \text{IF(DB\_AVG\_NUM\_IOVFICI\_BY\_UOW,GT,} \\
&1 \\
\text{)}
\]

Rule condition description
Specify a threshold on the average number of IOVF CIs used by a UOW in a DEDB area.

DB\_AVG\_NUM\_IOVFICI\_BY\_UOW: &1

An exception is issued if the threshold is exceeded.

Because the default threshold value is a dummy high value, the threshold is never exceeded. You must modify the threshold value to a non-dummy value to effectively enable this rule.

Rule exception expression
• EXCEPTION\_CLASS(DEDB\_EXCESS\_AVG\_IOVF_CI\_PER\_UOW)
• EXCEPTION\_LEVEL(WARNING)
• EXCEPTION\_MESSAGE

Rule message template
The average use of IOVF CIs per UOW exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

DB\_AVG\_NUM\_IOVFICI\_BY\_UOW &1

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 8388608</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 8388608</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 8388608</td>
</tr>
</tbody>
</table>
Rule: IBM.DEDB_OVERFLOW.50

IBM.DEDB_OVERFLOW.50 is a simple rule for calculating the maximum use of IOVF CIs by a UOW.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.DEDB_OVERFLOW.50

Rule description
Maximum use of IOVF CIs by a UOW

Resource types supported
DEDB

Exception class
DEDB_UOW_USING_EXCESSIVE_IOVF_CI

Rule condition expression

```
OR(
  IF(DB_MAX_NUM_IOVF_CI_BY_UOW, GT, &1
    )
)
```

Rule condition description
Specify a threshold on the maximum number of IOVF CIs used by a UOW in a DEDB area.

```
DB_MAX_NUM_IOVF_CI_BY_UOW: &1
```

An exception is issued if the threshold is exceeded.
Because the default threshold value is a dummy high value, the threshold is never exceeded. You must modify the threshold value to a non-dummy value to effectively enable this rule.

Rule exception expression

- EXCEPTION_CLASS(DEDB_UOW_USING_EXCESSIVE_IOVF_CI)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template
The maximum use of IOVF CIs by a UOW exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

| DB_MAX_NUM_IOVF_CI_BY_UOW | &1 |

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 8388608</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 8388608</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 8388608</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB_OVERFLOW.60
IBM.DEDB_OVERFLOW.60 is a simple rule for calculating the minimum use of IOVF CIs by a UOW.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.DEDB_OVERFLOW.60

Rule description
Minimum use of IOVF CIs by a UOW

Resource types supported
DEDB
**Exception class**
DEDB_EXCESS_MIN_IOVF_CI_PER_UOW

**Rule condition expression**

```
OR(
   IF(DB_MIN_NUM_IOVF_CI_BY_UOW, GT, &1)
)
```

**Rule condition description**

Specify a threshold on the minimum number of IOVF CIs used by a UOW in a DEDB area.

| DB_MIN_NUM_IOVF_CI_BY_UOW | &1 |

An exception is issued if the threshold is exceeded.

Because the default threshold value is a dummy high value, the threshold is never exceeded. You must modify the threshold value to a non-dummy value to effectively enable this rule.

**Rule exception expression**

- EXCEPTION_CLASS(DEDB_EXCESS_MIN_IOVF_CI_PER_UOW)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**
The minimum use of IOVF CIs by a UOW exceeded a threshold in area %RESOURCE%.

**Data elements being evaluated for this rule**

| DB_MIN_NUM_IOVF_CI_BY_UOW | &1 |

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 1.0</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 2.0</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 3.0</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB_OVERFLOW.70**

IBM.DEDB_OVERFLOW.70 is a simple rule for calculating the percentage of IOVF CIs used.

**Rule template version**
The rule template version is indicated by a four-byte integer value.
Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.DEDB_OVERFLOW.70

Rule description
Percent of IOVF CIs used

Resource types supported
DEDB

Exception class
DEDB_EXCESSIVE_IOVF_CI_USED

Rule condition expression
\[
\text{OR(}
\begin{align*}
\text{IF(Db\_Pct\_Num\_IOVFci\_Used,GT,} \\
&1 \\
\end{align*}
\) 
\]

Rule condition description
Specify a threshold on the percentage of the number of CIs used in the IOVF of a DEDB area.

DB_PCT_NUM_IOVF_CI_USED: &1

An exception is issued if the threshold is exceeded.
Because the default threshold value is a dummy high value, the threshold is never exceeded. You must modify the threshold value to a non-dummy value to effectively enable this rule.

Rule exception expression
- EXCEPTION_CLASS(DEDB_EXCESSIVE_IOVF_CI_USED)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The maximum use of IOVF CIs by a UOW exceeded a threshold in area %RESOURCE%. 

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Data elements being evaluated for this rule

<table>
<thead>
<tr>
<th>Data element</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_PCT_NUM_IOVFCI_USED &amp;1</td>
</tr>
</tbody>
</table>

Rule threshold sets

Table 77. Rule threshold sets for IBM.DEDB_OVERFLOW.70

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 50</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 60</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 70</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB_OVERFLOW.80

IBM.DEDB_OVERFLOW.80 is a simple rule for calculating the percentage of RAP CIs using overflow.

Rule template version

The rule template version is indicated by a four-byte integer value.

Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain

REORG

Rule template type

STANDARD

Rule template name

IBM.DEDB_OVERFLOW.80

Rule description

Percent of RAP CIs using overflow

Resource types supported

DEDB

Exception class

DEDB_EXCESS_RAP_CI_USING_OVFLOW
**Rule condition expression**

\[
\text{OR(}
\quad \text{IF(DB\_PCT\_NUM\_RAPCI\_OVFL, GT,} \\
\quad \quad \&1) \\
\text{)}
\]

**Rule condition description**

Specify a threshold on the percentage of the number of RAP CIs that are using CIs in the DOVF section or the IOVF section of a DEDB area.

\[
\text{DB\_PCT\_NUM\_RAPCI\_OVFL: } \&1
\]

An exception is issued if the threshold is exceeded.

**Rule exception expression**

- `EXCEPTION\_CLASS(DEDB\_EXCESS\_RAP\_CI\_USING\_OVFLOW)`
- `EXCEPTION\_LEVEL(WARNING)`
- `EXCEPTION\_MESSAGE`

**Rule message template**

The percentage of RAP CIs using overflow exceeded a threshold in area %RESOURCE%.

**Data elements being evaluated for this rule**

\[
\text{DB\_PCT\_NUM\_RAPCI\_OVFL } \&1
\]

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 20</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 30</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 40</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB\_OVERFLOW.90**

IBM.DEDB\_OVERFLOW.90 is a simple rule for calculating the percentage of database records using IOVF.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.
Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.DEDB_OVERFLOW.90

Rule description
Percent of database records using IOVF

Resource types supported
DEDB

Exception class
DEDB_EXCESSIVE_DBREC_USING_IOVF

Rule condition expression

OR(
   IF(DB_PCT_NUM_DBREC_IOVF,GT,
      &1
   )
)

Rule condition description
Specify a threshold on the percentage of database records that are using CIs in the IOVF section of a DEDB area.

DB_PCT_NUM_DBREC_IOVF: &1

An exception is issued if the threshold is exceeded.

Rule exception expression
• EXCEPTION_CLASS(DEDB_EXCESSIVE_DBREC_USING_IOVF)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template
The percentage of DB records using IOVF exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

DB_PCT_NUM_DBREC_IOVF &1
### Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 10</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 15</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 20</td>
</tr>
</tbody>
</table>

### Rule: IBM.DEDB_RFS.10

IBM.DEDB_RFS.10 is a simple rule for evaluating the number of UOWs that match the RFS condition.

#### Rule template version

The rule template version is indicated by a 4-byte integer value.

#### Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

#### Policy domain

REORG

#### Rule template type

STANDARD

#### Rule template name

IBM.DEDB_RFS.10

#### Rule description

Number of UOWs that match the RFS condition.

**Important:** This rule is not included in any of the IBM-supplied REORG Domain policies. You can use this rule in any of the following ways:

- Replace a similar rule in an existing REORG Domain policy
- Add this rule to one of the existing REORG Domain policies
- Create a REORG Domain policy and add this rule along with other rules

#### Resource types supported

DEDB

#### Exception class

DEDB_EXCESSIVE_UOWS_MATCH_COND
Rule condition expressions

OR(
  IF(DB_NUM_UOW_RFS_COND,GT,
     &1
  )
)

Rule condition description

Specify a threshold on the number of UOWs that match the RBASEFS or the RDOVFFS condition.

DB_NUM_UOW_RFS_COND: &1

An exception is issued if the threshold is exceeded.

Because the default threshold value is a dummy high value, the threshold is never exceeded. You must modify the threshold value to a non-dummy value to effectively enable this rule.

**Requirement:** If you want to trigger a utility action to reorganize the subject area, use IBM.DEDB_RFS.11 instead of this rule.

Rule exception expression

- EXCEPTION_CLASS(DEDB_EXCESSIVE_UOWS_MATCH_COND)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template

The number of UOWs that match the RBASEFS or the RDOVFFS condition exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

DB_NUM_UOW_RFS_COND &1

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 32766</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 32766</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 32766</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB_RFS.11**

IBM.DEDB_RFS.11 is a simple rule for evaluating the number of UOWs that match the RFS condition.

**Rule template version**

The rule template version is indicated by a 4-byte integer value.
**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.DEDB_RFS.11

**Rule description**

Number of UOWs that match the RFS condition. This rule can also trigger an action (such as a reorganization).

**Important:** This rule is not included in any of the IBM-supplied REORG Domain policies. You can use this rule in any of the following ways:

- Replace a similar rule in an existing REORG Domain policy
- Add this rule to one of the existing REORG Domain policies
- Create a REORG Domain policy and add this rule along with other rules

**Resource types supported**

DEDB

**Exception class**

DEDB_NEEDS_TO_BE_REORGANIZED

**Rule condition expression**

```
OR(
  IF(DB_NUM_UOW_RFS_COND,GT,
    &1
  )
)
```

**Rule condition description**

Specify a threshold on the number of UOWs that match the RBASEFS or the RDOVFFS condition.

**DB_NUM_UOW_RFS_COND:** &1

An exception is issued if the threshold is exceeded.

Because the default threshold value is a dummy high value, the threshold is never exceeded. You must modify the threshold value to a non-dummy value to effectively enable this rule.

**Requirement:** If you want to trigger a utility action to reorganize the subject area, use this rule instead of IBM.DEDB_RFS.10.
Rule exception expressions
- EXCEPTION_CLASS(DEDB_NEEDS_TO_BE_REORGANIZED)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The number of UOWs that match the RBASEFS or the RDOVFFS condition exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

<table>
<thead>
<tr>
<th>DB_NUM_UOW_RFS_COND</th>
<th>&amp;1</th>
</tr>
</thead>
</table>

Rule threshold sets
Table 81. Rule threshold sets for IBM.DEDB_RFS.11

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 32766</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 32766</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 32766</td>
</tr>
</tbody>
</table>

Rule: IBM.DEDB_RFS.20
IBM.DEDB_RFS.20 is a simple rule for evaluating the percentage of UOWs that match the RFS condition.

Rule template version
The rule template version is indicated by a 4-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.DEDB_RFS.20

Rule description
Percentage of UOWs that match the RFS condition.
**Important:** This rule is not included in any of the IBM-supplied REORG Domain policies. You can use this rule in any of the following ways:

- Replace a similar rule in an existing REORG Domain policy
- Add this rule to one of the existing REORG Domain policies
- Create a REORG Domain policy and add this rule along with other rules

**Resource types supported**
DED

**Exception class**
DED_EXCESS_PCT_UOWS_MATCH_COND

**Rule condition expression**

```
OR(
    IF(DB_PCT_NUM_UOW_RFS_COND,GT,&1)
)
```

**Rule condition description**
Specify a threshold on the percentage of UOWs that match the RBASEFS or the RDOVFFS condition.

- DB_PCT_NUM_UOW_RFS_COND: &1
- An exception is issued if the threshold is exceeded.

**Important:** If you want to trigger a utility action to reorganize the subject area, use IBM.DEDB_RFS.21 instead of this rule.

**Rule exception expression**

- EXCEPTION_CLASS(DEDB_EXCESS_PCT_UOWS_MATCH_COND)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**
The percentage of UOWs that match the RBASEFS or the RDOVFFS condition exceeded a threshold in area %RESOURCE%.

**Data elements being evaluated for this rule**

- DB_PCT_NUM_UOW_RFS_COND &1

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 1</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 5</td>
</tr>
</tbody>
</table>
Table 82. Rule threshold sets for IBM.DEDB_RFS.20 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>&amp;1 = 10</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB_RFS.21**

IBM.DEDB_RFS.21 is a simple rule for evaluating the percentage of UOWs that match the RFS condition.

**Rule template version**

The rule template version is indicated by a 4-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.DEDB_RFS.21

**Rule description**

Percent of UOWs that match the RFS condition. This rule can also trigger an action (such as a reorganization).

**Important:** This rule is not included in any of the IBM-supplied REORG Domain policies. You can use this rule in any of the following ways:

- Replace a similar rule in an existing REORG Domain policy
- Add this rule to one of the existing REORG Domain policies
- Create a REORG Domain policy and add this rule along with other rules

**Resource types supported**

DEDB

**Exception class**

DEDB_NEEDS_TO_BE_REORGANIZED

**Rule condition expression**

```
OR(
    IF(DB_PCT_NUM_UOW_RFS_COND,GT,&1)
)
```
Rule condition description
Specify a threshold on the number of UOWs that match the RBASEFS condition or the RDOVFFS condition.

| DB_PCT_NUM_UOW_RFS_COND: \&1 |

An exception is issued if the threshold is exceeded.

**Requirement:** If you want to trigger a utility action to reorganize the subject area, use this rule instead of IBM.DEDB_RFS.20.

Rule exception expression
- EXCEPTION_CLASS(DEDB_NEEDS_TO_BE_REORGANIZED)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The percentage of UOWs that match the RBASEFS or the RDOVFFS condition exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

| DB_PCT_NUM_UOW_RFS_COND \&1 |

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 1</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 5</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 10</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB_ROOT_IO.10**
IBM.DEDB_ROOT_IO.10 is a simple rule for calculating the average number of I/Os per root segment.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG
**Rule template type**
STANDARD

**Rule template name**
IBM.DEDB_ROOT_IO.10

**Rule description**
Average number of I/Os per root segment

**Resource types supported**
DEDB

**Exception class**
DEDB_EXCESSIVE_AVG_NUM_ROOT_IO

**Rule condition expression**

```
OR(
    IF(DB_AVG_ROOT_IO, GT,
    &1
    )
)
```

**Rule condition description**
Specify a threshold on the average number of I/Os that are required to read a root segment in a DEDB area.

**DB_AVG_ROOT_IO: &1**

An exception is issued if the threshold is exceeded.

**Rule exception expression**

- EXCEPTION_CLASS(DEDB_EXCESSIVE_AVG_NUM_ROOT_IO)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**
The average number of I/Os per root segment exceeded a threshold in area %RESOURCE%.

**Data elements being evaluated for this rule**

- DB_AVG_ROOT_IO &1

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 1.3</td>
</tr>
</tbody>
</table>

Table 84. Rule threshold sets for IBM.DEDB_ROOT_IO.10 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>MED</td>
<td>&amp;1 = 1.4</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 1.5</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB_ROOT_IO.20**

IBM.DEDB_ROOT_IO.20 is a simple rule for calculating the maximum number of I/Os per root segment.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.DEDB_ROOT_IO.20

**Rule description**
Maximum number of I/Os per root segment

**Resource types supported**
DEDB

**Exception class**
DEDB_ROOT_SEGMENT_WITH_EXCESS_IO

**Rule condition expression**

```
OR(
  IF(DB_MAX_ROOT_IO,GT,
    &1
  ),
)
```

**Rule condition description**
Specify a threshold on the maximum number of I/Os that are required to read a root segment in a DEDB area.
An exception is issued if the threshold is exceeded.

**Rule exception expression**

- EXCEPTION_CLASS(DEDB_ROOT_SEGMENT_WITH_EXCESS_IO)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**

The maximum number of I/Os per root segment exceeded a threshold in area %RESOURCE%.

**Data elements being evaluated for this rule**

DB_MAX_ROOT_IO &1

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 4.0</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 5.0</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 6.0</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB_SEGM_CNT.10**

IBM.DEDB_SEGM_CNT.10 is a simple rule for evaluating the number of segment occurrences.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.DEDB_SEGM_CNT.10
Rule description
Number of segment occurrences

Resource types supported
DEDDB

Exception class
EXCESSIVE_SEGMENT_OCCURRENCES

Rule condition expression
\[
\text{OR(}
\text{IF(DB\_NUM\_SEG, GE, \&1)}
\text{)}
\]

Rule condition description
Specify a threshold on the number of segment occurrences in a DEDB area.

\text{DB\_NUM\_SEG: \&1}

An exception is issued if the threshold is reached or exceeded.
Because the default threshold value is a dummy high value, the threshold is never exceeded. You must modify the threshold value to a non-dummy value to effectively enable this rule.

Rule exception expression
\begin{itemize}
  \item \text{EXCEPTION\_CLASS(EXCESSIVE\_SEGMENT\_OCCURRENCES)}
  \item \text{EXCEPTION\_LEVEL(WARNING)}
  \item \text{EXCEPTION\_MESSAGE}
\end{itemize}

Rule message template
The number of segment occurrences exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule
\text{DB\_NUM\_SEG \&1}

Rule threshold sets

\begin{table}
\begin{tabular}{|l|l|}
\hline
Threshold set name & Threshold values \\
\hline
LOW & \&1 = 4294967295 \\
\hline
MED & \&1 = 4294967295 \\
\hline
HIGH & \&1 = 4294967295 \\
\hline
\end{tabular}
\end{table}
**Rule: IBM.DEDB_SYN_LEN.10**

IBM.DEDB_SYN_LEN.10 is a simple rule for calculating the average length of RAP synonym chains.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.DEDB_SYN_LEN.10

**Rule description**
Average length of RAP synonym chains

**Resource types supported**
DEDB

**Exception class**
DEDB_EXCESSIVE_AVG_LEN_SYNONYMS

**Rule condition expression**
```plaintext
OR(
  IF(DB_AVG_LEN_SYNONYM_CHAIN, GT, &1)
)
```

**Rule condition description**
Specify a threshold on the average length of RAP synonym chains in a DEDB area.

DB_AVG_LEN_SYNONYM_CHAIN: &1

An exception is issued if the threshold is exceeded.
Because the default threshold value is a dummy high value, the threshold is never exceeded. You must modify the threshold value to a non-dummy value to effectively enable this rule.

**Rule exception expression**
- EXCEPTION_CLASS(DEDB_EXCESSIVE_AVG_LEN_SYNONYMS)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

**Rule message template**
The average length of RAP synonym chains exceeded a threshold in area %RESOURCE%.

**Data elements being evaluated for this rule**

| DB_AVG_LEN_SYNONYM_CHAIN &1 |

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 29496729</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 29496729</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 29496729</td>
</tr>
</tbody>
</table>

**Rule: IBM.DEDB_SYN_LEN.20**

IBM.DEDB_SYN_LEN.20 is a simple rule for evaluating the maximum length of RAP synonym chains.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.DEDB_SYN_LEN.20

**Rule description**
Maximum length of RAP synonym chains

**Resource types supported**
DEDB
Exception class
DEDB_LONG_SYNONYM_CHAIN

Rule condition expression

\[
\text{OR}(
\quad \text{IF(DB_MAX_LEN_SYNONYMCHAIN, GT, } \&1
\quad )
\)
\]

Rule condition description
Specify a threshold on the maximum length of RAP synonym chains in a DEDB area.

\[
\text{DB_MAX_LEN_SYNONYMCHAIN: } \&1
\]

An exception is issued if the threshold is exceeded.
Because the default threshold value is a dummy high value, the threshold is never exceeded. You must modify the threshold value to a non-dummy value to effectively enable this rule.

Rule exception expression

- EXCEPTION_CLASS(DEDB_LONG_SYNONYM_CHAIN)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The maximum length of RAP synonym chains exceeded a threshold in area %RESOURCE%.

Data elements being evaluated for this rule

\[
\text{DB_MAX_LEN_SYNONYMCHAIN } \&1
\]

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 29496729</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 29496729</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 29496729</td>
</tr>
</tbody>
</table>

Rule: IBM.FFDB_FRAGDFSE.10

IBM.FFDB_FRAGDFSE.10 is a rule for evaluating the percentage of fragmented free space elements in a full-function database.

Rule template version
The rule template version is indicated by a 4-byte integer value.
Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.FFDB_FRAGDFSE.10

Rule description
Percentage of fragmented free space elements in a full-function database.

Resource types supported
• HDAM
• HIDAM
• PHDAM
• PHIDAM
• HISAM
• SHISAM

Exception class
FRAGMENTED_FREE_SPACE_ELEMENTS

Rule condition expression

OR(
  AOR(
    IF(DB_PCT_NUM_FRAGD_FSE,GT,
       &1
     ),
  )
)

Rule condition description
Specify a threshold on the percentage of fragmented free space elements in a data set.

DB_PCT_NUM_FRAGD_FSE: &1

A fragmented free space element is an element that cannot hold the largest segment in the data set. An exception is issued if the threshold is exceeded in one of the data sets of the database or partition.

Rule exception expression
• EXCEPTION_CLASS(FRAGMENTED_FREE_SPACE_ELEMENTS)
• EXCEPTION_LEVEL(WARNING)
Rule message template
The percentage of fragmented free space elements in a data set of %RESOURCE% exceeded a threshold.

Data elements being evaluated for this rule

| DB_PCT_NUM_FRAGD_FSE &1 |

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 20</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 30</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 40</td>
</tr>
</tbody>
</table>

Rule: IBM.FFDB_NREUSFSE.10
IBM.FFDB_NREUSFSE.10 is a rule for evaluating the percentage of non-reusable free space elements in a full-function database.

Rule template version
The rule template version is indicated by a 4-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.FFDB_NREUSFSE.10

Rule description
Percentage of non-reusable free space elements in a full-function database.

Resource types supported
• HDAM
Exception class

NONREUSABLE_FREE_SPACE_ELEMENTS

Rule condition expression

\[ \text{OR(} \text{AOR(} \text{IF(DB_PCT_NUM_NOREUSE_FSE, GT,} \&1 \text{)} \text{)} \text{)} \]

Rule condition description

Specify a threshold on the average percentage, per block or CI (VSAM control interval), of free space elements whose lengths are shorter than that of the smallest segment in a data set.

\[ \text{DB_PCT_NUM_NOREUSE_FSE: } \&1 \]

An exception is issued if the threshold is exceeded in one of the data sets of the database or partition.

Rule exception expression

- EXCEPTION_CLASS(NONREUSABLE_FREE_SPACE_ELEMENTS)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template

The percentage of non-reusable free space elements in one of the data sets of %RESOURCE% has increased.

Data elements being evaluated for this rule

\[ \text{DB_PCT_NUM_NOREUSE_FSE } \&1 \]

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 20</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 30</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 40</td>
</tr>
</tbody>
</table>

Chapter 23. Domain REORG rules 275
Rule: IBM.FRAGMENTATION.10
IBM.FRAGMENTATION.10 is a simple rule for evaluating the statistics of Free Space Elements (FSE) in HD database data sets.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.FRAGMENTATION.10

Rule description
Fragmented free space in HD DB data sets

Resource types supported
The following resource types are supported by this rule.
• HDAM
• HIDAM
• PHDAM
• PHIDAM

Exception class
FRAGMENTED_FREE_SPACES

Rule condition expression
OR(
  AOR(
    IF(DB_AVG_NUM_FSE,GE, &1
    )
    IF(DB_AVG_NUM_NOREUSE_FSE,GE, &2
    )
    IF(DB_NUM_FSE,GE, &3
    )
    IF(DB_NUM_FSE_MIN,GE, &4
    )
    IF(DB_NUM_FSE_MAX,GE, &5
  )
)
)
**Rule condition description**

Specify various thresholds on free space elements (FSEs).

The following thresholds can be used in this rule:

1. Average number of FSEs per database data set block:
   
   \[ DB\_AVG\_NUM\_FSE: \&1 \]

2. Average number of non-reusable FSEs per database data set block:
   
   \[ DB\_AVG\_NUM\_NOREUSE\_FSE: \&2 \]

3. Total number of FSEs in a database data set:
   
   \[ DB\_NUM\_FSE: \&3 \]

4. Total number of FSEs that can hold the defined smallest segment in the data set:
   
   \[ DB\_NUM\_FSE\_MIN: \&4 \]

5. Total number of FSEs that can hold the defined largest segment in the data set:
   
   \[ DB\_NUM\_FSE\_MAX: \&5 \]

An exception is issued if one or more of these thresholds are reached or exceeded in one of the database data sets.

You can apply this rule to a non-partitioned HD database or a PHDAM/PHIDAM partition.

**Rule exception expression**

- EXCEPTION\_CLASS(FRAGMENTED\_FREE\_SPACES)
- EXCEPTION\_LEVEL(WARNING)
- EXCEPTION\_MESSAGE

**Rule message template**

The fragmentation of free space in \%RESOURCE\% has increased

**Data elements being evaluated for this rule**

<table>
<thead>
<tr>
<th>Data element</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_AVG_NUM_FSE</td>
<td>&amp;1</td>
</tr>
<tr>
<td>DB_AVG_NUM_NOREUSE_FSE</td>
<td>&amp;2</td>
</tr>
<tr>
<td>DB_NUM_FSE</td>
<td>&amp;3</td>
</tr>
<tr>
<td>DB_NUM_FSE_MIN</td>
<td>&amp;4</td>
</tr>
<tr>
<td>DB_NUM_FSE_MAX</td>
<td>&amp;5</td>
</tr>
</tbody>
</table>

The following data element values are evaluated for each data set that composes the database or the HALDB partition:

- The variable \&1 specifies a threshold for the data element value of DB\_AVG\_NUM\_FSE for the data set.
- The variable \&2 specifies a threshold for the data element value of DB\_AVG\_NUM\_NOREUSE\_FSE for the data set.
- The variable \&3 specifies a threshold for the data element value of DB\_NUM\_FSE for the data set.
- The variable \&4 specifies a threshold for the data element value of DB\_NUM\_FSE\_MIN for the data set.
- The variable \&5 specifies a threshold for the data element value of DB\_NUM\_FSE\_MAX for the data set.
Rule threshold sets

Table 91. Rule threshold sets for IBM.FRAGMENTATION.10

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 5</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 5</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 2147483648</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 2147483648</td>
</tr>
<tr>
<td></td>
<td>&amp;5 = 2147483648</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 10</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 10</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 2147483648</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 2147483648</td>
</tr>
<tr>
<td></td>
<td>&amp;5 = 2147483648</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 20</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 20</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 2147483648</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 2147483648</td>
</tr>
<tr>
<td></td>
<td>&amp;5 = 2147483648</td>
</tr>
</tbody>
</table>

The default threshold values for the variables &3, &4, and &5 are never reached nor exceeded.

It is expected that each of these threshold values be changed only if you want to monitor the data element value that correspond to the variable.

Rule: IBM.FREE_SPACES.10

IBM.FREE_SPACES.10 is a simple rule for evaluating the IMS free space availability

Rule template version

The rule template version is indicated by a four-byte integer value.

Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain

REORG

Rule template type

STANDARD

Rule template name

IBM.FREE_SPACES.10
**Rule description**

Availability of IMS free space.

**Important:** This rule is not included in any of the IBM-supplied REORG Domain policies. You can use this rule in any of the following ways:

- Replace a similar rule in an existing REORG Domain policy
- Add this rule to one of the existing REORG Domain policies
- Create a REORG Domain policy and add this rule along with other rules

**Resource types supported**

The following resource types are supported by this rule.

- HDAM
- HIDAM
- PHDAM
- PHIDAM
- HISAM
- SHISAM

**Exception class**

FREE_SPACE_AVAILABILITY

**Rule condition expression**

```plaintext
OR(
    AOR(
        IF(DB_BYTES_SEG,GE,&1)
    )
    IF(DB_PCT_BYTES_SEG,GE,&2)
    IF(DB_BYTES_FREE_SPACE,LE,&3)
    IF(DB_PCT_BYTES_FREE_SPACE,LE,&4)
)
```

**Rule condition description**

Specify thresholds on data volume and free space.

The following thresholds can be used in this rule:

1. Total number of bytes used by segment data:
   ```plaintext
   DB_BYTES_SEG: &1
   ``

2. Percentage of bytes used by segment data:
   ```plaintext
   DB_PCT_BYTES_SEG: &2
   ``

3. Total number of free space bytes:
   ```plaintext
   DB_BYTES_FREE_SPACE: &3
   ``

4. Percentage of total free space bytes:
An exception is issued if either:

- Thresholds “1” on page 279 or “2” on page 279 are reached or exceeded.
- Thresholds “3” on page 279 or “4” on page 279 are reached or fallen below the defined value in one of the database data sets.

You can apply this rule to a non-partitioned database or a HALDB partition, with the exception of an index or PSINDEX partition.

**Rule exception expression**

- EXCEPTION_CLASS(FREE_SPACE_AVAILABILITY)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**

IMS space utilization statistics of %RESOURCE% has reached or crossed a threshold

**Data elements being evaluated for this rule**

<table>
<thead>
<tr>
<th>Data element</th>
<th>Threshold</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_BYTES_SEG</td>
<td>&amp;1</td>
<td>specifies a threshold for the data element value of DB_BYTES_SEG for the data set.</td>
</tr>
<tr>
<td>DB_PCT_BYTES_SEG</td>
<td>&amp;2</td>
<td>specifies a threshold for the data element value of DB_PCT_BYTES_SEG for the data set.</td>
</tr>
<tr>
<td>DB_BYTES_FREE_SPACE</td>
<td>&amp;3</td>
<td>specifies a threshold for the data element value of DB_BYTES_FREE_SPACE for the data set.</td>
</tr>
<tr>
<td>DB_PCT_BYTES_FREE_SPACE</td>
<td>&amp;4</td>
<td>specifies a threshold for the data element value of DB_PCT_BYTES_FREE_SPACE for the data set.</td>
</tr>
</tbody>
</table>

The following data element values are evaluated for each data set that composes the database or the HALDB partition:

- The variable &1 specifies a threshold for the data element value of DB_BYTES_SEG for the data set.
- The variable &2 specifies a threshold for the data element value of DB_PCT_BYTES_SEG for the data set.
- The variable &3 specifies a threshold for the data element value of DB_BYTES_FREE_SPACE for the data set.
- The variable &4 specifies a threshold for the data element value of DB_PCT_BYTES_FREE_SPACE for the data set.

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Table 92. Rule threshold sets for IBM.FREE_SPACES.10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Threshold set name</strong></td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>LOW</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>MED</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Table 92. Rule threshold sets for IBM.FREE_SPACES.10 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>&amp;1  = 8589934592</td>
</tr>
<tr>
<td></td>
<td>&amp;2  = 90</td>
</tr>
<tr>
<td></td>
<td>&amp;3  = 0</td>
</tr>
<tr>
<td></td>
<td>&amp;4  = 10</td>
</tr>
</tbody>
</table>

The default threshold values for the variable &1 are never reached nor exceeded.

It is expected that these values be changed only if you want to monitor the total number of bytes of segment data in each data set of the database or the partition.

**Rule: IBM.HDAM_OVERFLOW.10**

IBM.HDAM_OVERFLOW.10 is a simple rule for evaluating the percentage of overflow data in an HDAM or PHDAM database.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.HDAM_OVERFLOW.10

**Rule description**

Percent of segment data overflow

**Resource types supported**

The following resource types are supported by this rule.

- HDAM
- PHDAM

**Exception class**

EXCESSIVE_HDAM_OVERFLOW
Rule condition expression

\[
\text{OR( IF(DB\_PCT\_BYTES\_OVFL,GE, } \\
&1 )
\]

Rule condition description

Specify a threshold on the percentage of the percentage of the total bytes of segment occurrences in the overflow area of an HDAM database or a PHDAM partition:

\[
\text{DB\_PCT\_BYTES\_OVFL: } &1
\]

An exception is issued if the threshold is reached or exceeded.

Rule exception expression

- EXCEPTION\_CLASS(EXCESSIVE\_HDAM\_OVERFLOW)
- EXCEPTION\_LEVEL(WARNING)
- EXCEPTION\_MESSAGE

Rule message template

Overflow data in %RESOURCE% has increased

Data elements being evaluated for this rule

\[
\text{DB\_PCT\_BYTES\_OVFL } &1
\]

The variable &1 specifies a threshold for the data element value of DB\_PCT\_BYTES\_OVFL for the HDAM database or the PHDAM partition.

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 40</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 50</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 60</td>
</tr>
</tbody>
</table>

Rule: IBM.HDAM\_SYN\_LEN.10

IBM.HDAM\_SYN\_LEN.10 is a rule for evaluating the average length of HDAM RAP synonym chains.

Rule template version

The rule template version is indicated by a 4-byte integer value.

Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.HDAM_SYN_LEN.10

**Rule description**
Average length of HDAM RAP synonym chains.

**Resource types supported**
- HDAM
- PHDAM

**Exception class**
HDAM_AVG_SYNONYM_CHAIN_LENGTH

**Rule condition expression**

```
OR(
    IF(DB_AVG_LEN_SYNONYM_CHAIN, GT, &1
)
)
```

**Rule condition description**
Specify a threshold on the average length of RAP synonym chains in an HDAM database or a PHDAM partition.

```
DB_AVG_LEN_SYNONYM_CHAIN: &1
```

An exception is issued if the threshold is exceeded.

**Important**: To activate this rule, you must specify SENSOR_HOME=YES for the DB Sensor.

**Rule exception expression**

- EXCEPTION_CLASS(HDAM_AVG_SYNONYM_CHAIN_LENGTH)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**
The average length of RAP synonym chains exceeded a threshold in %RESOURCE%.

**Data elements being evaluated for this rule**

```
DB_AVG_LEN_SYNONYM_CHAIN &1
```
Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 3</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 4</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 5</td>
</tr>
</tbody>
</table>

**Rule: IBM.HISAM_SEG_DEL.10**

IBM.HISAM_SEG_DEL.10 is a simple rule for evaluating the percentage of deleted segments in a HISAM database.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.HISAM_SEG_DEL.10

**Rule description**

Percent deleted segments in a HISAM database.

**Resource types supported**

The following resource types are supported by this rule.

- HISAM

**Exception class**

EXCESSIVE_HISAM_DELETE_SEGM

**Rule condition expression**

OR(
  IF(DB_PCT_NUM_DELSEG.1,GT,
    &1
  )
)
Rule condition description

Specify thresholds on the percentage of deleted segment occurrences (DB_PCT_NUM_DELSEG) for both the primary data set and the overflow data set of a HISAM database:

- For the primary data set:
  \[
  \&1
  \]

- For the overflow data set:
  \[
  \&2
  \]

An exception is issued if one of these thresholds is reached. If the overflow data set is not defined for the database, only the threshold for the primary data set is evaluated.

Rule exception expression

- EXCEPTION_CLASS(EXCESSIVE_HISAM_DELETE_SEGM)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template

Many segments of the HISAM database %RESOURCE% are marked as deleted.

Data elements being evaluated for this rule

\[
\begin{align*}
\text{DB_PCT_NUM_DELSEG} & \ & \&1 \\
\text{DB_PCT_NUM_DELSEG} & \ & \&2 \\
\end{align*}
\]

The variables \&1 and \&2 specify thresholds for the data element values of DB_PCT_NUM_DELSEG for the primary data set and the overflow data set, if it exists, of the HISAM database respectively.

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
</table>
| LOW                | \&1 = 5          \\
|                    | \&2 = 5          |
| MED                | \&1 = 10         \\
|                    | \&2 = 10         |
| HIGH               | \&1 = 20         \\
|                    | \&2 = 20         |
Rule: IBM.IX_NUM_SEGM.10

IBM.IX_NUM_SEGM.10 is a simple rule for calculating the total number of index pointer segments.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.IX_NUM_SEGM.10

Rule description
Total number of index pointer segments

Resource types supported
The following resource types are supported by this rule:
- INDEX
- PHIDAM
- PSINDEX

Exception class
NUMBER_OF_INDEX_POINTER_SEGMENTS

Rule condition expression

```
OR(
  IF(DBX_NUM_IPS,GE,
    &1
  )
)
```

Rule condition description
Specify a threshold on the number of occurrences of index pointer segments (IPS).

DBX_NUM_IPS: &1

An exception is issued if the threshold is exceeded.

You can apply this rule to a HIDAM primary index, a secondary index, a PHIDAM primary index, or a PSINDEX partition.
**Rule exception expression**

- EXCEPTION_CLASS(NUMBER_OF_INDEX_POINTER_SEGMENTS)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**

The number of index pointer segments reached or exceeded a threshold in %RESOURCE%.

**Data elements being evaluated for this rule**

| DBX_NUM_IPS | &1 |

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 2147483648</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 2147483648</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 2147483648</td>
</tr>
</tbody>
</table>

**Rule: IBM.IX_OVERFLOW.10**

IBM.IX_OVERFLOW.10 is a simple rule for calculating the total number of index pointer segments in overflow.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.IX_OVERFLOW.10

**Rule description**

Index pointer segments in overflow
Resource types supported
The following resource types are supported by this rule:
• INDEX
• PSINDEX

Exception class
EXCESSIVE_INDEX_OVERFLOW

Rule condition expression
\[
\text{OR(}
  \text{IF(DBX\_NUM\_IPS\_OVFL,GE,}
  \&1
  
  \text{)}
\text{IF(DBX\_PCT\_IPS\_OVFL,GE,}
  \&2
  
  \text{)}
\]

Rule condition description
Specify thresholds on the amount of index pointer segment occurrences in the overflow data set. You can specify the thresholds by a number (DBX\_NUM\_IPS\_OVFL), by a percentage (DBX\_PCT\_IPS\_OVFL), or both.

DBX\_NUM\_IPS\_OVFL: &1
DBX\_PCT\_IPS\_OVFL: &2

An exception is issued if the threshold is exceeded.
You can apply this rule to a secondary index or a PSINDEX partition.

Rule exception expression
• EXCEPTION_CLASS(EXCESSIVE_INDEX_OVERFLOW)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template
The amount of index pointer segments in overflow reached or exceeded a threshold in %RESOURCE%.

Data elements being evaluated for this rule
DBX\_NUM\_IPS\_OVFL &1
DBX\_PCT\_IPS\_OVFL &2

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 2147483648,</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 100</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 2147483648,</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 100</td>
</tr>
</tbody>
</table>
Table 97. Rule threshold sets for IBM.IX_OVERFLOW.10 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>&amp;1 = 2147483648,</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 100</td>
</tr>
</tbody>
</table>

**Rule: IBM.IX_EXTENTS.10**

IBM.IX_EXTENTS.10 is a simple rule for evaluating the availability of index data set extents.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.IX_EXTENTS.10

**Rule description**

Availability of index data set extents

**Resource types supported**

The following resource types are supported by this rule:

- INDEX
- PSINDEX

**Exception class**

INDEX_EXTENTS_AVAILABILITY

**Rule condition expression**

```
OR(
  AOR(
    AAND(
      IF(DBX_FLAG_SMS,IS,N)
      IF(DBX_AVAIL_EXT_LESS_100,IS,Y)
      IF(DBX_NUM_AVAIL_EXT,LE,&1
    )
  )
  AAND(
    IF(DBX_FLAG_SMS,IS,Y)
  )
)```

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Rule condition description

Specify a threshold on the estimated number of extents that are available on the DASD volumes that are assigned for an index data set (DBX_NUM_AVAIL_EXT). The threshold must be in the range of 0 - 99. For an SMS-managed data set, also specify a threshold on the number of candidate volumes (DBX_NUM_UNUSED_VOL_CAND).

1. For a non-SMS-managed data set, an exception is issued if DBX_NUM_AVAIL_EXT of one of database data sets is less than or equal to the following threshold.

   &1

2. For an SMS-managed data set, an exception is issued if DBX_NUM_UNUSED_VOL_CAND is less than or equal to

   &2

   and DBX_NUM_AVAIL_EXT is less than or equal to

   &3

   for one of the index data sets.

You can apply this rule to a HIDAM primary index, a secondary index, or a PSINDEX partition. Use the rule IBM.IX_EXTENTS.11 for a PHIDAM primary index.

Rule exception expression

• EXCEPTION_CLASS(INDEX_EXTENTS_AVAILABILITY)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template

The number of available extents for an index data set of %RESOURCE% is inadequate.

Data elements being evaluated for this rule

<table>
<thead>
<tr>
<th>DBX_NUM_AVAIL_EXT</th>
<th>&amp;1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBX_NUM_UNUSED_VOL_CAND</td>
<td>&amp;2</td>
</tr>
<tr>
<td>DBX_NUM_AVAIL_EXT</td>
<td>&amp;3</td>
</tr>
</tbody>
</table>

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 5, &amp;2 = 0, &amp;3 = 5</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 3, &amp;2 = 0, &amp;3 = 3</td>
</tr>
</tbody>
</table>
Rule: IBM.IX_EXTENTS.11

IBM.IX_EXTENTS.11 is a simple rule for evaluating the availability of PHIDAM primary index extents.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.IX_EXTENTS.11

Rule description
Availability of PHIDAM primary index extents

Resource types supported
PHIDAM

Exception class
INDEX_EXTENTS_AVAILABILITY

Rule condition expression

OR(
    AND(
        IF(DBX_FLAG_SMS,IS,N)
        IF(DBX_AVAIL_EXT_LESS_100,IS,Y)
        IF(DBX_NUM_AVAIL_EXT,LE,&1)
    )
    AND(
        IF(DBX_FLAG_SMS,IS,Y)
        IF(DBX_NUM_UNUSED_VOL_CAND,LE,&2)
        IF(DBX_AVAIL_EXT_LESS_100,IS,Y)
        IF(DBX_NUM_AVAIL_EXT,LE,&3)
    )
)
**Rule condition description**

Specify a threshold on the estimated number of extents that are available on the DASD volumes that are assigned for the PHIDAM primary index (DBX_NUM_AVAIL_EXT). The threshold must be in the range of 0 - 99. For an SMS-managed data set, also specify a threshold on the number of candidate volumes (DBX_NUM_UNUSED_VOL_CAND).

1. If the data set is not SMS-managed, an exception is issued if DBX_NUM_AVAIL_EXT of one of the database data sets is less than or equal to the following threshold.

\[
&1
\]

2. If the data set is SMS-managed, an exception is issued if DBX_NUM_UNUSED_VOL_CAND is less than or equal to

\[
&2
\]

and DBX_NUM_AVAIL_EXT is less than or equal to

\[
&3
\]

for one of the index data sets.

You can apply this rule only to a PHIDAM primary index.

Use the rule IBM.IX_EXTENTS.10 for a HIDAM primary index, a secondary index, or a PSINDEX partition.

**Rule exception expression**

- EXCEPTION_CLASS(INDEX_EXTENTS_AVAILABILITY)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**

The number of available extents for the primary index of %RESOURCE% is inadequate.

**Data elements being evaluated for this rule**

<table>
<thead>
<tr>
<th>DBX_NUM_AVAIL_EXT</th>
<th>&amp;1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBX_NUM_UNUSED_VOL_CAND</td>
<td>&amp;2</td>
</tr>
<tr>
<td>DBX_NUM_AVAIL_EXT</td>
<td>&amp;3</td>
</tr>
</tbody>
</table>

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW &amp;1 = 5, &amp;2 = 0, &amp;3 = 5</td>
<td></td>
</tr>
<tr>
<td>MED &amp;1 = 3, &amp;2 = 0, &amp;3 = 3</td>
<td></td>
</tr>
<tr>
<td>HIGH &amp;1 = 1, &amp;2 = 0, &amp;3 = 1</td>
<td></td>
</tr>
</tbody>
</table>
Rule: IBM.IX_GROWTH.10

IBM.IX_GROWTH.10 is a simple rule for evaluating the data set size of an index and its overflow.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.IX_GROWTH.10

**Rule description**
Data set size of an index and its overflow

**Resource types supported**
The following resource types are supported by this rule:
• INDEX
• PSINDEX

**Exception class**
INDEX_SIZE_GROWTH

**Rule condition expression**

```
OR(
  AOR(
    IF(DBX_NUM_DBDS_BLOCKS, GE, &1)
  )
  IF(DBX_PCT_OF_MAX_DS_SIZE, GE, &2)
  IF(DBX_RBA_HIGH_ALLOC, GE, &3)
  IF(DBX_RBA_HIGH_USED, GE, &4)
)
```

**Rule condition description**
Specify thresholds on the index data set size.
You can use the following thresholds in this rule:

1. Number of data set blocks
   
   \[
   \text{DBX\_NUM\_DBDS\_BLOCKS} : &1
   \]

2. Percentage of maximum data set size
   
   \[
   \text{DBX\_PCT\_OF\_MAX\_DS\_SIZE} : &2
   \]

3. High-Allocated-RBA (in decimal expression)
   
   \[
   \text{DBX\_RBA\_HIGH\_ALLOC} : &3
   \]

4. High-Used-RBA (in decimal expression)
   
   \[
   \text{DBX\_RBA\_HIGH\_USED} : &4
   \]

An exception is issued if one or more of these thresholds are reached or exceeded in one of the data sets.

You can apply this rule to a HIDAM primary index, a secondary index, or a PSINDEX partition.

Use the rule IBM.IX\_GROWTH.11 for a PHIDAM primary index.

**Rule exception expression**

- EXCEPTION\_CLASS(INDEX\_SIZE\_GROWTH)
- EXCEPTION\_LEVEL(WARNING)
- EXCEPTION\_MESSAGE

**Rule message template**

The size of an index data set reached or exceeded a threshold in %RESOURCE%.

**Data elements being evaluated for this rule**

<table>
<thead>
<tr>
<th>DBX_NUM_DBDS_BLOCKS</th>
<th>&amp;1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBX_PCT_OF_MAX_DS_SIZE</td>
<td>&amp;2</td>
</tr>
<tr>
<td>DBX_RBA_HIGH_ALLOC</td>
<td>&amp;3</td>
</tr>
<tr>
<td>DBX_RBA_HIGH_USED</td>
<td>&amp;4</td>
</tr>
</tbody>
</table>

**Rule threshold sets**

*Table 100. Rule threshold sets for IBM.IX\_GROWTH.10*

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 16777216, &amp;2 = 60, &amp;3 = 6442450944, &amp;4 = 6442450944</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 16777216, &amp;2 = 80, &amp;3 = 6442450944, &amp;4 = 6442450944</td>
</tr>
</tbody>
</table>
Table 100. Rule threshold sets for IBM.IX_GROWTH.10 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>&amp;1 = 16777216,</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 90,</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 6442450944,</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 6442450944</td>
</tr>
</tbody>
</table>

**Rule: IBM.IX_GROWTH.11**

IBM.IX_GROWTH.11 is a simple rule for evaluating the data set size of a PHIDAM primary index.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.IX_GROWTH.11

**Rule description**

Data set size of a PHIDAM primary index

**Resource types supported**

PHIDAM

**Exception class**

INDEX_SIZE_GROWTH

**Rule condition expression**

```sql
OR(
    IF(DBX_NUM_DBDS_BLOCKS,GE,
        &1
    )
    IF(DBX_PCT_OF_MAX_DS_SIZE,GE,
        &2
    )
    IF(DBX_RBA_HIGH_ALLOC,GE,
        &3
    )
    IF(DBX_RBA_HIGH_USED,GE,
        &4
    )
)
```
**Rule condition description**

Specify thresholds on the data set size of the PHIDAM primary index.

You can use the following thresholds in this rule:

1. Number of data set blocks
   
   \[
   \text{DBX\_NUM\_DBDS\_BLOCKS} : \&1
   \]

2. Percentage of maximum data set size
   
   \[
   \text{DBX\_PCT\_OF\_MAX\_DS\_SIZE} : \&2
   \]

3. High-Allocated-RBA (in decimal expression)
   
   \[
   \text{DBX\_RBA\_HIGH\_ALLOC} : \&3
   \]

4. High-Used-RBA (in decimal expression)
   
   \[
   \text{DBX\_RBA\_HIGH\_USED} : \&4
   \]

An exception is issued if one or more of these thresholds are reached or exceeded.

You can apply this rule only to a PHIDAM primary index.

Use the rule `IBM.IX\_GROWTH.10` for a HIDAM primary index, a secondary index, or a PSINDEX partition.

**Rule exception expression**

- `EXCEPTION\_CLASS(INDEX\_SIZE\_GROWTH)`
- `EXCEPTION\_LEVEL(WARNING)`
- `EXCEPTION\_MESSAGE`

**Rule message template**

The size of the primary index data set reached or exceeded a threshold in \%RESOURCE\%.

**Data elements being evaluated for this rule**

\[
\begin{align*}
\text{DBX\_NUM\_DBDS\_BLOCKS} & : \&1 \\
\text{DBX\_PCT\_OF\_MAX\_DS\_SIZE} & : \&2 \\
\text{DBX\_RBA\_HIGH\_ALLOC} & : \&3 \\
\text{DBX\_RBA\_HIGH\_USED} & : \&4 \\
\end{align*}
\]

**Rule threshold sets**

*Table 101. Rule threshold sets for IBM.IX\_GROWTH.11*

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 16777216,</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 60,</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 6442450944,</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 6442450944</td>
</tr>
</tbody>
</table>
Table 101. Rule threshold sets for IBM.IX_GROWTH.11 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>MED</td>
<td>&amp;1 = 16777216,</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 80,</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 6442450944,</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 6442450944</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 16777216,</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 90,</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 6442450944,</td>
</tr>
<tr>
<td></td>
<td>&amp;4 = 6442450944</td>
</tr>
</tbody>
</table>

**Rule: IBM.IX_GROWTH.20**

IBM.IX_GROWTH.20 is a simple rule for evaluating the data growth in an index and its overflow.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.IX_GROWTH.20

**Rule description**
Data growth in an index and its overflow

**Resource types supported**
The following resource types are supported by this rule:
• INDEX
 • PSINDEX

**Exception class**
GROWING_INDEX_WITH_DATA_FULL
Rule condition expression

OR(
    AAND(
        IF(DBX_PCT_OF_MAX_DS_SIZE, GE,
            &1
        )
        IF(DBX_PCT_UNUSED_BYTES, LE,
            &2
        )
    )
)

Rule condition description

Specify a threshold on the percentage of the maximum data set size (DBX_PCT_OF_MAX_DS_SIZE) and a threshold on the percentage of the free space in the data set (DBX_PCT_UNUSED_BYTES) for an index data set.

DBX_PCT_OF_MAX_DS_SIZE: &1
DBX_PCT_UNUSED_BYTES  : &2

An exception is issued if the first threshold is reached or exceeded and the second threshold has reached or fallen below the defined value in any of the index data sets. An exception indicates the possibility that the data set is approaching the size limitation of 4 GB.

You can apply this rule to a HIDAM primary index, a secondary index, or a PSINDEX partition. Use the rule IBM.IX_GROWTH.21 for a PHIDAM primary index.

Rule exception expression

• EXCEPTION_CLASS(GROWING_INDEX_WITH_DATA_FULL)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template

The size of an index data set is approaching its limit in %RESOURCE%.

Data elements being evaluated for this rule

DBX_PCT_OF_MAX_DS_SIZE &1
DBX_PCT_UNUSED_BYTES   &2

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 75, &amp;2 = 10</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 85, &amp;2 = 10</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 90, &amp;2 = 10</td>
</tr>
</tbody>
</table>
Rule: IBM.IX_GROWTH.21

IBM.IX_GROWTH.21 is a simple rule for evaluating the data growth in a PHIDAM primary index.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.IX_GROWTH.21

Rule description
Data growth in a PHIDAM primary index

Resource types supported
PHIDAM

Exception class
GROWING_INDEX_WITH_DATA_FULL

Rule condition expression
```
OR(
    AND(
        IF(DBX_PCT_OF_MAX_DS_SIZE,GE,&1
            IF(DBX_PCT_UNUSED_BYTES,LE,&2
                )
            )
        )
    )
```

Rule condition description
Specify a threshold on the percentage of the maximum data set size (DBX_PCT_OF_MAX_DS_SIZE) and a threshold on the percentage of the free space in the data set (DBX_PCT_UNUSED_BYTES) for the primary index data set.

| DBX_PCT_OF_MAX_DS_SIZE: &1 |
| DBX_PCT_UNUSED_BYTES    : &2 |
An exception is issued if the first threshold is reached or exceeded and the second threshold has reached or fallen below the defined value in the index data set. An exception indicates the possibility that the size of data set is approaching the 4 GB limit.

You can apply this rule only to a PHIDAM primary index.

Use the rule IBM.IX_GROWTH.20 for a HIDAM primary index, a secondary index, or a PSINDEX partition.

**Rule exception expression**

- EXCEPTION_CLASS(GROWING_INDEX_WITH_DATA_FULL)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**

The primary index data set is approaching its size limit in %RESOURCE%.

**Data elements being evaluated for this rule**

<table>
<thead>
<tr>
<th>DBX_PCT_OF_MAX_DS_SIZE</th>
<th>&amp;1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBX_PCT_UNUSED_BYTES</td>
<td>&amp;2</td>
</tr>
</tbody>
</table>

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 75, &amp;2 = 10</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 85, &amp;2 = 10</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 90, &amp;2 = 10</td>
</tr>
</tbody>
</table>

**Rule: IBM.IX_CICA_SPLIT.10**

IBM.IX_CICA_SPLIT.10 is a simple rule for evaluating the percentage of CI or CA splits in an index primary data set.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD
Rule template name
IBM.IX_CICA_SPLIT.10

Rule description
CI or CA splits in an index primary data set

Resource types supported
The following resource types are supported by this rule:
• INDEX
• PSINDEX

Exception class
EXCESSIVE_INDEX_CI_OR_CA_SPLITS

Rule condition expression

```
OR(
  IF(DBX_PCT_NUM_CI_SPLIT.1,GE,&1)
  IF(DBX_PCT_NUM_CA_SPLIT.1,GE,&2)
)
```

Rule condition description
Specify thresholds on the percentage of the number of CI splits (DBX_PCT_NUM_CI_SPLIT) and the percentage of the number of CA splits (DBX_PCT_NUM_CA_SPLIT) of the primary data set of an index.

\[
\begin{align*}
\text{DBX_PCT_NUM_CI_SPLIT}: &1 \\
\text{DBX_PCT_NUM_CA_SPLIT}: &2 \\
\end{align*}
\]

An exception is issued if one of these thresholds is reached or exceeded.

You can apply this rule to a HIDAM primary index, a secondary index, or a PSINDEX partition.

Use the rule IBM.IX_CICA_SPLIT.11 for a PHIDAM primary index.

Rule exception expression
• EXCEPTION_CLASS(EXCESSIVE_INDEX_CI_OR_CA_SPLITS)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template
The number of CI/CA splits of the index primary data set is increasing in %RESOURCE%.

Data elements being evaluated for this rule

\[
\begin{align*}
\text{DBX_PCT_NUM_CI_SPLIT}: &1 \\
\text{DBX_PCT_NUM_CA_SPLIT}: &2 \\
\end{align*}
\]
Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 20, &amp;2 = 20</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 30, &amp;2 = 30</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 40, &amp;2 = 40</td>
</tr>
</tbody>
</table>

**Rule: IBM.IX_CICA_SPLIT.11**

IBM.IX_CICA_SPLIT.11 is a simple rule for evaluating the percentage of CI or CA splits in a PHIDAM primary index.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.IX_CICA_SPLIT.11

**Rule description**

CI or CA splits in a PHIDAM primary index

**Resource types supported**

PHIDAM

**Exception class**

EXCESSIVE_INDEX_CI_OR_CA_SPLITS

**Rule condition expression**

\[
\text{OR}(
    \text{IF}(\text{DBX\_PCT\_NUM\_CI\_SPLIT}, \text{GE}, \&1)
    \text{IF}(\text{DBX\_PCT\_NUM\_CA\_SPLIT}, \text{GE}, \&2)
)\
\]
Rule condition description

Specify thresholds on the percentage of the number of CI splits (DBX_PCT_NUM_CI_SPLIT) and the percentage of the number of CA splits (DBX_PCT_NUM_CA_SPLIT) of the primary index data set of PHIDAM.

<table>
<thead>
<tr>
<th>Rule condition description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBX_PCT_NUM_CI_SPLIT: &amp;1</td>
</tr>
<tr>
<td>DBX_PCT_NUM_CA_SPLIT: &amp;2</td>
</tr>
</tbody>
</table>

An exception is issued if one of these thresholds is reached or exceeded.

You can apply this rule only to a PHIDAM primary index.

Use the rule IBM.IX_CICA_SPLIT.10 for a HIDAM primary index, a secondary index, or a PSINDEX partition.

Rule exception expression

- EXCEPTION_CLASS(EXCESSIVE_INDEX_CI_OR_CA_SPLITS)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template

The number of CI/CA splits of the primary index data set is increasing in %RESOURCE%.

Data elements being evaluated for this rule

<table>
<thead>
<tr>
<th>Data elements being evaluated for this rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBX_PCT_NUM_CI_SPLIT &amp;1</td>
</tr>
<tr>
<td>DBX_PCT_NUM_CA_SPLIT &amp;2</td>
</tr>
</tbody>
</table>

Rule threshold sets

<table>
<thead>
<tr>
<th>Rule threshold sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 105. Rule threshold sets for IBM.IX_CICA_SPLIT.11</td>
</tr>
<tr>
<td>Threshold set name</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>LOW</td>
</tr>
<tr>
<td>MED</td>
</tr>
<tr>
<td>HIGH</td>
</tr>
</tbody>
</table>

Rule: IBM.LAST_REORG.10

IBM.LAST_REORG.10 is a rule for evaluating the number of days that have elapsed since the last reorganization.

Rule template version

The rule template version is indicated by a 4-byte integer value.

Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.LAST_REORG.10

**Rule description**

Number of days since the last reorganization.

**Resource types supported**

- HDAM
- HIDAM
- PHDAM
- PHIDAM
- HISAM
- SHISAM
- DEDB

**Exception class**

DAYS_PASSED_SINCE_LAST_REORG

**Rule condition expression**

```
OR(
  IF(DB_DAYS_SINCE_LAST_REORG, GT, &1)
)
```

**Rule condition description**

Specify a threshold on the number of days that have passed since the last reorganization.

```
DB_DAYS_SINCE_LAST_REORG: &1
```

An exception is issued if the threshold is exceeded.

**Rule exception expression**

- EXCEPTION_CLASS(DAYS_PASSED_SINCE_LAST_REORG)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**

No reorganization has been performed on %RESOURCE% for a while.
Data elements being evaluated for this rule

<table>
<thead>
<tr>
<th>Data element</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_DAYS_SINCE_LAST_REORG &amp;1</td>
</tr>
</tbody>
</table>

Rule threshold sets

Table 106. Rule threshold sets for IBM.LAST_REORG.10

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 60</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 180</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 365</td>
</tr>
</tbody>
</table>

Rule: IBM.NUM_DBRECORDS.10

IBM.NUM_DBRECORDS.10 is a simple rule for evaluating the number of database records.

Rule template version

The rule template version is indicated by a four-byte integer value.

Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain

REORG

Rule template type

STANDARD

Rule template name

IBM.NUM_DBRECORDS.10

Rule description

Total number of database records.

Resource types supported

The following resource types are supported by this rule.

- HDAM
- HIDAM
- PHDAM
- PHIDAM
- HISAM
Exception class
NUMBER_OF_DB_RECORDS

Rule condition expression

\[
\text{OR(}
\text{IF(DB_NUM_ROOT,GE,}
&1
\}\n\)
\]

Rule condition description
Specify a threshold on the total number of root segment occurrences in the database or the partition:

\[
\text{DB_NUM_ROOT: } &1
\]

An exception is issued if the threshold is reached or exceeded. The threshold can be used to measure the growth of the number of database records.

You can apply this rule to a non-partitioned database or a HALDB partition, with the exception of an index or PSINDEX partition.

Rule exception expression

- EXCEPTION_CLASS(NUMBER_OF_DB_RECORDS)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The number of database records in \%RESOURCE\% has reached or exceeded a threshold.

Data elements being evaluated for this rule

<table>
<thead>
<tr>
<th>DB_NUM_ROOT</th>
<th>&amp;1</th>
</tr>
</thead>
</table>

The variable \&1 specifies a threshold for the data element value of DB_NUM_ROOT for the database or the HALDB partition.

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 4294967295</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 4294967295</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 4294967295</td>
</tr>
</tbody>
</table>

The default threshold values for the variable \&1 are never reached nor exceeded.

It is expected that these values be changed only if you want to monitor the number of database records in the database or the HALDB partition.

Rule: IBM.RAA_DENSITY.10

IBM.RAA_DENSITY.10 is a simple rule for evaluating the data volume in the Root Addressable Area of an HDAM or PHDAM database.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.RAA_DENSITY.10

Rule description
Volume of data in the RAA of HDAM or PHDAM.

Important: This rule is not included in any of the IBM-supplied REORG Domain policies. You can use this rule in any of the following ways:

- Replace a similar rule in an existing REORG Domain policy
- Add this rule to one of the existing REORG Domain policies
- Create a REORG Domain policy and add this rule along with other rules

Resource types supported
The following resource types are supported by this rule.
- HDAM
- PHDAM

Exception class
DATA_VOLUME_IN_HDAM_RAA

Rule condition expression

```
OR(
  IF(DB_BYTES_SEG_RAA, GE, 61)
)
```

Rule condition description
Specify a threshold on the total bytes of segment occurrences in the root addressable area:
An exception is issued if the threshold is reached or exceeded. You can apply this rule to an HDAM database or a PHDAM partition.

**Rule exception expression**

- EXCEPTION_CLASS(DATA_VOLUME_IN_HDAM_RAA)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**
The data volume in the Root Addressable Area of %RESOURCE% has increased

**Data elements being evaluated for this rule**

<table>
<thead>
<tr>
<th>DB_BYTESSEG_RA</th>
<th>&amp;1</th>
</tr>
</thead>
</table>

The variable &1 specifies a threshold for the data element value of DB_BYTES_SEG_RAA for the HDAM database or the PHDAM partition.

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 8589934592</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 8589934592</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 8589934592</td>
</tr>
</tbody>
</table>

The default threshold values for the variable &1 are never reached nor exceeded.

It is expected that these values be changed only if you want to monitor the total number of bytes in the RAA.

**Rule: IBM.RANDOMIZING.10**

IBM.RANDOMIZING.10 is a simple rule for evaluating the imbalanced HDAM or PHDAM randomizing.

**Note:** Imbalanced randomizing refers to Root Anchor Points (RAPs) in an HDAM database or PHDAM partition that are not evenly used in terms of both the RAP usage ratio and the average number of synonyms that occur in each RAP used.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.
Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.RANDOMIZING.10

Rule description
Imbalanced randomizing of root segments.

Resource types supported
The following resource types are supported by this rule.
• HDAM
• PHDAM

Exception class
IMBALANCED_RANDOMIZING

Rule condition expression

AND(
  IF(DB_PCT_NUM_UNUSED_RAP,GE,
    &1
  )
  IF(DB_PCT_NUM_SYNONYM,GE,
    &2
  )
)

Rule condition description
Specify thresholds on the percentage of unused root anchor points (DB_PCT_NUM_UNUSED_RAP) and the percentage of root segments on synonym chains (DB_PCT_NUM_SYNONYM):

DB_PCT_NUM_UNUSED_RAP: &1
DB_PCT_NUM_SYNONYM: &2

An exception is issued if both of these thresholds are reached or exceeded. This condition indicates imbalanced randomizing.

You can apply this rule to an HDAM database or a PHDAM partition.

Rule exception expression
• EXCEPTION_CLASS(IMBALANCED_RANDOMIZING)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template
Imbalanced randomizing and inefficient use of RAPs have increased in %RESOURCE%
Data elements being evaluated for this rule

| DB_PCT_NUM_UNUSED_RAP: &1 | DB_PCT_NUM_SYNONYM : &2 |

The following data element values are evaluated for the HDAM database or the PHDAM partition:
- The variable &1 specifies a threshold for the data element value of DB_PCT_NUM_UNUSED_RAP.
- The variable &2 specifies a threshold for the data element value of DB_PCT_NUM_SYNONYM.

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 20</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 20</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 30</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 30</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 40</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 40</td>
</tr>
</tbody>
</table>

**Rule: IBM.RAP_SYNONYMS.10**

IBM.RAP_SYNONYMS.10 is a simple rule for evaluating the number and the percentage of synonyms for an HDAM or PHDAM database.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.RAP_SYNONYMS.10

**Rule description**
Number of synonym root segments
Resource types supported
The following resource types are supported by this rule.
• HDAM
• PHDAM

Exception class
EXCESSIVE_RAP_SYNONYMS

Rule condition expression
\[
\text{OR(}
\text{IF(DB\_NUM\_SYNONYM,GE,} \&1
\text{)}
\text{IF(DB\_PCT\_NUM\_SYNONYM,GE,} \&2
\text{)}
\text{)}
\]

Rule condition description
Specify thresholds on the amount of root segment occurrences involved in synonym chains of HDAM/PHDAM randomizing. The thresholds can be specified by a number (DB\_NUM\_SYNONYM) and a percentage (DB\_PCT\_NUM\_SYNONYM):

\[
\begin{align*}
\text{DB\_NUM\_SYNONYM: } & \&1 \\
\text{DB\_PCT\_NUM\_SYNONYM: } & \&2
\end{align*}
\]

An exception is issued if one of these thresholds is reached or exceeded:
1. By default, only a threshold on DB\_PCT\_NUM\_SYNONYM is active. If you want to use a threshold on DB\_NUM\_SYNONYM, set an appropriate value.
2. If you want to monitor imbalanced randomizing, use the rule IBM.RANDOMIZING.10 instead of this rule.

Rule exception expression
• EXCEPTION\_CLASS(EXCESSIVE_RAP\_SYNONYMS)
• EXCEPTION\_LEVEL(WARNING)
• EXCEPTION\_MESSAGE

Rule message template
The number of synonyms in randomizing has increased in %RESOURCE%.

Data elements being evaluated for this rule
\[
\begin{align*}
\text{DB\_NUM\_SYNONYM} & : \&1 \\
\text{DB\_PCT\_NUM\_SYNONYM} & : \&2
\end{align*}
\]

The following data element values are evaluated for the HDAM database or the PHDAM partition:
• The variable &1 specifies a threshold for the data element value of DB\_NUM\_SYNONYM.
• The variable &2 specifies a threshold for the data element value of DB\_PCT\_NUM\_SYNONYM.
The default threshold values for the variable &1 are never reached nor exceeded. It is expected that these values be changed only if you want to monitor the number, rather than or in addition to the percentage, of synonyms.

**Rule: IBM.ROOT_OVERFLOW.10**

IBM.ROOT_OVERFLOW.10 is a simple rule for evaluating the number and the percentage of overflowed HDAM or PHDAM roots.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.ROOT_OVERFLOW.10

**Rule description**

Number of overflowed root segments.

**Resource types supported**

The following resource types are supported by this rule.

- HDAM
- PHDAM
Exception class
EXCESSIVE_HDAM_ROOTS_OVERFLOW

Rule condition expression

\[
\text{OR(}
\begin{align*}
\text{IF(DB_NUM_ROOT_OVFL,GE,} & \& 1 \\
\text{IF(DB_PCT_NUM_ROOT_OVFL,GE,} & \& 2 \\
\text{)} & \\
\text{)}
\end{align*}
\]

Rule condition description

Specify thresholds on the amount of root segment occurrences located in the overflow area of an HDAM database or a PHDAM partition. The thresholds can be specified by a number (DB_NUM_ROOT_OVFL) and a percentage (DB_PCT_NUM_ROOT_OVFL):

\[
\begin{align*}
\text{DB_NUM_ROOT_OVFL: } & \& 1 \\
\text{DB_PCT_NUM_ROOT_OVFL: } & \& 2
\end{align*}
\]

An exception is issued if one of these thresholds is reached or exceeded.

**Tip:** By default, only a threshold on DB_PCT_NUM_ROOT_OVFL is active. If you want to use a threshold on DB_NUM_ROOT_OVFL, set an appropriate value.

Rule exception expression

- EXCEPTION_CLASS(EXCESSIVE_HDAM_ROOTS_OVERFLOW)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template

The number or the percentage of roots in the overflow part in %RESOURCE% has increased

Data elements being evaluated for this rule

\[
\begin{align*}
\text{DB_NUM_ROOT_OVFL} & \& 1 \\
\text{DB_PCT_NUM_ROOT_OVFL} & \& 2
\end{align*}
\]

The following data element values are evaluated for the HDAM database or the PHDAM partition:

- The variable \&1 specifies a threshold for the data element value of DB_NUM_ROOT_OVFL.
- The variable \&2 specifies a threshold for the data element value of DB_PCT_NUM_ROOT_OVFL.

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 1073741824, &amp;2 = 40</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 1073741824, &amp;2 = 50</td>
</tr>
</tbody>
</table>
Table 111. Rule threshold sets for IBM.ROOT_OVERFLOW.10 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>&amp;1 = 1073741824</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 60</td>
</tr>
</tbody>
</table>

The default threshold values for the variable \&1 are never reached nor exceeded.
It is expected that these values be changed only if you want to monitor the number, rather than or in addition to the percentage, of root segments in the overflow.

**Rule: IBM.ROOTS_NOTHOME.10**

IBM.ROOTS_NOTHOME.10 is a simple rule for evaluating the number and the percentage of the roots that are not in home blocks.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.ROOTS_NOTHOME.10

**Rule description**
Number of roots not in home blocks.

**Resource types supported**
The following resource types are supported by this rule.
• HDAM
• PHDAM

**Exception class**
EXCESSIVE_HDAM_ROOTS_NOT_HOME

**Rule condition expression**
\[
\text{OR(}
\text{IF(\text{DB_NUM_ROOT_NOHOME}, \geq, \&1)}
\text{)}
\]
Rule condition description

Specify thresholds on the amount of root segment occurrences that are not located in their home blocks. The thresholds can be specified by a number (DB_NUM_ROOT_NOHOME) and a percentage (DB_PCT_NUM_ROOT_NOHOME):

DB_NUM_ROOT_NOHOME: &1
DB_PCT_NUM_ROOT_NOHOME: &2

An exception is issued if one of these thresholds is reached or exceeded.

You can apply this rule to an HDAM database or a PHDAM partition.

Tip: By default, only a threshold on DB_PCT_NUM_ROOT_NOHOME is active. If you want to use a threshold on DB_NUM_ROOT_NOHOME, set an appropriate value.

Rule exception expression

• EXCEPTION_CLASS(EXCESSIVE_HDAM_ROOTS_NOT_HOME)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template

The number of roots not in their home blocks in %RESOURCE% has increased

Data elements being evaluated for this rule

DB_NUM_ROOT_OVFL : &1
DB_PCT_NUM_ROOT_OVFL: &2

The following data element values are evaluated for the HDAM database or the PHDAM partition:

• The variable &1 specifies a threshold for the data element value of DB_NUM_ROOT_NOHOME.
• The variable &2 specifies a threshold for the data element value of DB_PCT_NUM_ROOT_NOHOME.

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 4294967295</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 10</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 4294967295</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 20</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 4294967295</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 30</td>
</tr>
</tbody>
</table>

The default threshold values for the variable &1 are never reached nor exceeded.
It is expected that these values be changed only if you want to monitor the number, rather than or in addition to the percentage, of root segments that are not in their home blocks.

**Rule: IBM.SEGM_COUNT.10**

IBM.SEGM_COUNT.10 is a simple rule for evaluating the number of segment occurrences.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.SEGM_COUNT.10

**Rule description**

Number of segment occurrences.

**Important:** This rule is not included in any of the IBM-supplied REORG Domain policies. You can use this rule in any of the following ways:

- Replace a similar rule in an existing REORG Domain policy
- Add this rule to one of the existing REORG Domain policies
- Create a REORG Domain policy and add this rule along with other rules

**Resource types supported**

The following resource types are supported by this rule.

- HDAM
- HIDAM
- PHDAM
- PHIDAM
- HISAM
- SHISAM

**Exception class**

EXCESSIVE_SEGMENT_OCCURRENCES
Rule condition expression

OR(
    AOR(
        IF(DB_NUM_SEG, GE, &1)
    )
)

Rule condition description

Specify a threshold on the total number of segment occurrences in a database data set:

DB_NUM_SEG: &1

An exception is issued if the threshold is reached or exceeded in one of the database data sets.

You can apply this rule to a non-partitioned database or a HALDB partition, with the exception of an index or PSINDEX partition.

Rule exception expression

• EXCEPTION_CLASS(EXCESSIVE_SEGMENT_OCCURRENCES)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template

The number of segments in a data set of %RESOURCE% has reached or exceeded a threshold

Data elements being evaluated for this rule

DB_NUM_SEG &1

The variable &1 specifies a threshold for the data element value of DB_NUM_SEG for each data set of the database or the HALDB partition.

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 4294967295</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 4294967295</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 4294967295</td>
</tr>
</tbody>
</table>

The default threshold values for the variable &1 is never reached nor exceeded.

It is expected that these values be changed only if you want to monitor the total number of segments in each data set of the database or the HALDB partition.
Rule: IBM.SEGM_SPREAD.10

IBM.SEGM_SPREAD.10 is a simple rule for evaluating the segment scattering.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
REORG

Rule template type
STANDARD

Rule template name
IBM.SEGM_SPREAD.10

Rule description
Scattered segment occurrences.

Resource types supported
The following resource types are supported by this rule.
- HDAM
- HIDAM
- PHDAM
- PHIDAM

Exception class
EXCESSIVE_SEGMENT_SCATTERING

Rule condition expression

OR(
  AOR(
    IF(DB_PCT_NUM_PTR_DIFF_BLK,GE, &1
    )
    IF(DB_NUM_PTR_DIFF_BLK,GE, &2
    )
  )
)
Rule condition description

Specify thresholds on the amount of physical pointers that point to a different database block. The thresholds can be specified by a percentage (DB_PCT_NUM_PTR_DIFF_BLK) and a number (DB_NUM_PTR_DIFF_BLK):

| DB_PCT_NUM_PTR_DIFF_BLK: &1 |
| DB_NUM_PTR_DIFF_BLK: &2 |

An exception is issued if one of these thresholds is reached or exceeded in one of the database data sets.

You can apply this rule to a non-partitioned HD database or a PHDAM/PHIDAM partition.

Tip: By default, only a threshold on DB_PCT_NUM_PTR_DIFF_BLK is active. If you want to use a threshold on DB_NUM_PTR_DIFF_BLK, set an appropriate value.

Rule exception expression

- EXCEPTION_CLASS(EXCESSIVE_SEGMENT_SCATTERING)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template

A data set of %RESOURCE% has many pointers that point to other blocks or CIs.

Data elements being evaluated for this rule

| DB_PCT_NUM_PTR_DIFF_BLK: &1 |
| DB_NUM_PTR_DIFF_BLK: &2 |

The following data element values are evaluated for each data set that composes the database or the HALDB partition:

- The variable &1 specifies a threshold for the data element value of DB_PCT_NUM_PTR_DIFF_BLK for the data set.
- The variable &2 specifies a threshold for the data element value of DB_NUM_PTR_DIFF_BLK for the data set.

Rule threshold sets

<table>
<thead>
<tr>
<th>Table 114. Rule threshold sets for IBM.SEGM_SPREAD.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold set name</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>LOW</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>MED</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>HIGH</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

The default threshold values for the variable &2 are never reached nor exceeded.

It is expected that these values be changed only if you want to monitor the number rather than or in addition to the percentage.
**Rule: IBM.SLACK_BYTES.10**

IBM.SLACK_BYTES.10 is a simple rule for evaluating the statistics on the slack bytes.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.SLACK_BYTES.10

**Rule description**
Slack byte occurrences.

**Resource types supported**
The following resource types are supported by this rule.

• HDAM
• HIDAM
• PHDAM
• PHIDAM

**Exception class**
EXCESSIVE_SLACK_BYTES

**Rule condition expression**

```
OR(
    AOR(
        IF(DB_AVG_NUM_UNIDENTIFIED, GE, &1)
        IF(DB_NUM_UNIDENTIFIED, GE, &2)
        IF(DB_BYTES_UNIDENTIFIED, GE, &3)
    )
)
```
Rule condition description

Specify thresholds on the amount of slack-byte elements in a database data set. The thresholds can be specified on the average number of slack-byte elements per database block (DB_AVG_NUM_UNIDENTIFIED), the total number of slack-byte elements in a data set (DB_NUM_UNIDENTIFIED), and the total number of bytes consumed by slack bytes in a data set (DB_BYTES_UNIDENTIFIED):

| DB_AVG_NUM_UNIDENTIFIED: &1 |
| DB_NUM_UNIDENTIFIED: &2 |
| DB_BYTES_UNIDENTIFIED: &3 |

An exception is issued if one of these thresholds is reached or exceeded in one of the database data sets. You can apply this rule to a non-partitioned HD database or a PHDAM/PHIDAM partition.

Tip: A slack-byte element is a sequence of bytes that is identified neither as a segment nor a free space. It is a space that is not reused by IMS.

Rule exception expression

- EXCEPTION_CLASS(EXCESSIVE_SLACK_BYTES)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template

The number of unidentified bytes in a data set of %RESOURCE% has reached or exceeded a threshold

Data elements being evaluated for this rule

| DB_AVG_NUM_UNIDENTIFIED: &1 |
| DB_NUM_UNIDENTIFIED: &2 |
| DB_BYTES_UNIDENTIFIED: &3 |

The following data element values are evaluated for each data set that composes the database or the HALDB partition:

- The variable &1 specifies a threshold for the data element value of DB_AVG_NUM_UNIDENTIFIED for the data set.
- The variable &2 specifies a threshold for the data element value of DB_NUM_UNIDENTIFIED for the data set.
- The variable &3 specifies a threshold for the data element value of DB_BYTES_UNIDENTIFIED for the data set.

Rule threshold sets

<table>
<thead>
<tr>
<th>Table 115. Rule threshold sets for IBM.SLACK_BYTES.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold set name</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>LOW</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>MED</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Chapter 23. Domain REORG rules 321
### Table 115. Rule threshold sets for IBM.SLACK_BYTES.10 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>&amp;1 = 40</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 2147483648</td>
</tr>
<tr>
<td></td>
<td>&amp;3 = 8589934592</td>
</tr>
</tbody>
</table>

The default threshold values for the variable &2 and &3 are never reached nor exceeded.

It is expected that these values be changed only if you want to monitor the number or the total number of bytes, rather than or in addition to the percentage, of the unidentified data in each data set of the database or the HALDB partition.

---

**Rule: IBM.UNUSED_RAPS.10**

IBM.UNUSED_RAPS.10 is a simple rule for evaluating the number and the percentage of unused RAPs in an HDAM or PHDAM database.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

REORG

**Rule template type**

STANDARD

**Rule template name**

IBM.UNUSED_RAPS.10

**Rule description**

Percentage of unused root anchor points.

**Important:** This rule is not included in any of the IBM-supplied REORG Domain policies. You can use this rule in any of the following ways:

- Replace a similar rule in an existing REORG Domain policy
- Add this rule to one of the existing REORG Domain policies
- Create a REORG Domain policy and add this rule along with other rules

**Resource types supported**

The following resource types are supported by this rule.

- HDAM
- PHDAM
Exception class
EXCESSIVE_UNUSED_RAPS

Rule condition expression

\[
\text{OR(}
\begin{align*}
\text{IF(} & DB\text{\_NUM\_UNUSED\_RAP}, \geq, \\
& \&1 \\
\text{)} \\
\text{IF(} & DB\text{\_PCT\_NUM\_UNUSED\_RAP}, \geq, \\
& \&2 \\
\text{)}
\end{align*}
\)
\]

Rule condition description
Specify thresholds on the amount of unused root anchor points in an HDAM database or a PHDAM partition. The thresholds can be specified by a number (DB_NUM_UNUSED_RAP) and a percentage (DB_PCT_NUM_UNUSED_RAP):

\[
\begin{align*}
\text{DB\_NUM\_UNUSED\_RAP} & : \&1 \\
\text{DB\_PCT\_NUM\_UNUSED\_RAP} & : \&2
\end{align*}
\]

An exception is issued if one of these thresholds is reached or exceeded.

Tips:
- By default, only a threshold on DB_PCT_NUM_UNUSED_RAP is active. If you want to use a threshold on DB_NUM_UNUSED_RAP, set an appropriate value.
- If you want to monitor imbalanced randomizing, use the rule IBM.RANDOMIZING.10 instead of this rule.

Rule exception expression
- EXCEPTION_CLASS(EXCESSIVE_UNUSED_RAPS)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The number or the percentage of unused RAPs in %RESOURCE% has increased

Data elements being evaluated for this rule

\[
\begin{align*}
\text{DB\_NUM\_UNUSED\_RAP} & : \&1 \\
\text{DB\_PCT\_NUM\_UNUSED\_RAP} & : \&2
\end{align*}
\]

The following data element values are evaluated for the HDAM database or the PHDAM partition:
- The variable \&1 specifies a threshold for the data element value of DB_NUM_UNUSED_RAP.
- The variable \&2 specifies a threshold for the data element value of DB_PCT_NUM_UNUSED_RAP.

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
</table>
| LOW                | \&1 = 4278189825  \\
|                    | \&2 = 10         |
Table 116. Rule threshold sets for IBM.UNUSED_RAPS.10 (continued)

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>MED</td>
<td>&amp;1 = 4278189825</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 20</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 4278189825</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 30</td>
</tr>
</tbody>
</table>

The default threshold values for the variable &1 are never reached nor exceeded. It is expected that these values be changed only if you want to monitor the number, rather than or in addition to the percentage, of unused RAPs.

**Rule: IBM.VL_SEGM_SPLIT.10**

IBM.VL_SEGM_SPLIT.10 is a simple rule for evaluating the number and the percentage of variable-length split segments.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
REORG

**Rule template type**
STANDARD

**Rule template name**
IBM.VL_SEGM_SPLIT.10

**Rule description**
Number of variable-length split segments.

**Resource types supported**
The following resource types are supported by this rule.
- HDAM
- HIDAM
- PHDAM
- PHIDAM
Exception class
EXCESSIVE_VL_SPLIT_SEGMENTS

Rule condition expression

\[
\text{OR(}
\text{AOR(}
\begin{align*}
&\text{IF(DB_PCT_NUM_VLSEG_SPLIT, GE,} \\
&\quad \&1 \\
&\text{)} \\
&\text{IF(DB_NUM_VLSEG_SPLIT, GE,} \\
&\quad \&2 \\
&\text{)}
\end{align*}
\)
\]

Rule condition description
Specify thresholds on the amount of variable-length split segments in a database data set. The thresholds can be specified by a percentage (DB_PCT_NUM_VLSEG_SPLIT) and a number (DB_NUM_VLSEG_SPLIT):

| DB_PCT_NUM_VLSEG_SPLIT: \&1 |
| DB_NUM_VLSEG_SPLIT: \&2 |

An exception is issued if one of these thresholds is reached or exceeded in one of the database data sets. You can apply this rule to a non-partitioned HD database or a PHDAM/PHIDAM partition.

Tip: By default, only a threshold on DB_PCT_NUM_VLSEG_SPLIT is active. If you want to use a threshold on DB_NUM_VLSEG_SPLIT, set an appropriate value.

Rule exception expression

- EXCEPTION_CLASS(EXCESSIVE_VL_SPLIT_SEGMENTS)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The number of variable-length split segments in %RESOURCE% has increased

Data elements being evaluated for this rule

| DB_PCT_NUM_VLSEG_SPLIT \&1 |
| DB_NUM_VLSEG_SPLIT \&2 |

The following data element values are evaluated for each data set that composes the database or the HALDB partition:

- The variable \&1 specifies a threshold for the data element value of DB_PCT_NUM_VLSEG_SPLIT for the data set.
- The variable \&2 specifies a threshold for the data element value of DB_NUM_VLSEG_SPLIT for the data set.
## Rule threshold sets

*Table 117. Rule threshold sets for IBM.VL_SEGM_SPLIT.10*

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 20</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 4294967295</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 30</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 4294967295</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 40</td>
</tr>
<tr>
<td></td>
<td>&amp;2 = 4294967295</td>
</tr>
</tbody>
</table>

The default threshold values for the variable &2 are never reached nor exceeded. It is expected that these values be changed only if you want to monitor the number rather than or in addition to the percentage.
Chapter 24. Domain REORG policies

The domain REORG policies are used to evaluate the database state, and specify how Policy Services responds to any events that reach or exceed the threshold values specified for the state.

**Policy template version**

The policy template version is indicated by a four-byte integer value.

**Maintenance messages**

A descriptive message within the rule that describes the maintenance history information for this policy.

The initial maintenance message is blank because at initial product installation no maintenance has been applied to the policy.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

**Template original name**

The original name of this policy template.

The name always begins with IBM.

**Policy domain**

Defines the domain for which this policy is intended to be used.

For IMS Database Reorganization Expert, the domain name is REORG.

**Policy template type**

Defines the policy template type.

Currently, there is only one type: Basic

**Policy name**

The policy name is same as the name that appears in the title line and is also the same as the template original name.

**Policy description**

Defines in words what database functionality this policy monitors.

**Action description**

Show exceptions and associated severity and actions.

**Notify reference list**

Policies are shipped with no notification lists provided.

You must create your own notification list or lists, and then update this policy to provide one or more of these notification lists.

The list you provide is where the summary notification message is sent.

**Resource type list**

The resource types are all IMS-supported Hierarchical Direct Access Methods.

**Rule list**

List of rules associated with this policy. The policy monitors the evaluation of all these rules and takes action when any rule threshold is met or exceeded (exception).
Rule list history
The initial rule list history is blank because no maintenance has been applied to the rule list for this policy.

When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.

Policy: IBM.DBDTYPE.DEDB
IBM.DBDTYPE.DEDB is a predefined IBM basic policy for DEDB databases.

Policy template version
The policy template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the policy.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

Template original name
IBM.DBDTYPE.DEDB

Policy domain
REORG

Policy template type
BASIC

Policy name
IBM.DBDTYPE.DEDB

Policy description
DEDB policy

Action description
The action for all exceptions of all severity levels for DEDB is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

Notify reference list
Policies are shipped with no notification lists provided.

You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

Resource type list
The following resource types are supported by this policy:
• DEDB
Rule list

The following table summarizes the default rules used in this policy.

SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold Set</th>
<th>Severity Level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.DEDB_DBREC_IO.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_DBREC_IO.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_DBRECCNT.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.30</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.40</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.50</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.60</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.70</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.80</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.30</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.40</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.50</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.60</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.70</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.80</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.90</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_ROOT_IO.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_ROOT_IO.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>Rule</td>
<td>Threshold Set</td>
<td>Severity Level</td>
<td>If comparison data is missing:</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>IBM.DEB.DBREC_CNT.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEB.DBREC_CNT.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEB_DBREC_CNT.30</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEB_DBREC_CNT.40</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEB_DBREC_CNT.50</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEB_DBREC_CNT.60</td>
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<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEB_DBREC_CNT.70</td>
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<td>SKIPEVAL</td>
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<tr>
<td>IBM.DEB_DBREC_CNT.80</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEB_DBREC_CNT.90</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEB_ROOT_IO.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEB_ROOT_IO.20</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
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</table>
### Table 118. Rule list for IBM.DBDTYPE.DEDB (continued)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold Set</th>
<th>Severity Level</th>
<th>If comparison data is missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.DEDB_SEGM_CNT.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_SYN_LEN.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_SYN_LEN.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_DBREC_IO.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_DBREC_IO.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_DBRECCNT.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.30</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.40</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.50</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.60</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.70</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_FS.80</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.30</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.40</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.50</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.60</td>
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<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.70</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.80</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_OVERFLOW.90</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_ROOT_IO.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_ROOT_IO.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>
Table 118. Rule list for IBM.DBDTYPE.DEDB (continued)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold Set</th>
<th>Severity Level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.DEDB_SEGM_CNT.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_SYN_LEN.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DEDB_SYN_LEN.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

**Rule list history**

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.

**Policy: IBM.DBDTYPE.FFDB**

IBM.DBDTYPE.FFDB is a predefined IBM basic policy for full function databases.

**Policy template version**

The policy template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the policy. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

**Template original name**

IBM.DBDTYPE.FFDB

**Policy domain**

REORG

**Policy template type**

BASIC

**Policy name**

IBM.DBDTYPE.FFDB

**Policy description**

Full-function database policy

**Action description**

The following table summarizes exception class and severity level pairs that result in REORG action.
Table 119. REORG action description for exceptions detected by IBM.DBDTYPE.FFDB

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORG</td>
<td>GROWING_DBDS_WITH_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>FRAGMENTED_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_SLACK_BYTES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_VL_SPLIT_SEGMENTS</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_CI_OR_CA_SPLITS</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_HISAM_DELETE_SEGM</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

Note: If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

Notify reference list

Policies are shipped with no notification lists provided.

You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

Resource type list

The following resource types are supported by this policy:

- HDAM
- HIDAM
- PHDAM
- PHIDAM
- HISAM
- SHISAM

Rule list

The following table summarizes the default rules used in this policy.

SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.

EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.

Table 120. Rule list for IBM.DBDTYPE.FFDB

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>Rule</td>
<td>Threshold set</td>
<td>Severity level</td>
<td>If comparison data is missing:</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RANDOMIZING.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RAP_SYNONYMS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HDAM_OVERFLOW.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOT_OVERFLOW.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HISAM_SEG_DEL.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
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<tr>
<td>IBM.DBDS_GROWTH.30</td>
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<td>SKIPEVAL</td>
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<tr>
<td>IBM.FRAGMENTATION.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RANDOMIZING.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
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</table>
Table 120. Rule list for IBM.DBDTYPE.FFDB (continued)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.RAP_SYNONYMS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HDAM_OVERFLOW.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOT_OVERFLOW.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HISAM_SEG_DEL.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
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<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
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<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
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<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RANDOMIZING.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RAP_SYNONYMS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HDAM_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOT_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HISAM_SEG_DEL.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
</tbody>
</table>

**Rule list history**

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.
**Policy: IBM.DBDTYPE.FFDBALL**

IBM.DBDTYPE.FFDBALL is a predefined IBM basic policy for full function databases and index databases.

**Policy template version**
The policy template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the policy. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

**Template original name**
IBM.DBDTYPE.FFDBALL

**Policy domain**
REORG

**Policy template type**
BASIC

**Policy name**
IBM.DBDTYPE.FFDBALL

**Policy description**
Full-function database and index policy

**Action description**
The following table summarizes exception class and severity level pairs that result in REORG action.

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORG</td>
<td>GROWING_DBDS_WITH_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>FRAGMENTED_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_SLACK_BYTES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_VL_SPLIT_SEGMENTS</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_CI_OR_CA_SPLITS</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_HISAM_DELETE_SEGM</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>DAYS_PASSED_SINCE_LAST_REORG</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>INDEXBLD</td>
<td>EXCESSIVE_INDEX_CI_OR_CA_SPLITS</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>
Note: If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

Notify reference list
Policies are shipped with no notification lists provided.
You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

Resource type list
The following resource types are supported by this policy:
• HDAM
• HIDAM
• PHDAM
• PHIDAM
• HISAM
• SHISAM

Rule list
The following table summarizes the default rules used in this policy.
SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.
EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.

Table 122. Rule list for IBM.DBDTYPE.FFDBALL

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>Rule</td>
<td>Threshold set</td>
<td>Severity level</td>
<td>If comparison data is missing:</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>IBM.RANDOMIZING.10</td>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
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<tr>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
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<tr>
<td>IBM.HDAM_OVERFLOW.10</td>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
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<tr>
<td>IBM.ROOT_OVERFLOW.10</td>
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<td>SKIPEVAL</td>
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<td>IBM.CICA_SPLITS.10</td>
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<td>SKIPEVAL</td>
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<td>CRITICAL</td>
<td>EVALUATE</td>
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<td>SKIPEVAL</td>
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<td>IBM.AVG_DBREC_LEN.10</td>
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<td>SKIPEVAL</td>
</tr>
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<td>EVALUATE</td>
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<td>SKIPEVAL</td>
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<td>IBM.VL_SEGM_SPLIT.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>Rule</td>
<td>Threshold set</td>
<td>Severity level</td>
<td>If comparison data is missing:</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>-------------------------------</td>
</tr>
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<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RANDOMIZING.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
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<td>IBM.RAP_SYNONYMS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
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<tr>
<td>IBM.HDAM_OVERFLOW.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOT_OVERFLOW.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
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<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HISAM_SEG_DEL.10</td>
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<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
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<td>IBM.IX_NUM_SEGM.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
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<tr>
<td>IBM.IX_OVERFLOW.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.10</td>
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<td>SEVERE</td>
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</tr>
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<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.11</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.21</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.11</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
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<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
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</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
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<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>
Table 122. Rule list for IBM.DBDTYPE.FFDBALL (continued)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RANDOMIZING.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RAP_SYNONYMS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HDAM_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOT_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HISAM_SEG_DEL.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_NUM_SEGM.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.11</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.11</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.21</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.11</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

Rule list history

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.
IBM.DBDTYPE.HDAM is a predefined IBM basic policy for HDAM databases.

**Policy template version**
The policy template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the policy.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

**Template original name**
IBM.DBDTYPE.HDAM

**Policy domain**
REORG

**Policy template type**
BASIC

**Policy name**
IBM.DBDTYPE.HDAM

**Policy description**
HDAM database policy.

**Action description**
The following table summarizes exception class and severity level pairs that result in REORG action.

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORG</td>
<td>GROWING_DBDS_WITH_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>FRAGMENTED_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_SLACK_BYTES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_VL_SPLIT_SEGMENTS</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

**Note:** If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

**Notify reference list**
Policies are shipped with no notification lists provided.
You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

**Resource types supported**

The following resource types are supported by this policy:

- HDAM

**Rule list**

The following table summarizes the default rules used in this policy.

SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.

EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
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<td>IBM.SEGM_SPREAD.10</td>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RAP_SYNONYMS.10</td>
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<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
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<td>CRITICAL</td>
<td>SKIPEVAL</td>
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<td>IBM.HDAM_OVERFLOW.10</td>
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<td>SKIPEVAL</td>
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<td>IBM.ROOT_OVERFLOW.10</td>
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<td>IBM.AVG_DBREC_LEN.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>Rule</td>
<td>Threshold set</td>
<td>Severity level</td>
<td>If comparison data is missing:</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
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<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
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<tr>
<td>IBM.FRAGMENTATION.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
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<tr>
<td>IBM.SEGM_SPREAD.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RANDOMIZING.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RAP_SYNONYMS.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HDAM_OVERFLOW.10</td>
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<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOT_OVERFLOW.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
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<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
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<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RANDOMIZING.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RAP_SYNONYMS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HDAM_OVERFLOW.10</td>
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<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
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</table>
Table 124. Rule list for IBM.DBDTYPE.HDAM (continued)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.ROOT_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

Rule list history

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.

Policy: IBM.DBDTYPE.HDDB

IBM.DBDTYPE.HDDB is a predefined IBM basic policy for HD databases.

Policy template version

The policy template version is indicated by a four-byte integer value.

Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the policy. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

Template original name

IBM.DBDTYPE.HDDB

Policy domain

REORG

Policy template type

BASIC

Policy name

IBM.DBDTYPE.HDDB

Policy description

HD database policy.

Action description

The following table summarizes exception class and severity level pairs that result in REORG action.

*Table 125. REORG action description for exceptions detected by IBM.DBDTYPE.HDDB*

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORG</td>
<td>GROWING_DBDS_WITH_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>
Table 125. REORG action description for exceptions detected by IBM.DBDTYPE.HDDB (continued)

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORG</td>
<td>FRAGMENTED_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_SLACK_BYTES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_VL_SPLIT_SEGMENTS</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

Note: If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

Notify reference list

Policies are shipped with no notification lists provided.

You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

Resource types supported

The following resource types are supported by this policy:

- HDAM
- PHDAM
- HIDAM
- PHIDAM

Rule list

The following table summarizes the default rules used in this policy.

SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.

EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.

Table 126. Rule list for IBM.DBDTYPE.HDDB

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>Rule</td>
<td>Threshold set</td>
<td>Severity level</td>
<td>If comparison data is missing:</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RANDOMIZING.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RAP_SYNONYMS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HDAM_OVERFLOW.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOT_OVERFLOW.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RANDOMIZING.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RAP_SYNONYMS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HDAM_OVERFLOW.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOT_OVERFLOW.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
</tbody>
</table>
Table 126. Rule list for IBM.DBDTYPE.HDDB (continued)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RANDOMIZING.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.RAP_SYNONYMS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOTS_NOTHOME.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HDAM_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.ROOT_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

Rule list history
The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.

Policy: IBM.DBDTYPE.HIDAM

IBM.DBDTYPE.HIDAM is a predefined IBM basic policy for HIDAM databases.

Policy template version
The policy template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the policy. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

Template original name
IBM.DBDTYPE.HIDAM

Policy domain
REORG
Policy template type
BASIC

Policy name
IBM.DBDTYPE.HIDAM

Policy description
HIDAM database policy.

Action description
The following table summarizes exception class and severity level pairs that result in REORG action.

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORG</td>
<td>GROWING_DBDS_WITH_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>FRAGMENTED_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_SLACK_BYTES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_VL_SPLIT_SEGMENTS</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

Note: If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

Notify reference list
Policies are shipped with no notification lists provided.
You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

Resource types supported
The following resource types are supported by this policy:
• HIDAM

Rule list
The following table summarizes the default rules used in this policy.

SKIPCPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.

EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.
<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>
Rule list history

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.

**Policy: IBM.DBDTYPE.HISAM**

IBM.DBDTYPE.HISAM is a predefined IBM basic policy for HISAM databases.

**Policy template version**

The policy template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the policy. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

**Template original name**

IBM.DBDTYPE.HISAM

**Policy domain**

REORG

**Policy template type**

BASIC

**Policy name**

IBM.DBDTYPE.HISAM

**Policy description**

HISAM database policy.

**Action description**

The following table summarizes exception class and severity level pairs that result in REORG action.
Table 129. REORG action description for exceptions detected by IBM.DBDTYPE.HISAM

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORG</td>
<td>GROWING_DBDS_WITH_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_CI_OR_CA_SPLITS</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_HISAM_DELETE_SEGM</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

**Note:** If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

**Resource types supported**

The following resource types are supported by this policy:

- HISAM

**Notify reference list**

Policies are shipped with no notification lists provided.

You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

**Rule list**

The following table summarizes the default rules used in this policy.

SKIIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.

EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.

Table 130. Rule list for IBM.DBDTYPE.HISAM

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIIPEVAL</td>
</tr>
<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIIPEVAL</td>
</tr>
<tr>
<td>IBM.HISAM_SEG_DEL.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIIPEVAL</td>
</tr>
</tbody>
</table>
Table 130. Rule list for IBM.DBDTYPE.HISAM (continued)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HISAM_SEG_DEL.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HISAM_SEG_DEL.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
</tbody>
</table>

Rule list history
The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.

Policy: IBM.DBDTYPE.INDEX

IBM.DBDTYPE.INDEX is a predefined IBM basic policy for non-partitioned index databases.

Policy template version
The policy template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the policy. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

Template original name
IBM.DBDTYPE.INDEX
Policy domain
REORG

Policy template type
BASIC

Policy name
IBM.DBDTYPE.INDEX

Policy description
Index policy for non-partitioned index.

Action description
The following table summarizes exception class and severity level pairs that result in REORG action.

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDEXBLD</td>
<td>EXCESSIVE_INDEX_CI_OR_CA_SPLITS</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>MESSAGE</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Note: If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

Notify reference list
Policies are shipped with no notification lists provided.
You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

Resource type list
The following resource types are supported by this policy:
- INDEX

Rule list
The following table summarizes the default rules used in this policy.
SKIP_EVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.
EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.
<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.IX_NUM_SEGM.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_OVERFLOW.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_NUM_SEGM.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_OVERFLOW.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_NUM_SEGM.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

**Rule list history**

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.

**Policy: IBM.DBDTYPE.PHDAM**

IBM.DBDTYPE.PHDAM is a predefined IBM basic policy for PHDAM partitions.

**Policy template version**

The policy template version is indicated by a four-byte integer value.
Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the policy. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

Template original name
IBM.DBDTYPE.PHDAM

Policy domain
REORG

Policy template type
BASIC

Policy name
IBM.DBDTYPE.PHDAM

Policy description
PHDAM partition policy.

Action description
The following table summarizes exception class and severity level pairs that result in REORG action.

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORG</td>
<td>GROWING_DBDS_WITH_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>FRAGMENTED_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_SLACK_BYTES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_VL_SPLIT_SEGMENTS</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

Note: If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

Notify reference list
Policies are shipped with no notification lists provided.

You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

Resource type list
The following resource type is supported by this policy:
• PHDAM
Rule list

The following table summarizes the default rules used in this policy.

SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.

EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.

Table 134. Rule list for IBM.DBDTYPE.PHDAM

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUM_DBCRECORDS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>AVG_DBCREC_LEN.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>DBDS_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>DBDS_GROWTH.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>DBDS_GROWTH.30</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>FRAGMENTATION.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>VL_SEGM_SPLIT.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>SLACK_BYTES.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>SEGM_SPREAD.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>RANDOMIZING.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>RAP_SYNONYMS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>ROOTS_NOTHOME.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>HDAM_OVERFLOW.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>ROOT_OVERFLOW.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>NUM_DBCRECORDS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>AVG_DBCREC_LEN.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>DBDS_EXTENTS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>DBDS_GROWTH.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>DBDS_GROWTH.30</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>FRAGMENTATION.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>
Table 134. Rule list for IBM.DBDTYPE.PHDAM (continued)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>VL_SEGM_SPLIT.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>SLACK_BYTES.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>SEGM_SPREAD.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>RANDOMIZING.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>RAP_SYNONYMS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>ROOTS_NOTHOME.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>HDAM_OVERFLOW.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>ROOT_OVERFLOW.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>NUM_DBRECORDS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>AVG_DBREC_LEN.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>DBDS_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>DBDS_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>DBDS_GROWTH.30</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>FRAGMENTATION.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>VL_SEGM_SPLIT.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>SLACK_BYTES.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>SEGM_SPREAD.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>RANDOMIZING.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>RAP_SYNONYMS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>ROOTS_NOTHOME.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>HDAM_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>ROOT_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

**Rule list history**

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.
**Policy: IBM.DBDTYPE.PHIDAM**

IBM.DBDTYPE.PHIDAM is a predefined IBM basic policy for PHIDAM partitions.

**Policy template version**

The policy template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the policy. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

**Template original name**

IBM.DBDTYPE.PHIDAM

**Policy domain**

REORG

**Policy template type**

BASIC

**Policy name**

IBM.DBDTYPE.PHIDAM

**Policy description**

PHIDAM partition policy.

**Action description**

The following table summarizes exception class and severity level pairs that result in REORG action.

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORG</td>
<td>GROWING_DBDS_WITH_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>FRAGMENTED_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_SLACK_BYTES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_VL_SPLIT_SEGMENTS</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

**Note:** If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

**Resource types supported**

The following resource types are supported by this policy:

- PHIDAM
**Notify reference list**

Policies are shipped with no notification lists provided.

You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

**Rule list**

The following table summarizes the default rules used in this policy.

SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.

EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.

*Table 136. Rule list for IBM.DBDTYPE.PHIDAM*

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>
Table 136. Rule list for IBM.DBDTYPE.PHIDAM (continued)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

Rule list history
The initial rule list history is blank because no maintenance has been applied to the rule list for this policy.
When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.

Policy: IBM.DBDTYPE.PHIDAM.A
IBM.DBDTYPE.PHIDAM.A is a predefined IBM basic policy for PHIDAM partitions and index databases.

Policy template version
The policy template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the policy.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

Template original name
IBM.DBDTYPE.PHIDAM.A

Policy domain
REORG
Policy template type
BASIC

Policy name
IBM.DBDTYPE.PHIDAM.A

Policy description
PHIDAM partition policy with index rules

Action description
The following table summarizes exception class and severity level pairs that result in REORG action.

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORG</td>
<td>GROWING_DBDS_WITH_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>FRAGMENTED_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_SLACK_BYTES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_VL_SPLIT_SEGMENTS</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>INDEXBLD</td>
<td>EXCESSIVE_INDEX_CI_OR_CA_SPLITS</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>MESSAGE</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Note: If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

Notify reference list
Policies are shipped with no notification lists provided.
You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

Resource type list
The following resource types are supported by this policy:
• PHIDAM

Rule list
The following table summarizes the default rules used in this policy.

SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.

EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.
<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_NUM_SEGM.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.11</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.11</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.21</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.11</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_NUM_SEGM.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.11</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
</tbody>
</table>
Table 138. Rule list for IBM.DBDTYPE.PHIDAM.A (continued)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.IX_GROWTH.11</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.21</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.11</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.FRAGMENTATION.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.VL_SEGM_SPLIT.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SLACK_BYTES.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.SEGM_SPREAD.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_NUM_SEGM.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.11</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.11</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.21</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.11</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

**Rule list history**

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.

**Policy: IBM.DBDTYPE.PSINDEX**

IBM.DBDTYPE.PSINDEX is a predefined IBM basic policy for PSINDEX partitions.

**Policy template version**

The policy template version is indicated by a four-byte integer value.
Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the policy. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

Template original name
IBM.DBDDTYPE.PSINDEX

Policy domain
REORG

Policy template type
BASIC

Policy name
IBM.DBDDTYPE.PSINDEX

Policy description
Index policy for PSINDEX partition

Action description
The following table summarizes exception class and severity level pairs that result in REORG action.

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDEXBLD</td>
<td>EXCESSIVE_INDEX_CI_OR_CA_SPLITS</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>MESSAGE</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Note: If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

Notify reference list
Policies are shipped with no notification lists provided.
You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

Resource type list
The following resource types are supported by this policy:
• PSINDEX

Rule list
The following table summarizes the default rules used in this policy.
SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.
EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.

Table 140. Rule list for IBM.DBDTYPE.PSINDEX

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.IX_NUM_SEGM.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_OVERFLOW.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_NUM_SEGM.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_OVERFLOW.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_NUM_SEGM.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_OVERFLOW.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IX_CICA_SPLIT.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

Rule list history

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.
Policy: IBM.DBDTYPE.SHISAM

IBM.DBDTYPE.SHISAM is a predefined IBM basic policy for SHISAM databases.

Policy template version
The policy template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the policy.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

Template original name
IBM.DBDTYPE.SHISAM

Policy domain
REORG

Policy template type
BASIC

Policy name
IBM.DBDTYPE.SHISAM

Policy description
SHISAM database policy.

Action description
The following table summarizes exception class and severity level pairs that result in REORG action.

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORG</td>
<td>GROWING_DBDS_WITH_FREE_SPACES</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>REORG</td>
<td>EXCESSIVE_CI_OR_CA_SPLITS</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

Note: If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 25, “Domain REORG exceptions,” on page 369.

Resource types supported
The following resource types are supported by this policy:

- SHISAM

Notify reference list
Policies are shipped with no notification lists provided.
You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

**Rule list**

The following table summarizes the default rules used in this policy.

SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.

EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NUM_DBRECORDS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.AVG_DBREC_LEN.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_EXTENTS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.20</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.DBDS_GROWTH.30</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.CICA_SPLITS.10</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>
**Rule list history**

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.
Chapter 25. Domain REORG exceptions

The domain REORG exceptions define the response to any database state that crosses the defined threshold boundaries.

Table 143. Exceptions for the REORG policy domain

<table>
<thead>
<tr>
<th>Exception class</th>
<th>Exception description</th>
<th>Originating rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVERAGE_DB_RECORD_LENGTH</td>
<td>Excessive average length of database records</td>
<td>IBM.AVG_DBREC_LEN.10</td>
</tr>
<tr>
<td>DATA_SET_EXTENTS_AVAILABILITY</td>
<td>Limited availability of data set extents</td>
<td>IBM.DBDS_EXTENTS.10</td>
</tr>
<tr>
<td>DATA_SET_SIZE_GROWTH</td>
<td>Excessive growth in one or more data sets</td>
<td>IBM.DBDS_GROWTH.10</td>
</tr>
<tr>
<td>DATA_VOLUME_IN_HDAM_RAA</td>
<td>Excessive volume of data in root addressable area</td>
<td>IBM.RAA_DENSITY.10</td>
</tr>
<tr>
<td>DEDB_FREE_SPACE_AVAIL_IN_RAA</td>
<td>Insufficient free space available in RAA BASE</td>
<td>IBM.DEDB_FS.10</td>
</tr>
<tr>
<td>DEDB_FREE_SPACE_AVAIL_IN_DOVF</td>
<td>Insufficient free space available in DOVF</td>
<td>IBM.DEDB_FS.20</td>
</tr>
<tr>
<td>DEDB_FREE_SPACE_AVAIL_IN_IOVF</td>
<td>Insufficient free space available in IOVF</td>
<td>IBM.DEDB_FS.30</td>
</tr>
<tr>
<td>DEDB_FREE_SPACE_IN_RAA_VS_DOVF</td>
<td>Insufficient free space in DOVF compared to RAA</td>
<td>IBM.DEDB_FS.40</td>
</tr>
<tr>
<td>DEDB_FREE_SPACE_IN_RAA_VS_IOVF</td>
<td>Insufficient free space in IOVF compared to RAA</td>
<td>IBM.DEDB_FS.50</td>
</tr>
<tr>
<td>DEDB_FREE_SPACE_AVAIL_IN_OVFLOW</td>
<td>Insufficient free space in the overflow part</td>
<td>IBM.DEDB_FS.60</td>
</tr>
<tr>
<td>DEDB_FREE_SPACE_IN_RAA_VS_OVFLOW</td>
<td>Insufficient free space in OVFLOW compared to RAA</td>
<td>IBM.DEDB_FS.70</td>
</tr>
<tr>
<td>DEDB_FREE_SPACE_AVAIL_IN_SDEP</td>
<td>Insufficient free space available in SDEP</td>
<td>IBM.DEDB_FS.80</td>
</tr>
<tr>
<td>DEDB_EXCESSIVE_AVG_NUM_RECORD_IO</td>
<td>Excessive average number of I/Os per DB record</td>
<td>IBM.DEDB_DBREC_IO.10</td>
</tr>
<tr>
<td>DEDB_DBRECORD_WITH_EXCESSIVE_IO</td>
<td>DB record that requires excessive number of I/Os</td>
<td>IBM.DEDB_DBREC_IO.20</td>
</tr>
<tr>
<td>DEDB_EXCESSIVE_AVG_NUM_ROOT_IO</td>
<td>Excessive average number of I/Os per root segment</td>
<td>IBM.DEDB_ROOT_IO.10</td>
</tr>
<tr>
<td>Exception class</td>
<td>Exception description</td>
<td>Originating rule</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>DEDB_ROOT_SEGMENT_WITH_EXCESS_IO</td>
<td>Root segment that requires excessive number of I/O</td>
<td>IBM.DEDB_ROOT_IO.20</td>
</tr>
<tr>
<td>DEDB_EXCESSIVE_AVG_LEN_SYNONYMS</td>
<td>Excessive average length of RAP synonym chains</td>
<td>IBM.DEDB_SYN_LEN.10</td>
</tr>
<tr>
<td>DEDB_LONG_SYNONYM_CHAIN</td>
<td>Excessive length of a RAP synonym chain</td>
<td>IBM.DEDB_SYN_LEN.20</td>
</tr>
<tr>
<td>DEDB_EXCESS_PCT_UOWS_USING_DOVF</td>
<td>Excessive number of UOWs that use DOVF CIs</td>
<td>IBM.DEDB_OVERFLOW.10</td>
</tr>
<tr>
<td>DEDB_EXCESS_PCT_UOWS_USING_IOVF</td>
<td>Excessive percentage of UOWs that use IOVF CIs</td>
<td>IBM.DEDB_OVERFLOW.20</td>
</tr>
<tr>
<td>DEDB_EXCESS_NUM_UOWS_USING_IOVF</td>
<td>Excessive number of UOWs that use IOVF CIs</td>
<td>IBM.DEDB_OVERFLOW.30</td>
</tr>
<tr>
<td>DEDB_EXCESS_AVG_IOVF_CI_PER_UOW</td>
<td>Excessive average number of IOVF CIs per UOW</td>
<td>IBM.DEDB_OVERFLOW.40</td>
</tr>
<tr>
<td>DEDB_UOW_USING_EXCESSIVE_IOVF_CI</td>
<td>UOW that uses excessive number of IOVF CIs</td>
<td>IBM.DEDB_OVERFLOW.50</td>
</tr>
<tr>
<td>DEDB_EXCESS_MIN_IOVF_CI_PER_UOW</td>
<td>Excessive use of IOVF CIs by every UOW</td>
<td>IBM.DEDB_OVERFLOW.60</td>
</tr>
<tr>
<td>DEDB_EXCESSIVE_IOVF_CI_USED</td>
<td>Excessive number of IOVF CIs used</td>
<td>IBM.DEDB_OVERFLOW.70</td>
</tr>
<tr>
<td>DEDB_EXCESS_RAP_CI_USING_OVFLOW</td>
<td>Excessive number of RAP CIs that use overflow</td>
<td>IBM.DEDB_OVERFLOW.80</td>
</tr>
<tr>
<td>DEDB_EXCESSIVE_DBREC_USING_IOVF</td>
<td>Excessive number of DB records that use IOVF</td>
<td>IBM.DEDB_OVERFLOW.90</td>
</tr>
<tr>
<td>EXCESSIVE_CI_OR_CA_SPLITS</td>
<td>Excessive number of VSAM CI/CA splits</td>
<td>IBM.CICA_SPLITS.10</td>
</tr>
<tr>
<td>EXCESSIVE_UNUSED_RAPS</td>
<td>Excessive number of unused root anchor points</td>
<td>IBM.UNUSED_RAPS.10</td>
</tr>
<tr>
<td>EXCESSIVE_HDAM_ROOTS_NOT_HOME</td>
<td>Excessive number of roots not in home blocks</td>
<td>IBM.ROOTS_NOTHOME.10</td>
</tr>
<tr>
<td>EXCESSIVE_HDAM_OVERFLOW</td>
<td>Excessive volume of data in (P)HDAM overflow area</td>
<td>IBM.HDAM_OVERFLOW.10</td>
</tr>
<tr>
<td>EXCESSIVE_HDAM_ROOTS_OVERFLOW</td>
<td>Excessive number of roots in (P)HDAM overflow area</td>
<td>IBM.ROOT_OVERFLOW.10</td>
</tr>
<tr>
<td>Exception class</td>
<td>Exception description</td>
<td>Originating rule</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>EXCESSIVE_HISAM_DELETE_SEGM</td>
<td>Excessive number of deleted segments in HISAM</td>
<td>IBM.HISAM_SEG_DEL.10</td>
</tr>
</tbody>
</table>
| EXCESSIVE_INDEX_CI_OR_CA_SPLITS | Excessive number of VSAM CI/CA splits | • IBM.IX_CICA_SPLIT.10  
• IBM.IX_CICA_SPLIT.11 |
| EXCESSIVE_INDEX_OVERFLOW | Excessive number of IPSs in overflow | IBM.IX_OVERFLOW.10  
*Important:* This rule is not applicable to non-partitioned or PHIDAM primary indexes. |
| EXCESSIVE_RAP_SYNONYMS | Excessive number of synonyms on root anchor points | IBM.RAP_SYNONYMS.10 |
| EXCESSIVE_SEGMENT_OCCURRENCES | Excessive number of segments in data set(s) | **Full function database resources:**  
IBM.SEVER_COUNT.10  
**DEDB areas:**  
IBM.DEDB_SEGM_CNT.10 |
| EXCESSIVE_SEGMENT_SCATTERING | Excessive number of extensively scattered segments | IBM.SEVER_SPREAD.10 |
| EXCESSIVE_SLACK_BYTES | Excessive number of slack bytes in data set(s) | IBM.SLACK_BYTES.10 |
| EXCESSIVE_VL_SPLIT_SEGMENTS | Excessive number of variable-length split segments | IBM.VL_SEGM_SPLIT.10 |
| FRAGMENTED_FREE_SPACES | Excessive free space fragmentation in data set(s) | IBM.FRAGMENTATION.10 |
| FREE_SPACE_AVAILABILITY | Insufficient free space available in data set(s) | IBM.FREE_SPACES.10 |
| GROWING_DBDS_WITH_DATA_FULL | Data set(s) full and approaching the size limit | IBM.DBDS_GROWTH.30 |
| GROWING_DBDS_WITH_FREE_SPACES | Large data set with high rate of total free space | IBM.DBDS_GROWTH.20 |
| GROWING_INDEX_WITH_DATA_FULL | Data set(s) full and approaching the size limit | • IBM.IX_GROWTH.20  
• IBM.IX_GROWTH.21 |
| IMBALANCEDRANDOMIZING | Imbalanced randomizing and inefficient use of RAPs | IBM.RANDOMIZING.10 |
| INDEX_EXTENTS_AVAILABILITY | Limited availability of data set extents in index | • IBM.IX_EXTENTS.10  
• IBM.IX_EXTENTS.11 |
<table>
<thead>
<tr>
<th>Exception class</th>
<th>Exception description</th>
<th>Originating rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDEX_SIZE_GROWTH</td>
<td>Excessive growth in one or more data set</td>
<td>• IBM.IX_GROWTH.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• IBM.IX_GROWTH.11</td>
</tr>
<tr>
<td>NUMBER_OF_DB_RECORDS</td>
<td>Excessive number of database records</td>
<td>Full function database resources:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IBM.NUM_DBRECORDS.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DEDB areas:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IBM.DEDB_DBRECCNT.10</td>
</tr>
<tr>
<td>NUMBER_OF_INDEX_POINTER_SEGMENTS</td>
<td>Excessive number of Index Pointer Segments</td>
<td>IBM.IX_NUM_SEGM.10</td>
</tr>
<tr>
<td>DEDB_IOVF_NEEDS_TO_BE_EXTENDED</td>
<td>The IOVF section needs to be extended</td>
<td>IBM.DEDB_FS.31</td>
</tr>
<tr>
<td>DEDB_SDEP_NEEDS_TO_BE_EXTENDED</td>
<td>The SDEP section needs to be extended</td>
<td>IBM.DEDB_FS.81</td>
</tr>
<tr>
<td>DEDB_EXCESSIVE_UOWS_MATCH_COND</td>
<td>Excessive number of UOWs match the RFS condition</td>
<td>IBM.DEDB_RFS.10</td>
</tr>
<tr>
<td>DEDB_EXCESS_PCT_UOWS_MATCH_COND</td>
<td>Excessive percentage of UOWs match the RFS condition</td>
<td>IBM.DEDB_RFS.20</td>
</tr>
<tr>
<td>DEDB_NEEDS_TO_BE_REORGANIZED</td>
<td>The area needs to be reorganized</td>
<td>IBM.DEDB_RFS.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IBM.DEDB_RFS.21</td>
</tr>
<tr>
<td>DAYS_PASSED_SINCE_LAST_REORG</td>
<td>Excessive number of days have passed since the last reorganization</td>
<td>IBM.LAST_REORG.10</td>
</tr>
<tr>
<td>HDAM_AVG_SYNONYM_CHAIN_LENGTH</td>
<td>Excessive average length of HDAM synonym chains</td>
<td>IBM.HDAM_SYN_LEN.10</td>
</tr>
<tr>
<td>FRAGMENTED_FREE_SPACE_ELEMENTS</td>
<td>Excessive percentage of fragmented FSEs</td>
<td>IBM.FFDB_FRAGDFSE.10</td>
</tr>
<tr>
<td>NONREUSABLE_FREE_SPACE_ELEMENTS</td>
<td>Excessive percentage of nonreusable FSEs</td>
<td>IBM.FFDB_NREUSFSE.10</td>
</tr>
</tbody>
</table>
Part 7. Reference: Domain RECOVERY

The topics in this section provide you with supplemental technical references for the Policy Services RECOVERY domain.

Topics:

• Chapter 26, “Domain RECOVERY rules,” on page 375
• Chapter 27, “Domain RECOVERY policies,” on page 391
• Chapter 28, “Domain RECOVERY exceptions,” on page 397
• Chapter 29, “Domain RECOVERY actions,” on page 399
Chapter 26. Domain RECOVERY rules

The domain RECOVERY rules are used to compare the stored data element values against the predefined threshold values that specify the limits for a set of data element values.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

A descriptive message within the rule that describes the maintenance history information for this rule.

The initial maintenance message is blank because at initial product installation no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

Defines the domain for which this rule is intended to be used.

**Rule template type**

Defines the rule template type.

Currently, there is only one type: Standard

**Rule template name**

The name of this rule template.

**Rule description**

Defines in words what database functionality this rule evaluates.

**Resource types supported**

The resource types are all IMS-supported Hierarchical Direct Access Methods.

**Exception class**

The exception class represents the type of exception that can be raised by this rule.

**Rule condition expression**

The actual condition expression that is applied to the list of data elements for this rule.

**Rule condition description**

Describes in words what the rule condition expression is doing.

**Rule exception expression**

The rule exception expression consists of the following items:

- Exception class
- Exception level
- Exception message

These lines in the rule template file are used only as the template for building rule definition streams that are included in various policy definition streams. The actual exception severity level for a rule is determined by the enclosing individual policy stream. The EXCEPTION_LEVEL(WARNING) statement is then overridden by the actual exception severity level that the policy creator (IBM or a user) assigned for a threshold level.

**Rule message template**

Defines the actual message that is sent to the notification list when the condition is met.
The following condition applies to the default exception messages that are shown in the rule message template section of each rule topic: %RESOURCE% is the IMS database that encountered the exception. %EXCPCOMP% is a list of data sets that encountered the exception.

**Data elements being evaluated for this rule**
The data element is the smallest named unit of information having predefined attributes.

**Rule threshold sets**
The set of threshold values that are initially set by IBM. There are two sets of threshold values:
- Original values set by IBM that cannot be changed
- Original values initially set by IBM that can be modified

**Rule: IBM.BACKOUT_NEEDED**
IBM.BACKOUT_NEEDED is a simple rule for checking RECON BACKOUT NEEDED flag for a database resource.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
RECOVERY

**Rule template type**
STANDARD

**Rule template name**
IBM.BACKOUT_NEEDED

**Rule description**
RECON BACKOUT NEEDED flag for a database resource.

**Resource types supported**
The following resource types are supported by this rule.
- HDAM
- HIDAM
- HISAM
- SHISAM
- PHDAM
- PHIDAM
- DEDB
- INDEX
Exception class
DATABASE_NEEDS_TO_BE_BACKED_OUT

Rule condition expression

\[ \text{OR(} \text{IF(DB\_DBRC\_BACKOUT\_NEEDED, IS, \&1) } \) \]

Rule condition description
If the RECON BACKOUT NEEDED flag is set to ON for a database resource, the following data element value will be set to Y and an exception will be reported:

DB\_DBRC\_BACKOUT\_NEEDED: \&1

You can apply this rule to any non-HALDB database, HALDB partition, or DEDB area.

Note: The threshold value cannot be changed for this rule, and only the exception level can be controlled.

Rule exception expression

• EXCEPTION\_CLASS(DATABASE\_NEEDS\_TO\_BE\_BACKED\_OUT)
• EXCEPTION\_LEVEL(WARNING)
• EXCEPTION\_MESSAGE

Rule message template
RECON BACKOUT NEEDED flag is turned ON for the database resource %RESOURCE%.

Data elements being evaluated for this rule

DB\_DBRC\_BACKOUT\_NEEDED \&1

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>&amp;1 = Y</td>
</tr>
</tbody>
</table>

Rule: IBM.EEQE_COUNT
IBM.EEQE_COUNT is a simple rule for evaluating the number of Extended Error Queue Elements for each data set of a database resource.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
RECOVERY

**Rule template type**
STANDARD

**Rule template name**
IBM.EEQE_COUNT

**Rule description**
Number of EEQEs for each data set of a DB resource.

**Resource types supported**
The following resource types are supported by this rule.
- HDAM
- HIDAM
- HISAM
- SHISAM
- PHDAM
- PHIDAM
- DEDB
- INDEX
- PSINDEX

**Exception class**
DATABASE_NEEDS_TO_BE_RECOVERED

**Rule condition expression**

```plaintext
OR(
  IF(DB_DBRC_EEQE_COUNT,GE,
     &1
   )
)
```

**Rule condition description**
Specify a threshold on the number of Extended Error Queue Elements for a data set.

`DB_DBRC_EEQE_COUNT: &1`

An exception is issued if the threshold is reached or exceeded in one of the data sets of the database or partition or in a DEDB area.

**Rule exception expression**

- EXCEPTION_CLASS(DATABASE_NEEDS_TO_BE_RECOVERED)
- EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

**Rule message template**
The number of EEQE has reached or exceeded a threshold for the following data sets of the resource %RESOURCE%: %EXCPCOMP%.

**Data elements being evaluated for this rule**

| DB_DBRC_EEQE_COUNT | &1 |

**Rule threshold sets**

*Table 145. Rule threshold sets for IBM.EEQE_COUNT*

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 1</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 2</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 3</td>
</tr>
</tbody>
</table>

**Rule: IBM.HRS_SINCE_LASTCA**

IBM.HRS_SINCE_LASTCA is a simple rule for evaluating the elapsed hours since the last change accumulation performed for a RECON change accumulation group.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
RECOVERY

**Rule template type**
STANDARD

**Rule template name**
IBM.HRS_SINCE_LASTCA

**Rule description**
Elapsed hours since last CA for CAGRP.

**Resource types supported**
CAGRP
Exception class
CHANGE_ACCUM_NEEDS_TO_BE_DONE

Rule condition expression

```
OR(
    IF(DB_HOURS_SINCE_LASTCA,GE &1
    )
)
```

Rule condition description
Specify a threshold on the number of hours since the last time the change accumulation was performed for a change accumulation group.

`DB_HOURS_SINCE_LASTCA: &1`

An exception is issued if the threshold is reached or exceeded.

Rule exception expression

- EXCEPTION_CLASS(CHANGE_ACCUM_NEEDS_TO_BE_DONE)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The number of hours since the last CA has reached or exceeded a threshold for the change accumulation group %RESOURCE%.

Data elements being evaluated for this rule

`DB_HOURS_SINCE_LASTCA &1`

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 12</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 14</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 16</td>
</tr>
</tbody>
</table>

Rule: IBM.HRS_SINCE_LASTIC

IBM.HRS_SINCE_LASTIC is a simple rule for evaluating the elapsed hours since the last image copy for a database data set or a DEDB area.

Rule template version
The rule template version is indicated by a four-byte integer value.
Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

Policy domain
RECOVERY

Rule template type
STANDARD

Rule template name
IBM.HRS_SINCE_LASTIC

Rule description
Elapsed hours since last IC for DB data sets/DEDB area.

Resource types supported
The following resource types are supported by this rule.
• HDAM
• HIDAM
• HISAM
• SHISAM
• PHDAM
• PHIDAM
• DEDB
• INDEX
• PSINDEX

Exception class
IMAGE_COPY_NEEDS_TO_BE_TAKEN

Rule condition expression
OR(
  IF(DB_HOURS_SINCE_LASTIC,GE,
    &1
  )
)

Rule condition description
Specify a threshold on the number of hours since the last time the image copy of a data set or area was taken.

DB_HOURS_SINCE_LASTIC: &1

An exception is issued if the threshold is reached or exceeded in one of the data sets of the database or the HALDB partition or in the DEDB area.
Rule exception expression
• EXCEPTION_CLASS(IMAGE_COPY_NEEDS_TO_BE_TAKEN)
• EXCEPTION_LEVEL(WARNING)
• EXCEPTION_MESSAGE

Rule message template
Hours since the last IC has reached or exceeded a threshold for the following data sets or area of
%RESOURCE%: %EXCPCOMP%.

Data elements being evaluated for this rule

<table>
<thead>
<tr>
<th>DB_HOURS_SINCE_LASTIC</th>
<th>&amp;1</th>
</tr>
</thead>
</table>

The variable &1 specifies a threshold for the data element value DBRC_HOURS_SINCE_LASTIC for the
data set or DEDB area.

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>&amp;1 = 264</td>
<td>Elapsed time of 11 days</td>
</tr>
<tr>
<td>MED</td>
<td>&amp;1 = 312</td>
<td>Elapsed time of 13 days</td>
</tr>
<tr>
<td>HIGH</td>
<td>&amp;1 = 360</td>
<td>Elapsed time of 15 days</td>
</tr>
</tbody>
</table>

Rule: IBM.IC_NEEDED

IBM.IC_NEEDED is a simple rule for checking RECON IC NEEDED flag for a database data set or a DEDB
area.

Rule template version
The rule template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the rule.
When maintenance is applied, this field contains information provided by IBM that describes the updates
made to this rule.

Policy domain
RECOVERY

Rule template type
STANDARD

Rule template name
IBM.IC_NEEDED
**Rule description**
RECON IC NEEDED flag for DB data sets/DEDB area.

**Resource types supported**
The following resource types are supported by this rule.
- HDAM
- HIDAM
- HISAM
- SHISAM
- PHDAM
- PHIDAM
- DEDB
- INDEX
- PSINDEX

**Exception class**
IMAGE_COPY_NEEDS_TO_BE_TAKEN

**Rule condition expression**
```
OR(
  IF(DB_DBRC_IC_NEEDED,IS,
  &1
  
)
)
```

**Rule condition description**
If the RECON IC NEEDED flag is set to ON for a database data set or a DEDB area, the following data element value will be set to Y:

- **DB_DBRC_IC_NEEDED: &1**

If the value is Y for at least one of the data sets or the area, an exception will be reported.

You can apply this rule to any non-HALDB database, HALDB partition, or DEDB area.

**Note:** The threshold value cannot be changed for this rule, and only the exception level can be controlled.

**Rule exception expression**
- EXCEPTION_CLASS(IMAGE_COPY_NEEDS_TO_BE_TAKEN)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**
The RECON IC NEEDED flag is turned ON for the following data set or data sets of %RESOURCE%: %EXCPCOMP%.

**Data elements being evaluated for this rule**
- **DB_DBRC_IC_NEEDED &1**
Rule threshold sets

Table 148. Rule threshold sets for IBM.IC_NEEDED

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>&amp;1 = Y</td>
</tr>
</tbody>
</table>

**Rule: IBM.IC_RECOMMENDED**

IBM.IC_RECOMMENDED is a simple rule for checking RECON IC RECOMMENDED flag for a database data set.

**Rule template version**

The rule template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**

RECOVERY

**Rule template type**

STANDARD

**Rule template name**

IBM.IC_RECOMMENDED

**Rule description**

RECON IC RECOMMENDED flag for DB data sets/DEDB area.

**Resource types supported**

The following resource types are supported by this rule.

- HDAM
- HIDAM
- HISAM
- SHISAM
- PHDAM
- PHIDAM
- DEDB
- INDEX
- PSINDEX

**Exception class**

IMAGE_COPY_NEEDS_TO_BE_TAKEN
Rule condition expression

\[
\text{OR(}
\begin{array}{l}
\text{IF(DB\_DBRC\_IC\_RECOMMENDED,IS,}
\end{array}
\]

\&1

\)

Rule condition description

If the RECON IC RECOMMENDED flag is set to ON for a database data set, the following data element value will be set to Y:

\[
\text{DB\_DBRC\_IC\_RECOMMENDED: } \&1
\]

If the value is Y for at least one of the data sets or the area, an exception will be reported.

You can apply this rule to any non-HALDB database, HALDB partition, or DEDB area.

**Note:** The threshold value cannot be changed for this rule, and only the exception level can be controlled.

Rule exception expression

- EXCEPTION\_CLASS(Image\_Copy\_Needs\_To\_Be\_Taken)
- EXCEPTION\_LEVEL(WARNING)
- EXCEPTION\_MESSAGE

Rule message template

The RECON IC RECOMMENDED flag is turned ON for the following data sets of the database resource %RESOURCE%: %EXCPCOMP%.

Data elements being evaluated for this rule

DB\_DBRC\_IC\_RECOMMENDED \&1

Rule threshold sets

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>&amp;1 = Y</td>
</tr>
</tbody>
</table>

**Rule: IBM\_NOT\_IN\_CAGRP**

IBM\_NOT\_IN\_CAGRP is a simple rule for checking whether all data sets of a full-function database, a HALDB partition, or a DEDB area belong to a change accumulation group.

Rule template version

The rule template version is indicated by a four-byte integer value.

Maintenance messages

The initial maintenance message is blank because no maintenance has been applied to the rule.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.
Policy domain
RECOVERY

Rule template type
STANDARD

Rule template name
IBM.NOT_IN_CAGRP

Rule description
Data sets not in a CA group.

Resource types supported
The following resource types are supported by this rule.
- HDAM
- HIDAM
- HISAM
- SHISAM
- PHDAM
- PHIDAM
- DEDB
- INDEX
- PSINDEX

Exception class
NOT_A_MEMBER_OF_ANY_CAGRP

Rule condition expression
\[ OR( IF(DB_IS_IN_A_DBRC_CAGRP, IS, &1) ) \]

Rule condition description
If a data set of a non-partitioned full-function database, a HALDB partition, or a DEDB area is not included in any change accumulation group defined in the RECON, the following data element value is set for the data set:

\[ DB_IS_IN_A_DBRC_CAGRP = &1 \]

If the value N is set for at least one of the data sets or the area, an exception will be reported.

Notes:
- The threshold value cannot be changed for this rule, and only the exception level can be controlled.
- No sensor data for the data element DB_HOURS_SINCE_LASTIC is collected for ILDS and primary index data sets for a HALDB partition and the sensor data for the data element is processed as missing data. This is normal.
For this rule, you must always specify directive EVALUATE for the ONMISSING option when you use this rule in a policy.

**Rule exception expression**
- EXCEPTION_CLASS(NOT_A_MEMBER_OF_ANY_CAGRP)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

**Rule message template**
The following data sets of the database resource %RESOURCE% are not included in any CA group: %EXCPCOMP%.

**Data elements being evaluated for this rule**
- DB_IS_IN_A_DBRC_CAGRP &1

**Rule threshold sets**

<table>
<thead>
<tr>
<th>Table 150. Rule threshold sets for IBM.NOT_IN_CAGRP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Threshold set name</strong></td>
</tr>
<tr>
<td>NO</td>
</tr>
</tbody>
</table>

**Rule: IBM.RECOV_NEEDED**

IBM.RECOV_NEEDED is a simple rule for checking RECON RECOV NEEDED flag for a database data set or a DEDB area.

**Rule template version**
The rule template version is indicated by a four-byte integer value.

**Maintenance messages**
The initial maintenance message is blank because no maintenance has been applied to the rule. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this rule.

**Policy domain**
RECOVERY

**Rule template type**
STANDARD

**Rule template name**
IBM.RECOV_NEEDED

**Rule description**
RECON RECOV NEEDED flag for DB data sets/DEDB area.
Resource types supported
The following resource types are supported by this rule.

- HDAM
- HIDAM
- HISAM
- SHISAM
- PHDAM
- PHIDAM
- DEDB
- INDEX
- PSINDEX

Exception class
DATABASE_NEEDS_TO_BE_RECOVERED

Rule condition expression

\[ OR(\text{IF(DB\_DBRC\_RECOV\_NEEDED,IS,1)}) \]

Rule condition description
If the RECON RECOV NEEDED flag is set to ON for a database data set or a DEDB area, the following data element value will be set to Y:

\[ \text{DB\_DBRC\_RECOV\_NEEDED: } &1 \]

If the value is Y for at least one of the data sets or the area, an exception will be reported.

You can apply this rule to any non-HALDB database, HALDB partition, or DEDB area.

Note: The threshold value cannot be changed for this rule, and only the exception level can be controlled.

Rule exception expression

- EXCEPTION_CLASS(DATABASE_NEEDS_TO_BE_RECOVERED)
- EXCEPTION_LEVEL(WARNING)
- EXCEPTION_MESSAGE

Rule message template
The RECON RECOV NEEDED flag is turned ON for the following data sets of the database resource %RESOURCE%: %EXCPCOMP%.

Data elements being evaluated for this rule

\[ \text{DB\_DBRC\_RECOV\_NEEDED: } &1 \]
### Rule threshold sets

*Table 151. Rule threshold sets for IBM.RECOV_NEEDED*

<table>
<thead>
<tr>
<th>Threshold set name</th>
<th>Threshold values</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>&amp;1 = Y</td>
</tr>
</tbody>
</table>
Chapter 27. Domain RECOVERY policies

The domain RECOVERY policies are used to evaluate the DBRC state of a full-function database, a HALDB partition, a DEDB area, or a change accumulation group, and specify how Policy Services responds to any events that reach or exceed the threshold values specified for the state.

**Policy template version**

The policy template version is indicated by a four-byte integer value.

**Maintenance messages**

A descriptive message within the rule that describes the maintenance history information for this policy.

The initial maintenance message is blank because at initial product installation no maintenance has been applied to the policy.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

**Template original name**

The original name of this policy template.

The name always begins with IBM.

**Policy domain**

Defines the domain for which this policy is intended to be used.

**Policy template type**

Defines the policy template type.

Currently, there is only one type: Basic

**Policy name**

The policy name is same as the name that appears in the title line and is also the same as the template original name.

**Policy description**

Defines in words what database functionality this policy monitors.

**Action description**

Show exceptions and associated severity and actions.

**Notify reference list**

Policies are shipped with no notification lists provided.

You must create your own notification list or lists, and then update this policy to provide one or more of these notification lists.

The list you provide is where the summary notification message is sent.

**Resource type list**

The resource types are all IMS-supported Hierarchical Direct Access Methods.

**Rule list**

List of rules associated with this policy. The policy monitors the evaluation of all these rules and takes action when any rule threshold is met or exceeded (exception).
Rule list history

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy.

When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.

**Policy: IBM.RECOV._DEFAULT**

IBM.RECOV._DEFAULT is a predefined IBM basic policy for recovery preparedness for a non-partitioned full-function database, a HALDB partition, or a DEDB area.

**Policy template version**

The policy template version is indicated by a four-byte integer value.

**Maintenance messages**

The initial maintenance message is blank because no maintenance has been applied to the policy.

When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

**Template original name**

IBM.RECOV._DEFAULT

**Policy domain**

RECOVERY

**Policy template type**

BASIC

**Policy name**

IBM.RECOV._DEFAULT

**Policy description**

Policy for a database, partition, or area.

**Action description**

The following table summarizes exception class and severity level pairs that result in RECOVERY action.

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMAGECOPY</td>
<td>IMAGE_COPY_NEEDS_TO_BE_TAKEN</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>ADDTOCAGRP</td>
<td>NOT_A_MEMBER_OF_ANY_CAGRP</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>DBRECOVERY</td>
<td>DATABASE_NEEDS_TO_BE_RECOVERED</td>
<td>CRITICAL</td>
</tr>
<tr>
<td>BACKOUT</td>
<td>DATABASE_NEEDS_TO_BE_BACKED_OUT</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>
Note: If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 28, “Domain RECOVERY exceptions,” on page 397.

Notify reference list
Policies are shipped with no notification lists provided.
You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

Resource type list
The following resource types are supported by this policy:
• HDAM
• HIDAM
• HISAM
• SHISAM
• PHDAM
• PHIDAM
• DEDB
• INDEX
• PSINDEX

Rule list
The following table summarizes the default rules used in this policy.
SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.
EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.HRS_SINCE_LASTIC</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.HRS_SINCE_LASTIC</td>
<td>MED</td>
<td>SEVERE</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.HRS_SINCE_LASTIC</td>
<td>LOW</td>
<td>WARNING</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.IC_NEEDED</td>
<td>YES</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.IC_RECOMMENDED</td>
<td>YES</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.NOT_IN_CAGRP</td>
<td>NO</td>
<td>CRITICAL</td>
<td>EVALUATE</td>
</tr>
<tr>
<td>IBM.RECOV_NEEDED</td>
<td>YES</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>
Table 153. Rule list for IBM.RECOV._DEFAULT (continued)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.EEQE_COUNT</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.EEQE_COUNT</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.EEQE_COUNT</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.BACKOUT_NEEDED</td>
<td>YES</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

Rule list history
The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.

Policy: IBM.CAGRP._DEFAULT
IBM.CAGRP._DEFAULT is a predefined IBM basic policy for a change accumulation group defined in RECON.

Policy template version
The policy template version is indicated by a four-byte integer value.

Maintenance messages
The initial maintenance message is blank because no maintenance has been applied to the policy. When maintenance is applied, this field contains information provided by IBM that describes the updates made to this policy.

Template original name
IBM.CAGRP._DEFAULT

Policy domain
RECOVERY

Policy template type
BASIC

Policy name
IBM.CAGRP._DEFAULT

Policy description
Policy for a CAGRP.

Action description
The following table summarizes exception class and severity level pairs that result in RECOVERY action.
Table 154. RECOVERY action description for exceptions detected by IBM.CAGRP._DEFAULT

<table>
<thead>
<tr>
<th>Action</th>
<th>Exception class</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANGEACCUM</td>
<td>CHANGE_ACCUM_NEEDS_TO_BE_DONE</td>
<td>CRITICAL</td>
</tr>
</tbody>
</table>

Note: If an exception and severity pair is not found in this table, the default action for that pair is MESSAGE. For a list of the correspondence between exception classes and their originating rules, see Chapter 28, “Domain RECOVERY exceptions,” on page 397.

Notify reference list

Policies are shipped with no notification lists provided.

You must create your own notification list or lists, and then update this policy to provide one or more notification lists.

Resource type list

The following resource types are supported by this policy:

- CAGRP

Rule list

The following table summarizes the default rules used in this policy.

SKIPEVAL means that the evaluation of this rule is skipped if any data that is referred to in the rule cannot be made available at the time of the policy evaluation.

EVALUATE means that the evaluation of this rule is made even if a data that is referred to in the rule cannot be made available at the time of the policy evaluation. The comparison of the unavailable data with the threshold value defined for it returns the default result that is determined by the rule condition expression.

Table 155. Rule list for IBM.CAGRP._DEFAULT

<table>
<thead>
<tr>
<th>Rule</th>
<th>Threshold set</th>
<th>Severity level</th>
<th>If comparison data is missing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM.HRS_SINCE_LASTCA</td>
<td>HIGH</td>
<td>CRITICAL</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HRS_SINCE_LASTCA</td>
<td>MED</td>
<td>SEVERE</td>
<td>SKIPEVAL</td>
</tr>
<tr>
<td>IBM.HRS_SINCE_LASTCA</td>
<td>LOW</td>
<td>WARNING</td>
<td>SKIPEVAL</td>
</tr>
</tbody>
</table>

Rule list history

The initial rule list history is blank because no maintenance has been applied to the rule list for this policy. When maintenance is applied, this field contains information provided by IBM that describes the addition, deletion, or changes to the rule list for this policy.
Chapter 28. Domain RECOVERY exceptions

The domain RECOVERY exceptions define the response to any DBRC-managed resource state that crosses the defined threshold boundaries.

<table>
<thead>
<tr>
<th>Exception class</th>
<th>Exception description</th>
<th>Originating rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMAGE_COPY_NEEDS_TO_BE_TAKEN</td>
<td>At least one data set needs an image copy.</td>
<td>IBM.HRS_SINCE_LASTIC, IBM.IC_NEEDED, IBM.IC_RECOMMENDED</td>
</tr>
<tr>
<td>NOT_A_MEMBER_OF_ANY_CAGRP</td>
<td>One or more data sets do not belong to any CAGRP.</td>
<td>IBM.NOT_IN_CAGRP</td>
</tr>
<tr>
<td>DATABASE_NEEDS_TO_BE_RECOVERED</td>
<td>The database, partition, or area needs recovery.</td>
<td>IBM.RECOV_NEEDED, IBM.EEQE_COUNT</td>
</tr>
<tr>
<td>DATABASE_NEEDS_TO_BE_BACKED_OUT</td>
<td>The database updates need to be backed out.</td>
<td>IBM.BACKOUT_NEEDED</td>
</tr>
<tr>
<td>CHANGE_ACCUM_NEEDS_TO_BE_DONE</td>
<td>A new change accumulation is needed for the CAGRP.</td>
<td>IBM.HRS_SINCE_LASTCA</td>
</tr>
</tbody>
</table>
Chapter 29. Domain RECOVERY actions

Policy Services RECOVERY domain action processes will return one or more of the following process requests that will result in a passive process as determined by Autonomics Director.

<table>
<thead>
<tr>
<th>Keyword for process action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMAGECOPY</td>
<td>Take an image copy of each data set of the database resource.</td>
</tr>
<tr>
<td>CHANGEACCUM</td>
<td>Create a new change accumulation for the change accumulation group.</td>
</tr>
<tr>
<td>DBRECOVERY</td>
<td>Perform recover process for the database resource.</td>
</tr>
<tr>
<td>ADDTOCAGRP</td>
<td>Add all data sets of the database resource to a DBRC CAGRP.</td>
</tr>
<tr>
<td>BACKOUT</td>
<td>Perform backout process for the database updates.</td>
</tr>
</tbody>
</table>
Part 8. Troubleshooting

The topics in this section provide you with technical references to help you troubleshoot and diagnose Policy Services problems.

**Topics:**

- Chapter 30, “Runtime error messages (BSN),” on page 403
- Chapter 31, “RECOVERY domain summary messages (IRO),” on page 485
- Chapter 32, “Return and reason codes,” on page 487
- Chapter 33, “Gathering diagnostic information,” on page 541
Chapter 30. Runtime error messages (BSN)

Use the information in these messages to help you diagnose and solve Policy Services problems.

Message format
Policy Services messages adhere to the following format:

BSNnnnx

Where:

BSN
Indicates that the message was issued by Policy Services

nnn
Indicates the message identification number

x
Indicates the severity of the message:

A
Indicates that operator intervention is required before processing can continue.

E
Indicates that an error occurred, which might or might not require operator intervention.

I
Indicates that the message is informational only.

W
Indicates that the message is a warning to alert you to a possible error condition.

Each message also includes the following information:

Explanation:
The Explanation section explains what the message text means, why it occurred, and what its variables represent.

System action:
The System action section explains what the system will do in response to the event that triggered this message.

User response:
The User response section describes whether a response is necessary, what the appropriate response is, and how the response will affect the system or program.

Module
The Module section indicates which module or modules are affected.

BSN1000E LOAD OF BSNSCI00 HAS FAILED

Explanation
Unable to load the Policy Services initialization module. This error should not occur.

System action
The requested function is rejected. A return code and a reason code that define the failure are returned to the client.

User response
Check to see if module BSNSCI00 resides in the hlq.SHKTLOAD load library. If the module is in the library, you might have an installation problem. Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNSCIF0

BSN1001E CLIENT REQUESTED FUNCTION (FUNC_CODE) NOT VALID.
R15=hhrrrrrr.
Explanation
The requested function is invalid.

System action
Policy Services rejected the call from the client. A return code and a reason code that define the failure are returned to the client.

System processing continues.

User response
Restart the client, which is either the IMS Tools client or the user interface client.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNSCIF0

BSN1002E -- CLIENT REQUESTED FUNCTION (func_code) REJECTED. POLICY SERVICES HAVE NOT BEEN INITIALIZED.

Explanation
The requested function has been rejected. The function being requested is not valid until the client issues the initialization request.

System action
The requested function is rejected. A return code and a reason code that define the failure are returned to the client.

User response
Restart the client, which is either the IMS Tools client or the dialogue client.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNSCIF0

BSN1008E -- THE POLICY SERVICES WAS UNABLE TO ALLOCATE WORK STORAGE FOR THE ESTAE ROUTINE

Explanation
Working storage could not be obtained for the ESTAE routine.

System action
Initialization of Policy Services continues and normal processing continues. The ESTAE routine is not active.

User response
This is an internal error. Contact IBM Software Support and notify them of the IMS tool that encountered this problem.

Module
BSNSCIF0

BSN1501I -- THE PES MODULE module_name RECEIVED CONTROL WITH FUNCTION function_code: RC=nn, RSN=nn.

Explanation
This message is a policy environment service (PES) message that indicates the module flow and provides the return code and the reason code for each module.
System action
None.

User response
No action is required.

Module
BSNPES10, BSNPES20, BSNPES30, BSNPES40,
BSNPESH0, BSNPESI0, BSNPESW0, BSNPES0,
BSNPESK0, BSNPESD0, BSNPESA0, BSNPESQ0,
BSNPESL0, BSNPESL1

BSN1503E  PES HAS A CRITICAL ERROR IN
MODULE module_name:
FUNCTION=function_code, RC=nn,
RS=nn.

Explanation
An error occurred in the policy environment service
(PES) module. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code
and a reason code that define the failure are returned
to the client.

User response
See the PES return code and reason code to determine
and correct the problem.

Module
BSNPESH0, BSNPES0, BSNPESK0, BSNPESD0,
BSNPESA0, BSNPESL0, BSNPESL1

BSN1506E  FOR DOMAIN=domain_name,
ENVIRONMENT=environment, THE
FPQSrv
FUNCTION=FPQ_function_code
FAILED IN MODULE module_name
WITH RC=nn, RSN=nn. THE
FPQSrv DIAGNOSTIC
FEEDBACK=
WORD1=word1_first_half-
word1_second_half,
WORD2=word2, WORD3=word3.

Explanation
A repository server function failed in the policy
environment service (PES) module. Return and reason codes are those
returned by the FPQ call and are documented in the
IBM Tools Base for z/OS IMS Tools Knowledge Base
User’s Guide and Reference. They are included for IBM
diagnostic and debugging information.

System action
The requested function is rejected. A return code and
a reason code that define the failure are returned to
the client.

Module
BSNPESH0, BSNPES0, BSNPESK0, BSNPESD0,
BSNPESA0, BSNPESL0, BSNPESL1

BSN1507E  THE PES CONTROL MEMBER HAS
ENCOUNTERED AN ERROR WITH
THE REPOSITORY.
THE FPQSrv FUNCTION=func
FAILED IN MODULE module WITH
RC=rc, RSN=rsn

Explanation
A repository server function failed in the policy
environment service (PES) module. Return and reason codes are those
returned by the FPQ call and are documented in the
IBM Tools Base for z/OS IMS Tools Knowledge Base
User’s Guide and Reference. They are included for IBM
diagnostic and debugging information.

System action
The requested function is rejected. A return code and
a reason code that define the failure are returned to
the client.
User response

See the description of the repository service return code and reason code in the reference section of the *IBM Tools Base for z/OS IMS Tools Knowledge Base User's Guide and Reference* to determine and correct the problem.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module

BSNPESH0

**BSN1509E**

THE USER HAS INSUFFICIENT ACCESS AUTHORITY TO THE REPOSITORY.

Explanation

The ISPF user or IMS Tool does not have the appropriate RACF® access of UPDATE that is required.

System action

The requested function is rejected and Policy Services is terminated.

User response

Either correct the user ID, or update the user ID to have UPDATE access for the IMS Tools KB Input repository.

Module

BSNSCI00

**BSN1511I**

FOR DOMAIN=domain_name, ENVIRONMENT LEVEL=environment_level, THE PES action ENDED, RC=nn, RSN=nn.

Explanation

The policy environment service (PES) process (action) has ended for *domain_name*, *environment_level*, and *recon_ID*.

The variable *action* is one of the following actions:

- GET WORKLIST ITEM SERVICE
- UPDATE WORKLIST ITEM SERVICE
- WORKLIST MAINTENANCE PROCESS
- IMPORT WORKLIST SERVICE
- ADD APARS SERVICE
- ADD PACKAGE SERVICE
- ENVIRONMENT COMMIT PROCESS
- ENVIRONMENT CREATE PROCESS
- ENVIRONMENT DELETE PROCESS
- ENVIRONMENT SELECT PROCESS
- ENVIRONMENT VALIDATE PROCESS

System action

None.

User response

No action is required.

Module

BSNPES20, BSNPES30, BSNPES40

**BSN1512I**

FOR DOMAIN=domain_name, ENVIRONMENT LEVEL=environment_level, THE PES action ENDED, RC=nn, RSN=nn.

Explanation

The policy environment service (PES) process (action) has started for *domain_name*, *environment_level*, and *recon_ID*.

The variable *action* is one of the following actions:

- GET WORKLIST ITEM SERVICE
- UPDATE WORKLIST ITEM SERVICE
- WORKLIST MAINTENANCE PROCESS
- IMPORT WORKLIST SERVICE
- ADD APARS SERVICE
- ADD PACKAGE SERVICE
- ENVIRONMENT COMMIT PROCESS
- ENVIRONMENT CREATE PROCESS
- ENVIRONMENT DELETE PROCESS
- ENVIRONMENT SELECT PROCESS
- ENVIRONMENT VALIDATE PROCESS

System action

None.

User response

No action is required.
BSN1600E A POCB CONTROL BLOCK COULD NOT BE OBTAINED: RC=nnn, RSN=nnn.

Explanation
The request to obtain an internal Policy Control Block (POCB) failed. The REGION parameter does not have enough specified memory for the job.

System action
Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. The base rule, policy, or notification list processing completes with an error, and system processing continues.

User response
Specify more memory for the REGION parameter, and then restart the job.

For example, you can specify REGION=0M so that the parameter can use all the main storage that it requires.

Module
BSNASM00

BSN1603E IMS POLICY SERVICES RETRY OF SYSTEM FAILURE FAILED, AND AN ABEND WAS REQUESTED.

Explanation
An internal Policy Services error has occurred, was resolved by Policy Services recovery, and has occurred a second time. The second occurrence resulted in a termination of Policy Services.

System action
The requested function is rejected. A return code and a reason code that define the failure are returned to the client.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNSCIF0

BSN1605I IMS PSS API TCB ABEND

Explanation
An internal Policy Services error was detected and reported back to the client for a retry option. The retry also failed, so a dump was taken.

• Line 1 - Abending TCB and abend code
• Line 2 - Abending module ID and EPA
• Line 3 - PSW at abend and module offset
• Line 4-7 - Registers at abend
If the abend is a propagated abend (U4095), or if the abend is being passed down from the parent TCB, then only the first line of the message is issued.

**System action**

A dump is taken and the Policy Services client is terminated.

**User response**

Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

**Module**

BSNSCIF0

**BSN1606E**  THE JOURNAL MANAGER UNIT OF WORK COULD NOT BE COMMITTED: RC=nn, RSN=nn, R15=hhrrrrrr.

**Explanation**

The request to commit a journal unit of work that represents the end of the Policy Decision Making Report failed.

**System action**

Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. The policy lookup processing that was requested by the Policy Services client completes with an error, and system processing continues.

**User response**

See the association manager return code and reason code to determine and correct the problem.

For the R15 code, see the client API interface return codes and reason codes.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

**Module**

BSNSCIF0

**BSN1607I**  PSW AND REGISTERS AT ABEND ARE NOT AVAILABLE.

**Explanation**

Policy Services detected an ABEND. However, the PSW and registers are not available.

**System action**

Error processing continues.

**User response**

None. This message is informational.

**Module**

BSNSCIF0

**BSN1608E**  SDUMP FAILED FOR nnnnn ABEND, RC=xx, RSN=xx

**Explanation**

Policy Services recovery intercepted an ABEND. While trying to request the dump, it failed.

**System action**

System is terminated.

**User response**

Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

**Module**

BSNXEST0

**BSN1609I**  DAE SUPPRESSED DUMP FOR nnn ABEND

**Explanation**

The dump for the ABEND was suppressed.

**System action**

The system is terminated.

**User response**

Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

**Module**

BSNXEST0

**BSN1610E**  AN INVALID FUNCTION WAS REQUESTED: FUNCTION=function_code.

**Explanation**

The client issued a request to IMS Policy Services with an invalid function request. The variable function_code is the function code passed to Policy Services. This
error is an internal problem with the IMS tool that made the request.

System action
Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNASM00

BSN1611E POLICY DATA STORE FUNCTION (func_code) HAS FAILED, RC=nn RSN=nn.

Explanation
A policy data store (PDS) func_code call was requested while processing a request to list policies.

Where:
func_code
The PDS function code is either:
• LSTP: Autonomics Director has requested a list of policies be returned
• LSTT: Autonomics Director has requested a list of policies be terminated

RC=nn
PDS return code

RSN=nn
PDS reason code

System action:
The original request, either LSTP or LSTT, is terminated and control is returned to the client. System processing continues.

User response:
No action is required.

Module
BSNASM00

BSN1614E AN INVALID POLICY NAME PREFIX OF "IBM" WAS SPECIFIED FOR THE POLICY NAME policy_name.

Explanation
An IMS tool made an IMS Policy Services request and passed a policy policy_name with IBM as a prefix, which is invalid for any client request. This error is an internal problem with the IMS tool that made the request.

System action
Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. The lookup process completes with an error, and system processing continues.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNASM00

BSN1616E THE POLICY DOMAIN DATA STORE TERMINATION FAILED:
RC=nn, RSN=nn, R15=hrrrrrrr.

Explanation
The request to terminate the policy domain data store termination (PDST) failed.

System action
Policy Services termination continues, and if any other service fails, another error message is issued.
User response
See the association manager return code and reason code to determine and correct the problem.
For the R15 code, see the client API interface return codes and reason codes.
If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNASM00

BSN1622E A RESOURCE NAME WAS NOT PROVIDED FOR THE REQUEST.

Explanation
The client made a request to Policy Services without passing the required resource name. This error is an internal problem with the IMS tool that made the request.

System action
Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNASM00

BSN1624E A POLICY DATA STORE POLICY OBJECT CONTROL BLOCK WAS NOT PROVIDED.

Explanation
The client function failed to pass a policy data store policy object control block (PDSP). This error is an internal problem with the IMS tool that made the request.

System action
Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.

Module
BSNASM00

BSN1626E THE RESOURCE LIST WAS NOT RETURNED BY POLICY DATA STORE.

Explanation
The client made a request to Policy Services for a policy lookup function. While the lookup function was processing, an internal request was made to list the supported resource type. This internal request failed.
This error is an internal problem with the IMS tool that made the request.

System action
Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNASM00

BSN1628E THE RESOURCE TYPE (resource_type) THAT WAS DEFINED ON THE CALL DOES NOT MATCH THE RESOURCE TYPES THAT WERE DEFINED FOR THE SELECTED POLICY (policy_name).

Explanation
While a client lookup function was processing, the resource_type that was passed was determined to be invalid for policy_name. The resource type that was specified by the IMS tool is incorrect or has not been added to the policy.

System action
Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.
**User response**

If the resource type is correct, add `resource_type` to `policy_name`.

If the resource type is incorrect, configure the IMS tool to specify a valid resource type.

---

**Module**

BSNASM00

**BSN1630E**

THE source LOCALE ID (nnnnnnn) IS INVALID OR IS NOT DEFINED TO ITKB.

**Explanation**

An invalid locale ID `nnnnnnn` was specified or has not been defined to the IMS Tools Knowledge Base (ITKB) as a valid RECON ID.

The variable `source` is INTERNAL or EXTERNAL, which refers to either the internal or external RECONID value.

**System action**

Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.

**User response**

If the locale ID is BSNGLOBL, use the ITKB service process to automatically generate this locale.

If the locale ID is not BSNGLOBL, this error is an internal IMS tools error. Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

---

**Module**

BSNASM00

**BSN1634E**

THE LEVEL CHANGE REQUEST IS INVALID. THE SYSTEM IS NOT IN A MAINTENANCE ENVIRONMENT.

**Explanation**

While the system was not in the maintenance environment, a request to change the environment level was made to Policy Services. However, this request is valid only in the maintenance environment.

**System action**

Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.

**User response**

A request to change the environment level is normally made only by a Policy Services dialogue session while in maintenance environment. If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

---

**Module**

BSNASM00

**BSN1636E**

THE DOMAIN NAME (domain_name) THAT WAS PASSED IS UNKNOWN TO THE SYSTEM FOR FUNCTION REQUEST func.

**Explanation**

The current operation or maintenance environment does not contain `domain_name`. The domain either has not installed the required items in Policy Services or is currently still in the initial maintenance environment that was created during the installation process.

**System action**

Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.

**User response**

Verify that the following tasks were completed during the installation of `domain_name`:

- Maintenance was applied to the Policy Domain Table Definition (BSNPDNT0).
- The Policy Domain Table was added for the domain name (BSNnnnnn), where `nnnnn` is the domain name that is supplied by the IMS tool.
- New policies and rules that are required by the new IMS tool were added.

If `domain_name` has not been installed, complete the installation.

If `domain_name` has been installed, promote `domain_name` out of the maintenance environment.

---

**Module**

BSNASM00
THE OPERATION ENVIRONMENT DOES NOT CONTAIN THE DOMAIN domain_name.

**Explanation**

domain_name has been recognized by Policy Services, but the domain has not been fully installed or is currently in the initial maintenance environment that was created during the installation process.

**System action**

Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.

**User response**

Verify that the following tasks were completed during the installation of domain_name:

- Maintenance was applied to the Policy Domain Table Definition (BSNPDNT0).
- The Policy Domain Table was added for the domain name (BSNnnnnn), where nnnnn is the domain name that is supplied by the IMS tool.
- New policies and rules that are required by the new IMS tool were added.

If domain_name has not been installed, complete the installation.

If domain_name has been installed, promote domain_name out of the maintenance environment.

---

THE POLICY DOMAIN ENVIRONMENT RECORDS ARE NOT PRESENT.

**Explanation**

No domains have been defined to Policy Services in the BSNPDNT0 table.

**System action**

Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.

**Module**

BSNASM00

---

THE REQUEST TO SELECT A NEW ENVIRONMENT WAS REJECTED. THE DOMAIN domain_name IS CURRENTLY IN THE MAINTENANCE ENVIRONMENT.

**Explanation**

A request was made to select an existing history environment as the new operation environment. The request was rejected because a new operation environment cannot be selected if the domain has an active maintenance environment.
System action
Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.

User response
Commit the maintenance environment, and then resubmit your request to make the specified history environment the new operation environment.

Module
BSNASM00

BSN1644E THE REQUEST TO DELETE DOMAIN domain_name FROM THE MAINTENANCE ENVIRONMENT WAS REJECTED. DOMAIN domain_name IS NOT PART OF THE MAINTENANCE ENVIRONMENT.

Explanation
domain_name cannot be deleted from the maintenance environment because it is not part of the existing maintenance environment.

System action
Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. System processing continues.

User response
If domain_name is the domain that you wanted to delete, no action is required. The domain_name does not exist.

If domain_name is not the domain that you want to delete, select the correct domain that is in the maintenance environment to be deleted.

Module
BSNASM00

BSN1803E ETV HAS A CRITICAL ERROR IN MODULE module_name: FUNCTION=function_code, RC=nn, RSN=nn.

Explanation:
An error occurred in the email/texting variable (ETV) module. This is an internal IMS Tools error.

System action:
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response:
See the ETV return code and reason code to determine and correct the problem. If the problem persists, contact IBM Software Support, and notify them of the IMS Tools product that encountered this problem.

Module:
BSNETVA0, BSNETVG0, BSNETVH0, BSNETVL0, BSNETVR0, BSNETVT0, BSNETVU0, BSNETV00

BSN1806E THE ETV REPOSITORY FUNCTION FAILED: DOMAIN=domain_name, LEVEL=environment_level, LOCALE=recon_ID, VAR=var_name. THE FPQSRV FPQ_function_code FAILED IN MODULE module_name WITH RC=nn, RSN=nn. THE FPQSRV DIAGNOSTIC FEEDBACK= WORD1=word1_first_halfword1_second_half, WORD2=word2, WORD3=word3.

Explanation
A repository server function failed in the email/texting variable (ETV) module for environment_level, recon_ID, and var_name because of a repository server function failure. The FPQ function code specifies the repository function name.

The feedback field includes IBM diagnostic and debugging information. This error is an internal IMS Tools error.

System action:
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response:**
See the repository service return code and reason code to determine and correct the problem. If the problem persists, contact IBM Software Support, and notify them of the IMS Tools product that encountered this problem.

**Module:**
BSNETVA0, BSNETVG0, BSNETVL0, BSNETVR0, BSNETVT0, BSNETVU0

---

**BSN1811I**
**THE VARIABLE TABLE LIST HAS STARTED LISTING OBJECTS FOR**
**DOMAIN=domain_name.**

**Explanation:**
The email/texting variable (ETV) process started listing for `domain_name`.

**System action:**
None.

**User response**
None. This message is informational.

**Module:**
BSNETVL0

---

**BSN1812I**
**THE VARIABLE function PROCESS HAS STARTED FOR**
**DOMAIN=domain_name,**
**LEVEL=environment_level,**
**LOCALE=locale, VAR=UPDATE.**

**Explanation:**
The email/texting (ETV) process (function) has started for `domain_name`, `environment_level`, and `locale`, where `locale` is the RECON ID that has been defined to the repository or BSNGLOBL. The output for `VAR=var_name` is displayed only if the rule name is known.

**System action:**
None.

**User response**
None. This message is informational.

**Module:**
BSNETVU0

---

**BSN1815I**
**THE VARIABLE TABLE LIST HAS ENDED FOR THE**
**DOMAIN=domain_name: RC=nn, RSN=nn.**

**Explanation:**
The email/texting variable (ETV) process ended listing for `domain_name`.

**System action:**
None.

**User response**
None. This message is informational.

**Module:**
BSNETVL0

---

**BSN1816I**
**THE VARIABLE function PROCESS HAS ENDED FOR:**
**DOMAIN=domain_name,**
**LEVEL=environment_level,**
**LOCALE=locale, VAR=UPDATE, RC=nn, RSN=nn.**

**Explanation:**
The email/texting variable (ETV) process (function) has ended for `domain_name`, `environment_level`, and `locale`, where `locale` is the RECON ID that has been defined to the repository or BSNGLOBL.

**System action:**
None.

**User response**
None. This message is informational.

**Module:**
BSNETVR0

---

**BSN1817I**
**THE VARIABLE DELETE BY RECON**
**recon_name HAS STARTED**

**Explanation:**
The email/texting variable (ETV) process started by `recon_name`.

**System action:**
None.

**User response**
None. This message is informational.

**Module:**
BSNETVU0

---

**BSN1818I**
**THE VARIABLE DELETE BY RECON**
**recon_name HAS ENDED FOR THE:**
**RC=nn, RSN=nn.**

**Explanation:**
The email/texting variable (ETV) process ended by `recon_name`.

**System action:**
None.

**User response**
None. This message is informational.
<table>
<thead>
<tr>
<th>Module: BSNETVR0</th>
</tr>
</thead>
</table>

**BSN2002E** STORAGE FOR *block_name* BLOCK COULD NOT BE OBTAINED.

**Explanation**
The internal storage block or table cannot be obtained. This error is an internal Policy Services error.

**System action**
Policy Services fails initialization, and a return code and a reason code that define the failure are returned to the client.

**User response**
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

<table>
<thead>
<tr>
<th>Module: BSNSCI00</th>
</tr>
</thead>
</table>

**BSN2004E** THE POLICY SERVICES MODULE *module_name* COULD NOT BE LOADED.

**Explanation**
A module that is loaded by the Policy Services initialization function failed the LOAD request. This error is an internal Policy Services error.

**System action**
Policy Services fails initialization, and a return code and a reason code that define the failure are returned to the client.

**User response**
Add the module that failed the LOAD request to the hlq.SHTLOAD load library.

If the module is in the library, you might have an install problem. Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

<table>
<thead>
<tr>
<th>Module: BSNSCI00</th>
</tr>
</thead>
</table>

**BSN2006E** THE REQUESTED INIT/STRT OF THE FACILITY FAILED.

**Explanation**
The Policy Services initialization function failed. This error is an internal Policy Services error.

<table>
<thead>
<tr>
<th>Module: BSNSCI00</th>
</tr>
</thead>
</table>

**BSN2008E** THE REPOSITORY DOES NOT CONTAIN ANY RECON CONTAINER ITEMS.

**Explanation**
RECON data sets must be defined to the repository. This error is a repository environment error.

During Policy Services initialization, the Policy Services calls the repository to obtain the list of user-defined RECON data sets that have been defined to the repository. Policy Services requires that at least a global (BSNGLOBL) RECON exists within the repository.

**System action**
The requested INIT function is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
Define the required RECON data sets to the repository, and then verify that the RECON definitions are in the repository by using the IMS tools Knowledge Base interface dialog.

<table>
<thead>
<tr>
<th>Module: BSNSCI00</th>
</tr>
</thead>
</table>

**BSN2009E** THE BSNGLOBL RECON ID IS NOT REGISTER WITH THE ITKB REPOSITORY.

**Explanation**
The global RECON ID (BSNGLOBL locale) is not registered with the IMS Tools Knowledge Base (ITKB).

The user might have deleted the BSNGLOBL RECON ID using the ITKB user interface.
**System action**
Initialization of Policy Services is halted and
termination is forced.

**User response**
Register the global RECON ID (BSNGLOBL).
See the IBM Tools Base for z/OS IMS Tools Knowledge
Base User's Guide and Reference for procedures on
how to reinstate BSNGLOBL as a RECON ID.

**Module**
BSNSCI00

**BSN2010I**  THE `services_name` SERVICES
v.r.m INITIALIZED.

**Explanation**
The service has been successfully initialized. The IMS
Tools product that is to use the services can proceed
to process requests.
The variable `services_name` is one of the following services:
- Policy Services - includes all components for
  processing the IMS Tools product client policy
  services request or the TSO client policy services
  request.
- Data dictionary services - includes all components for
  processing the IMS Tools product client data
  dictionary request or the TSO client data dictionary
  request.
- Stand-alone notification services - includes all
  components that process the IMS Tools product
  client notification manager message requests.
For variable v.r.m, v is the product version, r is the
product release, and m is the mod level.

**System action**
The service is activated and ready to process client
requests.

**User response**
No action is required.

**Module**
BSNSCI00

**BSN2011E**  THE `services_name` SERVICES INIT
REQUEST HAS FAILED.
`services_name` IS NOT
INITIALIZED.

**Explanation**
The service initialization function failed. The variable
`services_name` is one of the following services:
- IMS Policy Services, which includes all components for
  processing the IMS tools client policy services
  request or the TSO client policy services request.
- Data dictionary services, which includes all
  components for processing the IMS tools client data
dictionary request or the TSO client data dictionary
  request.
This error is an internal IMS Policy Services error.

**System action**
The requested INIT function is rejected, and a return
code and a reason code that define the failure are
 returned to the client.

**User response**
This error message is always preceded by another
message that defines a specific initialization failure.
See the preceding message to fix this initialization
failure.

**Module**
BSNSCI00

**BSN2012I**  THE `services_name` TERMINATED.

**Explanation**
The service `service_name` was terminated. The variable
`service_name` is one of the following services:
- IMS Policy Services, which includes all components for
  processing the IMS tools client policy services
  request or the TSO client policy services request.
- Data dictionary services, which includes all
  components for processing the IMS tools client data
dictionary request or the TSO client data dictionary
  request.

**System action**
The server `service_name` is terminated

**User response**
No action is required.

**Module**
BSNSCT00
BSN2014E  A CALL TO THE REPOSITORY TO OBTAIN RECON INFORMATION HAS FAILED.

Explanation
During Policy Services initialization, the Policy Services call to obtain the list of RECON data sets that have been defined to the repository failed. This error is an internal Policy Services error or an internal repository error.

System action
The requested INIT function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Define the required RECON data sets by using the IMS Tools Knowledge Base (ITKB) dialog. You must at least define BSNGLOBL.

Module
BSNSCI00

BSN2015I  POLICY SERVICES PHASE 1 EXCEPTION MESSAGE SYSTEM DEFAULT IS setting.

Explanation
The Policy Services phase 1 exception message default value was set to setting. The Policy Services phase 1 exception message default value was set to setting. You can set the phase 1 exception message system default value from the main menu of the Policy Services ISPF client. If you do not choose a value, the system default is set to N (DISABLED). The variable setting is one of the following values:

DISABLED  Exception messages that are generated during phase 1 of a policy evaluation are not sent to the directory entries defined in the policy notification list.

ENABLED  Exception messages that are generated during phase 1 of a policy evaluation are sent to the directory entries defined in the policy notification list.

Important: During a policy evaluation, phase 1 exception messages are those messages that are generated prior to a recommended process action, such as a reorganization.

System action:

BSN2016I  POLICY SERVICES PHASE 1 EXCEPTION MESSAGE FOR THIS EXECUTION IS CURRENTLY setting.

Explanation
The Policy Services phase 1 exception message option was set to setting for this client. If the setting value in this message is different from the setting value in message BSN2015I, the IMS Tool requested an override of the phase 1 exception message default value for this client only. The default value remains the system default.

You can set the phase 1 exception message system default value from the main menu of the Policy Services ISPF client. If you do not choose a value, the system default is set to N (DISABLED). The variable setting is one of the following values:

DISABLED  Exception messages that are generated during phase 1 of a policy evaluation are not sent to the directory entries defined in the policy notification list.

ENABLED  Exception messages that are generated during phase 1 of a policy evaluation are sent to the directory entries defined in the policy notification list.

Important: During a policy evaluation, phase 1 exception messages are those messages that are generated prior to a recommended process action, such as a reorganization.

System action:

BSN2021E  THE component_name SERVICES COULD NOT BE INITIALIZED:
RC=nn, RSN=nn, R15=hhr...
Explanation
During Policy Services initialization, \texttt{component\_name} failed to initialize. This error is an internal Policy Services error.

The return code and the reason code are returned by \texttt{component\_name}, where \texttt{component\_name} is one of the following components:

- DATA DICTIONARY
- JOURNAL MANAGER
- POLICY DATA STORE
- POLICY ENVIRONMENT
- RULE DATA STORE

System action
The requested INIT function is rejected, and a return code and a reason code that define the failure are returned to the client.

Register 15 defines the internal call that failed. The return and reason code values refer to the failed call.

User response
See Register 15 return code and reason codes to determine and correct the problem.

Module
BSNSCI00

**BSN2022E** A SECOND BSNSC FUNC=INIT CALL WAS ISSUED. THIS INITIALIZATION CALL FORCED TERMINATION OF POLICY SERVICES.

Explanation
A second INIT call was issued before a TERM call was issued, or the client was restarted and a second INIT call was issued after the first INIT call was terminated in error. This error is caused by the IMS tools client.

System action
The requested INIT function is rejected, and a return code and a reason code that define the failure are returned to the client.

The second INIT call is not processed, and Policy Services terminates the Policy Services environment. The environment is terminated because the first environment must be terminated to ensure that all processes are terminated and that all locks are released.

User response
Restart the IMS tools client or the dialogue client.

Module
BSNSCT00

**BSN2024E** A FUNC=TERM CALL WAS ISSUED. THIS TERMINATION REQUEST COULD NOT BE PROCESSED.

Explanation
A second TERM function request was made and then rejected because the environment has already terminated. This error is a client error.

System action
The requested TERM function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Restart the IMS tools client or the dialog client. If the problem persists, contact IBM Software Support.
Module
BSNSCT00

BSN2026E  A BSNSC FUNC=STRT CALL WAS ISSUED BEFORE A BSNSC FUNC=INIT CALL WAS ISSUED. THE STRT CALL WAS IGNORED.

Explanation
A STRT call was issued before issuing an INIT call. This error is a call sequence error by the client code and is an internal client call sequence error.

System action
The STRT call is not processed and Policy Services terminates. The requested STRT function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Restart the client, which is either the IMS tools client or the dialogue client and issue the INIT call before a STRT call.

Module
BSNSCI00

BSN2027E  THE POLICY ENVIRONMENT STATUS COULD NOT BE OBTAINED: RC=nn, RSN=nn.

Explanation
During Policy Services initialization, the call to Policy Environment Services to retrieve the environment status failed. This error is an internal Policy Services error. RC=nn and RSN=nn are the return and reason codes returned by Policy Environment Services (PES).

System action
The requested INIT function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
See the description of the return code and reason code in the reference section (Return/reason codes: Policy Environment Services (BSN150-1599) of this user's guide to determine and correct the problem.

Module
BSNSCI00

BSN2028E  THE POLICY ENVIRONMENT CONTROL BLOCKS COULD NOT BE OBTAINED.

Explanation
During Policy Services initialization, a request for the Policy Environment Control Block (PDEB) failed. This error is an internal Policy Services error.

System action
The requested INIT function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNSCI00

BSN2030I  POLICY SERVICES HAS INITIALIZED THE BPE SERVICES.

Explanation
The Base Primitive Environment Services is initialized.

System action
The Policy Services initialization process continues.

User response
No action is required.

Module
BSNSCI00

BSN2031E  BPE SERVICES COULD NOT BE INITIALIZED.

Explanation
The Base Primitive Environment failed initialization. This error is an internal Policy Services or IMS tools error.

System action
The requested INIT function is rejected, and a return code and a reason code that define the failure are returned to the client.
User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNSCI00
BSN2032I
POLICY SERVICES HAS TERMINATED THE BPE SERVICES.

Explanation
The Base Primitive Environment of Policy Services has been terminated.

System action
Policy Services is terminated.

User response
No action is required.

Module
BSNSCT00
BSN2033E
THE BPE SERVICES COULD NOT BE TERMINATED.

Explanation
The Policy Services Base Primitive Environment failed to terminate.

System action
The Base Primitive Environment is not terminated, and Policy Services continues termination.

User response
If the problem persists, contact IBM Software Support.

Module
BSNSCT00
BSN2040I
POLICY SERVICES HAS CONNECTED TO THE REPOSITORY.

Explanation
The initialization process connected to the repository.

System action
The Policy Services initialization process continues.

User response
No action is required.

Module
BSNSCI00
BSN2041E
POLICY SERVICES COULD NOT CONNECT TO THE ITKB REPOSITORY: RC=nn, RSN=nn.

Explanation
During Policy Services initialization, a connection request to the IMS tools Knowledge Base repository failed.

This error is an internal Policy Services error. The return code and the reason code are returned by the IMS tools Knowledge Base repository.

A common failure (RC=00000008, RSN=0000000A) results if the RACF setting for the Input repository is defined as UPDATE or READ and the User_ID does not have READ access authority or higher. If this is the problem, correct the RACF setting for the Input repository or the User_ID, whichever is in error.

System action
The requested INIT function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Start the IMS tools Knowledge Base server and request that the IMS tools client restarts Policy Services. See the IMS tools Knowledge Base return and reason codes to determine and correct the problem.

Module
BSNSCI00
BSN2042I
POLICY SERVICES HAS DISCONNECTED FROM THE REPOSITORY.

Explanation
Policy Services disconnected from the repository.

System action
Policy Services continues termination.

User response
No action is required.
Module
BSNSCT00

BSN2043E POLICY SERVICES COULD NOT DISCONNECT FROM THE REPOSITORY: RC=nn, RSN=nn.

Explanation
Policy Services failed to disconnect from the repository.

System action
Policy Services continues termination.

User response
See the FPQ return codes and reason codes to determine and correct the problem.

Module
BSNSCT00

BSN2044E POLICY SERVICES COULD NOT FORCE TERMINATION AFTER AN INITIALIZATION FAILURE.

Explanation
During Policy Services initialization, a failure resulted in the forced termination of Policy Services. However, the termination failed.

System action
Policy Services and data dictionary terminate.

User response
See the previously issued messages in the MVS console output to determine the initialization and termination failure.

Module
BSNSCI00

BSN2045E POLICY SERVICES COULD NOT BE INITIALIZED. POLICY SERVICES HAS FORCED TERMINATION.

Explanation
During Policy Services initialization, a failure resulted in the forced termination of Policy Services.

System action
Policy Services and data dictionary terminate.

User response
See the previously issued messages in the MVS console output to determine the initialization and termination failure.

Module
BSNSCI00

BSN2800I GENERAL STATUS:
RESOURCE=resource_name
ACTION_NAME=action_name
EXECUTION_STATUS=status

Explanation
This message is an informational message.

System action
None.

User response
No action is required.

Module
BSNAMT00

BSN2801E STORAGE COULD NOT BE OBTAINED FOR AMCB

Explanation
Storage could not be obtained for the action manager control block (AMCB) on the action manager initialization call (FUNC=AMIT). The REGION parameter does not have enough memory for the job. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify more memory for the REGION parameter, and then restart the job.

For example, you can specify REGION=0M so that the parameter can use all the main storage that it requires.

Module
BSNAM100

BSN2802E STORAGE COULD NOT BE OBTAINED FOR ADCB
Explanation
Storage could not be obtain for the action manager descriptor control block (ADCB) on the action manager initialization call (FUNC=AMIT). The REGION parameter does not have enough memory for the job. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify more memory for the REGION parameter, and then restart the job.

For example, you can specify REGION=0M so that the parameter can use all the main storage that it requires.

Module
BSNAMI00

BSN2803E STORAGE COULD NOT BE OBTAINED FOR MTCB

Explanation
Storage could not be obtained for the action message text control block (MTCB) on the action manager initialization call (FUNC=AMIT). The REGION parameter does not have enough memory for the job. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify more memory for the REGION parameter, and then restart the job.

For example, you can specify REGION=0M so that the parameter can use all the main storage that it requires.

Module
BSNAMI00

BSN2804E STORAGE COULD NOT BE OBTAINED FOR ANRB

Explanation
Storage could not be obtained for the action notification request block (ANRB) on the action manager initialization call (FUNC=AMIT). The REGION parameter does not have enough memory for the job. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify more memory for the REGION parameter, and then restart the job.

For example, you can specify REGION=0M so that the parameter can use all the main storage that it requires.

Module
BSNAMI00

BSN2805E THE PHASE NUMBER IS INVALID

Explanation
An invalid phase number was passed in the call to the action manager call (FUNC=AMP2). The valid phase number is 2.
System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNAMP00

BSN2807E  NO ACTION LIST WAS PASSED WITH AN AMIT

Explanation
No action list was passed to the action manager on the action manager initialization call (FUNC=AMIT). This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNAMD00

BSN2900I  The message text is one of the BBE2900I through BBE2910I summary messages

Explanation
This message is an informational message that is written to the Journal.

System action
System processing continues. The BBE29nnI message is written to the Policy Services Journal, in the following format:

2019-07-14 11:09:175@AM : BSN2900I BBE29nnI Summary message text.

User response
No action is required. See the latest version of the IMS Database Reorganization Expert for z/OS User's Guide for further information about the BBE29nnI messages.

Module
BSNAMT00

BSN3401I  THE JOURNAL MANAGER MODULE module_name RECEIVED CONTROL WITH FUNCTION function_code: RC=nn, RS=nn.

Explanation
This message is a journal manager (JM) message that indicates the module flow with the return code and the reason code for each module.

System action
None.

User response
No action is required.

Module
BSNJMSH0, BSNJMSR0, BSNJMSU0, BSNJMSW0, BSNJUOW0

BSN3403E  THE JOURNAL MANAGER HAD A CRITICAL ERROR IN MODULE module_name: FUNCTION=function_code, RC=nn, RS=nn.

Explanation
An error occurred in the journal manager (JM) module. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
See the JM return code and reason code to determine and correct the problem.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.
Explanation
An error occurred in the journal manager (JM) module because of a failure in the IMS Tools KB report service function. Where:

- **product_ID**: The product ID of the product using the IMS Tools KB report service.
- **report_ID**: The report ID that JM is processing.
- **ITKB_release**: The release of the IMS Tools KB server that is running.
- **HKT_function_code**: The IMS Tools KB report service function name.

**System action:**
The request to the IMS Tools KB report service is rejected. A return code and a reason code that define the failure are returned to the client. System processing continues.

**User response:**
See the topic "HKT return and reason codes (repositories)" in the *IBM Tools Base for z/OS IMS Tools Knowledge Base User's Guide and Reference* to determine and correct the problem. If the problem persists, contact IBM Software Support and notify them of the IMS tool that encountered this problem.

### Module
BSNJMSH0, BSNJMSR0, BSNJMSU0, BSNJMSW0, BSNJUOW0

**BSN3406E**

**Explanation**
An error occurred in the journal manager (JM) module because of an OPEN function failure. The ddname is the name of the DD statement that failed to open. This error is an internal IMS tools error.

**System action**
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
See the JM return code and reason code to determine and correct the problem. For more detailed information, see the MVS MESSAGE IECnnnn and check the data set that is indicated by the ddname.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

### Module
BSNJMSH0

**BSN3407E**

**Explanation**
An error occurred in the journal manager (JM) module because of a CLOSE function failure. The ddname is the name of the DD statement that failed to open. This error is an internal IMS tools error.

**System action**
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
See the JM return code and reason code to determine and correct the problem. For more detailed information, see the MVS MESSAGE IECnnnn and check the data set that is indicated by the ddname.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

### Module
BSNJMSH0

**BSN3408E**

**Explanation**
An error occurred in the journal manager (JM) module because of a DYNAMIC ALLOCATION function failure. This error is an internal IMS tools error.

**System action**
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.
User response
See the JM return code and reason code to determine and correct the problem. For more detailed information, see the MVS MESSAGE IECnnnn and check the data set that is indicated by the ddname.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNJMSH0
BSN3409E JOURNAL MANAGER ENCOUNTERED AN ERROR WHEN WRITING TO A DATA SET.

Explanation
An error occurred in the journal manager (JM) module because of a PUT function failure.

System action
Journal manager stops the function, and no more reports are written to the journal.

User response
See the MVS MESSAGE IECnnnn and check the data set that is indicated by the ddname. The data set might have been full.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNJMSR0
BSN4000I THE POLICY VALIDATION PROCESS HAS STARTED FOR THE RESOURCE resource_name.

Explanation
The policy validation process started.

System action
The policy validation process continues.

User response
No action is required.

Module
BSNPAI00
BSN4002I THE POLICY EVALUATION PROCESS HAS STARTED FOR THE RESOURCE resource_name.

Explanation
The policy evaluation process started.

System action
The policy evaluation process continues.

User response
No action is required.

Module
BSNPAI00
BSN4003I THE POLICY EVALUATION PROCESS HAS ENDED FOR THE RESOURCE resource_name: RC=nn, RSN=nn.

Explanation
The policy evaluation process ended.

System action
Processing continues.
See the return and reason codes for PVE. If the return code is zero, other error messages might accompany this message. Correct the errors and rerun the job.

If no messages are accompanied with a return code of zero, contact IBM Software Support.

Module
BSNPAI00

BSN4004E STORAGE COULD NOT BE OBTAINED FOR THE REQUESTED LENGTH=n.nn.nnnn: RC=nn, RSN=nn.

Explanation
The policy validation or the policy evaluation process could not obtain a storage.

System action
The requested function is rejected, and a return code and reason code that define the failure are returned to the client.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNPASM0


Explanation
The policy validation process or the policy evaluation process could not obtain a module EP address by using the CSVQUERY macro. The module_name variable indicates the module name that failed to obtain the address. The return code is from CSVQUERY.

System action
The requested function is rejected, and a return code and reason code that define the failure are returned to the client.

User response
See the z/OS MVS Programming: Assembler Services Reference for more information about the return code. Correct the error, then rerun the job.

If the problem persists, contact IBM Software Support.

Module
BSNPAI00

BSN4008W THE BPE STRING PRINT FORMATTING SERVICE DETECTED AN ERROR: RC=nn.

Explanation
The internal messaging service detected an error during the policy validation process or the policy evaluation process.

System action
The policy validation or the policy evaluation process stops to issue messages, and then the process continues.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNPAMS0

BSN4009W THE BPE WTO PRINT FORMATTING SERVICE DETECTED AN ERROR: RC=nn.

Explanation
The internal messaging service detected an error during the policy validation or policy evaluation process.

System action
The policy validation or policy evaluation process stops and issues messages, and then continues the process.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.
BSN4010I  A CONDITION WAS MET FOR THE RULE rule_name.

Explanation
The policy evaluation process detected an exception condition that met the condition for rule_name.

System action
The policy evaluation process continues.

User response
No action is required.

Module
BSNPEDC0

BSN4011I  AN EXCEPTION WAS DETECTED DURING THE POLICY EVALUATION PROCESS FOR THE RULE rule_name WITH EXCEPTION MESSAGE=exception_message, EXCEPTION CLASS=exception_class, EXCEPTION LEVEL=exception_level, AND SELECTED ACTION=action_name.

Explanation
An exception was detected during the policy evaluation process.

System action
The policy evaluation process continues.

User response
No action is required.

Module
BSNPEDC0

BSN4012I  NO EXCEPTION WAS DETECTED DURING THE POLICY EVALUATION PROCESS.

Explanation
An exception was not detected during the policy evaluation process.

System action
The policy evaluation process continues.

User response
No action is required.

Module
BSNPEDC0

BSN4013I  EVALUATION WAS SKIPPED FOR THE RULE rule_name: RSN=reason

Explanation
The policy evaluation process did not evaluate rule_name because of reason.

The following list explains the two possible reasons:

• RESOURCE TYPE WAS INCONSISTENT WITH THIS RULE. rule_name was incompatible with the processing resource type.
• NO DATA ELEMENTS FOR THE RULE EVALUATION WERE PROVIDED. All data elements specified in the Boolean operators were not provided as the input of the policy evaluation.

System action
The policy evaluation process continues.

User response
No action is required.

Module
BSNPEDC0

BSN4014I  THE EVALUATION PROCESS WAS DIRECTED BECAUSE OF A MISSING DATA ELEMENT FOR RULE NAME rule_name AND DATA ELEMENT NAME data_element_name. THE DIRECTION [GENERATE AN EXCEPTION/SKIP EVALUATION] WAS REQUESTED.

Explanation
The policy evaluation process detected a missing data element that is specified in the ONMISSING expression. The second parameter of the ONMISSING expression directs the rule evaluation.

The two directions are described in the following list:

• GENERATE AN EXCEPTION, which means that the policy evaluation process generates an exception for the rule.
• SKIP EVALUATION, which means that the policy evaluation process skips evaluation for the rule.

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**System action**
The policy evaluation process continues.

**User response**
No action is required.

**Module**
BSNPEMS0

**BSN4015I** THE DATA ELEMENT `data_element_name` IS NOT IN THE DATA RECORD.

**Explanation**
The policy evaluation process detected that `data_element_name` is missing in the data record.

**System action**
The policy evaluation process continues.

**User response**
No action is required.

**Module**
BSNPECPO

**BSN4016E** THE DOMAIN NAMES ARE INCONSISTENT. THE DOMAIN NAME THAT WAS SPECIFIED BY THE CLIENT PRODUCT IS `domain_name_1`, BUT THE DOMAIN NAME THAT WAS SPECIFIED IN THE POLICY IS `domain_name_2`.

**Explanation**
The policy domain name `domain_name_2` that is described in the policy is inconsistent with the policy domain name `domain_name_1` that was specified by the client product.

**System action**
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
Specify the domain name so that it is consistent with the domain in the policy, then rerun the job.

**Module**
BSNPVDM0

**BSN4017E** A RESOURCE TYPE THAT WAS DEFINED IN A RULE IS INAPPROPRIATE FOR THE POLICY RULE NAME `rule_name`.

**Explanation**
All resource types that are specified by the RESOURCE_REF expressions of a rule are not defined as the resource type in the policy.

**System action**
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
Specify the rule resource type so that it is consistent with the policy resource type, then rerun the job.

**Module**
BSNPVPD0

**BSN4018E** A POLICY DEFINITION DOES NOT MATCH THE POLICY DOMAIN DEFINITION FOR THE FOLLOWING LOCATION: [POLICY LEVEL | RULE LEVEL] [POLICY NAME | RULE NAME] `policy_name/rule_name` WITH DATA ATTRIBUTE= [EXCEPTION CLASS | EXCEPTION LEVEL | ACTION NAME] AND DATA VALUE= `value`.

**Explanation**
A data value that is defined in a policy or a rule does not match the policy domain definition.

The data value `value` is the data value of the exception class, exception level, or action name.

The `policy_name` or `rule_name` is the name of the policy or rule that has the data value that does not match the domain definition.

**System action**
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
Specify the domain name so that it is consistent with the domain in the policy, then rerun the job.
User response
Specify valid values for the exception class, exception level, and action name, then rerun the job. The valid values are given in the policy domain.

Module
BSNPVDM0

BSN4019E
THE DATA ELEMENT THAT WAS SPECIFIED BY THE ONMISSING EXPRESSION WAS NOT FOUND IN CONDITION EXPRESSION RULE NAME: rule_name AND DATA ELEMENT NAME: data_element_name. 

Explanation
The data element that is specified in the ONMISSING expression of a RULE expression is not defined in the CONDITION expression of the RULE expression.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify the data element that is defined in the ONMISSING expression in the CONDITION expression then rerun the job.

Module
BSNPVDM0

BSN4020E

Explanation
The BPE parsing service detected an error in the policy definition. The variable function_name indicates the function name of the BPE parsing service.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
If the function name is PARSE, see the BPE0003E message for the details of this error.

For any other function name, see the policy definition to correct any errors in the definition then rerun the job.

Module
BSNPPPS0

BSN4021E
A SYNTAX ERROR WAS FOUND IN THE POLICY DEFINITION STREAM FOR RULE NAME rule_name, BOOLEAN EXPRESSION #nn IN NEST LEVEL nn (OPERATOR: operator), COMPARISON EXPRESSION #nn, AND THE POSITION OF THE OPERAND WITH THE ERROR: IS nn. SEE THE BSNnnnnE MESSAGE FOR THE REASON OF THIS ERROR.

Explanation
The policy validation process detected a syntax error in the policy definition. The subsequent error message BSNnnnnE describes the error.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
See the BSNnnnnE message. Correct the error then rerun the job.

Module
BSNPVEHO, BSNPES0, BSNPPGVO, BSNPVDM0

BSN4022E
THE THRESHOLD DEFINITION IS INVALID FOR THE RESOURCE DEFINITION DATA ELEMENT NAME data_element_name.

Explanation
A threshold definition that is specified by the IF expression is invalid. The definition is invalid for the resource definition in the rule that is specified by the RESOURCE_REF expression.
System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify the data element name that is valid for the resources defined in the rule, then rerun the job. A valid data element name is given in the policy domain.

Module
BSNPVDM0

BSN4023E INVALID CHARACTERS WERE SPECIFIED IN invalid_content FOR expression.

Explanation
An expression contains invalid content. For example, specifying "CI/CA_SPLITS" for the EXCEPTION CLASS is invalid because slashes (/) cannot be used.

The expression variable is the expression that includes the invalid content and can be one of the following expressions:
- POLICY NAME
- POLICY ORIGINAL NAME
- RULE NAME
- NOTIFICATION LIST NAME
- ACTION NAME
- DOMAIN NAME
- RESOURCE NAME
- DATA ELEMENT NAME OF ONMISSING
- DATA ELEMENT NAME OF IF
- EXCEPTION CLASS
- EXCEPTION LEVEL
- ANNOTATION TEXT
- EXCEPTION MESSAGE TEXT

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Use valid characters when specifying the content for the expression then rerun the job.

Module
BSNPPGV0

BSN4024E THE MAXIMUM ALLOWABLE NUMBER OF OCCURRENCES WAS EXCEEDED FOR EXPRESSION NAME expression_name.

Explanation
The expression expression_name exceeded the maximum allowable number of occurrences.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify an expression name that is within the allowable number of occurrences then rerun the job.

For the NTFYLIST_REF expression, the maximum number of occurrences is 10.
For the IF expression, the maximum number of occurrences is 5.
All other expressions do not have a maximum number of occurrences.

Module
BSNPPGV0, BSNPPEH0

BSN4025E THE MAXIMUM NEST LEVEL WAS EXCEEDED.

Explanation
The nest level from the CONDITION expression exceeded the maximum allowable nest level.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Remove any nest that exceeds the maximum allowable nest level of 3 then rerun the job.

Module
BSNPPES0

BSN4026E THE ARRAYED BOOLEAN OPERATOR CONTAINS A NON-
ARRAYED DATA ELEMENT

data_element_name.

Explanation
The Boolean operator for arrayed data (AAND or AOR) contains a data element that is not treated as arrayed data.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify an arrayed data element for the arrayed Boolean operator then rerun the job.

Module
BSNPVDM0

BSN4027E
THE NON-ARRAYED BOOLEAN OPERATOR CONTAINS AN ARRAYED DATA ELEMENT
data_element_name.

Explanation
The Boolean operator for non-arrayed data (AND or OR) contains a data element that is treated as arrayed data.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify a non-arrayed data element for the non-arrayed Boolean operator then rerun the job.

Module
BSNPVDM0

BSN4028E
THE SPECIFIED NOTIFICATION LIST WAS NOT FOUND FOR THE FOLLOWING LOCATION: [POLICY LEVEL | RULE LEVEL] THE NAME name AND NOTIFICATION LIST NAME nl_name.

Explanation
A notification list, which is specified in the policy or rule expression, was not found in the IMS tools Knowledge Base repository.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify the notification lists that are stored in the input repository then rerun the job.

Module
BSNPVNL0

BSN4031E
AN ACTION COULD NOT BE ASSOCIATED WITH THE EXCEPTION CLASS AND LEVEL FOR THE RULE NAME rule_name.

Explanation
The policy validation process could not associate an action with the EXCEPTION_CLASS and the EXCEPTION_LEVEL for a rule that is defined in the policy.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
In the rule, specify the exception class and level that are associated with the policy action, and then rerun the job.

Module
BSNPPEAL0

BSN4032E
THE SPECIFIED RESOURCE TYPE IS INCORRECT FOR THE POLICY DOMAIN domain_name AND THE RESOURCE TYPE resource_type.

Explanation
The resource type that was specified for the policy validation process is incompatible for domain_name.
**System action**
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
Define the resource type that is evaluated for the policy domain then rerun the job.

**Module**
BSNPPEH0

**BSN4033E**
The threshold definition is incorrect for the threshold name `threshold_name`.

**Explanation**
The syntax of the threshold definition that is in the IF expression is incorrect.

**System action**
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
Specify the correct threshold definition in the IF expression then rerun the job.

**Module**
BSNPPEH0

**BSN4034E**
The boolean expression is inconsistent with threshold definition for the threshold name `threshold_name`.

**Explanation**
The suffixed data element was incorrectly specified as AAND or AOR in the arrayed Boolean operator.

**System action**
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
Replace the AAND or AOR expression with the AND or OR expression. Alternatively, you can remove the suffix from the data element that is specified in the arrayed Boolean operator. After replacing or removing the expression, rerun the job.

**Module**
BSNPPEH0

**BSN4035I**
An expression that refers to `data_element_name` is evaluated as {TRUE|FALSE|IGNORE}. The following expression was evaluated: comparison expression #nn of boolean expression #nn in nest level n (operator: `operator`) in the rule `rule_name`.

**Explanation**
The data element `data_element_name` is missing in the data record. The variable `rule_name` indicates the CONDITION expression that contains comparison operators for `data_element_name`. The `data_element_name` is evaluated as one of the following conditions:

- TRUE: the comparison expression that contains the missing data is true.
- FALSE: the comparison expression that contains the missing data is false.
- IGNORE: the comparison expression that contains the missing data is ignored.

**System action**
The policy evaluation process continues.

**User response**
No action is required.

**Module**
BSNPPEH0

**BSN4036E**
The comparison operator `operator` cannot be used for the data element `data_element_name`.

**Explanation**
The comparison operator `operator` for the IF expression cannot be used for the data element `data_element_name`. 

**System action**
The policy evaluation process is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
Specify the correct comparison operator for the IF expression, then rerun the job.

Use the following comparison operators for data elements when the physical format is a character type:
- IS
- ISNOT

Use the following comparison operators for data elements when the physical format is not a character type:
- GT
- LT
- GE
- LE
- EQ
- NE

**Module**
BSNPVDI0

**BSN4037W**  
**DATA ELEMENT**  
*data_element_name* IS MISSING IN THE SENSOR DATA RECORD.

**Explanation:**
The policy evaluation process detected that the value for the *data_element_name* is missing in the sensor data record set.

**System action:**
The policy evaluation process continues, and a return code of 4 and a reason code of X'10' are returned to the Policy Services API.

**User response:**
Check if a correct sensor data record set was read and that a correct policy was specified for the policy evaluation. Correct the error, and rerun the job.

**Module**
BSNPEMS0

**BSN4041E**  
THE INPUT DATA RECORD LIST IS INVALID FOR THE POLICY EVALUATION PROCESS. SINGLE AND ARRAYED DATA VALUES WERE MIXED IN A DATA RECORD.

**Explanation:**
Single data values and arrayed data values were contained in a single data record.

**System action**
The policy evaluation process is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response:**
Specify the correct load module library for IMS Policy Sensor Services. If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

**Module**
BSNPEMS0

**BSN4043E**  
THE INPUT DATA RECORD LIST IS INVALID FOR THE POLICY EVALUATION PROCESS. THE DATA RECORD LIST ADDRESS WAS NULL.

**Explanation:**
The data record list was not provided for policy evaluation.

**System action**
The policy evaluation process is rejected, and a return code and a reason code that define the failure are returned to the client.
User response
Specify the correct load module library for IMS Policy Sensor Services. If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNPECP0

BSN4051E THE DATA DICTIONARY SERVICE DETECTED PROBLEMS WHILE RUNNING FUNC=function_code: FRC=nnnn FRSN=nnnn.

Explanation
One or more errors were detected when the data dictionary function function_code was run.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNPVDI0

BSN4052E THE DATA DICTIONARY SERVICE DETECTED PROBLEMS WHILE RUNNING . AN INVALID THRESHOLD=threshold_name (TRC=nnnn TRSN=nnnn) WAS SPECIFIED FOR FUNC=function_code: FRC=nnnn, FRSN=nnnn.

Explanation
The threshold name threshold_name is incorrect or not defined in the data dictionary.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify the correct data element name in the CONDITION expression that is defined in the data dictionary then rerun the job.

Module
BSNPVDI0

BSN4053E THE DATA DICTIONARY SERVICE DETECTED PROBLEMS WHILE RUNNING . AN INVALID THRESHOLD VALUE=threshold_value (TRC=nnnn TRSN=nnnn) WAS SPECIFIED FOR THRESHOLD=threshold_name IN FUNC=function_code: FRC=nnnn, FRSN=nnnn.

Explanation
The threshold value threshold_value is incorrect for threshold_name.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Specify a valid threshold value that does not exceed the range in the CONDITION expression then rerun the job.

Module
BSNPVDI0

BSN4054E THE DATA DICTIONARY SERVICE DETECTED PROBLEMS WHILE RUNNING . AN INVALID THRESHOLD VALUE=threshold_value OR SENSORY DATA VALUE=sensory_data_value (TRC=nnnn TRSN=nnnn) WAS SPECIFIED FOR THRESHOLD=threshold_name IN FUNC=function_code: FRC=nnnn, FRSN=nnnn.

Explanation
The threshold value or the sensory data value for threshold_name is invalid for the Data Dictionary function function_code.

System action
The policy validation process is rejected, and a return code and a reason code that define the failure are returned to the client.
User response
Specify the correct load module library for IMS Policy Sensor Services. If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNPVD10

BSN4600I THE MESSAGE NOTIFICATION PROCESS HAS STARTED FOR THE DESTINATION TYPE destination_type.

Explanation
The message notification process has started.
The destination_type variable specifies where these notification messages are being sent. Possible destination types include the TSO USER, where messages are sent to a TSO user ID, and the SYSTEM CONSOLE, where messages are sent to an operator console.

System action
The message notification process continues.

User response
No action is required.

Module
BSNNMM00

BSN4601I THE MESSAGE NOTIFICATION PROCESS HAS ENDED FOR THE DESTINATION TYPE destination_type.

Explanation
The message notification process ended.
The destination_type variable specifies where these notification messages were being sent. Possible destination types include the TSO USER, where messages are sent to a TSO user ID, and the SYSTEM CONSOLE, where messages are sent to an operator console.

System action
The message notification process continues.

User response
No action is required.

Module
BSNNMM00

BSN4602E STORAGE COULD NOT BE OBTAINED FOR THE REQUESTED LENGTH=nnnnnnnn: RC=nn, RSN=dd.

Explanation
The message notification process could not obtain a storage. The LENGTH variable is the requested length. The return code nn and reason code dd are hexadecimal values that are returned by Policy Services Storage management.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNNMM00

BSN4603I THE TSO/E SEND COMMAND IS BEING USED FOR THE NOTIFICATION PROCESS.

Explanation
The message notification process uses the TSO/E SEND command to issue notification messages to TSO users.

System action
The message notification process continues.

User response
No action is required.

Module
BSNNMM00

BSN4604I THE WTO SERVICE IS BEING USED FOR THE NOTIFICATION PROCESS.
**Explanation**
The message notification process uses the z/OS WTO service to issue notification messages to the system console.

**System action**
The message notification process continues.

**User response**
No action is required.

**Module**
BSNNMM00

**BSN4607E**
The current level of the message notification process does not support the destination type for the destination name destination_name.

**Explanation**
The current level of the message notification process does not support the destination type that is associated with the destination name.

Policy Services supports only two destinations: the TSO user and the system console. If any other destination is specified, this message is issued.

**System action**
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
Specify the correct destination type for the message notification by using the Policy Dialog, then rerun the job.

**Module**
BSNNMCV0

**BSN4608W**
The BPE string print formatting service detected an error during the message notification process: RC=nn.

**Explanation**
Internal messaging service detected an error during the message notification process. The return code nn is a hexadecimal value that is returned by BPE message processing.

**System action**
The message notification process aborts by issuing messages, and then continues the process.

**User response**
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

**Module**
BSNNMMS0

**BSN4609W**
The BPE WTO print formatting service detected an error during the message notification process: RC=nn.

**Explanation**
The current level of the message notification process does not support the destination type that is associated with the destination name.

**System action**
The message notification process stops and issues messages, and then continues the notification process.

**User response**
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

**Module**
BSNNMMS0

**BSN4610E**
The message notification process could not read the notification list notification_list_name: FUNC=nnnn, RC=nn, RSN=nn.

**Explanation**
The message notification process failed to read a notification list from the repository.

The nnnn notification list function variable indicates the 4-byte function code. The return code and the reason code are hexadecimal values that are returned by the repository read service. The notification_list_name variable indicates the name of the notification list that could not be read.
**System action**
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
Specify the correct notification list name in the policy, then rerun the job.

**Module**
BSNNMNLO

**BSN4611I**  
THE FOLLOWING MESSAGES WERE RETURNED: message_text.

**Explanation**
The message notification process received one or more messages by using the notification service.

**System action**
The message notification process continues.

**User response**
No action is required.

**Module**
BSNNMM00

**BSN4612I**  
THE TSO/E SEND COMMAND WAS SUCCESSFUL: RC=nn

**Explanation**
The message notification process issued notification messages to TSO users by using the TSO/E SEND command. The return code is a hexadecimal value that is returned by the TSO SEND command.

**System action**
The message notification process continues.

**User response**
No action is required.

**Module**
BSNNMM00

**BSN4613E**  
THE TSO/E SEND COMMAND WAS UNSUCCESSFUL: RC=nnnnnnnn.

**Explanation**
The message notification process called the TSO notifier but failed to issue notification messages to TSO users by using the TSO/E SEND command. The variable nnnnnnnn indicates the hexadecimal return code of the TSO SEND command.

**System action**
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
See the z/OS TSO/E Command Reference to find the return code of the SEND command, and see BSN4611I for more information about this error.

**Module**
BSNNMM00

**BSN4614E**  
A SYSTEM ERROR OCCURRED DURING THE TSO NOTIFICATION PROCESS: RC=nnnn, RSN=nnnnnnnnnn.

**Explanation**
An environmental error occurred when the message notification process called the TSO notifier to issue notification messages to TSO users. The return code is a hexadecimal value that is returned by Policy Services Notification management. The following list shows possible return codes:

- X'0000C'
  The TSO notifier failed to obtain storage. The reason code is for the z/OS STORAGE macro.

- X'00010'
  The TSO notifier failed to open a data set that is used internally. The reason code is for the z/OS OPEN macro.

- X'00014'
  The TSO notifier failed to dynamically allocate a data set that is used internally. The reason code is for the z/OS DYNALLOC macro (S99RSC).

- X'00018'
  The TSO notifier failed to load a module. The first four bytes of the nnnnnnnn variable show the system completion code and the last four bytes show the reason code.

- X'0001C'
  The task that called the TSO notifier was not an APF-authorized task. The variable nnnnnnnn is always the hexadecimal reason code 00000004.
Policy Services does not support sending notification messages to TSO clients for the requesting IMS Tool because the IMS Tool is not executing in Key 8. The variable \texttt{nnnnnnnn} is the key of the caller.

The TSO notifier ended abnormally. The reason code shows the system completion code.

**System action**
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
If you have one of the following return codes, complete the accompanying steps for that return code. If you do not have one of the following return codes, contact IBM Software Support.

- \texttt{X'000C'}
  See the \textit{z/OS MVS Programming: Assembler Services Reference} for more information about the return code for the STORAGE OBTAIN macro. Correct any errors, then rerun the job.

- \texttt{X'0010'}
  See the \textit{z/OS DFSMS Macro Instructions for Data Sets} for more information about the return code for the OPEN macro. Correct any errors, then rerun the job.

- \texttt{X'0014'}
  See the \textit{z/OS MVS Programming Authorized Assembler Services Guide} for more information about the return code for the DYNALLOC macro. Correct any errors, then rerun the job.

- \texttt{X'0018'}
  See the \textit{z/OS MVS System Codes} for more information about the system completion code. Correct any errors, then rerun the job.

- \texttt{X'001C'}
  APF-authorize the task that called the TSO notifier, then rerun the job.

- \texttt{X'0020'}
  Change the notification list to send messages to the email directory entry, the texting directory entry, or both directory entries.

- \texttt{X'00FF'}
  Contact IBM Software Support.

**Explanation**
The message notification process issued notification messages to the system console by using the z/OS WTO service. The return code is a hexadecimal value that MVS returned for the WTO.

**System action**
The message notification process continues.

**User response**
If you have one of the following return codes, complete the accompanying steps for that return code. If you do not have one of the following return codes, contact IBM Software Support.

- \texttt{X'000C'}
  See the \textit{z/OS MVS Programming: Assembler Services Reference} for more information about the return code for the STORAGE OBTAIN macro. Correct any errors, then rerun the job.

- \texttt{X'0010'}
  See the \textit{z/OS DFSMS Macro Instructions for Data Sets} for more information about the return code for the OPEN macro. Correct any errors, then rerun the job.

- \texttt{X'0014'}
  See the \textit{z/OS MVS Programming Authorized Assembler Services Guide} for more information about the return code for the DYNALLOC macro. Correct any errors, then rerun the job.

- \texttt{X'0018'}
  See the \textit{z/OS MVS System Codes} for more information about the system completion code. Correct any errors, then rerun the job.

- \texttt{X'001C'}
  APF-authorize the task that called the TSO notifier, then rerun the job.

**Module**
BSNNMM00

**Explanation**
The message notification process failed to issue notification messages to the system console by using the z/OS WTO service. The return code is a hexadecimal value returned by MVS for the WTO.

**System action**
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
See the MVS programming assembler services reference for more information about the WTO return code. Correct the error then rerun the job.

**Module**
BSNNMM00

**Explanation**
This message is a notification list data store (NLDS) message that indicates the module flow with the return code and the reason code for each module.
System action
None.

User response
No action is required.

Module
BSNNLCB0, BSNNLDI0, BSNNLDU0, BSNNLDL0, BSNNLDP0, BSNNLPD0, BSNNLDE0, BSNLDA0

BSN5203E
NLDS HAD A CRITICAL ERROR IN MODULE module_name:
FUNCTION=function_code RC=nn, RS=nn.

Explanation
An error occurred in the notification list data store (NLDS) module. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
See the NLDS return code and reason code to determine and correct the problem.

If the problem persists, contact IBM Software Support and notify them of the IMS tool that encountered this problem.

Module
BSNNLDI0, BSNNLDU0, BSNNLDL0, BSNNLDP0, BSNNLPD0, BSNLDA0

BSN5207E
A NLDS REPOSITORY FUNCTION FAILED FOR NLDS PENDING DELETE TABLE FOR ENVIRONMENT LEVEL=environment_level.
The FPQSRV FPQ_ function_code FAILED IN MODULE module_name WITH RC=nn, RSN=nn. THE FPQSRV DIAGNOSTIC FEEDBACK=
WORD1=word1_first_half-word1_second_half, WORD2=word2, WORD3=word3.

Explanation
A repository server function failed in the notification list data store (NLDS) module for environment_level, recon_ID, and notification_list_name. The FPQ function code specifies the repository function name.

The feedback field includes IBM diagnostic and debugging information. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
See the repository service return code and reason code to determine and correct the problem.

If the problem persists, contact IBM Software Support and notify them of the IMS tool that encountered this problem.
User response
See the repository service return code and reason code to determine and correct the problem.
If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNNLDI0, BSNNLDU0, BSNNLDL0, BSNNLDP0, BSNNLPO0, BSNNLDA0

BSN5208E THE NOTIFICATION LIST: notification_list_name, COULD NOT BE DELETED BECAUSE IT IS BEING REFERENCED BY DOMAIN referenced_policy_domain_name: LOCAL=referenced_policy_recon_ID, POLICY=referenced_policy_name.

Explanation
A request to delete the notification list failed because it is being referenced by a policy.

System action
The requested function is rejected, and another error message BSN5203E with return code (X'08') and reason code (X'70') is returned to the caller.

User response
To delete the notification list, remove the reference to the notification list from the policy.

Module
BSNNLPO0

BSN5217I THE NOTIFICATION LIST function BY RECON recon_name HAS STARTED

Explanation
The notification list data store (NLDS) process is started by recon_name. The variable function is one of the following actions:

- DELETE
- QUERY

System action
None.

User response
None. This message is informational.

Module
BSNNLDI0

BSN5212I FOR LEVEL=environment_level, LOCALE=locale, AND NOTIFICATION LIST=notification_list_name, THE NOTIFICATION LIST list_action STARTED.

Explanation
The notification list process (list_action) has started for environment_level, recon_ID, and notification_list_name.
The variable list_action is one of the following actions:

- UPDATE
- DELETE
- IMPORT
BSN5215I THE NOTIFICATION LIST HAS ENDED LISTING OBJECTS: RC=nn, RSN=nn

Explanation
The notification list process ended listing.

System action
None.

User response
No action is required.

Module
BSNNLDU0, BSNNLDL0, BSNNLDP0

BSN5216I FOR LEVEL=environment_level, LOCALE=locale, AND NOTIFICATION LIST=notification_list_name, THE NOTIFICATION LIST list_action HAS ENDED.

Explanation
The notification list process (list_action) has ended for environment_level, recon_ID, and notification_list_name.
The variable list_action is one of the following actions:
• UPDATE
• DELETE
• IMPORT

System action
None.

User response
No action is required.

Module
BSNNLDI0

BSN5222W NO DELEGATE NAME WAS FOUND IN THE DIRECTORY ENTRY directory_entry_name.

Explanation
The directory entry does not have a delegate name that is specified, but the delegate option was set.

System action
Normal processing continues.

User response
If the directory entry requires a delegate name, add a delegate name by updating the directory entry.
If a delegate name is not required, request that the delegate option be turned off.

Module
BSNNLDL0

BSN5223W NO DELEGATE OPTION WAS FOUND IN THE DIRECTORY ENTRY directory_entry_name.

Explanation
The directory entry does not have a delegate option that is specified. A delegate name was specified, but the delegate option is not set. This condition is valid, but the rerouting to an alternate destination cannot occur until the delegate option is set.

System action
Normal processing continues.

User response
If you want to reroute to an alternate destination, set the delegate option. Otherwise, no action is required.

Module
BSNNLDL0

BSN5224W THE DIRECTORY ENTRY directory_entry_name DOES NOT EXIST IN THE REPOSITORY.

Explanation
The directory entry directory_entry_name does not exist in the repository. A request for the named directory does not exist.
System action
Normal processing continues.

User response
If directory_entry_name is a valid directory name, add the directory entry into the system. Otherwise, no action is required.

Module
BSNNLDL0

BSN5801I THE PDDS MOD module_name RECEIVED CONTROL WITH FUNC=function_code: RC=nn, RSN=nn.

Explanation
This message is a policy domain data store (PDDS) message that indicates the module flow with the return code and the reason code for each module.

System action
None.

User response
No action is required.

Module
BSNPDDSO, BSNPDDHO, BSNPDDIO

BSN6401I THE RDS MOD module_name RECEIVED CONTROL WITH FUNC=function_code: RC=nn, RSN=nn.

Explanation
This message is a rule data store (RDS) message that indicates the module flow with the return code and the reason code for each module.

System action
None.

User response
No action is required.

Module
BSNRDST0, BSNRDSL0, BSNRDSSO, BSNRDSU0, BSNRDSR0, BSNRDSCO, BSNRDSDO, BSNRDSA0

BSN6402I THE RULE STREAM (rule_stream_name) HAS BEEN DELETED

Explanation
The rule data store (RDS) process deleted rule_stream_name.

System action
None.

User response
No action is required.

Module
BSNRDSS0

BSN6403E RDS HAS A CRITICAL ERROR IN MODULE module_name: FUNCTION=function_code, RC=nn, RSN=nn. FOR RULE=rule_name, LOCALE=locale_name.

Explanation
An error occurred in the rule data store (RDS) module. The output for RULE=rule_name and LOCALE=locale_name are displayed only if rule and locale names are known. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
See the PDDS return code and reason code to determine and correct the problem.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
See the RDS return code and reason code to determine and correct the problem.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNRDST0, BSNRDSL0, BSNRDSU0, BSNRDSV0, BSNRDSR0, BSNRDC0, BSNRDSA0, BSNRDS00, BSNRDSH0

BSN6405E  THE THRESHOLD WAS NOT DELETED, IT’S REFERENCED BY POLICY policy_name: LOCALE=locale_name.

Explanation
A request to delete a rule threshold set or rule failed because the set or rule is being referenced by a policy.

System action
The requested function to delete a threshold set (TDTS), update a rule (UPWT), or delete a rule template (RTDL) is rejected, and a return code that defines the failure is returned to the client.

User response
To delete the threshold set or rule, remove the reference to the threshold set or rule from the policy.

Module
BSNRDST0, BSNRDSL0, BSNRDSU0, BSNRDS0

BSN6406E  THE RDS REPOSITORY FUNCTION FAILED: DOMAIN=domain_name, LEVEL=environment_level, LOCALE=recon_ID, RULE=rule_name. THE FPQSRV FPQ_function_code FAILED IN MODULE module_name WITH RC=nn, RSN=nn. THE FPQSRV DIAGNOSTIC FEEDBACK= WORD1=word1_first_half-word1_second_half, WORD2=word2, WORD3=word3.

Explanation
A repository server function failed in the rule data store (RDS) module for environment_level, recon_ID, and rule_name because of a repository server function failure. The FPQ function code specifies the repository function name.

The feedback field includes IBM diagnostic and debugging information. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
See the repository service return code and reason code to determine and correct the problem.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNRDST0, BSNRDSL0, BSNRDSU0, BSNRDSV0, BSNRDSR0, BSNRDSA0

BSN6411I  THE RULE TEMPLATE/STREAM LIST HAS STARTED LISTING OBJECTS FOR DOMAIN=domain_name.

Explanation
A repository server function failed in the rule data store (RDS) module for environment_level, recon_ID, and rule_name because of a repository server function failure. The FPQ function code specifies the repository function name.

The feedback field includes IBM diagnostic and debugging information. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
To delete the threshold set or rule, remove the reference to the threshold set or rule from the policy.

Module
BSNRDST0, BSNRDSL0, BSNRDSU0, BSNRDS0

BSN6412I  THE RULE TEMPLATE function PROCESS HAS STARTED FOR DOMAIN=domain_name, LEVEL=environment_level, LOCALE=locale, RULE=rule_name.
Explanation
The rule data store (RDS) process (function) has started for domain_name, environment_level, and locale, where locale is the RECON ID that has been defined to the repository or BSNGLOBL. The output for RULE=rule_name is displayed only if the rule name is known.

The variable function is one of the following actions:
• COPY UPDATE
• IMPORT
• DELETE
• UPDATE

System action
None.

User response
No action is required.

Module
BSNRDST0, BSNRDSU0

BSN6415I  THE RULE TEMPLATE/STREAM LIST HAS ENDED FOR THE
          DOMAIN=domain_name: RC=nn, RSN=nn.

Explanation
The rule data store (RDS) process has ended listing for domain_name.

System action
None.

User response
No action is required.

Module
BSNRDSL0

BSN6416I  THE RULE template function PROCESS HAS ENDED FOR:
          DOMAIN=domain_name, LEVEL=environment_level, 
          LOCALE=locale, RULE=rule_template_name, 
          RC=nn, RSN=nn.

Explanation
The rule data store (RDS) process has ended for domain_name, environment_level, and locale, where LOCALE is the RECON ID that has been defined to the repository or BSNGLOBL.

The variable function is one of the following actions:
• IMPORT
• DELETE
• UPDATE

System action
None.

User response
No action is required.

Module
BSNRDST0, BSNRDSU0

BSN6417I  THE RULE function BY RECON recon_name HAS STARTED

Explanation
The rule data store (RDS) process is started by recon_name. The variable function is one of the following actions:
• DELETE
• QUERY

System action:
None.

User response
None. This message is informational.

Module:
BSNRDSN0

BSN6418I  THE RULE function BY RECON recon_name HAS ENDED FOR THE:
          RC=nn, RSN=nn.

Explanation
The rule data store (RDS) process is ended by recon_name. The variable function is one of the following actions:
• DELETE
• QUERY

System action:
None.
BSN7001I  THE MODULE module_name RECEIVED CONTROL WITH FUNC function_code: RC=nn, RS=nn.

Explanation
This message is a policy data store (PDS) message that indicates the module flow with the return code and the reason code for each module.

System action
None.

User response
No action is required.

Module
BSNRDSN0

BSN7002I  THE POLICY WAS FOUND IN THE GLOBAL LOCALE

Explanation
Policies exist in the global locale.

System action
None.

User response
No action is required.

Module
BSNPDSL0, BSNPDST0, BSNPDSS0, BSNPDSU0, BSNPDSA0, BSNPDSP0, BSNPDSV0, BSNPDSC0

BSN7003E  PDS HAS A CRITICAL ERROR IN MODULE module_name: FUNCTION=function_code RC=nn, RS=nn.

Explanation
An error occurred in the policy data store (PDS) module. This error is an internal IMS tools error.

System action
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

User response
See the PDS return code and reason code to determine and correct the problem.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNPDSL0, BSNPDST0, BSNPDSS0, BSNPDSU0, BSNPDSA0, BSNPDSP0, BSNPDSV0, BSNPDSC0

BSN7005I  NO NOTIFICATION LIST WAS SPECIFIED IN THE POLICY TEMPLATE.

Explanation
No notification list has been specified in the policy template.

System action
None.

User response
No action is required.

Module
BSNPDSU0

BSN7006E  THE REPOSITORY FUNCTION function_code FAILED IN MODULE module_name: DOMAIN=domain_name, LEVEL=environment_level, LOCALE=recon_ID, POLICY=policy_name. RC=nn, RSN=nn. THE FPQSRV DIAGNOSTIC FEEDBACK: WORD1=word1_first_half-word1_second_half, WORD2=word2, WORD3=word3.

Explanation
A repository server function failed for policy data store (PDS) module for environment_level, recon_ID, and policy_name. The FPQ function code specifies the repository function name.
The feedback field includes words for IBM diagnostic information. This error is an internal IMS tools error.

**System action**
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
See the repository service return code and reason code to determine and correct the problem.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

**Module**
BSNPDSL0, BSNPDST0, BSNPDSS0, BSNPDSU0, BSNPDSA0, BSNPDSP0

**BSN7007E** THE GLOBAL RECON ID BSGLOBL IS NOT REGISTERED.

**Explanation**
The global RECON ID is not registered. This error is an internal IMS tools error.

**System action**
The requested function is rejected, and a return code and a reason code that define the failure are returned to the client.

**User response**
See the repository service return code and reason code to determine and correct the problem.

If the problem persists, contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

**Module**
BSNPDSL0, BSNPDST0, BSNPDSS0, BSNPDSU0, BSNPDSA0, BSNPDSP0

**BSN7008I** THE POLICY WAS NOT FOUND IN THE RECON LOCALE. WILL CONTINUE TO SEARCH THE GLOBAL LOCALE.

**Explanation**
Policy Services searched the RECON locale for the requested policy, but the policy was not found in the RECON locale.

Policy Services will continue the search in the global locale.

**System action**
The policy lookup process continues.

**User response**
None. This message is informational.

**Module**
BSNPDSL0

**BSN7011I** THE LISTING OF THE POLICY TEMPLATE/STREAM PROCESSING HAS STARTED FOR DOMAIN domain_name.

**Explanation**
The policy data store (PDS) process started listing for domain_name.

**System action**
None.

**User response**
No action is required.

**Module**
BSNPDSL0

**BSN7012I** THE POLICY action PROCESS HAS STARTED FOR DOMAIN=domain_name, POLICY=policy_name, LEVEL=environment_level, LOCALE=locale.

**Explanation**
The policy data store (PDS) services process (action) has started for domain_name, environment_level, recon_ID, and policy_name.

The variable action is one of the following actions:

- TEMPLATE IMPORT
- TEMPLATE DELETE
- STREAM IMPORT
- STREAM DELETE
- TEMPLATE UPDATE
System action
None.

User response
No action is required.

Module
BSNPDST0, BSNPDSS0, BSNPDSU0

BSN7015I THE POLICY TEMPLATE/STREAM LIST HAS ENDED FOR
DOMAIN=domain_name, RC=nn, RSN=nn.

Explanation
The policy data store (PDS) services process ended listing for domain_name.

System action
None.

User response
No action is required.

Module
BSNPDSL0

BSN7016I THE POLICY action PROCESS HAS ENDED FOR POLICY=policy_name
IN DOMAIN=domain_name: LEVEL=environment_level,
LOCALE=locale, RC=nn, RSN=nn.

Explanation
The policy data store (PDS) services process (action) has ended for domain_name, environment_level, recon_ID, and policy_name.

The variable action is one of the following actions:
- TEMPLATE IMPORT
- TEMPLATE DELETE
- STREAM IMPORT
- STREAM DELETE
- TEMPLATE UPDATE

System action
None.

User response
No action is required.

Module
BSNPDSL0

BSN7017I THE POLICY function BY RECON recon_name HAS STARTED

Explanation
The policy data store (PDS) process is started by recon_name. The variable function is one of the following actions:
- DELETE
- QUERY

System action:
None.

User response
None. This message is informational.

Module:
BSNPDSL0

BSN7018I THE POLICY function BY RECON recon_name HAS ENDED FOR THE:
RC=nn, RSN=nn.

Explanation
The policy data store (PDS) process is ended by recon_name. The variable function is one of the following actions:
- DELETE
- QUERY

System action:
None.

User response
None. This message is informational.

Module:
BSNPDSL0

BSN7600E AN INVALID FUNCTION WAS REQUESTED.

Explanation
The client issued a request to the IMS Policy Services Data Dictionary component with an invalid function request. This error is an internal problem with the IMS tool that made the request.

System action
IMS Policy Services rejects the call from the client, and a return code and a reason code that define the failure...
are returned to the client. System processing continues.

**User response**
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

<table>
<thead>
<tr>
<th>Module</th>
<th>BSNDDMI00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BSN7601E</strong></td>
<td><strong>STORAGE FOR DDES BLOCK COULD NOT BE OBTAINED.</strong></td>
</tr>
</tbody>
</table>

**Explanation**
An internal storage block or table could not be obtained. This error is an internal IMS Policy Services Data Dictionary component error.

**System action**
IMS Policy Services fails initialization, and a return code and a reason code that define the failure are returned to the client.

**User response**
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

<table>
<thead>
<tr>
<th>Module</th>
<th>BSNDDMI00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BSN7602E</strong></td>
<td><strong>THE DATA DICTIONARY MODULE module_name COULD NOT BE LOADED.</strong></td>
</tr>
</tbody>
</table>

**Explanation**
A module that is loaded by the initialization function of the IMS Policy Services Data Dictionary component failed the LOAD request. This error is an internal IMS Policy Services error.

**System action**
IMS Policy Services Data Dictionary fails initialization, and a return code and a reason code that define the failure are returned to the client.

**User response**
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

<table>
<thead>
<tr>
<th>Module</th>
<th>BSNDDMI00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BSN7603E</strong></td>
<td><strong>THE CREATE NAME/TOKEN FUNCTION FAILED.</strong></td>
</tr>
</tbody>
</table>

**Explanation**
The MVS request to create a name-token pair failed. This error is an internal IMS Policy Services Data Dictionary component error.

**System action**
IMS Policy Services Data Dictionary fails initialization, and a return code and a reason code that define the failure are returned to the client.

**User response**
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

<table>
<thead>
<tr>
<th>Module</th>
<th>BSNDDMI00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BSN7604E</strong></td>
<td><strong>THE DICTIONARY DEFINITIONS COULD NOT BE LOADED.</strong></td>
</tr>
</tbody>
</table>

**Explanation**
The Dictionary Definitions Table that is loaded by the IMS Policy Services Data Dictionary component failed the LOAD request. This error is an internal IMS Policy Services error.

**System action**
IMS Policy Services Data Dictionary initialization fails.

**User response**
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

<table>
<thead>
<tr>
<th>Module</th>
<th>BSNDDMI00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BSN7606E</strong></td>
<td><strong>STORAGE FOR DDDS BLOCK COULD NOT BE OBTAINED.</strong></td>
</tr>
</tbody>
</table>

**Explanation**
An internal storage block or table could not be obtained. This error is an internal IMS Policy Services Data Dictionary component error.
System action
IMS Policy Services fails initialization, and a return code and a reason code that define the failure are returned to the client.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNDDMI00

BSN7607E STORAGE FOR DDIS BLOCK COULD NOT BE OBTAINED.

Explanation
An internal storage block or table could not be obtained. This error is an internal IMS Policy Services Data Dictionary component error.

System action
IMS Policy Services fails initialization, and a return code and a reason code that define the failure are returned to the client.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNDDMI00

BSN7608E STORAGE FOR DDNS BLOCK COULD NOT BE OBTAINED.

Explanation
An internal storage block or table could not be obtained. This error is an internal IMS Policy Services Data Dictionary component error.

System action
IMS Policy Services fails initialization, and a return code and a reason code that define the failure are returned to the client.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

Module
BSNDDMI00

BSN7609E STORAGE FOR DDDS BLOCK COULD NOT BE RELEASED.

Explanation
The request to release an internal control block failed.

System action
IMS Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. The base rule, policy, or notification list processing completes with an error. System processing continues.

User response
The REGION parameter does not have enough specified memory for the job. Specify more memory for the REGION parameter, and then restart the job. For example, you can specify REGION=0M so that the parameter can use all the main storage that it requires.

Module
BSNDDMI00

BSN7610E STORAGE FOR DDNS BLOCK COULD NOT BE RELEASED.

Explanation
The request to release an internal control block failed.

System action
IMS Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. The base rule, policy, or notification list processing completes with an error. System processing continues.

User response
The REGION parameter does not have enough specified memory for the job. Specify more memory for the REGION parameter, and then restart the job. For example, you can specify REGION=0M so that the parameter can use all the main storage that it requires.

Module
BSNDDMI00

BSN7611E STORAGE FOR DDNS BLOCK COULD NOT BE RELEASED.
<table>
<thead>
<tr>
<th>Module</th>
<th>BSNDDMI00</th>
<th>BSN7615E</th>
<th>THE DATA DICTIONARY MODULE COULD NOT BE DELETED.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanation</td>
<td>A module that is loaded by the termination function of the IMS Policy Services Data Dictionary component failed the DELETE request. This error is an internal IMS Policy Services error.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System action</td>
<td>IMS Policy Services Data Dictionary continues termination.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User response</td>
<td>Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module</th>
<th>BSNDDMI00</th>
<th>BSN7616E</th>
<th>STORAGE FOR DDES BLOCK COULD NOT BE RELEASED.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanation</td>
<td>The request to release an internal control block failed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System action</td>
<td>IMS Policy Services rejects the call from the client, and a return code and a reason code that define the failure are returned to the client. The base rule, policy, or notification list processing completes with an error. System processing continues.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User response</td>
<td>The REGION parameter does not have enough specified memory for the job. Specify more memory for the REGION parameter, and then restart the job. For example, you can specify REGION=0M so that the parameter can use all the main storage that it requires.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Module</td>
<td>BSNDDMI00</td>
<td>BSN7614E</td>
<td>THE DELETE NAME/TOKEN FUNCTION FAILED.</td>
</tr>
<tr>
<td>Explanation</td>
<td>The MVS request to delete a name-token pair failed. This error is an internal IMS Policy Services Data Dictionary component error.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System action</td>
<td>IMS Policy Services Data Dictionary continues termination.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User response</td>
<td>Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Explanation
Data Dictionary has processed the termination request from the last active client. However, some clients failed to issue a disconnect request, and if any of those clients attempt any Data Dictionary call, that call could result in a system failure. This error is an internal problem with the IMS tools client.

System action
The request to terminate Data Dictionary is completed.

User response
Contact IBM Software Support, and notify them of the IMS tool that encountered this problem.

BSN8000E INCORRECT EXEC PARAMETER IS SPECIFIED.

Explanation
An incorrect EXEC parameter is specified for the Policy Services batch utility interface (BSNUTIL0).

System action
Processing ends with a return code of 8.

User response
Correct the EXEC parameter, and rerun the job.

BSN8001I THE utility_name PROCESS HAS STARTED.

Explanation
The Policy Services utility named utility_name has started.

System action
Processing continues.

User response
None. This message is informational.

BSN8002I THE utility_name PROCESS HAS ENDED NORMALLY.

Explanation
The Policy Services utility named utility_name has ended normally.

BSN8003W THE utility_name PROCESS HAS ENDED WITH WARNING.

Explanation
The Policy Services utility named utility_name has ended with warnings.

System action
Processing ends with a return code of 4.

User response
Check another message whose suffix is W. If this is not the expected result, correct the error, and rerun the job.

BSN8004E THE utility_name PROCESS HAS ENDED WITH ERROR.

Explanation
The Policy Services utility named utility_name has ended with errors.

System action
Processing ends with a return code of 8.

User response
Check another message whose suffix is E. Correct the error, and rerun the job.

BSN8005E STORAGE OBTAIN FAILED.
RC=return_code, SIZE=size, MOD=module, ERROR_ID=error_id.

Explanation
The Policy Services utility failed to obtain storage.

return_code
Shows the return code (in hexadecimal) that is returned from the STORAGE macro.

size
Shows the size of the storage that could not be obtained.
module
   Shows the name of the failed module.

error_id
   Shows the error ID that is associated with the module.

System action
   Processing ends with a return code of 8.

User response
   Increase the REGION size on the JOB statement in the JCL, and rerun the utility.

BSN8006E   STORAGE RELEASE FAILED.
   RC=return_code, SIZE=size, MOD=module, ERROR_ID=error_id.

Explanation
   The Policy Services utility failed to release storage. In the message text,
   return_code
      Shows the return code (in hexadecimal) that is returned from the STORAGE macro.
   size
      Shows the size of the storage that could not be released.
   module
      Shows the name of the failed module.
   error_id
      Shows the error ID that is associated with the module.

System action
   Processing continues with a return code of 4.

User response
   Correct the error, and rerun the job.

BSN8009E   DYNALLOC SERVICE FAILED FOR
   FUNC=[ALLOC | UNALLOC], [DDNAME=ddname | DSNAME=dsname],
   RC=return_code, RSN=reason_code.

Explanation
   The Policy Services utility failed to allocate or unallocate the data set for DD name ddname or the data set named dsname. The hexadecimal value return_code is the return code from the SNAP macro. The hexadecima value reason_code is the S99ERROR and S99INFO contents.

System action
   Processing ends with a return code of 8.

User response
   Correct the problem, and rerun the job.

BSN8010E   UTILITY ENDED WITH ERROR.
   RC=return_code, RSN=reason_code.

Explanation
   The Policy Services batch utility interface (BSNUTIL0) ended with an error. Hexadecimal values return_code and reason_code indicate the return and reason codes from the requested function, respectively.
System action
Processing ends with a return code of 8.

User response
Correct the error, and rerun the job.

BSN8011E ERRORS DETECTED WHILE xxxxxxxx

Explanation
The Policy Services utility encountered errors during its processing.

Indicates one of the following:
- ANALYZING INPUT PARAMETERS
- EXTRACTING SENSOR DATA ELEMENTS
- GENERATING REPORTS

System action
Processing ends with a return code of 8.

User response
Check the message whose suffix is E in the journal data set. Correct the error, and rerun the job.

BSN8012E LOAD FAILED.
MODULE=modname, SC=code,
RSN=reason_code.

Explanation
The Policy Services utility failed to load the module named modname. The hexadecimal value code is the abend code, and the hexadecimal value reason_code is the reason code associated with the abend.

System action
Processing ends with a return code of 8.

User response
Check if the correct load module library is specified in the STEPLIB DD statement.

BSN8013E CONNECTION TO THE ITKB SERVER FAILED.
NAME=servername.

Explanation
The connection to the IMS Tools KB server failed. This message might be issued for the following reasons:
- The server is not started.
- The server name that is specified by the ITKBSRVR keyword is incorrect.
- Insufficient access authority to the repository.

System action
Processing ends with a return code of 8.

User response
Complete the following steps:
1. Ensure that the server name specified on the ITKBSRVR keyword is correct.
2. Ensure that the IMS Tools KB server is configured and started without any errors. For configuration steps, see the topic "Configuring IMS Tools Knowledge Base" in IBM Tools Base for z/OS Configuration Guide for IMS.

If the problem persists, contact your system administrator to obtain the required level of authorization.

BSN8014E SPECIFIED RECON ID IS NOT DEFINED IN REPOSITORY. RECON ID=recon_id.

Explanation
The Policy Services utility failed to retrieve the RECON ID of recon_id from the IMS Tools KB Input repository.

System action
Processing ends with a return code of 8.

User response
Ensure that the RECONID keyword specifies the correct RECON ID. Also, ensure that the RECON data set name is registered with IMS Tools KB.

BSN8015E UNABLE TO OBTAIN RECON ID FROM REPOSITORY. RECON ID=recon_id, RC=return_code,
RSN=reason_code.

Explanation
The Policy Services utility failed to retrieve the RECON ID of recon_id from the IMS Tools KB Input repository. Hexadecimal values return_code and reason_code are the return code and the reason code from the RECON ID retrieval module.

System action
Processing ends with a return code of 8.
User response

Ensure that the RECONID keyword specifies the correct RECON ID. Also, ensure that the RECON data set name is registered with IMS Tools Knowledge Base. If the problem persists, contact IBM Software Support.

BSN8016E  UNSUPPORTED DOMAIN.
          DOMAIN=domain_name.
          or
          UNSUPPORTED DATABASE TYPE.
          DBTYPE=database_type.
          or
          UNSUPPORTED DATABASE TYPE
          PREACCES=X'nn'.
          or
          UNSUPPORTED INPUT FORMAT.

Explanation

The Policy Services utility does not support the requested domain, database, or input sensor data format.

System action

Processing ends with a return code of 8.

User response

This error might be an internal system error. Contact IBM Software Support.

BSN8020E  INTERNAL ERROR OCCURRED IN
          MODULE modname, CODE=code

Explanation

The Policy Services utility encountered an internal error. modname is the name of the module that encountered the error. code is the information code associated with the error.

System action

Processing ends with a return code of 8.

User response

This error might be an internal system error. Contact IBM Software Support.

BSN8017E  DBD dbd_name NOT FOUND IN
          DBDLIB.

Explanation

The Policy Services utility could not find the DBD member dbd_name in the DBD library.

System action

Processing ends with a return code of 8.

User response

Ensure that the correct DBD library is specified in the IMS DD statement.

BSN8019E  ESTAE FAILED. RC=return_code,
          MOD=modname.

Explanation

The ESTAE request issued by the Policy Services utility failed. The hexadecimal value return_code is the return code of the ESTAE macro. modname is the module name that requested the ESTAE macro.

System action

Processing ends with a return code of 8.

User response

Correct the error, and rerun the job.

BSN8021E  SENSOR DATA SERVICE FAILED
          FOR FUNC=function,
          RC=return_code,
          RSN=reason_code.
          [- KHTIMST API FUNC=function2,
          RC=return_code2,
          RSN=reason_code2]

Explanation

The Policy Services batch utility failed to extract sensor data by using the Sensor Data Service API. function is the function code of the Sensor Data Service API. Hexadecimal values return_code and reason_code are the return code and the reason code from the Sensor Data Service API.

If the error occurred in the utility history data API (HKTIMST API), the second line is printed. function2 is the function code of the HKTIMST API. Hexadecimal values return_code2 and reason_code2 are the return code and the reason code from the HKTIMST API.

System action

Processing ends with a return code of 8.

User response

This error might be an internal system error. Contact IBM Software Support.

BSN8022I  REQUESTED SENSOR DATA WAS
          NOT [FOUND IN THE REPOSITORY
          | IMPORTED TO THE HISTORICAL
          SENSOR DATA SET].

Explanation

The Policy Services utility did not find the requested sensor data in the repository or imported to the historical sensor data set.
Explanation

Sensor data of the specified policy domain domain, RECON ID recon_id, DBD name dbname, partition name partname, and area name areaname is not stored in the IMS Tools KB Sensor Data repository or was not imported to the historical sensor data set.

System action

The Sensor Data Extractor skipped extracting the requested sensor data from the requested policy domain. Processing continues.

User response

If this is not the expected result, check the following, and rerun the job.

- The policy domain name specified by the DOMAIN keyword is correct.
- The RECON ID specified by the RECONID keyword is correct.
- The DBD name specified by the DBDNAME keyword is correct.
- If the database is a HALDB, the partition name specified by the PARTNAME keyword is correct.
- If the database is a DEDB, the area name specified by the AREANAME keyword is correct.
- Sensor data of the requested database was actually stored in the IMS Tools KB Sensor Data repository by DB Sensor.
- Sensor data of the requested database was actually imported to the historical sensor data set.

BSN8023E DATA DICTIONARY SERVICE FAILED FOR FUNC=function, RC=overall_return_code, RSN=overall_reason_code.
- DATA ELEMENT:
  data_element_name, RC=return_code, RSN=reason_code.
- DATA VALUE: data_element_value

Explanation

An error was detected when the indicated function function of the Data Dictionary Service was running. Hexadecimal values overall_return_code and overall_reason_code indicate the return and reason codes from the Data Dictionary Service, respectively. If the error was detected in specific data elements, the second BSN8023E message is issued. If the error was detected in a data value of a specific data element, the third line of the BSN8023E message is issued.

In the message text,

overall_return_code
overall_reason_code

These hexadecimal values indicate the return and reason codes from the Data Dictionary Service.

data_element_name
The name of the data element that caused the error.

return_code
reason_code

These hexadecimal values indicate the return and reason codes associated with the data element.

data_element_value
The value of the data element that caused the error.

System action

Processing continues with a return code of 4.

User response

Correct the error, and rerun the job.
BSN8026W  THERE ARE NO DATA ELEMENTS THAT MATCH THE LASTDATE SPECIFICATION. 
DOMAIN=domain

Explanation:
Sensor data of all generations is not extracted from the policy domain domain because the collection date of the latest sensor data is older than the date specified by the LASTDATE keyword.

System action:
Processing continues with a return code of 4.

User response:
Check if the LASTDATE keyword parameter is correct.

BSN8027W  SENSOR DATA FOR dbdname WAS NOT EXTRACTED.

Explanation:
No sensor data for database dbdname is extracted from any of the requested domains.

System action:
Processing continues with a return code of 4.

User response:
Check if the database name specified by the DBDNAME keyword and the RECON ID specified by the RECONID keyword are correct.

BSN8028I  UTILITY HISTORY DATA WAS ADDED TO SENSOR DATA REPOSITORY. 
[DBD=dbname.] 
[DBD=dbname, PARTITION=partname.] 
[DBD=dbname, AREA=areaname.]

Explanation:
The Statistics Data Import Utility stored catalog information about the imported sensor data (utility history data) for database dbname (HALDB partition partname or DEDB area areaname) in the IMS Tools KB Sensor Data repository.

System action:
Processing continues.

User response:
None. This message is informational.

BSN8029I  HISTORICAL SENSOR DATA SET WAS GENERATED FOR 
[DBD=dbname.] 
[DBD=dbname, PARTITION=partname.] 
[DBD=dbname, AREA=areaname.]

Explanation:
The Statistics Data Import Utility generated the historical sensor data set for database dbname (HALDB partition partname or DEDB area areaname) from input CSV-formatted sensor data sets.

System action:
Processing continues.

User response:
None. This message is informational.

BSN8030E  AN ERROR WAS DETECTED WHILE ANALYZING THE CONTROL STATEMENT. RC=return_code, FUNC=function. 
DETAIL OF THE ERROR IS AS FOLLOWS:
...

Explanation:
The control statement analysis process detected a syntax error in the control statement. Review the other generated message, BPE0003E, which explains the details of the error.

System action:
Processing ends with a return code of 8.

User response:
Correct the control statement, and rerun the job.

BSN8031I  THE FOLLOWING OPTIONS ARE USED FOR THE SENSOR DATA EXTRACTOR:
- keyword_name1 ... value1
- keyword_name2 ... value2
...

Explanation:
This message shows individual processing options of the Policy Services utility on each line. This message is for informational purposes only.

System action:
Processing continues.
User response

None. This message is informational.

Explanation

Neither the DBDNAME keyword nor the CAGRP keyword is specified.

System action

Processing ends with a return code of 8.

User response

Specify either the DBDNAME keyword or the CAGRP keyword, and rerun the job.

Explanation

The keyword keyword1 was specified. However, the keyword keyword2 or the parameter keyword2(parameter), which is required for keyword1, was not specified.

System action

Processing ends with a return code of 8.

User response

Correct the control statement, and rerun the job.

Explanation

The keyword keyword1 was specified with the keyword keyword2. These keywords cannot be specified simultaneously.

System action

Processing ends with a return code of 8.

User response

Correct the control statement, and rerun the job.

Explanation

Multiple HALDB partition names were specified by the PARTNAME keyword, or multiple DEDB area names were specified by the AREANAME keyword. Currently, multiple partitions or areas are not supported.

System action

Processing ends with a return code of 8.

User response

Correct the control statement, and rerun the job.

Explanation

The parameter value specified by the LASTDATE keyword was not in a correct format. The parameter value must be in yyyyymmdd or yyyyymmddhhmmss format.

System action

Processing ends with a return code of 8.

User response

Correct the control statement, and rerun the job.

Explanation

REPORT_TYPE(CSV) was specified with DOMAIN(ALL) or multiple parameters for the DOMAIN keyword. REPORT_TYPE(CSV) must be specified with a single policy domain.

System action

Processing ends with a return code of 8.

User response

Correct the control statement, and rerun the job.

Explanation

Multiple DALDB partition names were specified by the PARTNAME keyword, or multiple DEDB area names were specified by the AREANAME keyword. Currently, multiple partitions or areas are not supported.

System action

Processing ends with a return code of 8.

User response

Correct the control statement, and rerun the job.

Explanation

Sensor data for dbdname has been extracted from [SENSOR DATA REPOSITORY | HISTORICAL SENSOR DATA SET]. - DOMAIN=domain, the number of extracted generations is generation_number
Explanation
The requested sensor data was extracted successfully from the IMS Tools KB sensor data repository or the historical sensor data set. dbdname shows the DBD name whose sensor data was extracted. domain shows the policy domain of the sensor data. generation_number shows how many generations of sensor data were extracted.

System action
Processing continues.

User response
None. This message is informational.

BSN8041I   SENSOR DATA HISTORY REPORT HAS BEEN GENERATED.
- REPORT_TYPE=[SHORT | LONG | CSV].
- DOMAIN=domain, THE NUMBER OF GENERATIONS TO BE REPORTED IS generation_number

Explanation
The Sensor Data History report of the requested type was generated successfully. domain shows the policy domain of the sensor data. generation_number shows how many generations of sensor data were reported.

System action
Processing continues.

User response
None. This message is informational.

BSN8042E   DATE FORMAT IS INCORRECT FOR REQUEST TYPE=request_type.
- CSV DATA SET NAME=data_set_name
  LINE=line_number

Explanation
The date format of the Run Date column was yyyy/mm, while the value in the Request Type column was D. Or, the date format of the Run Date column was yyyy/mm/dd, while the value in the Request Type column was M. data_set_name is the name of the input CSV-formatted data set. line_number is the line number in the CSV file that caused the error.

System action
Processing ends with a return code of 8.

User response
Ensure that the value in the Run Date column and the value in the Request Type column are correct.

BSN8043E   AT LEAST 1 INPUT FILE MUST BE SPECIFIED.

Explanation
No input sensor data set was specified for the Statistics Data Import Utility.

System action
Processing ends with a return code of 8.

User response
Specify at least one of the following keywords: CSV_DB, CSV_AREA, or CSV_DSG.

BSN8044E   INCORRECT COLUMN NAME IS SPECIFIED.
- CSV DATA SET NAME=data_set_name
  COLUMN NAME=column_name

Explanation
The column name column_name in the input CSV-formatted data set is not supported. data_set_name is the name of the input CSV-formatted data set.

System action
Processing ends with a return code of 8.

User response
Remove the unsupported column from the CSV-formatted data set.

BSN8045E   MANDATORY COLUMN column_name IS NOT FOUND.
- CSV DATA SET NAME=data_set_name

Explanation
The mandatory column name column_name was not specified in the input CSV-formatted data set. data_set_name is the name of the input CSV-formatted data set.

System action
Processing ends with a return code of 8.
User response
Add the mandatory column column_name into the CSV-formatted data set.

BSN8046E  INCORRECT VALUE IS SPECIFIED FOR column_name COLUMN.
- CSV DATA SET
  NAME=data_set_name
  LINE=line_number
  VALUE=data_value,
  RC=return_code].

Explanation
The mandatory column name column_name was not specified in the input CSV-formatted data set. data_set_name is the name of the input CSV-formatted data set.

System action
Processing continues.

User response
None. This message is informational.

BSN8047I  EXISTING UTILITY HISTORY DATA DID NOT CONTAIN INFORMATION OF HISTORICAL SENSOR DATA.
- RECONID=recon_id,
  DBD=dbd_name [,.
  PARTITION=partition_name | ,
  AREA=area_name].

Explanation
The Statistics Data Import Utility obtained existing utility history data for the database to be imported, but the utility history data did not contain catalog information about the historical sensor data.

In the message text,

recon_id
  Shows the RECON ID associated with the IMS Tools Knowledge Base that contains the utility history data.

dbd_name
  Shows the name of the database to be imported.

partition_name
  Shows the name of the HALDB partition to be imported.

area_name
  Shows the name of the DEDB area to be imported.

The Statistics Data Import Utility will replace the utility history data with the new one.

System action
Processing continues.

User response
None. This message is informational.

BSN8048E  INPUT SENSOR DATA IS OLDER THAN HISTORICAL SENSOR DATA.
- THE LATEST RUN DATE OF INPUT SENSOR DATA: yyyy-mm-dd1
- THE OLDEST RUN DATE OF HISTORICAL SENSOR DATA: yyyy-mm-dd2

Explanation
The set of sensor data to be imported is older than the oldest sensor data that was imported in the past. yyyy-mm-dd1 is the latest date in the Run Date column of the CSV-formatted data set. yyyy-mm-dd2 is the oldest date in the historical sensor data set.

System action
Processing ends with a return code of 8.

User response
Add sensor data whose Run Date value is newer than yyyy-mm-dd2.

BSN8049E  DIFFERENT column_name IS SPECIFIED IN THE INPUT FILE.
- CSV DATA SET
  NAME=data_set_name
  LINE=line_number
  column_name=data_value.

Explanation
In a CSV-formatted data set, certain column values must be the same for all generations. The Statistics Data Import Utility detected a difference in the value data_value in the column column_name.

data_set_name is the name of the input CSV-formatted data set. line_number is the line number in the CSV file that caused the error.

System action
Processing ends with a return code of 8.
### System Response

**BSN8050I**  
**Explanation**  
The Statistics Data Import Utility failed to allocate a historical sensor data set dynamically with DISP=SHR. The Statistics Data Import Utility will try to allocate a historical sensor data set dynamically with DISP=NEW.

**System action**  
Processing continues.

**User response**  
None. This message is informational.

**BSN8051E**  
**Explanation**  
The sensor data in the CSV-formatted data set is not sorted in descending order.

**System action**  
Processing ends with a return code of 8.

**User response**  
Sort the data by the Run Date column in descending order.

**BSN8052E**  
**Explanation**  
Data set group ID `dsg_id` is specified in the DSG ID column of more than one input CSV-formatted data set.

**System action**  
Processing ends with a return code of 8.

**User response**  
Correct the alias definition table, and rerun the job.

**BSN8053E**  
**Explanation**  
The Statistics Data Import Utility detected one of the following conditions:
- The input file specified by the CSV_DB or CSV_DSG keyword was sensor data for a DEDB area.
- The input file specified by the CSV_AREA keyword was sensor data for a full-function database.

**System action**  
Processing ends with a return code of 8.

**User response**  
Correct the keyword specification for the input data set.

**BSN8054E**  
**Explanation**  
The Statistics Data Import Utility detected a syntax error in the alias definition table.

**System action**  
Processing ends with a return code of 8.

**User response**  
Correct the alias definition table, and rerun the job.

**BSN8055E**  
**Explanation**  
The Catalog Search Interface detected an error.

**System action**  
Processing ends with a return code of 8.
The z/OS catalog search interface (CSI) detected an error. *return_code* and *reason_code* are the return code and the reason code from the catalog search interface.

**System action:**
Processing ends with a return code of 8.

**User response:**
Correct the error, and rerun the job. If the problem persists, contact IBM Software Support.

**BSN8056E**

**Explanation:**
The Policy Services utility tried to obtain a DBD member list from the DBD library, but there were no members in the DBD library.

**System action:**
Processing ends with a return code of 8.

**User response:**
Specify the correct DBD library, and rerun the job.

**BSN8057E**

**Explanation:**
The Policy Services issued the z/OS DESERV macro internally, but the macro failed.

- *function_code*, *return_code*, and *reason_code* show the function code, the return code, and the reason code of the DESERV macro, respectively.
- *ddname* shows the name of the DD statement that caused the error.

**System action:**
Processing ends with a return code of 8.

**User response:**
Check if the correct data set is specified in the *ddname* DD, and rerun the job. If the problem persists, contact IBM Software Support.

**BSN8058E**

**Explanation:**
The Statistics Data Import Utility could not find any input CSV files in the data sets whose high level qualifier was *high_level_qualifier*. The *high_level_qualifier* is specified by the HLQ_CSVSET keyword.

**System action:**
Processing ends with a return code of 8.

**User response:**
Specify the correct high level qualifier by using the HLQ_CSVSET keyword, prepare appropriate CSV-formatted sensor data sets, and rerun the job.

**BSN8059E**

**Explanation:**
The alias *alias* is a reserved name and cannot be used. Or, the alias *alias* is already defined for another data element.

- *dsname* shows the data set name of the alias definition table.
- *line_number* shows the line number in the alias definition table that caused the error.

**System action:**
Processing ends with a return code of 8.

**User response:**
Correct the alias definition table, and rerun the job.

**BSN8060E**

**Explanation:**
The column name that starts with *column_name* in the input CSV-formatted data set is too long. The column name must be 42 bytes or shorter.

- *data_set_name* is the name of the input CSV-formatted data set.

**System action:**
Processing ends with a return code of 8.

**User response:**
Correct the column name to make it shorter, and rerun the job.

**BSN8061E**

**Explanation:**
The utility history data of the specified RECON ID recon_id, DBD name *dbd_name*, partition name *partition_name* is incorrect.
**System action**
Processing ends with a return code of 8.

**User response**
This error might be an internal system error. Contact IBM Software Support.

**BSN8062E**  INTERNAL SORT API ENDED WITH ERROR. RC=return_code, RSN=reason_code.

**Explanation**
The Policy Services batch utility failed to sort internal data. Hexadecimal values return_code and reason_code are the return code and the reason code from the internal sort API.

**System action**
Processing ends with a return code of 8.

**User response**
This error might be an internal system error. Contact IBM Software Support.

**BSN8063W**  HISTORICAL SENSOR DATA WAS NOT FOUND FOR THE SPECIFIED DATABASE.

**Explanation**
The historical sensor data of the specified databases is not found in the IMS Tools KB sensor data repository.

**System action**
Processing ends with a return code of 4.

**User response**
Check if the database name specified by the DBDNAME keyword and the RECON ID specified by the RECONID keyword are correct.

**BSN8801E**  THE FUNCTION TYPE function_type IS INVALID.

**Explanation**
The name of a sensor data function is invalid or missing.

**System action**
The program returns an error.

**BSN8802E**  AN INVALID PACK OPTION WAS SPECIFIED. THE OPTION MUST BE 'C' OR 'A'.

**Explanation**
When the data elements were processed, invalid pack options were passed.

**System action**
The program returns an error.

**User response**
Specify either A or C for functions that use pack options. The value A is for append and the value C is for copy. The default setting is A.

**Module**
BSNSDSD0

**BSN8803E**  THE GROUP NAME group_name IS INVALID.

**Explanation**
The specified group or server name for the sensor data repository is missing or incorrect.

**System action**
The program returns an error.

**User response**
Specify the correct group or server name.

**Module**
BSNSDSD0

**BSN8804E**  THE SENSOR DATA VERSION NUMBER IS INVALID.

**Explanation**
An invalid version of sensor data was specified.

**System action**
The program returns an error.
User response
Specify a valid version number.
If the specified sensor data macro is using a default value, set the BSNSDSM macro to the correct level.

Module
BSNSDSD0

BSN8805E  AN INVALID TEST OPTION WAS SPECIFIED. THE OPTION MUST BE 'Y', 'N', OR BLANK.

Explanation
The TEST option has an invalid option for testing valid record set handles.

System action
The program returns an error.

User response
Specify Y for automatic queuing or N for no automatic queuing. By default the TEST option is set to N.

Module
BSNSDSD0

BSN8806E  THE SENSOR DATA PROCESSING TASK IS INVALID.

Explanation
The task that is used to create an instance of sensor data is different from the current processing function.

System action
The program returns an error.

User response
During initialization, start all functions to a specific sensor data instance within the same task.
In a multitasking environment, you must specify each task to create its own instance or instances of sensor data.

Module
BSNSDSD0

BSN8807E  THE SENSOR DATA HISTORY COULD NOT BE FOUND.

Explanation
In the sensor data repository, a setting for the sensor data product and type is incorrect.
During the initialization of a sensor data instance, a validation is performed to verify that the sensor data history for the sensor data product and type exists.

System action
The program returns an error.

User response
Use the log file to determine the problem, and then set the correct history settings with a control function.
If the error persists, contact the system administrator.

Module
BSNSDSD0

BSN8808E  THE APPLICATION NAME application_name IS INVALID.

Explanation
A bad or null application name was passed.

System action
The program returns an error.

User response
Specify an application name as one of the input parameters for the BSNSDSM macro.

Module
BSNSDSD0

BSN8809E  POLICY SERVICES FAILED TO BROWSE THE SENSOR DATA REPOSITORY.

Explanation
An error occurred when the sensor data repository was browsed internally.

System action
The program returns an error.

User response
Rerun the job with a log file, and then view the log file to determine the problem. If the problem persists, contact the system administrator.
THE RECORD SET RSI VALUE IS INVALID.

A required non-null record set indicator (RSI) was passed as part of a sensor data function.

The program returns an error.

Specify a non-null RSI on the BSNSDSM macro. The sensor data must receive a non-null RSI for the sensor data function.

THE CONNECTION TO THE SENSOR DATA REPOSITORY FAILED FOR THE GROUP group_name AND REPOSITORY repository_name.

The connection to the sensor data repository failed.

The program returns an error.

Specify the correct the group or server name and ensure that the server is active, for example, by using SDSF. Also, see the log file to determine other possible errors.

THE ELEMENT LIST IS INVALID.

An invalid element was detected while data dictionary was processing.

The program returns an error.

View the returned status control block or the log file, and correctly define the data elements, such as the data type and value.

THE ENVIRONMENT IS NOT INITIALIZED.

The first call to a sensor data instance was not an INIT or a TERM call.

The program returns an error.

Issue an INIT call as the first call to the sensor data for initialization.

If a partial environment was created and must be terminated, issue a TERM call as the first call to the sensor data. The TERM call deletes the partial sensor data environment.

A FUNCTION WAS PROCESSED WITHOUT A CONNECTION TO THE SENSOR DATA REPOSITORY.

After initialization, a function failed because no connection to the server exists.

The program returns an error.

Issue a TERM call to cleanup the outstanding sensor data environment, and then see the log file and status block to determine possible errors.

THE DATA TAG IN AN INPUT ELEMENT IS INVALID.
During the front-end validation process, sensor data detected an invalid data tag in an input element.

The program returns an error.

Verify that all input data tags and the associated data length are valid.

AN INVALID HANDLE TYPE WAS PASSED TO THE SENSOR DATA REPOSITORY.

A null or invalid handle type (record handle or record set handle) was passed to sensor data.

The program returns an error.

Specify a valid handle type that represents an active record for the given function. For example, do not specify a record set handle when a record handle is required.

THE KEY FOR A SENSOR DATA REPOSITORY IS INVALID.

The major key for a sensor data repository is invalid or missing.

The program returns an error.

Specify a valid major key for the sensor data function. Any combination of characters (printable or non-printable) are valid.

THE STORAGE ADDRESS IS INVALID.

The required storage address for the record elements is missing.

The program returns an error.
User response
Specify the required area for storage elements, which is provided by data dictionary, in the IMS tools client.

**Module**
BSNSDSD0

**BSN8821E** THE PACKED DATA AREA IS INVALID.

**Explanation**
A required packed data area is missing for an unpack elements operation.

**System action**
The program returns an error.

**User response**
Specify an area with packed elements for unpacking. The packed area of elements must be consistent with the data dictionary specifications.

**Module**
BSNSDSD0

**BSN8822E** AN INVALID LENGTH FOR PACKED DATA WAS SPECIFIED.

**Explanation**
Within an element tag, an invalid length for pack data and for the data length was specified.

**System action**
The program returns an error.

**User response**
View the output in the log file and correct all of the supplied lengths for packed elements and element tags.

**Module**
BSNSDSD0

**BSN8823E** A SET CLOCK ERROR OCCURRED WHILE THE TIME AND DATE WAS PROCESSING.

**Explanation**
An undefined error occurred while a time and date was processed.

**System action**
The program returns an error.

**User response**
Rerun the user program. If the problem persists, contact the system administrator.

**Module**
BSNSDSD0

**BSN8824E** AN OPTION COMMAND WAS CALLED THAT CONTAINS AN INVALID OPTION.

**Explanation**
An options command function was called with a null or invalid option.

**System action**
The program returns an error.

**User response**
Specify a valid option in the user program.

**Module**
BSNSDSD0

**BSN8825E** THE HISTORY VALUES COULD NOT BE SET.

**Explanation**
The server failed to set the history values (retention days or versions).

**System action**
The program returns an error.

**User response**
The connection between sensor data and the server might have been lost. Specify a log file, then rerun the job.

If the problem persists, contact the system administrator.

**Module**
BSNSDSD0

**BSN8826E** THE SUPPLIER ID FOR AN ADD RECORD IS INVALID.
Explanation
A required supplier ID field for an add record is missing.

System action
The program returns an error.

User response
Specify a supplier ID specification for adding a record.

Module
BSNSDSD0

BSN8827E THE SUPPLIER PROGRAM FOR AN ADD RECORD IS INVALID.

Explanation
A required supplier program for an add record is missing.

System action
The program returns an error.

User response
Specify a supplier program specification for adding a record.

Module
BSNSDSD0

BSN8828E THE RECORD HANDLE HAS AN INVALID OWNER.

Explanation
The handle of a record indicates an inconsistent owner for the set.

System action
The program returns an error.

User response
Specify the correct record handle and ensure that the record handle has not been corrupted. If the handle is corrupted, contact the system administrator.

Module
BSNSDSD0

BSN8829E NO RECORD POSITION WAS SET FOR RETRIEVING RECORD ELEMENTS.

Explanation
Before elements can be accessed in a record, a record position must be set.

System action
The program returns an error.

User response
Specify a valid record that is referenced in a read function before you access elements.

Module
BSNSDSD0

BSN8830E THE RECORD SET HANDLE IS INVALID.

Explanation
The handle of a record set is invalid.

System action
The program returns with an error.

User response
Pass a record set handle that is for a record set and not for some other entity, such as a record.
Explanation
An invalid record handle was passed to a record.

System action
The program returns with an error.

User response
If the record handle is null, specify a valid non-null handle.
If the record handle is not null, contact the system administrator.

Module
BSNSDSD0
BSN8833E THE RECORD TYPE IS INVALID.

Explanation
The type associated with a record is invalid.

System action
The program returns with an error.

User response
Pass a record handle that is for a record and not for some other entity, such as a record set.

Module
BSNSDSD0
BSN8834E THE RECORD OR RECORD SET COULD NOT BE DELETED.

Explanation
The affiliated record or record set could not be deleted after the write operation.

System action
The program returns an error. The record or record set are not written and remain in the memory.

User response
View the log file to determine the problem. The record or record set might have already been written, and therefore, could not be written again. If the problem persists, contact the system administrator.

Module
BSNSDSD0
BSN8835E THE SENSOR DATA REPOSITORY COULD NOT BE QUERIED.

Explanation
The sensor data repository history could not be queried.

System action
The program returns an error.

User response
Rerun the job with a log file and fix any repository access errors. If the problem persists, contact the system administrator.

Module
BSNSDSD0
BSN8836E NO LOG FILE WAS OPENED FOR THE DATA DUMP.

Explanation
The data dump to the log file failed because no log file was open.

System action
The program returns an error.

User response
Rerun the sensor data with a valid log file.

Module
BSNSDSD0
BSN8837W NO LOG FILE WAS OPENED TO SNAP OR PRINT.

Explanation
A request for a snap or print to the log file failed because no active log file is open.

System action
The program continues with an optional return of a warning.
**User response**

If you want debug to a problem, specify a log file to collect processing information. Otherwise, no action is required.

**Attention:** Using a log file can increase the amount of output that can negatively affect performance and spool space.

**Module**

BSNSDSD0

**BSN8838E**  THE CONTROL HISTORY COULD NOT BE SET.

**Explanation**

The control history (maximum days or versions) could not be set.

**System action**

The program returns an error.

**User response**

Rerun the job with a log file and fix any repository access errors. If the problem persists, contact the system administrator.

**Module**

BSNSDSD0

**BSN8839W**  NO MEMBERS WERE FOUND IN THE REPOSITORY.

**Explanation**

No members were found in the repository during a search to dump members to the log file.

**System action**

The program continues with a warning to the log file.

**User response**

Ensure that the search criteria is correct. If the search criteria is correct, no member matched the criteria, and no action is required.

If the criteria is incorrect, specify the correct criteria, then rerun the job.

**Module**

BSNSDSD0

**BSN8840E**  THE STATUS CONTROL BLOCK IS UNDEFINED.

**Explanation**

The required status control block for a function is missing.

**System action**

The program returns an error.

**User response**

Specify a status area control block for the function.

**Module**

BSNSDSD0

**BSN8841E**  THE SENSOR DATA HISTORY SETTING COULD NOT BE DELETED.

**Explanation**

The sensor data history setting could not be deleted.

**System action**

The program returns an error.

**User response**

Rerun the job with a log file and fix any repository errors in the log file.

If the problem persists, contact the system administrator.

**Module**

BSNSDSD0

**BSN8842W**  A RECORD MEMBER WAS NOT QUEUED.

**Explanation**

Each record member that you want to write to the repository must be queued. A record set that is to be written to the repository had at least one record member that was not queued.

Records might not be queued either because of application program logic or because the application program bypasses a record that is being queued. A record is bypassed if it is not queued by a BSNSDSM queue record request.

**System action**

The program returns with a warning.
User response
Review the log file to help determine if the members were written.

If the members were not written, issue a BSNSDSM QREC function to queue the record, and then rerun the job. If the members were written, no action is required.

Module
BSNSDSD0

BSN8843E
AN INVALID STARTING LOCATION WAS SPECIFIED. THE LOCATION MUST BE 'N' OR 'O'.

Explanation
The starting location for reading sensor data members is invalid.

System action
The program returns with an error.

User response
Specify the starting location of the read begin process as either N to process the records from the newest to the oldest, or specify 0 to the process records from the oldest to the newest.

Module
BSNSDSD0

BSN8844E
THE ELEMENT COUNT IS INVALID FOR THE ELEMENTS FUNCTION.

Explanation
The element count that is passed to the add elements function is invalid.

System action
The program returns an error.

User response
Specify a positive value for the element count. The element count must be a positive value in the data dictionary image block that was specified for the add elements function.

Module
BSNSDSD0

BSN8845E
THE TAG LENGTH IS INVALID FOR THE ADD ELEMENTS FUNCTION.

Explanation
The element tag length supplied by the version is invalid.

System action
The program returns an error.

User response
For the add elements function, specify a valid version setting for all elements specified.

Module
BSNSDSD0

BSN8846E
A RECORD WAS QUEUED MORE THAN ONCE.

Explanation
A record was attempted to be queued more than once. A record that is already queued cannot be queued again.

System action
The program returns an error.

User response
Queue a record to a record set only once.

Module
BSNSDSD0

BSN8847E
THE SENSOR DATA KEY FIELDS COULD NOT BE FOUND.

Explanation
The repository did not return consistent information. The sensor data key fields might be corrupted.

System action
The program returns an error.

User response
Contact the system administrator.
BSN8848E  AN INVALID READING LOCATION WAS SPECIFIED. THE LOCATION MUST BE 'R', 'M', OR 'B'.

**Explanation**
The specified location from where members are being read is invalid.

**System action**
The program returns an error.

**User response**
Specify R, M, or B as the location from where the members are read. The location indicator is for the BSNDSM macro when the macro attempts to read a repository member.
- Specify R to read members from the repository.
- Specify M to read members from the current memory.
- Specify B to read members first from the memory. If the members are not found, the members are then read from the repository.

**Module**
BSNSDSD0

BSN8849E  THE REGION DUMP TYPE IS INVALID.

**Explanation**
The dump region to log file option was invalid. This error is an internally generated error.

**System action**
The program returns an error.

**User response**
Rerun the job, and if the problem persists, contact the system administrator.

**Module**
BSNSDSD0

BSN8850E  THE DUMP FUNCTION ENCOUNTERED AN ERROR.

**Explanation**
The requested dump function encountered an error.

**System action**
The program returns an error.

**User response**
Specify valid dump storage parameters for the dump function, such as storage, length, and label.

**Module**
BSNSDSD0

BSN8851E  THE PRINT FUNCTION ENCOUNTERED AN ERROR.

**Explanation**
The requested print function encountered an error.

**System action**
The program returns an error.

**User response**
Specify valid print text parameters for the print function, such as storage and length.

**Module**
BSNSDSD0

BSN8852W  THE CRITERIA DOES NOT MATCH ANY SENSOR DATA MEMBER.

**Explanation**
The application program failed to find a sensor data member that matched all the requested criteria.

**System action**
The program returns a warning.

**User response**
You can change the criteria and rerun the job. If the criteria are correct, no action is required.

**Module**
BSNSDSD0

BSN8853E  AN INVALID KEEP VALUE WAS SPECIFIED. THE VALUE MUST BE 'Y' OR 'N'.

**Explanation**
The specified KEEP value is invalid.
**System action**
The program returns with an error.

**User response**
The KEEP value determines whether records or a record set remain in the memory after being read or written.

Specify **Y** to keep records in the memory for future processing, or specify **N** to release the record images.

By default the KEEP value is set to **N**.

**Module**
BSNSDSD0

BSN8854E **A REPOSITORY MEMBER COULD NOT BE ACCESSED FOR READING.**

**Explanation**
A repository member was inaccessible for reading.

**System action**
The program returns an error.

**User response**
Rerun the job at a later time because another user might be exclusively accessing the member.

If the problem persists, contact the system administrator.

**Module**
BSNSDSD0

BSN8855E **THE RETURN DATA AREA IS UNDEFINED.**

**Explanation**
A required return data area for the requested function is missing.

**System action**
The program returns an error.

**User response**
Specify the required return area for the current function.

**Module**
BSNSDSD0

BSN8856E **THE LENGTH OF A RETURN AREA IS INVALID.**

**Explanation**
The length of the associated return area is missing or invalid.

**System action**
The program returns an error.

**User response**
Specify a valid length along with the return area. A valid length is a length greater than zero.

**Module**
BSNSDSD0

BSN8857E **AN INVALID READ OPTION WAS SPECIFIED. THE VALUE MUST BE 'H' OR 'D'.**

**Explanation**
The READ option for reading records into memory has an invalid value.

**System action**
The program returns with an error.

**User response**
Specify the READ option as either **H** for header only or **D** for header and data. By default the READ option is set to **H**.

**Important:** Use option **D** only to snap out the elements that might have a formatting problem in the repository. Option **D** returns data that is in raw form, and data elements in raw form do not have verification or translation.

**Module**
BSNSDSD0

BSN8858W **THE RETURN LENGTH WAS TRUNCATED.**

**Explanation**
The supplied read length for the input read buffer is too small to hold all the record data.

**System action**
The program returns with a warning.
User response
Increase the input buffer size. The length is passed by the BSNSDSM macro.

Module
BSNSDS0

BSN8859W THE MEMBER COULD NOT BE FOUND IN THE MEMORY.

Explanation
The request to read a member from memory failed because no member was found in the memory.

System action
The program returns a warning.

User response
Set the read members option to be read from both the memory and the repository.

Module
BSNSDS0

BSN8860E THE READ BEGIN FUNCTION COULD NOT FIND THE REQUESTED SENSOR DATA MEMBER.

Explanation
The requested sensor data member was not found. The sensor data member is the application and the major key.

System action
The program returns an error.

User response
Specify the correct member name and read location. The read location can be R (repository), M (memory), or B (both).

If you specified N (no) for the KEEP option, the member is not retained in the memory, so you must specify either R or B for the read location.

Module
BSNSDS0

BSN8861E AN INVALID TIME SEQUENCE SETTING WAS SPECIFIED.

Explanation
The specified system or user time is invalid for record retrieval.

System action
The program returns an error.

User response
Specify a valid begin time in the BSNSDSM macro. Ensure that the begin time is not later than the associated end time, and that the time value is in the correct time format. For example, March 5, 2020 might be specified as 05032020, but the value might need to be 03052020.

Module
BSNSDS0

BSN8862E AN INVALID TIME LOCALE WAS SPECIFIED FOR DATE AND TIME PROCESSING.

Explanation
The LOCALE that was specified for date and time processing is invalid.

System action
The program returns an error.

User response
Specify S, U, or L for the time locale.

Specify the LOCALE indicates the location that a specified date and time are derived from. The LOCALE value S is for STCK form, U is for coordinated universal time, and L is for local time.

Module
BSNSDS0

BSN8863E AN INVALID TIME ZONE FACTOR WAS SPECIFIED.
Explanation
An invalid time zone factor was specified.

System action
The program returns with an error.

User response
Depending on the specified time type, specify a time specification that is plus or minus the number of quarter hours from UTC or a value between -95 and +95.

Module
BSNSDSD0

BSN8864E  INVALID LEAP SECONDS WERE SPECIFIED.

Explanation
For the specified date and time, leap seconds were not specified. The number of leap seconds is required for date and time calculations.

System action
The program returns with an error.

User response
Specify the correct number of leap seconds. Certain specified date and time values require that you specify the number of leaps seconds between UTC and STCK form.

Module
BSNSDSD0

BSN8865E  AN INVALID TIME TYPE WAS SPECIFIED.

Explanation
An invalid time type for date and time interpretation was specified.

System action
The program returns an error.

User response
Specify the date and time in one of the following allowable formats:

- STCK-8 byte STCK image
- STCKE-16 byte STCKE image
- PICGREG-20 character YYYYMMDDHHMMSSTHMIJU
- PICJULI-20 character YYYYDDD0HHMMSSTHMIJUFQQS
- IMSGREG-12 byte packed YYYYMMDDHHMMSSTHMIJUFQQS
- IMSJULI-12 byte packed YYYYDDD0HHMMSSTHMIJUFQQS
- DECGREG-12 byte packed YYYYMMDDHHMMSSTHMIJUXXXX
- DECJULI-12 byte packed YYYYDDD0HHMMSSTHMIJUXXXX

Module
BSNSDSD0

BSN8866E  AN INVALID TIME VALUE WAS SPECIFIED.

Explanation
The specified DATE value was invalid because it did not match the date and time format.

System action
The program returns an error.

User response
Specify a DATE value in the correct date and time format.

Module
BSNSDSD0

BSN8867E  AN INVALID GET ELEMENTS COUNT WAS SPECIFIED.

Explanation
A specified elements count in a GET ELEMENTS process is negative.

System action
The program returns an error.

User response
Specify a valid GET ELEMENTS count for the function call. A valid GET ELEMENTS count must be zero or greater.

Module
BSNSDSD0
Explanation
No data elements were found on the specified read record.

System action
The program returns with a warning.

User response
Member records can be created without any associated data fields. If the record is valid, no action is required.
If the record is not valid, contact the system administrator.

Module
BSNSDSD0

BSN8871E  THE GET OPERATION COULD NOT GET A LIST OF THE SENSOR DATA REPOSITORY MEMBERS.

Explanation
An error occurred when attempting to get a list of sensor data repository members.

System action
The program returns an error.

User response
Rerun the job with a log file, and then view the log file to determine the problem. If the problem persists, contact the system administrator.

Module
BSNSDSD0

BSN8872E  POLICY SERVICES COULD NOT FIND MATCHING MEMBER NAMES IN THE SENSOR DATA REPOSITORY.

Explanation
Policy Services failed to find matching member names (application and major key) in the sensor data repository.

System action
The program returns an error.

User response
Rerun the job with a log file, and then view the log file to determine the problem. If the problem persists, contact the system administrator.

Module
BSNSDSD0

BSN8873W  THE END OF THE REPOSITORY LIST WAS ISSUED.
Explanation
The end of the repository list has been issued.

System action
The program continues processing.

User response
No action is required.

Module
BSNSDSD0

BSN8874E THE PUT OPERATION COULD NOT WRITE A MEMBER TO THE SENSOR DATA REPOSITORY.

Explanation
An error occurred when writing a member to the sensor data repository.

System action
The program returns an error.

User response
Rerun the job with a log file, and then view the log file to determine the problem. If the problem persists, contact the system administrator.

Module
BSNSDSD0

BSN8875E A NULL RECORD CANNOT BE WRITTEN TO THE SENSOR DATA REPOSITORY.

Explanation
An attempt was made to write a null record to the repository. A null record does not have a header or data.

System action
The program returns an error.

User response
The sensor data program storage might have been corrupted. Contact the system administrator.

Module
BSNSDSD0

BSN8876E DATA DICTIONARY COULD NOT BE INITIALIZED.

Explanation
Data dictionary for sensor data failed to initialize.

System action
The program returns an error.

User response
Ensure that you are accessing the correct version of sensor data by checking the load library concatenation.

Rerun the job with a log file, and then view the log file to determine the problem. If the log file indicates a data dictionary initialization error, ensure that the sensor data and the data dictionary versions are compatible.

If the problem persists, contact the system administrator.

Module
BSNSDSD0

BSN8877E THE SENSOR DATA REPOSITORY COULD NOT CONNECT TO DATA DICTIONARY.

Explanation
Sensor data and data dictionary failed to initialize a connection.

System action
The program returns an error.

User response
Ensure that you are accessing the correct version of sensor data by checking the load library concatenation.

Rerun the job with a log file, and then view the log file to determine the problem. If the problem persists, contact the system administrator.

Module
BSNSDSD0

BSN8878E THE ENDLIST OPERATION ENCOUNTERED AN ERROR WHEN TERMINATING ACQUISITION OF THE REPOSITORY MEMBERS.
Explaination
An error occurred when terminating the acquisition of the sensor data repository members that were requested.

System action
The program returns an error.

User response
Rerun the job with a log file, and then view the log file to determine the problem. If the problem persists, contact the system administrator.

Module
BSNSDS0

BSN8879E  AN INVALID RECORD TYPE WAS SPECIFIED. THE RECORD TYPE MUST BE NONULL AND CANNOT BEGIN WITH AN UNDERSCORE.

Explanation
A record with a record type that begins with an underscore (_) cannot be written.

System action
The program returns an error.

User response
Specify a different first character for the record type when writing records. The underscore is reserved for the system and special usage.

Module
BSNSDS0

BSN8880E  AN INVALID ELEMENT VALUE LENGTH WAS SPECIFIED IN THE ELEMENT TAG.

Explanation
In the element tag, the length of an element for a GET ELEMENTS operation is negative.

System action
The program returns an error.

User response
Specify a valid element value length in the element tags. A valid element value must be zero or greater.

Module
BSNSDS0

BSN8881E  DATA DICTIONARY COULD NOT TRANSFORM THE RECORD ELEMENTS.

Explanation
Transformation of record elements by using data dictionary failed.

System action
The program returns an error.

User response
Specify the correct target types and areas for returned elements, and verify that the record elements in the repository are of the correct format based on the data definition.

Module
BSNSDS0

BSN8882W  THE REPOSITORY SEARCH FIELDS FOR KEY FIELDS COULD NOT BE FOUND.

Explanation
The repository key fields could not be found. The key field might not be defined to the repository.

System action
The current sensor data process continues.

User response
If you are authorized, define the key fields by using a sensor data CNTL request before requesting sensor data.

If you are not authorized, contact the system administrator.

Module
BSNSDS0

BSN8901E  BSNIN OR BSNPRINT WAS NOT DEFINED CORRECTLY.

Explanation
OPEN files failed. At least one of the required files, BSNIN or BSNPRINT, was not defined or was defined with incompatible attributes.
System action
The program returns an error with a return code of 16 and a reason code of 1.

User response
Ensure that the BSNIN and BSNPRINT files are defined correctly in the JCL for the delete utility job step.
- For BSNIN, use LRECL=80 and RECFM=FB
- For BSNPRINT, use LRECL=125 and RECFM=VBA

Module
BSNSDDL0

BSN8902E
THE INPUT COMMANDS FOR PROCESSING ARE MISSING.

Explanation
The input commands for processing were missing from the input file or the user memory buffer.

System action
The program returns an error.

User response
Verify that the correct input media for the input commands have been specified. Specify the input file for the batch interface and either the input file or the input buffer for the API.

Module
BSNSDDL0

BSN8903E
THE INPUT COMMAND LENGTH FOR THE BSNSDSL MACRO IS MISSING.

Explanation
The length of the input command buffer specified on the BSNSDSL macro is missing.

System action
The program returns an error.

User response
Set the value of INLEN on the BSNSDSL macro to the length of the input command buffer.

Module
BSNSDDL0

BSN8904E
THE INPUT LINE COUNT FOR AN INPUT COMMAND FILE WAS EXCEEDED.

Explanation
The maximum number of input command lines from an input command file has been exceeded.

System action
The program returns an error.

User response
Verify that the correct input command file is being used and delete any extra blank lines. The maximum number of input command lines that can be defined is 1000.

Module
BSNSDDL0

BSN8905E
AN INVALID COMMAND LENGTH WAS SPECIFIED.

Explanation
An invalid length was specified for the length of the input command buffer.

System action
The program returns an error.

User response
Specify the length for the input command buffer that is used with the API, then rerun the job. The length value must be the length of the buffer and a non-negative value.

Module
BSNSDDL0

BSN8906E
THE SPECIFIED INPUT COMMANDS CONTAIN INVALID SYNTAX.

Explanation
An error occurred in the BPE parser. The input commands included invalid syntax.

System action
The program returns an error.
User response
Examine the input commands and correct any invalid syntax. Input commands must conform to the standard BPE parser syntax.

Module
BSNSDDL0

BSN8907E  THE BPE CSCD COULD NOT BE ACCESSED FOR PARSING.

Explanation
The CSCD entity that is needed for parsing was not obtained by the program.

System action
The program returns an error.

User response
Specify all of the required BPE execution libraries, and then rerun the BSNSDDL0 delete utility. If the problem persists, contact the system administrator.

Module
BSNSDDL0

BSN8908E  BOTH AN INPUT FILE AND AN INPUT BUFFER CANNOT BE SPECIFIED.

Explanation
Both an input file and an input buffer were specified as the media for input commands, which is not valid. The input file and the input buffer are mutually exclusive.

System action
The program returns an error.

User response
Specify an input file or an input buffer but not both.

Module
BSNSDDL0

BSN8909E  THE INPUT FILE OR INPUT COMMAND BUFFER DID NOT CONTAIN COMMANDS TO PARSE.

Explanation
The media (input file or input command buffer) of the input commands was present. However, the media did not include any commands to parse.

System action
The program returns an error.

User response
For an input file, ensure that the file is not a dummy or empty.
For an input buffer, specify a positive value for the buffer length.

Module
BSNSDDL0

BSN8910E  THE PROCESSING MODULE COULD NOT BE LOADED.

Explanation
The attempt to load a required delete utility processing module, such as the RECON translation program, failed.

System action
The program returns an error.

User response
If the log file is present, check the file for any MVS link or load error. The required linked or loaded program might not have been found. If you find a link or load error, check that the program library, such as STEPLIB, includes all the required libraries in the concatenation.

If you have determined that all the required libraries are present in the concatenation, this error might be caused by another link or load MVS system error. Contact the system administrator.

Module
BSNSDDL0

BSN8911E  THE RECON LOG COULD NOT BE OPENED.

Explanation
A log file for login RECON translation could not be opened.
System action
The program returns an error.

User response
Verify that the RECON log file has the correct attributes and that the correct ddname was specified.

Module
BSNSDDL0

BSN8912E THE RECON TRANSLATION FAILED.

Explanation
The external RECON ID could not be translated for internal use.

System action
The program returns an error.

User response
Verify that the correct RECON ID was specified. Also verify that the external RECON ID is correctly defined in the RECON registry repository.

Module
BSNSDDL0

BSN8913E THE CONNECTION TO THE SERVER server_name AND TO THE REPOSITORY repository_name FAILED.

Explanation
The attempted connection to the sensor data repository server failed.

System action
The program returns an error.

User response
Verify that the correct server and sensor data repository are correctly specified and active.

Module
BSNSDDL0

BSN8914E AN UNDEFINED SET CLOCK ERROR OCCURRED.

Explanation
An undefined set clock error occurred during the date and time calculation.

System action
The program returns an error.

User response
Rerun the program. If the problem persists, contact the system administrator.

Module
BSNSDDL0

BSN8915E THE APPLICATION NAME COULD NOT BE FOUND.

Explanation
The base application name for members to be deleted was not found. An incorrect application member name might have been specified.

System action
The program returns an error.

User response
Verify that the specified application member name is correct. If the application member name is incorrect, specify the correct application name. If the application member name is correct, the application name is not in the sensor data, and no action is required.

Module
BSNSDDL0

BSN8916E AN INVALID FUNCTION function_name WAS PASSED TO THE DELETE UTILITY.

Explanation
An invalid function was passed for processing the delete utility.

System action
The program returns an error.

User response
Verify that a valid function is being passed to the delete utility. The only allowable values are DELETE to
delete members and REPORT to report only affected members.

**Module**
BSNSDDL0

**BSN8917E**  A TIME VALUE OR DATE VALUE COULD NOT BE CONVERTED TO A TIME OF DAY.

**Explanation**
A time value or a date value failed to convert to a time of day.

**System action**
The program returns an error.

**User response**
Specify a date or time value that is in the correct form and in the allowable range.

**Module**
BSNSDDL0

**BSN8918E**  A TIME VALUE OR DATE VALUE COULD NOT BE CONVERTED TO A STORE CLOCK FORMAT.

**Explanation**
A time value or a date value failed to convert to a store clock format.

**System action**
The program returns an error.

**User response**
Specify a date or time value that is in the correct form and in the allowable range.

**Module**
BSNSDDL0

**BSN8920E**  BOTH THE DATE AND THE AGE WERE SPECIFIED.

**Explanation**
Both the date and the age were specified as deletion criteria.

**System action**
The program returns an error.

**User response**
Specify only one criterion for deletion.
The date and the age are mutually exclusive as criteria for determining which members are deleted.

**Module**
BSNSDDL0

**BSN8921E**  AN INVALID AGE TYPE WAS SPECIFIED.

**Explanation**
The specified age is an invalid type.

**System action**
The program returns an error.

**User response**
Specify an age that is a valid numeric value that represents the number of days. The age must be within the range from 0 to 9999.

**Module**
BSNSDDL0

**BSN8922E**  THE DATE OR THE AGE WAS NOT SPECIFIED.

**Explanation**
The date or the age was not specified.

**System action**
The program returns an error.

**User response**
Specify either the date or the age.

**Module**
BSNSDDL0

**BSN8923E**  AN INVALID DATE VALUE WAS SPECIFIED.

**Explanation**
The specified DATE value was not a numeric value or an asterisk.

**System action**
The program returns an error.
User response
Specify the DATE value either as an asterisk (*) for all dates or as a Gregorian date (YYYYMMDD).

Module
BSNSDDL0
BSN8926E THE SERVER NAME CANNOT BE SPECIFIED.

Explanation
When the delete utility with the batch interface was called, the name of the server was specified. This error is also typically reported by the BSNSDL macro.

System action
The program returns an error.

User response
Remove the server name specification. You can specify a server name for the delete utility only in the API interface.

Module
BSNSDDL0
BSN8927E THE APPLICATION NAME CANNOT BE SPECIFIED.

Explanation
When the delete utility with the batch interface was called, the name of the application was specified. The BATCH interface cannot be used to specify an application name on the BSNSDSL macro.

System action
The program returns an error.

User response
Remove the application reference from the macro, or switch to the BSNSDSL API interface that does not reference INCMDS or INFILE.

Module
BSNSDDL0
BSN8928E THE RECON ID CANNOT BE SPECIFIED.

Explanation
When the delete utility with the batch interface was called, the RECON ID was specified. This error is also typically reported by the BSNDL macro.

System action
The program returns an error.

User response
Remove the RECON ID specification. You can specify a RECON ID for the delete utility only in the API interface.

Module
BSNSDDL0
BSN8929E THE DATABASE CANNOT BE SPECIFIED.

Explanation
When the delete utility with the batch interface was called, the database was specified. This error is also typically reported by the BSNSDL macro.

System action
The program returns an error.

User response
Remove the database specification. You can specify a database for the delete utility only in the API interface.

Module
BSNSDDL0
BSN8930E THE DELETION OF A MEMBER OR THE VERSION OF A MEMBER FAILED.

Explanation
The attempt to delete at least one member or the version of a member failed.

System action
The program returns an error.

User response
Rerun the process with the log file option to obtain additional information. Also, this error might have been accompanied with a BSN8940E message that includes repository extended error information.
If the problem cannot be resolved by analyzing the log and repository information, contact the system administrator.

**Module**
BSNSDDL0

**BSN8931W** THE DELETION CRITERIA DID NOT MATCH ANY SENSOR DATA MEMBERS.

**Explanation**
No members in the sensor data repository matched the criteria for deletion.

**System action**
The program returns with a warning return code.

**User response**
Verify that the requested members, the date range, and other criteria for deletion were specified correctly. If the criteria are correct, no action is required.

**Module**
BSNSDDL0

**BSN8933E** AN INVALID TIME LOCALE WAS SPECIFIED.

**Explanation**
The locale that was specified for date and time processing is invalid. The locale is always fixed to local time.

**System action**
The program returns an error.

**User response**
Contact the system administrator.

**Module**
BSNSDDL0

**BSN8934E** AN INVALID TIME ZONE WAS PROVIDED.

**Explanation**
An invalid time zone factor was supplied for time and date calculations. The time zone factor is determined internally.

**System action**
The program returns an error.

**User response**
Contact the system administrator.

**Module**
BSNSDDL0

**BSN8935E** INVALID LEAP SECONDS WERE SPECIFIED.

**Explanation**
Based on the specified date and time values, the number of leap seconds required for date and time calculations was not specified.

**System action**
The program returns an error.

**User response**
Contact the system administrator.

**Module**
BSNSDDL0

**BSN8936E** AN INVALID TIME TYPE WAS SPECIFIED.

**Explanation**
The specified time type for date and time interpretation was invalid.

**System action**
The program returns an error.

**User response**
For the DATE command, specify a valid value for the time. The time must be in the HHMMSS format. If you do not specify a time value, the time defaults to 000000.

**Module**
BSNSDDL0

**BSN8937E** AN INVALID TIME VALUE WAS SPECIFIED.

**Explanation**
The specified DATE value was invalid.
System action
The program returns an error.

User response
Specify the DATE value in the input commands either as an asterisk (*) for all dates or as a Gregorian date that can optionally be followed by the time (YYYYMMDDHHMMSS).

Module
BSNSDDL0

BSN8940E THE DELETE FUNCTION FAILED.

Explanation
The delete function for deleting a member or the version of a member failed.

System action
The program returns an error.

User response
Rerun the process with the log file option to obtain additional information. Also, this error might have been accompanied with a BSN8930E message that includes repository extended error information.

If the problem cannot be resolved by analyzing the log and repository information, contact the system administrator.

Module
BSNSDDL0

BSN9000E THE HIGH LEVEL QUALIFIER WAS NOT SPECIFIED.

Explanation
The high-level qualifier (HLQ) was not given.

System action
The EXEC is not executed.

User response
Specify the HLQ keyword parameter, for example, HLQ(user.name). You can also set the HLQ by changing the assignment statement of the HLQ at the beginning of the EXEC.

Module
Not applicable

BSN9002E THE DATA SET data_set_name WAS NOT FOUND.

Explanation
The high-level qualifier (HLQ) for the ISPF IMS Policy Services Dialog library data sets was not given or was invalid.

System action
The EXEC was not executed.

User response
Correct the HLQ keyword for the ISPF Policy Services Dialog EXEC library. The HLQ was specified during the IMS Tool Base installation.

Module
Not applicable
Chapter 31. RECOVERY domain summary messages (IRO)

IRO\textsuperscript{nnnnx} messages are summary messages for the RECOVERY domain.

**Message format**

Summary messages for the RECOVERY domain adhere to the following format:

\*[IRO\textsuperscript{nnnnx}]

Where:

- **IRO**
  - Indicates that the message is a summary message for the RECOVERY domain.

- **nnnn**
  - Indicates the message identification number

- **x**
  - Indicates the severity of the message:
    - **E**
      - Indicates that an error occurred, which might or might not require operator intervention.
    - **I**
      - Indicates that the message is informational only.
    - **W**
      - Indicates that the message is a warning to alert you to a possible error condition.

Each message also includes the following information:

**Explanation:**

The Explanation section explains what the message text means, why it occurred, and what its variables represent.

**System action:**

The System action section explains what the system will do in response to the event that triggered this message.

**User response:**

The User response section describes whether a response is necessary, what the appropriate response is, and how the response will affect the system or program.

\*[IRO4962I resource_name IN RECONID=\textit{recon_id} HAS WARNING EXCEPTIONS IN THE RECOVERY DOMAIN.]

**Explanation**

Policy Services detected exceptions in the DBRC-managed resource \textit{resource_name}. All the exceptions were warning-level exceptions. \textit{recon_id} shows the 8 byte RECON ID of the RECON environment to which the resource belongs.

**System action**

Policy Services continues processing.

\*[IRO4965I resource_name IN RECONID=\textit{recon_id} HAS CRITICAL EXCEPTIONS IN THE RECOVERY DOMAIN. USER ACTION IS REQUIRED.]

**Explanation**

Policy Services detected one or more critical-level exceptions in the DBRC-managed resource \textit{resource_name}. \textit{recon_id} shows the 8 byte RECON ID

**User response**

Check the exceptions that were reported by Policy Services and identify whether any of those exceptions need to be addressed.
of the RECON environment to which the database resource belongs.

**System action**
Policy Services continues processing.

**User response**
Check the critical-level exceptions that were reported and any accompanying exceptions that are in lower severity, and plan an action or actions to resolve the exceptional state of the reported resource.

**Explanation**
Policy Services detected one or more severe-level exceptions in the DBRC-managed resource resource_name. However, no critical level exception was reported. recon_id shows the 8 byte RECON ID of the RECON environment to which the resource belongs.

**System action**
Policy Services continues processing.

**User response**
Check the severe-level exceptions that were detected by Policy Services and any accompanying warning-level exceptions and identify whether any of those exceptions need to be addressed.

**Explanation**
Policy Services detected one or more critical-level exceptions in the DBRC-managed resource resource_name and recommends the action action for the resource. recon_id shows the 8 byte RECON ID of the RECON environment to which the resource belongs.

<table>
<thead>
<tr>
<th>action</th>
<th>Recommended action</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMAGECOPY</td>
<td>Take an image copy of each data set of the database resource. You can use IMS Database Image Copy utilities or IBM IMS High Performance Image Copy.</td>
</tr>
<tr>
<td>CHANGEACCUM</td>
<td>Create a new change accumulation for the change accumulation group. You can use IMS Database Change Accumulation utility or IMS High Performance Change Accumulation in IBM IMS Recovery Solution Pack for z/OS.</td>
</tr>
<tr>
<td>DBRECOVERY</td>
<td>Perform the recovery process for the database resource. You can use IMS Database Recovery utility or IMS Database Recovery Facility in IBM IMS Recovery Solution Pack for z/OS.</td>
</tr>
<tr>
<td>ADDTOCAGRP</td>
<td>Add all the data sets of the database resource to a DBRC CAGRP. You can use the ADD sub command of the IMS DBRC CHANGE.CAGRP command.</td>
</tr>
<tr>
<td>BACKOUT</td>
<td>Perform the backout process for the database updates. You can use IMS Batch Backout utility.</td>
</tr>
</tbody>
</table>
Chapter 32. Return and reason codes

The information provided in this return and reason code reference can help you diagnose, troubleshoot, and solve Policy Services problems.

Topics:
- “Return/reason codes: Client API interface (BSN1000-1009) (BSN2000-2099)” on page 487
- “Return/reason codes: Policy Environment Services (BSN1500-1599)” on page 495
- “Return/reason codes: Association Manager (BSN1600-1799)” on page 498
- “Return/reason codes: Email/Texting Variable (BSN1800-1899)” on page 500
- “Return/reason codes: Storage Manager (BSN2200-2399)” on page 502
- “Return/reason codes: Action Manager (BSN2800-2999)” on page 502
- “Return/reason codes: Journal Manager (BSN3400-3499)” on page 503
- “Return/reason codes: Parser, Validation, Evaluation (BSN4000-4199)” on page 505
- “Return/reason codes: Notification Manager (BSN4600-4799)” on page 506
- “Return/reason codes: Notification List Data Store (BSN5200-5399)” on page 506
- “Return/reason codes: Policy Domain Data Store (BSN5800-5999)” on page 510
- “Return/reason codes: Rules Data Store (BSN6400-6599)” on page 511
- “Return/reason codes: Policy Data Store (BSN7000-7199)” on page 516
- “Return/reason codes: Data Dictionary (BSN7600-7799, BBE1450E)” on page 518
- “Return/reason codes: Sensor Data read/write (BSN8800-8999, BBE1451E)” on page 532
- “Return/reason codes: Sensor Data delete (BSN8800-8999)” on page 537
- “Return codes: Sensor Data Extractor” on page 539
- “Return codes: Statistics Data Import Utility” on page 540
- “Return codes: History Data Summarization Utility” on page 540

Return/reason codes: Client API interface (BSN1000-1009) (BSN2000-2099)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Client API interface in messages BSN1000-1009 and BSN2000-2099.

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td></td>
<td>X'00'</td>
<td>Call successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'04'</td>
<td></td>
<td>Unable to obtain PSCB storage</td>
</tr>
<tr>
<td>X'08'</td>
<td></td>
<td>Unable to load policy module</td>
</tr>
<tr>
<td>X'0C'</td>
<td></td>
<td>BPE initialization failed</td>
</tr>
<tr>
<td>X'10'</td>
<td></td>
<td>Unable to obtain IFCB storage</td>
</tr>
<tr>
<td>X'14'</td>
<td></td>
<td>RECON container call failed</td>
</tr>
<tr>
<td>X'18'</td>
<td></td>
<td>No RECON container data</td>
</tr>
<tr>
<td>X'1C'</td>
<td></td>
<td>Unable to obtain RECON table</td>
</tr>
<tr>
<td>X'20'</td>
<td></td>
<td>Data Dictionary INIT failed</td>
</tr>
<tr>
<td>X'24'</td>
<td></td>
<td>Invalid function</td>
</tr>
<tr>
<td>X'28'</td>
<td></td>
<td>No valid RECON in container</td>
</tr>
<tr>
<td>X'2C'</td>
<td></td>
<td>Unable to obtain POCB storage</td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>X'08'</td>
<td>X'30'</td>
<td>No resource passed</td>
</tr>
<tr>
<td></td>
<td>X'34'</td>
<td>No PDSP returned on PDS PTRD call</td>
</tr>
<tr>
<td></td>
<td>X'38'</td>
<td>No resource list returned on PDS GETC call</td>
</tr>
<tr>
<td></td>
<td>X'3C'</td>
<td>No match on resource name from PDDS open</td>
</tr>
<tr>
<td></td>
<td>X'40'</td>
<td>No policy name passed</td>
</tr>
<tr>
<td></td>
<td>X'44'</td>
<td>Invalid policy name; prefix is &quot;IBM.&quot;</td>
</tr>
<tr>
<td></td>
<td>X'48'</td>
<td>Unable to obtain PDEB control block</td>
</tr>
<tr>
<td></td>
<td>X'4C'</td>
<td>Invalid level change request</td>
</tr>
<tr>
<td></td>
<td>X'50'</td>
<td>Invalid domain name specified</td>
</tr>
<tr>
<td></td>
<td>X'54'</td>
<td>Set no PDED's defined to system</td>
</tr>
<tr>
<td></td>
<td>X'58'</td>
<td>No PDEB defined for specified domain name</td>
</tr>
<tr>
<td></td>
<td>X'5C'</td>
<td>Domain already in maintenance mode</td>
</tr>
<tr>
<td></td>
<td>X'60'</td>
<td>Policy Services have not been initialized</td>
</tr>
<tr>
<td></td>
<td>X'64'</td>
<td>BSNGLOBL locale not defined to IMS Tools KB</td>
</tr>
<tr>
<td></td>
<td>X'68'</td>
<td>Unable to obtain LISTAREA storage</td>
</tr>
<tr>
<td></td>
<td>X'70'</td>
<td>Domain is not in operation environment</td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Critical error</td>
</tr>
<tr>
<td>X'04'</td>
<td></td>
<td>Invalid INIT call issued by client (second or greater INIT call)</td>
</tr>
<tr>
<td>X'08'</td>
<td></td>
<td>Invalid TERM call issued by client, either a second TERM call or INIT call failed and this TERM call was issued; or TERM call was issued with no preceding INIT call</td>
</tr>
<tr>
<td>X'0C'</td>
<td></td>
<td>Component call failed</td>
</tr>
<tr>
<td>X'10'</td>
<td></td>
<td>Invalid STRT call issued by client, no INIT call issued first</td>
</tr>
<tr>
<td>X'14'</td>
<td></td>
<td>Initialization request failed for either Policy Services or Data Dictionary Services</td>
</tr>
<tr>
<td>X'18'</td>
<td></td>
<td>Internal failure caught by Policy Services ESTAE routine; retry can be attempted</td>
</tr>
<tr>
<td>X'1C'</td>
<td></td>
<td>Load library is not APF authorized</td>
</tr>
<tr>
<td>X'20'</td>
<td>X'20'</td>
<td>Component not active (Policy initialization not requested)</td>
</tr>
</tbody>
</table>

**Register 15 high byte values**

Calls made using the Client API and some of the calls made using the Association Manager API can result in multiple calls to other Policy Services components. The call can fail when being processed by the Client API component, or the Association Manager component or in one of the other Policy Services components.

Register 15 is used to identify the Policy Services component when a failure occurs. The high byte of register 15 is set to define the exact component of Policy Services that failed. The remaining three bytes of register 15 contain the return code for the component. The RETCODE= and RSCNDE= parameters of the Client API call are set to the failing component return/reason codes.

The following example shows the results of a BSNSC FUNC=ASLK call on return from processing:

- If register 15 contains X'22000008', then the call failed in the Client API component that was processing a FUNC=ASLK call:
  
  X'22' Client API call function being made was for FUNC=ASLK

  The resulting RETCODE would be X'08' and the RSCNDE would be one of the valid Client API reason codes.

- If register 15 contains X'32000008', then the call failed in the Association Manager component that was processing a FUNC=ASLK call:
  
  X'32' Association Manager call function being made was for FUNC=ASLK

  The resulting RETCODE would be X'08' and the RSCNDE would be one of the valid Association Manager reason codes.

- If register 15 contains X'61000008', then the call failed in the Policy Data Store component that was processing a FUNC=PTRD call:
X'61' Policy Data Store call function being made was for FUNC=PTRD

The resulting RETCODE would be X'08' and the RSNCODE would be one of the valid Policy Data Store reason codes.

Table 159. Register 15 high byte values for Action Manager interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Action Manager (BSNAM FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'10'</td>
<td>Action Manager call function being made was for FUNC=AMIT</td>
</tr>
<tr>
<td>X'11'</td>
<td>Action Manager call function being made was for FUNC=AMGA</td>
</tr>
<tr>
<td>X'12'</td>
<td>Action Manager call function being made was for FUNC=AMUS</td>
</tr>
<tr>
<td>X'13'</td>
<td>Action Manager call function being made was for FUNC=AMP2</td>
</tr>
<tr>
<td>X'19'</td>
<td>Action Manager call function being made was for FUNC=AMTM</td>
</tr>
</tbody>
</table>

Note: See Action Manager return code (same as register 15 three-byte return code) and reason code values.

Table 160. Register 15 high byte values for Client API interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Client API (BSNSC FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'01'</td>
<td>Client API call function being made was for FUNC=INIT</td>
</tr>
<tr>
<td>X'15'</td>
<td>Client API call function being made was for FUNC=LSTP</td>
</tr>
<tr>
<td>X'16'</td>
<td>Client API call function being made was for FUNC=LSTT</td>
</tr>
<tr>
<td>X'17'</td>
<td>Client API call function being made was for FUNC=PAEV</td>
</tr>
<tr>
<td>X'18'</td>
<td>Client API call function being made was for FUNC=PACU</td>
</tr>
<tr>
<td>X'20'</td>
<td>Client API call function being made was for FUNC=INIT</td>
</tr>
<tr>
<td>X'21'</td>
<td>Client API call function being made was for FUNC=STRT</td>
</tr>
<tr>
<td>X'22'</td>
<td>Client API call function being made was for FUNC=ASLK</td>
</tr>
<tr>
<td>X'26'</td>
<td>Client API call function being made was for FUNC=ASGP</td>
</tr>
<tr>
<td>X'27'</td>
<td>Client API call function being made was for FUNC=ASFP</td>
</tr>
<tr>
<td>X'28'</td>
<td>Client API call function being made was for FUNC=ASUP</td>
</tr>
<tr>
<td>X'29'</td>
<td>Client API call function being made was for FUNC=TERM</td>
</tr>
</tbody>
</table>

Note: See Client API return code (same as register 15 three-byte return code) and reason code values.
Table 161. Register 15 high byte values for Association Manager interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Association Manager (BSNAS FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'32'</td>
<td>Association Manager call function being made was for FUNC=ASLK</td>
</tr>
<tr>
<td>X'33'</td>
<td>Association Manager call function being made was for FUNC=ASVT</td>
</tr>
<tr>
<td>X'34'</td>
<td>Association Manager call function being made was for FUNC=ASVS</td>
</tr>
<tr>
<td>X'35'</td>
<td>Association Manager call function being made was for FUNC=ASPT</td>
</tr>
<tr>
<td>X'36'</td>
<td>Association Manager call function being made was for FUNC=ASGP</td>
</tr>
<tr>
<td>X'37'</td>
<td>Association Manager call function being made was for FUNC=ASFP</td>
</tr>
<tr>
<td>X'38'</td>
<td>Association Manager call function being made was for FUNC=ASUP</td>
</tr>
</tbody>
</table>

Note: See Association Manager return code (same as register 15 three-byte return code) and reason code values.

Table 162. Register 15 high byte values for Journal Manager interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Journal Manager (BSNJM FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'40'</td>
<td>Journal Manager call function being made was for FUNC=INIT</td>
</tr>
<tr>
<td>X'41'</td>
<td>Journal Manager call function being made was for FUNC=STAU</td>
</tr>
<tr>
<td>X'42'</td>
<td>Journal Manager call function being made was for FUNC=WRIT</td>
</tr>
<tr>
<td>X'43'</td>
<td>Journal Manager call function being made was for FUNC=CMTU</td>
</tr>
<tr>
<td>X'49'</td>
<td>Journal Manager call function being made was for FUNC=TERM</td>
</tr>
</tbody>
</table>

Note: See Journal Manager return code (same as register 15 three-byte return code) and reason code values.

Table 163. Register 15 high byte values for Policy Domain Data Store interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Policy Domain Data Store (BSNPDDS FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'50'</td>
<td>Policy Domain Data Store call function being made was for FUNC=INIT</td>
</tr>
<tr>
<td>X'51'</td>
<td>Policy Domain Data Store call function being made was for FUNC=OPEN</td>
</tr>
<tr>
<td>X'52'</td>
<td>Policy Domain Data Store call function being made was for FUNC=CLSE</td>
</tr>
<tr>
<td>X'59'</td>
<td>Policy Domain Data Store call function being made was for FUNC=TERM</td>
</tr>
</tbody>
</table>

Note: See Policy Domain Data Store return code (same as register 15 three-byte return code) and reason code values.
### Table 164. Register 15 high byte values for Policy Data Store interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Policy Data Store (BSNPDS FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'60'</td>
<td>Policy Data Store call function being made was for FUNC=INIT</td>
</tr>
<tr>
<td>X'61'</td>
<td>Policy Data Store call function being made was for FUNC=PTRD</td>
</tr>
<tr>
<td>X'62'</td>
<td>Policy Data Store call function being made was for FUNC=GETC</td>
</tr>
<tr>
<td>X'63'</td>
<td>Policy Data Store call function being made was for FUNC=PTRL</td>
</tr>
<tr>
<td>X'64'</td>
<td>Policy Data Store call function being made was for FUNC=PSRD</td>
</tr>
<tr>
<td>X'65'</td>
<td>Policy Data Store call function being made was for FUNC=PSRL</td>
</tr>
<tr>
<td>X'66'</td>
<td>Policy Data Store call function being made was for FUNC=PSFT</td>
</tr>
<tr>
<td>X'67'</td>
<td>Policy Data Store call function being made was for FUNC=STRL</td>
</tr>
<tr>
<td>X'68'</td>
<td>Policy Data Store call function being made was for FUNC=GETL</td>
</tr>
<tr>
<td>X'69'</td>
<td>Policy Data Store call function being made was for FUNC=TERM</td>
</tr>
</tbody>
</table>

**Note:** See Policy Data Store return code (same as register 15 three-byte return code) and reason code values.

### Table 165. Register 15 high byte values for Parser, Validation, Evaluation interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Parser, Validation, Evaluation (BSNPA FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'70'</td>
<td>Parser, Validation, Evaluation call function being made was for FUNC=INIT</td>
</tr>
<tr>
<td>X'71'</td>
<td>Parser, Validation, Evaluation call function being made was for FUNC=PARS</td>
</tr>
<tr>
<td>X'72'</td>
<td>Parser, Validation, Evaluation call function being made was for FUNC=VALD</td>
</tr>
<tr>
<td>X'73'</td>
<td>Parser, Validation, Evaluation call function being made was for FUNC=EVAL</td>
</tr>
<tr>
<td>X'78'</td>
<td>Parser, Validation, Evaluation call function being made was for FUNC=CLUP</td>
</tr>
<tr>
<td>X'79'</td>
<td>Parser, Validation, Evaluation call function being made was for FUNC=TERM</td>
</tr>
</tbody>
</table>

**Note:** See Parser, Validation, Evaluation return code (same as register 15 three-byte return code) and reason code values.

### Table 166. Register 15 high byte values for Storage Manager interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Storage Manager (BSNSM FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'80'</td>
<td>Storage Manager call function being made was for FUNC=INIT</td>
</tr>
</tbody>
</table>
### Table 166. Register 15 high byte values for Storage Manager interface (continued)

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Storage Manager (BSNSM FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'81'</td>
<td>Storage Manager call function being made was for FUNC=GET</td>
</tr>
<tr>
<td>X'82'</td>
<td>Storage Manager call function being made was for FUNC=FREE</td>
</tr>
<tr>
<td>X'83'</td>
<td>Storage Manager call function being made was for FUNC=TERM</td>
</tr>
</tbody>
</table>

**Note:** See Storage Manager return code (same as register 15 three-byte return code) and reason code values.

### Table 167. Register 15 high byte values for Policy Environment Services interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Policy Environment Services (BSNPES FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'85'</td>
<td>Policy Environment Services call function being made was for FUNC=INIT</td>
</tr>
<tr>
<td>X'86'</td>
<td>Policy Environment Services call function being made was for FUNC=STAT</td>
</tr>
<tr>
<td>X'89'</td>
<td>Policy Environment Services call function being made was for FUNC=TERM</td>
</tr>
</tbody>
</table>

**Note:** See Policy Environment Services return code (same as register 15 three-byte return code) and reason code values.

### Table 168. Register 15 high byte values for Data Dictionary interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Data Dictionary (BSNDD FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'90'</td>
<td>Data Dictionary call function being made was for FUNC=INIT</td>
</tr>
<tr>
<td>X'91'</td>
<td>Data Dictionary call function being made was for FUNC=TERM</td>
</tr>
</tbody>
</table>

**Note:** See Data Dictionary return code (same as register 15 three-byte return code) and reason code values.

### Table 169. Register 15 high byte values for Rule Data Store interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Rule Data Store (BSNRDS FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'92'</td>
<td>Rule Data Store call function being made was for FUNC=INIT</td>
</tr>
<tr>
<td>X'93'</td>
<td>Rule Data Store call function being made was for FUNC=TERM</td>
</tr>
</tbody>
</table>

**Note:** See Rule Data Store return code (same as register 15 three-byte return code) and reason code values.
Table 170. Register 15 high byte values for Notification List Data Store interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Notification List Data Store (BSNNLDS FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'94'</td>
<td>Notification List Data Store call function being made was for FUNC=INIT</td>
</tr>
<tr>
<td>X'95'</td>
<td>Notification List Data Store call function being made was for FUNC=TERM</td>
</tr>
<tr>
<td>X'96'</td>
<td>ETV call function being made was for FUNC=CONNECT</td>
</tr>
<tr>
<td>X'97'</td>
<td>ETV call function being made was for FUNC=DISCONNECT</td>
</tr>
</tbody>
</table>

**Note:** See Notification List Data Store return code (same as register 15 three-byte return code) and reason code values.

Table 171. Register 15 high byte values for ITKB interface

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>ITKB (ITKB FUNC=) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'98'</td>
<td>ITKB call function being made was for FUNC=CONNECT</td>
</tr>
<tr>
<td>X'99'</td>
<td>ITKB call function being made was for FUNC=DISCONNECT</td>
</tr>
</tbody>
</table>

**Note:** See IMS Tools Knowledge Base (ITKB) return code (same as register 15 three-byte return code) and reason code values.

Table 172. Register 15 high byte values for invalid calls

<table>
<thead>
<tr>
<th>High Byte of Register 15</th>
<th>Client API (BSNSC FUNC=invalid_func) Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'01'</td>
<td>Client API call function being made before FUNC=INIT issued</td>
</tr>
</tbody>
</table>

Return/reason codes: Policy Environment Services (BSN1500-1599)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Policy Environment Services interface in messages BSN1500-1599.

Table 173. Return and reason codes reported by Policy Services Policy Environment Services interface

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td>X'00'</td>
<td>none</td>
<td>X'00'</td>
<td>PES function was successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>none</td>
<td>X'04'</td>
<td>No more data</td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code (Hex)</td>
<td>Reason code (Symbolic)</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------</td>
<td>------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>FPQSRV call failure</td>
<td></td>
</tr>
<tr>
<td>X'08'</td>
<td>OBTAIN</td>
<td>OBTPESA</td>
<td>Unable to obtain PES storage (PESA block)</td>
</tr>
<tr>
<td></td>
<td>OBTPESH</td>
<td>OBTPESH</td>
<td>Unable to obtain PES storage (PESH block)</td>
</tr>
<tr>
<td>X'0C'</td>
<td>RELEASE</td>
<td>RELPESD</td>
<td>Unable to release PES storage (PESD block)</td>
</tr>
<tr>
<td></td>
<td>RELPESE</td>
<td>RELPESE</td>
<td>Unable to release PES storage (PESE block)</td>
</tr>
<tr>
<td></td>
<td>RELPESA</td>
<td>RELPESA</td>
<td>Unable to release PES storage (PESA block)</td>
</tr>
<tr>
<td></td>
<td>RELPESK</td>
<td>RELPESK</td>
<td>Unable to release PES storage (PESK block)</td>
</tr>
<tr>
<td></td>
<td>RELPESP</td>
<td>RELPESP</td>
<td>Unable to release PES storage (PESH block)</td>
</tr>
<tr>
<td>X'10'</td>
<td>PES_ENQ</td>
<td>PES_ENQ</td>
<td>PES latch failure (ENQ)</td>
</tr>
<tr>
<td></td>
<td>PES_DEQ</td>
<td>PES_DEQ</td>
<td>PES latch failure (DEQ)</td>
</tr>
<tr>
<td>X'14'</td>
<td>DOMLOC</td>
<td>DOMLOC</td>
<td>Domain latch failure</td>
</tr>
<tr>
<td>X'18'</td>
<td>NDMLOC</td>
<td>NDMLOC</td>
<td>Non-domain latch failure</td>
</tr>
<tr>
<td>X'20'</td>
<td>NOPESH</td>
<td>NOPESH</td>
<td>No PESH control block</td>
</tr>
<tr>
<td>X'24'</td>
<td>NOPESE</td>
<td>NOPESE</td>
<td>No PESE control block</td>
</tr>
<tr>
<td>X'28'</td>
<td>NOPOCB</td>
<td>NOPOCB</td>
<td>No POCB control block</td>
</tr>
<tr>
<td>X'2C'</td>
<td>NOPESA</td>
<td>NOPESA</td>
<td>No PESA control block</td>
</tr>
<tr>
<td>X'30'</td>
<td>NOPESD</td>
<td>NOPESD</td>
<td>No PESD control block</td>
</tr>
<tr>
<td>X'34'</td>
<td>NODMNM</td>
<td>NODMNM</td>
<td>No domain name provided</td>
</tr>
<tr>
<td>X'38'</td>
<td>NOPESK</td>
<td>NOPESK</td>
<td>No PESK control block</td>
</tr>
<tr>
<td>X'3C'</td>
<td>NOINPT</td>
<td>NOINPT</td>
<td>No input data</td>
</tr>
<tr>
<td>Return code (Hex)</td>
<td>Reason code (Hex)</td>
<td>Reason code (Symbolic)</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------</td>
<td>------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>X'08' (continued)</td>
<td>X'50'</td>
<td>INVFUN</td>
<td>Invalid function</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UNKFUN</td>
<td>Invalid function</td>
</tr>
<tr>
<td></td>
<td>X'54'</td>
<td>INVMOD</td>
<td>Invalid mode</td>
</tr>
<tr>
<td></td>
<td>X'58'</td>
<td>INVPOL</td>
<td>Invalid policy objects</td>
</tr>
<tr>
<td></td>
<td>X'60'</td>
<td>INVORG</td>
<td>Invalid environment level</td>
</tr>
<tr>
<td></td>
<td>X'68'</td>
<td>INVORG</td>
<td>Invalid origin environment</td>
</tr>
<tr>
<td></td>
<td>X'70'</td>
<td>COPA</td>
<td>BSNPDS call failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DELA</td>
<td>BSNPDS call failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ENDL</td>
<td>BSNPDS call failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VALA</td>
<td>BSNPDS call failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RNMA</td>
<td>BSNPDS call failure</td>
</tr>
<tr>
<td></td>
<td>X'74'</td>
<td>DELA</td>
<td>BSNRDS call failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RNMA</td>
<td>BSNRDS call failure</td>
</tr>
<tr>
<td></td>
<td>X'78'</td>
<td>COPA</td>
<td>BSNNLDS call failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DSTY</td>
<td>BSNNLDS call failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DELP</td>
<td>BSNNLDS call failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RNMA</td>
<td>BSNNLDS call failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DELA</td>
<td>BSNNLDS call failure</td>
</tr>
<tr>
<td></td>
<td>X'7C'</td>
<td>OBTRIB</td>
<td>GQSCAN call failure</td>
</tr>
<tr>
<td></td>
<td>X'80'</td>
<td>OBJCON</td>
<td>Objects in contention</td>
</tr>
<tr>
<td></td>
<td>X'84'</td>
<td>MEMFND</td>
<td>Member found in the repository</td>
</tr>
</tbody>
</table>
### Table 173. Return and reason codes reported by Policy Services Policy Environment Services interface (continued)

<table>
<thead>
<tr>
<th>Return code (Hex)</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'08' (continued)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X'88'</td>
<td>INVUID</td>
<td>Invalid user ID</td>
<td></td>
</tr>
<tr>
<td>X'8C'</td>
<td>INVPKG</td>
<td>Invalid package ID</td>
<td></td>
</tr>
<tr>
<td>X'90'</td>
<td>INVGTP</td>
<td>Invalid get type</td>
<td></td>
</tr>
<tr>
<td>X'94'</td>
<td>INVUSG</td>
<td>Invalid usage</td>
<td></td>
</tr>
<tr>
<td>X'98'</td>
<td>INVITP</td>
<td>Invalid item type</td>
<td></td>
</tr>
<tr>
<td>X'9C'</td>
<td>INSACC</td>
<td>Insufficient access authorization to the repository</td>
<td></td>
</tr>
</tbody>
</table>

### Return/reason codes: Association Manager (BSN1600-1799)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Association Manager interface in messages BSN1600-1799.

<table>
<thead>
<tr>
<th>Return code (Hex)</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td></td>
<td>X'00'</td>
<td>Call successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'04'</td>
<td></td>
<td>Currently not used</td>
</tr>
<tr>
<td>X'08'</td>
<td></td>
<td>Currently not used</td>
</tr>
<tr>
<td>X'0C'</td>
<td></td>
<td>Currently not used</td>
</tr>
<tr>
<td>X'10'</td>
<td></td>
<td>Currently not used</td>
</tr>
<tr>
<td>X'14'</td>
<td></td>
<td>Currently not used</td>
</tr>
<tr>
<td>X'18'</td>
<td></td>
<td>No RECON container data</td>
</tr>
<tr>
<td>X'1C'</td>
<td></td>
<td>Currently not used</td>
</tr>
<tr>
<td>X'20'</td>
<td></td>
<td>Currently not used</td>
</tr>
<tr>
<td>X'24'</td>
<td></td>
<td>Invalid function</td>
</tr>
<tr>
<td>X'28'</td>
<td></td>
<td>No valid RECON in container</td>
</tr>
<tr>
<td>X'2C'</td>
<td></td>
<td>Unable to obtain POCB</td>
</tr>
<tr>
<td>X'30'</td>
<td></td>
<td>No resource passed</td>
</tr>
<tr>
<td>X'34'</td>
<td></td>
<td>No PDSP returned on PDS PTRD call</td>
</tr>
<tr>
<td>X'38'</td>
<td></td>
<td>No resource list returned on PDS GETC call</td>
</tr>
<tr>
<td>X'3C'</td>
<td></td>
<td>No match on resource name from PDDS open</td>
</tr>
<tr>
<td>X'40'</td>
<td></td>
<td>No policy name passed</td>
</tr>
<tr>
<td>X'44'</td>
<td></td>
<td>Invalid policy name; prefix is &quot;IBM.&quot;</td>
</tr>
<tr>
<td>X'48'</td>
<td></td>
<td>Currently not used</td>
</tr>
<tr>
<td>X'4C'</td>
<td></td>
<td>Invalid level change request</td>
</tr>
<tr>
<td>X'50'</td>
<td></td>
<td>Invalid domain name specified</td>
</tr>
<tr>
<td>X'54'</td>
<td></td>
<td>Set no PDED's defined to system</td>
</tr>
<tr>
<td>X'58'</td>
<td></td>
<td>No PDEB defined for specified domain name</td>
</tr>
</tbody>
</table>
Table 174. Return and reason codes reported by Policy Services Association Manager interface (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'08'</td>
<td>X'5C'</td>
<td>Domain already in maintenance mode</td>
</tr>
<tr>
<td></td>
<td>X'60'</td>
<td>Reserved</td>
</tr>
<tr>
<td></td>
<td>X'64'</td>
<td>Reserved</td>
</tr>
<tr>
<td></td>
<td>X'68'</td>
<td>Unable to obtain LISTAREA storage</td>
</tr>
<tr>
<td></td>
<td>X'6C'</td>
<td>Invalid POLICYBY= parm</td>
</tr>
<tr>
<td></td>
<td>X'70'</td>
<td>Domain is not in operation environment</td>
</tr>
<tr>
<td>X'D4' - X'D7'</td>
<td>Reserved</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'80' - X'90'</td>
<td>Not used by Association Manager</td>
</tr>
</tbody>
</table>

Return/reason codes: Email/Texting Variable (BSN1800-1899)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Email/Texting Variable interface in messages BSN1800-1899.

Table 175. Return and reason codes reported by Policy Services Email/Texting Variable interface

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td></td>
<td>X'00'</td>
<td>ETV function was successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td></td>
<td>X'04'</td>
<td>No more data</td>
</tr>
<tr>
<td>X'08'</td>
<td>Member found in the repository</td>
<td></td>
</tr>
<tr>
<td>X'20'</td>
<td>Partial delete occurred</td>
<td></td>
</tr>
</tbody>
</table>
### Table 175. Return and reason codes reported by Policy Services Email/Texting Variable interface (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'04'</td>
<td></td>
<td>FPQSRV call failure</td>
</tr>
<tr>
<td>X'08'</td>
<td></td>
<td>Unable to obtain ETV storage</td>
</tr>
<tr>
<td>X'0C'</td>
<td></td>
<td>Unable to release ETV storage</td>
</tr>
<tr>
<td>X'10'</td>
<td></td>
<td>No SMTP in the RECON</td>
</tr>
<tr>
<td>X'14'</td>
<td></td>
<td>The default global SMTP not modified</td>
</tr>
<tr>
<td>X'20'</td>
<td></td>
<td>No ETVT control block</td>
</tr>
<tr>
<td>X'24'</td>
<td></td>
<td>No ETVH control block</td>
</tr>
<tr>
<td>X'28'</td>
<td></td>
<td>No ETVL control block</td>
</tr>
<tr>
<td>X'2C'</td>
<td></td>
<td>No POCB control block</td>
</tr>
<tr>
<td>X'30'</td>
<td></td>
<td>No variable type provided</td>
</tr>
<tr>
<td>X'34'</td>
<td></td>
<td>No domain name provided</td>
</tr>
<tr>
<td>X'38'</td>
<td></td>
<td>No input data</td>
</tr>
<tr>
<td>X'50'</td>
<td></td>
<td>Invalid function</td>
</tr>
<tr>
<td>X'54'</td>
<td></td>
<td>Invalid mode</td>
</tr>
<tr>
<td>X'58'</td>
<td></td>
<td>Invalid email variable</td>
</tr>
<tr>
<td>X'5C'</td>
<td></td>
<td>Invalid texting variable</td>
</tr>
<tr>
<td>X'64'</td>
<td></td>
<td>Invalid locale</td>
</tr>
</tbody>
</table>
Table 175. Return and reason codes reported by Policy Services Email/Texting Variable interface (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'08'</td>
<td>X'68'</td>
<td>Invalid environment</td>
</tr>
<tr>
<td></td>
<td>X'6C'</td>
<td>Invalid RECON</td>
</tr>
<tr>
<td></td>
<td>X'70'</td>
<td>Member not found in the repository</td>
</tr>
<tr>
<td></td>
<td>X'74'</td>
<td>BSNETV call failure</td>
</tr>
<tr>
<td></td>
<td>X'78'</td>
<td>No change to the repository allowed</td>
</tr>
<tr>
<td></td>
<td>X'7C'</td>
<td>Input string has invalid character</td>
</tr>
<tr>
<td></td>
<td>X'80'</td>
<td>Member in use</td>
</tr>
<tr>
<td></td>
<td>X'84'</td>
<td>Invalid UOW handle</td>
</tr>
</tbody>
</table>

Return/reason codes: Storage Manager (BSN2200-2399)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Storage Manager interface is messages BSN2200-2399.

Table 176. Return and reason codes reported by Policy Services Storage Manager interface

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td></td>
<td>X'00'</td>
<td>SM function was successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td></td>
<td>X'0C'</td>
<td>Cell size not supported</td>
</tr>
<tr>
<td></td>
<td>X'10'</td>
<td>CPOOL Manager not INIT</td>
</tr>
</tbody>
</table>

Return/reason codes: Action Manager (BSN2800-2999)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Action Manager interface in messages BSN2800-2999.

Table 177. Return and reason codes reported by Policy Services Action Manager interface

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td></td>
<td>X'00'</td>
<td>AM function was successful</td>
</tr>
</tbody>
</table>
### Table 177. Return and reason codes reported by Policy Services Action Manager interface (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td>X'04'</td>
<td></td>
<td>No more data</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'04' - X'20</td>
<td></td>
<td>Not used by Action Manager</td>
</tr>
<tr>
<td>X'24'</td>
<td></td>
<td>Invalid function</td>
</tr>
<tr>
<td>X'28' - X'6C'</td>
<td></td>
<td>Reserved</td>
</tr>
<tr>
<td>X'80'</td>
<td></td>
<td>No Action Descriptor address</td>
</tr>
<tr>
<td>X'84'</td>
<td></td>
<td>No Action List address</td>
</tr>
<tr>
<td>X'88'</td>
<td></td>
<td>Storage Manager failure</td>
</tr>
<tr>
<td>X'8C'</td>
<td></td>
<td>No Action Manager AMCB control block</td>
</tr>
<tr>
<td>X'90'</td>
<td></td>
<td>Invalid Action Manager Phase</td>
</tr>
</tbody>
</table>

### Return/reason codes: Journal Manager (BSN3400-3499)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Journal Manager interface in messages BSN3400-3499.

### Table 178. Return and reason codes reported by Policy Services Journal Manager interface

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td></td>
<td>X'00'</td>
<td>none</td>
<td>JMS function was successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td></td>
<td>X'04'</td>
<td>NODATA</td>
<td>No more data</td>
</tr>
</tbody>
</table>
### Table 178. Return and reason codes reported by Policy Services Journal Manager interface (continued)

<table>
<thead>
<tr>
<th>Return code (Hex)</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'04'</td>
<td>HKTXXLI</td>
<td>HKTXACC call failure</td>
<td></td>
</tr>
<tr>
<td>X'08'</td>
<td>OBTJMSH</td>
<td>Unable to obtain JMS storage</td>
<td></td>
</tr>
<tr>
<td>X'0C'</td>
<td>FREERROR</td>
<td>Unable to release JMS storage (input buffer)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELJMSH</td>
<td>Unable to release JMS storage (anchor block storage)</td>
<td></td>
</tr>
<tr>
<td>X'10'</td>
<td>NOJMSH</td>
<td>No JMSH control block</td>
<td></td>
</tr>
<tr>
<td>X'20'</td>
<td>NOJUOW</td>
<td>No JUOW control block</td>
<td></td>
</tr>
<tr>
<td>X'24'</td>
<td>NOPOCB</td>
<td>No POCB control block (no POCB)</td>
<td></td>
</tr>
<tr>
<td>X'28'</td>
<td>NOHEAD</td>
<td>No heading block provided</td>
<td></td>
</tr>
<tr>
<td>X'2C'</td>
<td>NOSUBT</td>
<td>No sub title provided</td>
<td></td>
</tr>
<tr>
<td>X'30'</td>
<td>NOINPT</td>
<td>No input data</td>
<td></td>
</tr>
<tr>
<td>X'34'</td>
<td>INVFUN</td>
<td>Invalid function</td>
<td></td>
</tr>
<tr>
<td>X'38'</td>
<td>INVMOD</td>
<td>Invalid mode</td>
<td></td>
</tr>
<tr>
<td>X'3C'</td>
<td>NODDCARD</td>
<td>No JM DD card in the JCL</td>
<td></td>
</tr>
<tr>
<td>X'40'</td>
<td>dd_name</td>
<td>OPEN call failure</td>
<td></td>
</tr>
<tr>
<td>X'44'</td>
<td>PUTFAIL</td>
<td>PUT call failure</td>
<td></td>
</tr>
<tr>
<td>X'48'</td>
<td>dd_name</td>
<td>CLOSE call failure</td>
<td></td>
</tr>
<tr>
<td>X'4C'</td>
<td>ALLOCERR</td>
<td>Dynamic allocation failed</td>
<td></td>
</tr>
</tbody>
</table>
This reference section provides detailed information about the return and reason codes reported by the Policy Services Parser, Validation, Evaluation (PVE) interface in messages BSN4000-4199.

Table 179. Return and reason codes reported by Policy Services Parser, Validation, Evaluation (PVE) interface

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>PVE Function was successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Process ended with warning</td>
</tr>
<tr>
<td>X'10'</td>
<td>Any code</td>
<td>Missing data is found in a policy evaluation processing</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>System error inside PVE</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>System error outside PVE</td>
</tr>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Policy validation error</td>
</tr>
<tr>
<td>X'10'</td>
<td>Any code</td>
<td>Missing data is found in a policy evaluation processing</td>
</tr>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Critical error (Function is missing)</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>PVE module is not loaded</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Incorrect data record list</td>
</tr>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>API sequence error</td>
</tr>
<tr>
<td>X'10'</td>
<td>Any code</td>
<td>Save area obtain failure</td>
</tr>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Cell size not supported</td>
</tr>
<tr>
<td>X'10'</td>
<td>Any code</td>
<td>CPOOL Manager not INIT</td>
</tr>
<tr>
<td>X'14'</td>
<td>Any code</td>
<td>Invalid Control Blocks passed</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Policy environment block (PSCB) address was null</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Policy session block (POCB) address was null</td>
</tr>
</tbody>
</table>
## Return/reason codes: Notification Manager (BSN4600-4799)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Notification Manager interface in messages BSN4600-4799.

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td>X'00'</td>
<td></td>
<td>Notification Manager function was successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td>X'04'</td>
<td></td>
<td>Notification Manager function completed with information</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'04'</td>
<td></td>
<td>A system error occurred inside the Notification Manager module</td>
</tr>
<tr>
<td>X'08'</td>
<td></td>
<td>A system error occurred outside the Notification Manager module</td>
</tr>
<tr>
<td>X'10'</td>
<td>Any code</td>
<td>Save area obtain failure</td>
</tr>
<tr>
<td>X'0C'</td>
<td></td>
<td>Cell size not supported</td>
</tr>
<tr>
<td>X'10'</td>
<td></td>
<td>CPOOL Manager not INIT</td>
</tr>
<tr>
<td>X'14'</td>
<td>Any MVS key</td>
<td>Valid MVS KEY</td>
</tr>
<tr>
<td>X'0000000nn'</td>
<td>Callers KEY</td>
<td>(The TSO SEND call failed. Policy Services does not support sending notification messages to TSO clients for the requesting IMS Tool because the IMS Tool is not executing in key 8. The notification list should be changed to send messages to the email directory entry, the texting directory entry, or both entries.)</td>
</tr>
</tbody>
</table>

## Return/reason codes: Notification List Data Store (BSN5200-5399)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Notification List Data Store interface in messages BSN5200-5399.

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td>X'00'</td>
<td>none</td>
<td>BSNNLDS function was successful</td>
<td></td>
</tr>
</tbody>
</table>
Table 181. Return and reason codes reported by Policy Services Notification List Data Store interface (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td>X'04'</td>
<td>NODATA</td>
<td></td>
<td>No more data provided</td>
</tr>
<tr>
<td>X'08'</td>
<td>NOENTR</td>
<td></td>
<td>No entry in notification list</td>
</tr>
<tr>
<td>X'0C'</td>
<td>NONLPD</td>
<td></td>
<td>No pending delete table</td>
</tr>
<tr>
<td>X'10'</td>
<td>FNDLST</td>
<td></td>
<td>Found list in the repository</td>
</tr>
<tr>
<td>X'14'</td>
<td>FNDPDR</td>
<td></td>
<td>Found pending delete record</td>
</tr>
<tr>
<td>X'20'</td>
<td>PDEMAX</td>
<td></td>
<td>Pending delete record exceeded maximum limit</td>
</tr>
<tr>
<td>X'24'</td>
<td>LEEMAX</td>
<td></td>
<td>List entry exceeded maximum limit</td>
</tr>
<tr>
<td>Return code (Hex)</td>
<td>Return code (Hex)</td>
<td>Reason code (Symbolic)</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
<td>------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'04'</td>
<td>FPQSRV</td>
<td>FPQSRV call failure</td>
<td></td>
</tr>
<tr>
<td>X'08'</td>
<td>OBTNTFI</td>
<td>Unable to obtain NLDS storage (NTFI block)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBTNTFL</td>
<td>Unable to obtain NLDS storage (NTFL block)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBTNLC</td>
<td>Unable to obtain NLDS storage (NLCD block)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBTAIN</td>
<td>Unable to obtain NLDS storage (NTFL work storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBTNLPD</td>
<td>Unable to obtain NLDS storage (NLPD table storage)</td>
<td></td>
</tr>
<tr>
<td>X'0C'</td>
<td>RELWORK</td>
<td>Unable to release NLDS storage (NTFL work storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELNLPD</td>
<td>Unable to release NLDS storage (NLPD table storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FREWKAR</td>
<td>Unable to release NLDS storage (work storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELNTFL</td>
<td>Unable to release NLDS storage (NTFL block)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELNTFI</td>
<td>Unable to release NLDS storage (NTFI block)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELNLCB</td>
<td>Unable to release NLDS storage (NLCD block)</td>
<td></td>
</tr>
<tr>
<td>X'10'</td>
<td>PRN_ENQ</td>
<td>PRN lock failure (ENQ failed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRN_DEQ</td>
<td>PRN lock failure (DEQ failed)</td>
<td></td>
</tr>
<tr>
<td>X'14'</td>
<td>NOPOCB</td>
<td>No POCB control block</td>
<td></td>
</tr>
<tr>
<td>X'20'</td>
<td>NONLCB</td>
<td>No NLCD control block</td>
<td></td>
</tr>
<tr>
<td>X'24'</td>
<td>NONTFI</td>
<td>No NTFI control block</td>
<td></td>
</tr>
</tbody>
</table>
### Table 181. Return and reason codes reported by Policy Services Notification List Data Store interface (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'08'</td>
<td>X'28'</td>
<td>NONTFL</td>
<td>No NTFL control block</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'2C'</td>
<td>NONTFE</td>
<td>No NTFE control block</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'30'</td>
<td>NOWKAR</td>
<td>No work area for NTFL control block</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'34'</td>
<td>NOLTNM</td>
<td>No notification list name</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'38'</td>
<td>NOLTNL</td>
<td>No notification list name length</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'3C'</td>
<td>NODESC</td>
<td>No description</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'40'</td>
<td>NODSCL</td>
<td>No description length</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'44'</td>
<td>NOLNMN</td>
<td>No list name to be copied to</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'50'</td>
<td>UNKFUN</td>
<td>Invalid function</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'54'</td>
<td>INVFUN</td>
<td>Invalid function</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'58'</td>
<td>INVMOD</td>
<td>Invalid mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'5C'</td>
<td>ASSINT</td>
<td>Short name internally assigned</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'68'</td>
<td>NOFLST</td>
<td>From list does not exist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'6C'</td>
<td>TOLEXT</td>
<td>To list already exists</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'70'</td>
<td>LSTREF</td>
<td>The list is referred by policy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'74'</td>
<td>INVLOC</td>
<td>Invalid locale</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'78'</td>
<td>INVENV</td>
<td>Invalid environment level</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'7C'</td>
<td>NOINPT</td>
<td>No input data</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X'80'</td>
<td>INVTEM</td>
<td>Invalid item</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 181. Return and reason codes reported by Policy Services Notification List Data Store interface (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'08'</td>
<td>X'84'</td>
<td>FDNLPD</td>
<td>Found NLPD member in repository</td>
</tr>
<tr>
<td></td>
<td>X'88'</td>
<td>NOCHNG</td>
<td>No change to the repository allowed</td>
</tr>
<tr>
<td></td>
<td>X'8C'</td>
<td>INVCHA</td>
<td>Invalid string</td>
</tr>
<tr>
<td></td>
<td>X'90'</td>
<td>DUPTYP</td>
<td>Duplicated entry type added</td>
</tr>
<tr>
<td></td>
<td>X'94'</td>
<td>MISTYP</td>
<td>Mismatch entry type when replace entered</td>
</tr>
<tr>
<td></td>
<td>X'98'</td>
<td>EXCTYP</td>
<td>Mutual Exclusive entry type added</td>
</tr>
<tr>
<td></td>
<td>X'9C'</td>
<td>MEMINU</td>
<td>Member in use</td>
</tr>
</tbody>
</table>

### Return/reason codes: Policy Domain Data Store (BSN5800-5999)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Policy Domain Data Store interface in messages BSN5800-5999.

### Table 182. Return and reason codes reported by Policy Services Policy Domain Data Store interface

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td></td>
<td>X'00'</td>
<td>none</td>
<td>PDDS function was successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>none</td>
<td></td>
</tr>
</tbody>
</table>
### Return/reason codes: Rules Data Store (BSN6400-6599)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Rules Data Store interface in messages BSN6400-6599.

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td>X'00'</td>
<td>ENTRY</td>
<td></td>
<td>The requested function has started successfully.</td>
</tr>
<tr>
<td>X'00'</td>
<td>none</td>
<td></td>
<td>RDS function was successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td>X'04'</td>
<td>NODATA</td>
<td></td>
<td>No more data</td>
</tr>
<tr>
<td>X'08'</td>
<td>MEMFND</td>
<td></td>
<td>Member found in the repository</td>
</tr>
<tr>
<td>X'0C'</td>
<td>TRSFND</td>
<td></td>
<td>Threshold set found in RDSR</td>
</tr>
</tbody>
</table>

*Table 183. Return and reason codes reported by Policy Services Rules Data Store interface*
<table>
<thead>
<tr>
<th>Return code (Hex)</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>Any code</td>
<td>CTAG</td>
<td></td>
<td>An internal error occurred. A possible reason might be that module BSNREORG or BSNDDO00 is not updated to the latest level and therefore installation of the new rule that was created in the hlq.SHKTTMPL data set failed.</td>
</tr>
<tr>
<td>EXIT</td>
<td></td>
<td></td>
<td>Module exited</td>
</tr>
<tr>
<td>X'04'</td>
<td>FPQSVR</td>
<td>FPQSRV</td>
<td>FPQSRV call failure</td>
</tr>
<tr>
<td>X'08'</td>
<td>OBTAIN</td>
<td></td>
<td>Unable to obtain RDS storage (RDSC block)</td>
</tr>
<tr>
<td></td>
<td>OBTRDSC</td>
<td></td>
<td>Unable to obtain RDS storage (RDSC block)</td>
</tr>
<tr>
<td></td>
<td>OBTRDSL</td>
<td></td>
<td>Unable to obtain RDS storage (RDSL block)</td>
</tr>
<tr>
<td></td>
<td>OBTDELT</td>
<td></td>
<td>Unable to obtain RDS storage (DELETE TRSD SET NAME TABLE)</td>
</tr>
<tr>
<td></td>
<td>OBTRDSH</td>
<td></td>
<td>Unable to obtain RDS storage (RDSH block)</td>
</tr>
<tr>
<td></td>
<td>OBTAIN</td>
<td></td>
<td>Unable to obtain RDS storage (RDSC block)</td>
</tr>
<tr>
<td>Return code (Hex)</td>
<td>Reason code (Symbolic)</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>X'08' (continued)</td>
<td>RELRDSH</td>
<td>Unable to release RDS storage (RDSH block)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELRDSL</td>
<td>Unable to release RDS storage (RSHL block)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELMMSG</td>
<td>Unable to release RDS storage (Message Clause storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELCEXP</td>
<td>Unable to release RDS storage (Condition Expression Clause storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELRTYP</td>
<td>Unable to release RDS storage (Resource Type Clause storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELEEXP</td>
<td>Unable to release RDS storage (Exception Expression Clause storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELTRSD</td>
<td>Unable to release RDS storage (Threshold Set List storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELOTRSD</td>
<td>Unable to release RDS storage (Original Threshold Set List storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELRCDE</td>
<td>Unable to release RDS storage (Rule Condition Description Clause storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELDAEL</td>
<td>Unable to release RDS storage (Data Element List Clause storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELMSGT</td>
<td>Unable to release RDS storage (Message Template Clause storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DELNMLST</td>
<td>Unable to release RDS storage (Deleted Threshold Name List storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STREAM</td>
<td>Unable to release RDS storage (Rule Stream storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WORKAREA</td>
<td>Unable to release RDS storage (Parsing Work Area storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FREERDSR</td>
<td>Unable to release RDS storage (RDSR Parsing Work Area storage)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RELRCDE</td>
<td>Unable to release RDS storage (Rule Condition Description Clause storage)</td>
<td></td>
</tr>
<tr>
<td>X'20'</td>
<td>NORDSH</td>
<td>No RDSH control block</td>
<td></td>
</tr>
<tr>
<td>X'24'</td>
<td>INVRDSC</td>
<td>No RDSR control block</td>
<td></td>
</tr>
<tr>
<td>Return code (Hex)</td>
<td>Reason code (Hex)</td>
<td>Reason code (Symbolic)</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
<td>------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>X'08' (continued)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X'28'</td>
<td>NORDSL</td>
<td>No RDSL control block</td>
<td></td>
</tr>
<tr>
<td>X'2C'</td>
<td>NOPOCB</td>
<td>No POCB control block</td>
<td></td>
</tr>
<tr>
<td>X'30'</td>
<td>NORUNM</td>
<td>No rule name provided</td>
<td></td>
</tr>
<tr>
<td>X'34'</td>
<td>NODMNM</td>
<td>No domain name provided</td>
<td></td>
</tr>
<tr>
<td>X'38'</td>
<td>NOINPT</td>
<td>No input data</td>
<td></td>
</tr>
<tr>
<td>X'50'</td>
<td>INVFUN</td>
<td>Invalid function</td>
<td></td>
</tr>
<tr>
<td>X'54'</td>
<td>INVMOD</td>
<td>Invalid mode</td>
<td></td>
</tr>
<tr>
<td>X'58'</td>
<td>INVRTYP</td>
<td>Parsing error - Invalid resource type in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>INVTEN</td>
<td>Parsing error - Invalid domain name in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Parsing error - Invalid file name in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>INVEEXP</td>
<td>Parsing error - Invalid exception expression in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>INVTRSD</td>
<td>Parsing error - Invalid threshold list</td>
<td></td>
</tr>
<tr>
<td></td>
<td>INVCEXP</td>
<td>Parsing error - Invalid condition expression in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>INVDAEL</td>
<td>Parsing error - Invalid data element List in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>INVMSGT</td>
<td>Parsing error - Invalid message in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOCEXP</td>
<td>No exception clause in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NORTYP</td>
<td>No resource type in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOTRSD</td>
<td>No threshold list</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOOTRSD</td>
<td>No original threshold list</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOEEXP</td>
<td>No exception expression in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NODAEL</td>
<td>No data element list in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOMSGT</td>
<td>No message in template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NORCDE</td>
<td>No rule condition description</td>
<td></td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code (Hex)</td>
<td>Reason code (Symbolic)</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------</td>
<td>------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>X’08‘ (continued)</td>
<td>X’5C‘</td>
<td>INVTRSD</td>
<td>Invalid threshold set</td>
</tr>
<tr>
<td></td>
<td>X’60‘</td>
<td>PRN_ENQ</td>
<td>PRN latch failure (ENQ)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PRN_DEQ</td>
<td>PRN latch failure (DEQ)</td>
</tr>
<tr>
<td></td>
<td>X’62‘</td>
<td>INVLEN</td>
<td>Invalid message template</td>
</tr>
<tr>
<td></td>
<td>X’68‘</td>
<td>MEMNFD</td>
<td>Member not found in the repository</td>
</tr>
<tr>
<td></td>
<td>X’6C‘</td>
<td>REFPOL</td>
<td>Referencing policy template found</td>
</tr>
<tr>
<td></td>
<td>X’70‘</td>
<td>STRL</td>
<td>BSNPDS call failure (STRL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GETL</td>
<td>BSNPDS call failure (GETL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PTRD</td>
<td>BSNPDS call failure (PTRD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GETC</td>
<td>BSNPDS call failure (GETC)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ENDL</td>
<td>BSNPDS call failure (ENDL)</td>
</tr>
<tr>
<td></td>
<td>X’72‘</td>
<td>INVLOC</td>
<td>No RECON ID provided</td>
</tr>
<tr>
<td></td>
<td>X’78‘</td>
<td>INVEN</td>
<td>Invalid environment level</td>
</tr>
<tr>
<td></td>
<td>X’80‘</td>
<td>INVRECON</td>
<td>Invalid external RECON ID</td>
</tr>
<tr>
<td></td>
<td>X’88‘</td>
<td>NOCHNG</td>
<td>No change to the repository allowed</td>
</tr>
<tr>
<td></td>
<td>X’8C‘</td>
<td>TRSDMS</td>
<td>TRSD missing in the replacing template</td>
</tr>
<tr>
<td></td>
<td>X’90‘</td>
<td>INVCHAR</td>
<td>Invalid character</td>
</tr>
<tr>
<td></td>
<td>X’94‘</td>
<td>UOW</td>
<td>Handle invalid</td>
</tr>
</tbody>
</table>

None “1” on page 515

<table>
<thead>
<tr>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISC</td>
<td>Data Dictionary disconnect failed</td>
</tr>
<tr>
<td>CONN</td>
<td>Data Dictionary connect failed</td>
</tr>
<tr>
<td>VALE</td>
<td>Data Dictionary validation failed</td>
</tr>
</tbody>
</table>

**Note:**

1. The reason codes are displayed in messages without a return code.
Return/reason codes: Policy Data Store (BSN7000-7199)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Policy Data Store interface in messages BSN7000-7199.

**Table 184. Return and reason codes reported by Policy Services Policy Data Store interface**

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code (Hex)</th>
<th>Reason code (Symbolic)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Any code</td>
<td>Successful (Function was successful)</td>
</tr>
<tr>
<td></td>
<td>X'00'</td>
<td>none</td>
<td>PDS function was successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td></td>
<td>X'04'</td>
<td>NODATA</td>
<td>No more data</td>
</tr>
<tr>
<td></td>
<td>X'08'</td>
<td>FNDTMP</td>
<td>Found template in the repository</td>
</tr>
<tr>
<td></td>
<td>X'0C'</td>
<td>FNDSTR</td>
<td>Found stream in the repository</td>
</tr>
<tr>
<td></td>
<td>X'10'</td>
<td>FNDCLS</td>
<td>Found clause in the PDSP</td>
</tr>
<tr>
<td>Return code (Hex)</td>
<td>Reason code (Hex)</td>
<td>Reason code (Symbolic)</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
<td>------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>X'08'</td>
<td>X'08'</td>
<td>STGGET</td>
<td>Unable to obtain PDS storage</td>
</tr>
<tr>
<td>X'0C'</td>
<td>X'0C'</td>
<td>STGREL</td>
<td>Unable to release PDS storage</td>
</tr>
<tr>
<td>X'10'</td>
<td>X'10'</td>
<td>PRNLOC</td>
<td>PRN latch failure</td>
</tr>
<tr>
<td>X'20'</td>
<td>X'20'</td>
<td>NOPDSH</td>
<td>No PDSH control block</td>
</tr>
<tr>
<td>X'24'</td>
<td>X'24'</td>
<td>NOPDSP</td>
<td>No PDSP control block</td>
</tr>
<tr>
<td>X'28'</td>
<td>X'28'</td>
<td>NOPOCB</td>
<td>No POCB control block</td>
</tr>
<tr>
<td>X'2C'</td>
<td>X'2C'</td>
<td>NOPDSL</td>
<td>No PDSL control block</td>
</tr>
<tr>
<td>X'30'</td>
<td>X'30'</td>
<td>NOPLNM</td>
<td>No policy name provided</td>
</tr>
<tr>
<td>X'34'</td>
<td>X'34'</td>
<td>NODMNM</td>
<td>No domain name provided</td>
</tr>
<tr>
<td>X'38'</td>
<td>X'38'</td>
<td>NOINPT</td>
<td>No input data</td>
</tr>
<tr>
<td>X'50'</td>
<td>X'50'</td>
<td>INVFUNC</td>
<td>Invalid function</td>
</tr>
<tr>
<td>X'54'</td>
<td>X'54'</td>
<td>INVMOD</td>
<td>Invalid mode</td>
</tr>
<tr>
<td>X'58'</td>
<td>X'58'</td>
<td>INVTEM</td>
<td>Invalid policy template</td>
</tr>
<tr>
<td>X'5C'</td>
<td>X'5C'</td>
<td>INVSTR</td>
<td>Invalid policy stream</td>
</tr>
<tr>
<td>X'60'</td>
<td>X'60'</td>
<td>INVCLS</td>
<td>Invalid policy clause</td>
</tr>
<tr>
<td>X'64'</td>
<td>X'64'</td>
<td>INVLOC</td>
<td>Invalid locale</td>
</tr>
<tr>
<td>X'68'</td>
<td>X'68'</td>
<td>INVENV</td>
<td>Invalid environment level</td>
</tr>
<tr>
<td>X'6C'</td>
<td>X'6C'</td>
<td>INVREC</td>
<td>Invalid RECON</td>
</tr>
<tr>
<td>X'70'</td>
<td>X'70'</td>
<td>NOPOLY</td>
<td>No policies in repository</td>
</tr>
<tr>
<td>X'74'</td>
<td>X'74'</td>
<td>MEMINU</td>
<td>Member in use</td>
</tr>
<tr>
<td>X'78'</td>
<td>X'78'</td>
<td>NOCHNG</td>
<td>No change to the repository allowed</td>
</tr>
<tr>
<td>X'7C'</td>
<td>X'7C'</td>
<td>INVCHA</td>
<td>Invalid char</td>
</tr>
</tbody>
</table>
**Return/reason codes: Data Dictionary (BSN7600-7799, BBE1450E)**

This reference section provides detailed information about the return and reason codes reported by the Policy Services Data Dictionary interface in messages BSN7600-7799 and message BBE1450E.

**Topics:**
- “Data Dictionary return/reason codes overview” on page 518
- “Parmlist return/reason code analysis” on page 519
- “Data Dictionary: Parmlist codes for all List functions” on page 520
- “Data Dictionary LKUP function: List and List Entry codes” on page 521
- “Data Dictionary CTAG(ID/NAME) function: List and List Entry codes” on page 521
- “Data Dictionary VALE function: List and List Entry codes” on page 522
- “Data Dictionary TRAN function: List and List Entry codes” on page 525
- “Data Dictionary COMP function: List and List Entry codes” on page 527
- “Data Dictionary FORM function: List and List Entry codes” on page 528
- “Data Dictionary: Codes for non-List function calls” on page 530

**Data Dictionary return/reason codes overview**

This reference section provides an overview of the return and reason codes reported by the Policy Services Data Dictionary interface.

**Data Dictionary function call types**

The Data Dictionary processes two types of function calls:
- List
- Non-List

The non-List function calls include:
- Initialization (BSNDD FUNC=INIT)
- Termination (BSNDD FUNC=TERM)
- Connect (BSNDD FUNC=CONN)
- Disconnect (BSNDD FUNC=DISC)

The List function calls include:
- Lookup (BSNDD FUNC=LKUP)
- Create Tag using Tag ID (BSNDD FUNC=CTAG(ID))
- Create Tag using Tag name (BSNDD FUNC=CTAG(NAME))
- Validate (BSNDD FUNC=VALE)
- Transform (BSNDD FUNC=TRAN)
- Compare Format 1 (BSNDD FUNC=COMP(FORMAT1))
- Compare Format 2 (BSNDD FUNC=COMP(FORMAT2))
- Format (BSNDD FUNC=FORM)

**When Data Dictionary return and reason codes are returned (API-specific)**

The Data Dictionary non-list function calls will return Data Dictionary Parmlist return/reason codes in the parameter list only.

Data Dictionary non-list function calls do not return:
- Data Dictionary Overall List return/reason codes
• Data Dictionary List Entry return/reason codes
The Data Dictionary list function calls will return:
• Data Dictionary Parmlist return/reason codes
• Data Dictionary Overall List return/reason codes
• Data Dictionary List Entry return/reason codes

**Information revealed by Data Dictionary return and reason codes**

Parmlist return and reason codes reveal information about whether the Data Dictionary is present and functioning.

List return and reason codes reveal information about whether there is an error in any of the list entries. This type of error warns the user that the list entries must be inspected for errors.

List Entry return and reason codes reveal information that this specific function request has failed.

**Parmlist return/reason code analysis**

Analysis of Data Dictionary parameter list (Parmlist) return and reason codes follow a specific order.

The following order is used for analyzing Parmlist return and reason codes:

1. Data Dictionary Parmlist return/reason codes
2. Data Dictionary Overall List return/reason codes
3. Data Dictionary List Entry return/reason codes

**Non-List function analysis**

For non-list functions (INIT, CONN, DISC or TERM), analysis of the Data Dictionary Parmlist return/reason codes (BSNDD_PARM_RETCODE, and/or BSNDD_PARM_RETCODE) is all that is required.

For non-List functions, there are no Overall List return/reason codes or List Entry return/reason codes returned to be evaluated.

• If the Data Dictionary Parmlist return code is zero then the call completed successfully.
  
  No additional return/reason code analysis of either Data Dictionary Overall List return/reason codes or Data Dictionary List Entry return/reason codes is required.

• If the Data Dictionary Parmlist Return Code is non-zero then an environment error has occurred and Data Dictionary was unable to process the requested function.
  
  No additional return/reason code analysis of either Data Dictionary Overall List return/reason codes or Data Dictionary List Entry return/reason codes is required.

**List function analysis**

List functions (LKUP, CTAG(ID), CTAG(NAME), VALE, TRAN, FORM, or COMP) require the following analysis:

• Analysis of the Data Dictionary Parmlist return/reason code (BSNDD_PARM_RETCODE, and/or BSNDD_PARM_RETCODE) is required:
  
  − If the Data Dictionary Parmlist return code is X'00', then the call completed.
    
    Additional return/reason code analysis of the Data Dictionary Overall List Return/Reason Codes is required to determine if any of the list elements completed in error.

  − If the Data Dictionary Parmlist Return Code is non-zero, then an environment error has occurred and Data Dictionary was unable to process the requested function.
    
    The call completed in error with the Data Dictionary function not being processed. No additional return/reason code analysis of either Data Dictionary Overall List return/reason codes or Data Dictionary List Entry return/reason codes is required.
• Analysis of the Data Dictionary Overall List Return/Reason Codes (BSNDD_xxxxLIST_RETCODE and BSNDD_xxxxLIST_RSNCODE) is required:

  – If the Data Dictionary Overall List return code BSNDD_xxxxLIST_RETCODE is X'00', then the call completed with no error.
  
  No additional analysis of Data Dictionary List Entry return/reason codes is required.

  – If the Data Dictionary Overall List return code BSNDD_xxxxLIST_RETCODE is X'08', then the call completed with one or more list element items in error.
  
  The List Entry return/reason codes values BSNDD_xxxxLISTE_RETCODE and BSNDD_xxxxLISTE_RSNCODE for each list entry needs to be analyzed to determine the completion of each of the list element requests.

  – If the Data Dictionary Parmlist return code is greater than X'08', then a list error has occurred and the Data Dictionary was unable to process the requested function.

  Error example: something is wrong with the list parameters, such as a list pointer and a list count of zero, or a valid count and no list pointer.

  The call completed in error with the Data Dictionary function not being processed. No additional analysis of the Data Dictionary List Entry return/reason codes is required.

• Analysis of the Data Dictionary List Element Return/Reason Codes (BSNDD_xxxxLISTE_RETCODE and BSNDD_xxxxLISTE_RSNCODE) is required:

  Evaluate the BASNDD_xxxxLISTE_RETCODE and BSNDD_xxxxLIST_RSNCODE.

Data Dictionary: Parmlist codes for all List functions

This reference section provides detailed information about the parameter list (parmlist) return and reason codes reported by all List functions of the Policy Services Data Dictionary interface. These List functions include lookup (LKUP), create tag (CTAG(ID/NAME)), validate (VALE), transform (TRAN), compare format (COMP), and format (FORM).

Parmlist codes for Format (BSNDDFUNC= LKUP|CTAG(ID)|CTAG(NAME)|VALE|TRAN|FORM|COMP)

BSNDD_PARM_RETURN/BSNDD_PARM_REASON CODE DEFINITION

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'30'</td>
<td>Any code</td>
<td>Environment Error - No Token in parameter area</td>
</tr>
<tr>
<td>X'2C'</td>
<td>Any code</td>
<td>Environment Error - BSNDDEIS invalid address defined in token</td>
</tr>
<tr>
<td>X'28'</td>
<td>Any code</td>
<td>Environment Error - BSNDDES invalid address defined in token</td>
</tr>
<tr>
<td>X'24'</td>
<td>Any code</td>
<td>Environment Error - BSNDDDS invalid address defined in token</td>
</tr>
<tr>
<td>X'20'</td>
<td>Any code</td>
<td>Environment Error - BSNDDIS invalid address defined in token</td>
</tr>
<tr>
<td>X'1C'</td>
<td>Any code</td>
<td>Environment Error - BSNDDNS invalid address defined in token</td>
</tr>
<tr>
<td>X'18'</td>
<td>Any code</td>
<td>Environment Error - No List in parameter area</td>
</tr>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Invalid function requested (BSNDD FUNC=invalid value)</td>
</tr>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Method successful - Validation of the List Header return/reason code is required.</td>
</tr>
</tbody>
</table>
**Data Dictionary LKUP function: List and List Entry codes**

This reference section provides detailed information about the List and List Entry return and reason codes reported by the Policy Services Data Dictionary lookup function (LKUP).

See also “Data Dictionary: Parmlist codes for all List functions” on page 520

**List codes for Lookup (BSNDD FUNC=LKUP)**

BSNDD_LKUPLIST_RETURN/BSNDD_LKUPLIST_REASON CODE DEFINITION

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'30'</td>
<td>Any code</td>
<td>List Error - Not a LKUP list</td>
</tr>
<tr>
<td>X'2C'</td>
<td>Any code</td>
<td>List Error - No number of list entries</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>List Error - A list entry had a failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>List Entry return/reason codes need to be analyzed.</td>
</tr>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>No List Entry errors, call successful</td>
</tr>
</tbody>
</table>

**List Entry codes for Lookup (BSNDD FUNC=LKUP)**

BSNDD_LKUPLISTE_RETURN/BSNDD_LKUPLISTE_REASON CODE DEFINITION

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'30'</td>
<td>Any code</td>
<td>Entry Error - Tag ID invalid</td>
</tr>
<tr>
<td>X'2C'</td>
<td>Any code</td>
<td>Entry Error - Tag Name invalid</td>
</tr>
</tbody>
</table>

**Data Dictionary CTAG(ID/NAME) function: List and List Entry codes**

This reference section provides detailed information about the List and List Entry return and reason codes reported by the Policy Services Data Dictionary create tag function (CTAG(ID/NAME)).

See also “Data Dictionary: Parmlist codes for all List functions” on page 520

**List codes for Create Tag (BSNDD FUNC=CTAG(ID/NAME))**

BSNDD_CTIDLIST_RETURN/BSNDD_CTIDLIST_REASON CODE DEFINITION

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'30'</td>
<td>Any code</td>
<td>List Error - Not a CTAG (CTID/CTNM) list</td>
</tr>
<tr>
<td>X'2C'</td>
<td>Any code</td>
<td>List Error - No number of list entries</td>
</tr>
<tr>
<td>X'28'</td>
<td>Any code</td>
<td>List Error - Storage allocation failure for list</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>List Error - A list entry had a failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>List Entry return/reason codes need to be analyzed.</td>
</tr>
</tbody>
</table>
Table 188. List return and reason codes reported by Policy Services Data Dictionary CTID function (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>No List Entry errors, call successful</td>
</tr>
</tbody>
</table>

**List Entry codes for Create Tag (BSNDD FUNC=CTAG(ID/NAME))**

BSNDD_CTIDLISTE_RETURN/BSNDD_CTIDLISTE_REASON CODE DEFINITION

Table 189. List Entry return and reason codes reported by Policy Services Data Dictionary CTID function

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'60'</td>
<td>Any code</td>
<td>Entry Error - No Tag specified (CTID)</td>
</tr>
<tr>
<td>X'5C'</td>
<td>Any code</td>
<td>Entry Error - No Tag ID specified (CTID)</td>
</tr>
<tr>
<td>X'58'</td>
<td>Any code</td>
<td>Entry Error - Tag ID not found (CTID)</td>
</tr>
<tr>
<td>X'30'</td>
<td>Any code</td>
<td>Entry Error - No Tag specified (CTNM)</td>
</tr>
<tr>
<td>X'2C'</td>
<td>Any code</td>
<td>Entry Error - No Tag Name specified (CTNM)</td>
</tr>
<tr>
<td>X'28'</td>
<td>Any code</td>
<td>Entry Error - Tag Name not found (CTNM)</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>List Error - A list entry had a failure.</td>
</tr>
</tbody>
</table>

List Entry return/reason codes need to be analyzed

**Data Dictionary VALE function: List and List Entry codes**

This reference section provides detailed information about the List and List Entry return and reason codes reported by the Policy Services Data Dictionary validate function (VALE).

See also “Data Dictionary: Parmlist codes for all List functions” on page 520

**List codes for Validate (BSNDD FUNC=VALE)**

BSNDD_VALELIST_RETURN/BSNDD_VALELIST_REASON CODE DEFINITION

Table 190. List return and reason codes reported by Policy Services Data Dictionary VALE function

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'30'</td>
<td>Any code</td>
<td>List Error - Not a VALE list</td>
</tr>
<tr>
<td>X'2C'</td>
<td>Any code</td>
<td>List Error - No number of list entries</td>
</tr>
<tr>
<td>X'28'</td>
<td>Any code</td>
<td>List Error - Storage allocation failure for list</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>List Error - A list entry had a failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>List entry return/reason codes need to be analyzed</td>
</tr>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>No List Entry errors, call successful</td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>X'30'</td>
<td>Any code</td>
<td>Entry Error - No Tag Address</td>
</tr>
<tr>
<td>X'2C'</td>
<td>Any code</td>
<td>Entry Error - No Value Address</td>
</tr>
<tr>
<td>X'28'</td>
<td>Any code</td>
<td>Entry Error - No Value Length</td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>X'24'</td>
<td>Any code</td>
<td>Entry Error - Tag Validation Failed (see reason codes)</td>
</tr>
<tr>
<td>X'C4'</td>
<td>Tag Error - Incorrect SIGNED/UNSIGNED setting</td>
<td></td>
</tr>
<tr>
<td>X'C0'</td>
<td>Tag Error - Incorrect SCALE setting</td>
<td></td>
</tr>
<tr>
<td>X'BC'</td>
<td>Tag Error - Invalid LOGICAL Type</td>
<td></td>
</tr>
<tr>
<td>X'B8'</td>
<td>LOGICAL(INTEGER) PHYSICAL(EXTERNAL) sign error</td>
<td></td>
</tr>
<tr>
<td>X'B4'</td>
<td>LOGICAL(INTEGER) PHYSICAL(EXTERNAL) validate error</td>
<td></td>
</tr>
<tr>
<td>X'B0'</td>
<td>LOGICAL(INTEGER) PHYSICAL(INTERNAL) invalid</td>
<td></td>
</tr>
<tr>
<td>X'AC'</td>
<td>LOGICAL(INTEGER) PHYSICAL(PACKED) validate error</td>
<td></td>
</tr>
<tr>
<td>X'A8'</td>
<td>LOGICAL(INTEGER) PHYSICAL(ZONED) validate error</td>
<td></td>
</tr>
<tr>
<td>X'A4'</td>
<td>LOGICAL(INTEGER) PHYSICAL(FLOATBHP) invalid</td>
<td></td>
</tr>
<tr>
<td>X'A0'</td>
<td>LOGICAL(INTEGER) PHYSICAL(FLOATHFP) invalid</td>
<td></td>
</tr>
<tr>
<td>X'9C'</td>
<td>LOGICAL(INTEGER) PHYSICAL(CHARACTER) validate error</td>
<td></td>
</tr>
<tr>
<td>X'98'</td>
<td>LOGICAL(INTEGER) PHYSICAL(unknown) invalid physical representation in file</td>
<td></td>
</tr>
<tr>
<td>X'94'</td>
<td>LOGICAL(FLOATINGPOINT) not implement</td>
<td></td>
</tr>
<tr>
<td>X'90'</td>
<td>LOGICAL(CHARACTER) sign error</td>
<td></td>
</tr>
</tbody>
</table>
| X'8C'       | LOGICAL(CHARACTER) not one of the following:  
• PHYSICAL(EXTERNAL)  
• PHYSICAL(BINARY)  
• PHYSICAL(FIXEDCHARACTER) |
| X'88'       | LOGICAL(CHARACTER) value not char |
| X'80'       | LOGICAL(BOOLEAN) sign error |
| X'7C'       | LOGICAL(BOOLEAN) not one of the following:  
• PHYSICAL(EXTERNAL)  
• PHYSICAL(BINARY)  
• PHYSICAL(FIXEDCHARACTER) |
| X'64'       | Validate Successful |
### Table 191. List Entry return and reason codes reported by Policy Services Data Dictionary VALE function (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'20'</td>
<td>Any code</td>
<td>Entry Error - Range Validation Failed (see reason codes)</td>
</tr>
<tr>
<td>X'128'</td>
<td>Tag ID error - Tag ID is zero</td>
<td></td>
</tr>
<tr>
<td>X'124'</td>
<td>DDEF error - RANGE not found</td>
<td></td>
</tr>
<tr>
<td>X'120'</td>
<td>BOUNDARY List error - Tag value less than Low Boundary</td>
<td></td>
</tr>
<tr>
<td>X'11C'</td>
<td>BOUNDARY List error - Tag value greater than High Boundary</td>
<td></td>
</tr>
<tr>
<td>X'118'</td>
<td>VALUE List error - Tag value not found in list</td>
<td></td>
</tr>
<tr>
<td>X'C8'</td>
<td>Validate successful</td>
<td></td>
</tr>
</tbody>
</table>

### Data Dictionary TRAN function: List and List Entry codes

This reference section provides detailed information about the List and List Entry return and reason codes reported by the Policy Services Data Dictionary transform function (TRAN).

See also “Data Dictionary: Parmlist codes for all List functions” on page 520

#### List codes for Transform (BSNDD FUNC=TRAN)

BSNDD_TRANLIST_RETURN/BSNDD_TRANLIST_REASON CODE DEFINITION

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'30'</td>
<td>Any code</td>
<td>List Error - Not a TRAN list</td>
</tr>
<tr>
<td>X'2C'</td>
<td>Any code</td>
<td>List Error - No number of list entries</td>
</tr>
<tr>
<td>X'28'</td>
<td>Any code</td>
<td>List Error - Storage allocation failure for list</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>List Error - A list entry had a failure. List entry return/reason codes need to be analyzed.</td>
</tr>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>No List Entry errors, call successful</td>
</tr>
</tbody>
</table>

#### List Entry codes for Transform (BSNDD FUNC=TRAN)

BSNDD_TRANLISTE_REASON CODE SOURCE CODE DEFINITION

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'128'</td>
<td>Any code</td>
<td>Target Error - No Source Tag</td>
</tr>
<tr>
<td>X'124'</td>
<td>Any code</td>
<td>Target Error - No Source Value</td>
</tr>
</tbody>
</table>
### Table 193. List Entry return and reason codes reported by Policy Services Data Dictionary TRAN function (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'120'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(EXTERNAL) conversion to external format failed (CTEFF)</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>CTEFF = Conversion to external format failed</td>
</tr>
<tr>
<td>X'11C'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(INTERNAL) CTEFF</td>
</tr>
<tr>
<td>X'118'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(BINARY) CTEFF</td>
</tr>
<tr>
<td>X'114'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(PACKED) CTEFF</td>
</tr>
<tr>
<td>X'110'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(ZONED) CTEFF</td>
</tr>
<tr>
<td>X'10C'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(FLOATBHP) CTEFF</td>
</tr>
<tr>
<td>X'108'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(FLOATFHP) CTEFF</td>
</tr>
<tr>
<td>X'104'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(FIXEDCHARACTER) CTEFF</td>
</tr>
<tr>
<td>X'100'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(STRINGL) Not supported</td>
</tr>
<tr>
<td>X'FC'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(STRINGLL) Not supported</td>
</tr>
<tr>
<td>X'F8'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(STRINGLLLL) Not supported</td>
</tr>
<tr>
<td>X'F4'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(STRINGLLBB) Not supported</td>
</tr>
<tr>
<td>X'F0'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(STRINGG) Not supported</td>
</tr>
<tr>
<td>X'EC'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(STCK) Not supported</td>
</tr>
<tr>
<td>X'E8'</td>
<td>Any code</td>
<td>Target Error - PHYSICAL(STCKE) Not supported</td>
</tr>
<tr>
<td>X'D0'</td>
<td>Any code</td>
<td>Target Error - Unknown PHYSICAL type</td>
</tr>
<tr>
<td>X'C4'</td>
<td>Any code</td>
<td>Source Error - No Source Tag</td>
</tr>
<tr>
<td>X'C0'</td>
<td>Any code</td>
<td>Source Error - No Source Value</td>
</tr>
<tr>
<td>X'BC'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(EXTERNAL) conversion to internal format failed (CTIFF)</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>CTIFF = Conversion to internal format failed</td>
</tr>
<tr>
<td>X'B8'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(INTERNAL) CTIFF</td>
</tr>
<tr>
<td>X'B4'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(BINARY) CTIFF</td>
</tr>
<tr>
<td>X'B0'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(PACKED) CTIFF</td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>X'AC'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(ZONED) CTIFF</td>
</tr>
<tr>
<td>X'A8'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(FLOATBHP) CTIFF</td>
</tr>
<tr>
<td>X'A4'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(FLOATFHP) CTIFF</td>
</tr>
<tr>
<td>X'A0'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(FIXEDCHARACTER) CTIFF</td>
</tr>
<tr>
<td>X'9C'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(STRINGL) Not supported</td>
</tr>
<tr>
<td>X'98'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(STRINGLL) Not supported</td>
</tr>
<tr>
<td>X'94'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(STRINGLLLL) Not supported</td>
</tr>
<tr>
<td>X'90'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(STRINGLLBB) Not supported</td>
</tr>
<tr>
<td>X'8C'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(STRINGG) Not supported</td>
</tr>
<tr>
<td>X'88'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(STCK) Not supported</td>
</tr>
<tr>
<td>X'84'</td>
<td>Any code</td>
<td>Source Error - PHYSICAL(STCKE) Not supported</td>
</tr>
<tr>
<td>X'6C'</td>
<td>Any code</td>
<td>Source Error - Unknown PHYSICAL Type</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>List Error - A list entry had a failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>List entry Return/Reason Codes need to be analyzed.</td>
</tr>
</tbody>
</table>

**Data Dictionary COMP function: List and List Entry codes**

This reference section provides detailed information about the List and List Entry return and reason codes reported by the Policy Services Data Dictionary compare format function (COMP).

See also “Data Dictionary: Parmlist codes for all List functions” on page 520

**List codes for Compare (BSNDD FUNC=COMP)**

BSNDD_COMPLIST_RETURN/BSNDD_COMPLIST_REASON CODE TARGET CODE DEFINITION

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Process ended normally</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>List Warning - A list entry had an information.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>List entry return/reason codes can be analyzed.</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>List Error - A list entry had a failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>List entry return/reason codes need to be analyzed</td>
</tr>
</tbody>
</table>
Table 194. List return and reason codes reported by Policy Services Data Dictionary COMP function (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Environmental error. See reason code for details.</td>
</tr>
<tr>
<td>X'10'</td>
<td></td>
<td>Incorrect parameter list</td>
</tr>
<tr>
<td>X'14'</td>
<td></td>
<td>Storage obtain failed</td>
</tr>
</tbody>
</table>

List Entry codes for Compare (BSNDD FUNC=COMP)

Table 195. List Entry return and reason codes reported by Policy Services Data Dictionary COMP function

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Process ended normally</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Process ended with warning</td>
</tr>
<tr>
<td>X'04'</td>
<td></td>
<td>Source tag value for target tag value was not found</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Process ended with error</td>
</tr>
<tr>
<td>X'08'</td>
<td></td>
<td>Incomparable value was found</td>
</tr>
</tbody>
</table>

Data Dictionary FORM function: List and List Entry codes

This reference section provides detailed information about the List and List Entry return and reason codes reported by the Policy Services Data Dictionary format function (FORM).

See also “Data Dictionary: Parmlist codes for all List functions” on page 520

List codes for Format (BSNDD FUNC=FORM)

Table 196. List return and reason codes reported by Policy Services Data Dictionary FORM function

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'30'</td>
<td>Any code</td>
<td>List Error - Not a FORM list</td>
</tr>
<tr>
<td>X'2C'</td>
<td>Any code</td>
<td>List Error - No number of list entries</td>
</tr>
<tr>
<td>X'28'</td>
<td>Any code</td>
<td>List Error - Storage allocation failure for list</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>List Error - A list entry had a failure</td>
</tr>
</tbody>
</table>

List Entry codes for Format (BSNDD FUNC=FORM)

Tools Base: Policy Services User’s Guide and Reference
<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'30'</td>
<td>Any code</td>
<td>Entry Error - No tag specified</td>
</tr>
<tr>
<td>X'2C'</td>
<td>Any code</td>
<td>Entry Error - No value specified</td>
</tr>
<tr>
<td>X'28'</td>
<td>Any code</td>
<td>Entry Error - Value of zero specified</td>
</tr>
<tr>
<td>X'24'</td>
<td>Any code</td>
<td>Entry Error - No presentation area specified</td>
</tr>
<tr>
<td>X'20'</td>
<td>Any code</td>
<td>Entry Error - Transform tag/value failure</td>
</tr>
<tr>
<td>X'C4'</td>
<td></td>
<td>Invalid Tag - LOGICAL(FLOATINGPOINT)</td>
</tr>
<tr>
<td>X'C0'</td>
<td></td>
<td>Invalid Tag - LOGICAL(STRING)</td>
</tr>
<tr>
<td>X'BC'</td>
<td></td>
<td>Invalid Tag - LOGICAL(TIMEVALUE)</td>
</tr>
<tr>
<td>X'B8'</td>
<td></td>
<td>Invalid Tag - LOGICAL(TIMESTAMP)</td>
</tr>
<tr>
<td>X'94'</td>
<td></td>
<td>Invalid Tag - LOGICAL(UNKNOWN)</td>
</tr>
<tr>
<td>X'90'</td>
<td></td>
<td>Invalid Tag - PHYSICAL(INTERNAL)</td>
</tr>
<tr>
<td>X'8C'</td>
<td></td>
<td>Invalid Tag - PHYSICAL(BINARY)</td>
</tr>
<tr>
<td>X'88'</td>
<td></td>
<td>Invalid Tag - PHYSICAL(PACKED)</td>
</tr>
<tr>
<td>X'84'</td>
<td></td>
<td>Invalid Tag - PHYSICAL(ZONED)</td>
</tr>
<tr>
<td>X'80'</td>
<td></td>
<td>Invalid Tag - PHYSICAL(FLOATBHP)</td>
</tr>
<tr>
<td>X'7C'</td>
<td></td>
<td>Invalid Tag - PHYSICAL(FLOATHFP)</td>
</tr>
<tr>
<td>X'78'</td>
<td></td>
<td>Invalid Value - PHYSICAL(FIXEDCHARACTER)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PHYSICAL(BOOLEAN)</td>
</tr>
<tr>
<td>X'68'</td>
<td></td>
<td>Invalid Tag - PHYSICAL(UNKNOWN)</td>
</tr>
<tr>
<td>X'00'</td>
<td></td>
<td>Transform successful</td>
</tr>
<tr>
<td>X'1C'</td>
<td>Any code</td>
<td>Entry Error - Format transformed tag/value failure</td>
</tr>
<tr>
<td>X'128'</td>
<td></td>
<td>Invalid Tag - ID is zero</td>
</tr>
<tr>
<td>X'124'</td>
<td></td>
<td>Invalid Tag - Value length is zero</td>
</tr>
<tr>
<td>X'114'</td>
<td></td>
<td>Internal Error - Presentation length of zero</td>
</tr>
</tbody>
</table>
Data Dictionary: Codes for non-List function calls

This reference section provides detailed information about the return and reason codes reported by the Policy Services Data Dictionary initialization (INIT), termination (TERM), connect (CONN), and disconnect (DISC) non-List function calls.

Initialization (BSNDD FUNC=INIT)

BSNDD_PARM_RETURN/BSNDD_PARM_REASON CODE DEFINITION

Table 198. Return and reason codes reported by Policy Services Data Dictionary initialization (INIT) non-List function call

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Initialization was successful</td>
</tr>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Invalid function requested (BSNDD FUNC=invalid value)</td>
</tr>
<tr>
<td>X'28'</td>
<td>Any code</td>
<td>Unable to connect the Data Dictionary definition</td>
</tr>
<tr>
<td>X'2C'</td>
<td>Any code</td>
<td>Unable to initialize the Data Dictionary definition structures</td>
</tr>
<tr>
<td>X'30'</td>
<td>Any code</td>
<td>Unable to allocate (obtain) Data Dictionary definition structures</td>
</tr>
<tr>
<td>X'34'</td>
<td>Any code</td>
<td>Unable to load Data Dictionary definition table</td>
</tr>
<tr>
<td>X'38'</td>
<td>Any code</td>
<td>Unable to connect to the Data Dictionary definition</td>
</tr>
<tr>
<td>X'3C'</td>
<td>Any code</td>
<td>Unable to allocate working storage</td>
</tr>
</tbody>
</table>

Termination (BSNDD FUNC=TERM)

BSNDD_PARM_RETURN/BSNDD_PARM_REASON CODE DEFINITION

Table 199. Return and reason codes reported by Policy Services Data Dictionary termination (TERM) non-List function call

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Termination was successful</td>
</tr>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Invalid function requested (BSNDD FUNC=invalid value)</td>
</tr>
<tr>
<td>X'10'</td>
<td>Any code</td>
<td>Unable to delete Data Dictionary modules or delete name token</td>
</tr>
<tr>
<td>X'14'</td>
<td>Any code</td>
<td>Unable to delete Data Dictionary Definition table</td>
</tr>
<tr>
<td>X'18'</td>
<td>Any code</td>
<td>Unable to deallocate (release) Data Dictionary definition structures</td>
</tr>
<tr>
<td>X'1C'</td>
<td>Any code</td>
<td>Unable to disconnect from the Data Dictionary definition</td>
</tr>
<tr>
<td>X'20'</td>
<td>Any code</td>
<td>Termination has occurred with active sessions missing disconnect requests</td>
</tr>
</tbody>
</table>

Connect (BSNDD FUNC=CONN)

BSNDD_PARM_RETURN/BSNDD_PARM_REASON CODE DEFINITION
### Table 200. Return and reason codes reported by Policy Services Data Dictionary connect (CONN) non-List function call

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Connection was successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Storage allocation failure</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Duplicate instance requesting connection</td>
</tr>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Invalid function requested (BSNDD FUNC=invalid value)</td>
</tr>
</tbody>
</table>

#### Disconnect (BSNDD FUNC=DISC)

BSNDD_PARM_RETURN/BSNDD_PARM_REASON CODE DEFINITION

### Table 201. Return and reason codes reported by Policy Services Data Dictionary disconnect (DISC) non-List function call

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'00'</td>
<td>Any code</td>
<td>Disconnect was successful</td>
</tr>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Not used</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Storage deallocation failure</td>
</tr>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Invalid function requested (BSNDD FUNC=invalid value)</td>
</tr>
<tr>
<td>X'10'</td>
<td>Any code</td>
<td>Instance requesting disconnection does not exist</td>
</tr>
</tbody>
</table>
This reference section provides detailed information about the return and reason codes reported by the Policy Services Sensor Data read/write interface in messages BSN8800-8999 and message BBE1451E.

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td>X'25'</td>
<td></td>
<td>No log file open</td>
</tr>
<tr>
<td>X'27'</td>
<td></td>
<td>No member access</td>
</tr>
<tr>
<td>X'2A'</td>
<td></td>
<td>Non-queued record in set</td>
</tr>
<tr>
<td>X'34'</td>
<td></td>
<td>Read entry not found</td>
</tr>
<tr>
<td>X'3A'</td>
<td></td>
<td>Return length truncated</td>
</tr>
<tr>
<td>X'3B'</td>
<td></td>
<td>Memory key not found</td>
</tr>
<tr>
<td>X'44'</td>
<td></td>
<td>Null GET elements</td>
</tr>
<tr>
<td>X'49'</td>
<td></td>
<td>End of list</td>
</tr>
<tr>
<td>X'52'</td>
<td></td>
<td>The required key field definitions are incomplete. The other possibility is that the Sensor Data repository was not initialized. For more information about initializing the Sensor Data repository, refer to the IBM Tools Base for z/OS Configuration Guide for IMS.</td>
</tr>
</tbody>
</table>
Table 202. Return and reason codes reported by Policy Services Sensor Data read/write interface (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'02'</td>
<td></td>
<td>Bad packed option: must be 'C' or 'A'</td>
</tr>
<tr>
<td>X'08'</td>
<td></td>
<td>Bad application name</td>
</tr>
<tr>
<td>X'0C'</td>
<td></td>
<td>Element list is invalid</td>
</tr>
<tr>
<td>X'13'</td>
<td></td>
<td>Member not found</td>
</tr>
<tr>
<td>X'15'</td>
<td></td>
<td>Bad packed data area</td>
</tr>
<tr>
<td>X'16'</td>
<td></td>
<td>Bad packed data length</td>
</tr>
<tr>
<td>X'1C'</td>
<td></td>
<td>Invalid owner</td>
</tr>
<tr>
<td>X'1E'</td>
<td></td>
<td>Bad record set</td>
</tr>
<tr>
<td>X'1F'</td>
<td></td>
<td>Type not record set</td>
</tr>
<tr>
<td>X'20'</td>
<td></td>
<td>Bad record</td>
</tr>
<tr>
<td>X'21'</td>
<td></td>
<td>Type not record</td>
</tr>
<tr>
<td>X'24'</td>
<td></td>
<td>No log file access</td>
</tr>
<tr>
<td>X'2B'</td>
<td></td>
<td>Bad location: must be 'N' or 'O'</td>
</tr>
<tr>
<td>X'30'</td>
<td></td>
<td>Invalid location for reading: must be 'R', 'M', or 'B'</td>
</tr>
<tr>
<td>X'35'</td>
<td></td>
<td>KEEP value is invalid: must be 'Y' or 'N'</td>
</tr>
<tr>
<td>X'39'</td>
<td></td>
<td>Invalid read option: must be 'H' or 'D'</td>
</tr>
<tr>
<td>X'3C'</td>
<td></td>
<td>Begin read entry not found</td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>X'08'</td>
<td>X'3D'</td>
<td>Bad time sequence setting</td>
</tr>
<tr>
<td></td>
<td>X'3E'</td>
<td>Invalid time locale</td>
</tr>
<tr>
<td></td>
<td>X'3F'</td>
<td>Invalid time zone</td>
</tr>
<tr>
<td></td>
<td>X'40'</td>
<td>Invalid leap seconds</td>
</tr>
<tr>
<td></td>
<td>X'41'</td>
<td>Invalid time type</td>
</tr>
<tr>
<td></td>
<td>X'42'</td>
<td>Invalid time value</td>
</tr>
<tr>
<td></td>
<td>X'47'</td>
<td>GET failed</td>
</tr>
<tr>
<td></td>
<td>X'48'</td>
<td>Key not found</td>
</tr>
<tr>
<td></td>
<td>X'4B'</td>
<td>Write null data to ADD</td>
</tr>
<tr>
<td></td>
<td>X'51'</td>
<td>GET element transform error</td>
</tr>
</tbody>
</table>
Table 202. Return and reason codes reported by Policy Services Sensor Data read/write interface (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'03'</td>
<td></td>
<td>Bad group name</td>
</tr>
<tr>
<td>X'05'</td>
<td></td>
<td>Test invalid option: must be 'Y', 'N', or blank</td>
</tr>
<tr>
<td>X'07'</td>
<td></td>
<td>History could not be found</td>
</tr>
<tr>
<td>X'0A'</td>
<td></td>
<td>Invalid record set RSI value</td>
</tr>
<tr>
<td>X'0B'</td>
<td></td>
<td>Connection failed for group and repository</td>
</tr>
<tr>
<td>X'0D'</td>
<td></td>
<td>Uninitialized environment</td>
</tr>
<tr>
<td>X'0E'</td>
<td></td>
<td>No connection</td>
</tr>
<tr>
<td>X'0F'</td>
<td></td>
<td>Invalid tag</td>
</tr>
<tr>
<td>X'10'</td>
<td></td>
<td>Invalid handle</td>
</tr>
<tr>
<td>X'11'</td>
<td></td>
<td>Invalid key</td>
</tr>
<tr>
<td>X'12'</td>
<td></td>
<td>Invalid key length</td>
</tr>
<tr>
<td>X'14'</td>
<td></td>
<td>Bad element address</td>
</tr>
<tr>
<td>X'17'</td>
<td></td>
<td>Undefined set clock error</td>
</tr>
<tr>
<td>X'18'</td>
<td></td>
<td>Invalid option</td>
</tr>
<tr>
<td>X'19'</td>
<td></td>
<td>Cannot set history</td>
</tr>
<tr>
<td>X'1A'</td>
<td></td>
<td>Bad supplier ID</td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>X'0C'</td>
<td>X'1B'</td>
<td>Bad supplier program</td>
</tr>
<tr>
<td></td>
<td>X'1D'</td>
<td>No record position set</td>
</tr>
<tr>
<td></td>
<td>X'22'</td>
<td>Delete failed</td>
</tr>
<tr>
<td></td>
<td>X'23'</td>
<td>Cannot issue query</td>
</tr>
<tr>
<td></td>
<td>X'26'</td>
<td>Cannot set control entities</td>
</tr>
<tr>
<td></td>
<td>X'28'</td>
<td>Missing status area</td>
</tr>
<tr>
<td></td>
<td>X'29'</td>
<td>Cannot clear control entities</td>
</tr>
<tr>
<td></td>
<td>X'2C'</td>
<td>Adding bad element count</td>
</tr>
<tr>
<td></td>
<td>X'2D'</td>
<td>Adding bad tag length</td>
</tr>
<tr>
<td></td>
<td>X'2E'</td>
<td>Record already queued</td>
</tr>
<tr>
<td></td>
<td>X'31'</td>
<td>Invalid region dump type</td>
</tr>
<tr>
<td></td>
<td>X'32'</td>
<td>Dump log error</td>
</tr>
<tr>
<td></td>
<td>X'33'</td>
<td>Log error</td>
</tr>
<tr>
<td></td>
<td>X'36'</td>
<td>Read search error</td>
</tr>
<tr>
<td></td>
<td>X'37'</td>
<td>Return area undefined</td>
</tr>
<tr>
<td></td>
<td>X'38'</td>
<td>Return length invalid</td>
</tr>
<tr>
<td></td>
<td>X'43'</td>
<td>GET elements bad count</td>
</tr>
<tr>
<td></td>
<td>X'45'</td>
<td>GET bad tag in record</td>
</tr>
<tr>
<td></td>
<td>X'4F'</td>
<td>Bad record type: record type must be non-null and cannot begin with an underscore ('_')</td>
</tr>
<tr>
<td></td>
<td>X'50'</td>
<td>GET bad tag data length</td>
</tr>
</tbody>
</table>
### Table 202. Return and reason codes reported by Policy Services Sensor Data read/write interface (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'10'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'01'</td>
<td></td>
<td>Invalid function type</td>
</tr>
<tr>
<td>X'04'</td>
<td></td>
<td>Invalid version number</td>
</tr>
<tr>
<td>X'06'</td>
<td></td>
<td>Invalid processing task</td>
</tr>
<tr>
<td>X'09'</td>
<td></td>
<td>Browse failed</td>
</tr>
<tr>
<td>X'46'</td>
<td></td>
<td>Start failed for member list</td>
</tr>
<tr>
<td>X'4A'</td>
<td></td>
<td>PUT member failed</td>
</tr>
<tr>
<td>X'4C'</td>
<td></td>
<td>Data dictionary initialization failed</td>
</tr>
<tr>
<td>X'4D'</td>
<td></td>
<td>Data dictionary connection failed</td>
</tr>
<tr>
<td>X'4E'</td>
<td></td>
<td>End list failed</td>
</tr>
</tbody>
</table>

### Return/reason codes: Sensor Data delete (BSN8800-8999)

This reference section provides detailed information about the return and reason codes reported by the Policy Services Sensor Data delete interface in messages BSN8800-8999.

### Table 203. Return and reason codes reported by Policy Services Sensor Data delete interface

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'04'</td>
<td>Any code</td>
<td>Warning (Function completed with information)</td>
</tr>
<tr>
<td>X'1F'</td>
<td></td>
<td>No entries matched</td>
</tr>
<tr>
<td>X'08'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'0F'</td>
<td></td>
<td>Application not found</td>
</tr>
<tr>
<td>X'21'</td>
<td></td>
<td>Invalid time locale</td>
</tr>
<tr>
<td>X'22'</td>
<td></td>
<td>Invalid time zone</td>
</tr>
<tr>
<td>X'23'</td>
<td></td>
<td>Invalid leap seconds</td>
</tr>
<tr>
<td>X'24'</td>
<td></td>
<td>Invalid time type</td>
</tr>
<tr>
<td>X'25'</td>
<td></td>
<td>Invalid date value</td>
</tr>
<tr>
<td>Return code</td>
<td>Reason code</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>X'0C'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'06'</td>
<td></td>
<td>Parser error</td>
</tr>
<tr>
<td>X'08'</td>
<td></td>
<td>No input commands to process</td>
</tr>
<tr>
<td>X'0D'</td>
<td></td>
<td>Connection to server repository failed</td>
</tr>
<tr>
<td>X'0E'</td>
<td></td>
<td>Undefined set clock error</td>
</tr>
<tr>
<td>X'10'</td>
<td></td>
<td>Invalid function</td>
</tr>
<tr>
<td>X'14'</td>
<td></td>
<td>Both date and age specified</td>
</tr>
<tr>
<td>X'15'</td>
<td></td>
<td>Invalid age specified</td>
</tr>
<tr>
<td>X'16'</td>
<td></td>
<td>Required one of date or age</td>
</tr>
<tr>
<td>X'17'</td>
<td></td>
<td>Invalid date specified</td>
</tr>
<tr>
<td>X'1A'</td>
<td></td>
<td>Command does not allow for server</td>
</tr>
<tr>
<td>X'1B'</td>
<td></td>
<td>Command does not allow for application</td>
</tr>
<tr>
<td>X'1C'</td>
<td></td>
<td>Command does not allow for RECON ID</td>
</tr>
<tr>
<td>X'1D'</td>
<td></td>
<td>Command does not allow for database</td>
</tr>
<tr>
<td>X'1E'</td>
<td></td>
<td>At least one process failed</td>
</tr>
<tr>
<td>X'28'</td>
<td></td>
<td>Delete by version failed</td>
</tr>
</tbody>
</table>
### Table 203. Return and reason codes reported by Policy Services Sensor Data delete interface (continued)

<table>
<thead>
<tr>
<th>Return code</th>
<th>Reason code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'16'</td>
<td>Any code</td>
<td>Error (Function completed with error)</td>
</tr>
<tr>
<td>X'01'</td>
<td></td>
<td>Open files failed</td>
</tr>
<tr>
<td>X'02'</td>
<td></td>
<td>Input commands missing</td>
</tr>
<tr>
<td>X'03'</td>
<td></td>
<td>Input command length missing</td>
</tr>
<tr>
<td>X'04'</td>
<td></td>
<td>Input line count exceeded</td>
</tr>
<tr>
<td>X'05'</td>
<td></td>
<td>Input command length invalid</td>
</tr>
<tr>
<td>X'07'</td>
<td></td>
<td>Unable to access BPE CSCD for parsing</td>
</tr>
<tr>
<td>X'09'</td>
<td></td>
<td>Null input to parse</td>
</tr>
<tr>
<td>X'0A'</td>
<td></td>
<td>Load error</td>
</tr>
<tr>
<td>X'0B'</td>
<td></td>
<td>Unable to open RECON log</td>
</tr>
<tr>
<td>X'0C'</td>
<td></td>
<td>RECON translation failed</td>
</tr>
<tr>
<td>X'11'</td>
<td></td>
<td>Bad conversion to time of day</td>
</tr>
<tr>
<td>X'12'</td>
<td></td>
<td>Bad store clock conversion</td>
</tr>
</tbody>
</table>

### Return codes: Sensor Data Extractor

The Sensor Data Extractor ends with one of the following return codes:

<table>
<thead>
<tr>
<th>Return code</th>
<th>Description</th>
<th>User response</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Job successfully ended.</td>
<td>None.</td>
</tr>
<tr>
<td>4</td>
<td>Job ended with a warning message.</td>
<td>Check the messages whose message numbers are suffixed by 'W'. If this is not the expected result, correct the error, and rerun the job.</td>
</tr>
<tr>
<td>8</td>
<td>Job ended with an error message.</td>
<td>Check the messages whose message numbers are suffixed by 'E'. Correct the error, and rerun the job.</td>
</tr>
<tr>
<td>12</td>
<td>Job abnormally ended and recovered by ESTAE routine.</td>
<td>This might be an internal system error. Contact IBM Software Support.</td>
</tr>
<tr>
<td>16</td>
<td>Job failed to initialize the BPE environment.</td>
<td>Correct any errors, and rerun the job. If this situation persists, contact IBM Software Support.</td>
</tr>
</tbody>
</table>
## Return codes: Statistics Data Import Utility

The Statistics Data Import Utility ends with one of the following return codes:

<table>
<thead>
<tr>
<th>Return code</th>
<th>Description</th>
<th>User response</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Job successfully ended.</td>
<td>None.</td>
</tr>
<tr>
<td>4</td>
<td>Job ended with a warning message.</td>
<td>Check the messages whose message numbers are suffixed by 'W'. If this is not the expected result, correct the error, and rerun the job.</td>
</tr>
<tr>
<td>8</td>
<td>Job ended with an error message.</td>
<td>Check the messages whose message numbers are suffixed by 'E'. Correct the error, and rerun the job.</td>
</tr>
<tr>
<td>12</td>
<td>Job abnormally ended and recovered by ESTAE routine.</td>
<td>This might be an internal system error. Contact IBM Software Support.</td>
</tr>
<tr>
<td>16</td>
<td>Job failed to initialize the BPE environment.</td>
<td>Correct any errors, and rerun the job. If this situation persists, contact IBM Software Support.</td>
</tr>
</tbody>
</table>

## Return codes: History Data Summarization Utility

The History Data Summarization Utility ends with one of the following return codes:

<table>
<thead>
<tr>
<th>Return code</th>
<th>Description</th>
<th>User response</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Job successfully ended.</td>
<td>None.</td>
</tr>
<tr>
<td>4</td>
<td>Job ended with a warning message.</td>
<td>Check the messages whose message numbers are suffixed by 'W'. If this is not the expected result, correct the error, and rerun the job.</td>
</tr>
<tr>
<td>8</td>
<td>Job ended with an error message.</td>
<td>Check the messages whose message numbers are suffixed by 'E'. Correct the error, and rerun the job.</td>
</tr>
<tr>
<td>12</td>
<td>Job abnormally ended and recovered by ESTAE routine.</td>
<td>This might be an internal system error. Contact IBM Software Support.</td>
</tr>
<tr>
<td>16</td>
<td>Job failed to initialize the BPE environment.</td>
<td>Correct any errors, and rerun the job. If this situation persists, contact IBM Software Support.</td>
</tr>
</tbody>
</table>
Chapter 33. Gathering diagnostic information

Before you report a problem with Policy Services to IBM Software Support, you need to gather the appropriate diagnostic information.

Procedure

1. Provide the following information for all Policy Services problems:
   - A clear description of the problem and the steps that are required to recreate the problem
   - All messages that were issued preceding and following the problem
   - The timestamps of the messages
   - The Policy Services journal output
   - Product release number and the number of the last program temporary fix (PTF) that was installed
   - The version of IMS that you are using and the type and version of the operating system that you are using
   - A Load Module/Macro APAR Status report. Use the Tools Base Diagnostics Aid (HKTUDIAG) to generate a Load Module APAR Status report. For details, see the IBM Tools Base for z/OS IMS Tools Common Services User’s Guide.

2. Provide additional information based on the type of problem that you experienced:

   **For user interface abends, provide the following information**
   - A screen shot of the panel that you were using when the abend occurred
   - The job log from the TSO session that encountered the abend
   - The job log from the server
   - A description of the task that you were doing before the abend occurred

   **For errors that occur in processing an IMS Tool, provide the following information**
   - The complete job log
   - Print output
   - Contents of the any data sets that were used during the processing
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