IBM IMS Recovery Solution Pack for z/OS
Version 1 Release 1

Overview and Customization

IBM
IBM IMS Recovery Solution Pack for z/OS
Version 1 Release 1

Overview and Customization
Note:

Before using this information and the product it supports, read the "Notices" topic at the end of this information.

Third Edition (March 2016)

This edition applies to Version 1 Release 1 of IBM IMS Recovery Solution Pack for z/OS: Overview and Customization (program number 5655-V86) and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces SC19-2902-01.

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About this information

IBM® IMS™ Recovery Solution Pack for z/OS® (also referred to as IMS Recovery Solution Pack) is a product that combines a number of IBM tools into a consolidated solution that provides a complete and efficient IMS database backup and recovery environment.

IMS Recovery Solution Pack combines the following tools into a single offering:
- IMS Database Recovery Facility
- IMS Database Recovery Facility Extended Functions
- IMS High Performance Change Accumulation Utility
- IMS Recovery Expert
- IMS High Performance Image Copy
- IMS Index Builder

These topics provide an overview of the products and capabilities that are delivered with the IMS Recovery Solution Pack, as well as some common usage scenarios to help you understand the capabilities of the product. It also includes post-SMP/E installation instructions that must be performed before you can use this product.

To use the functions described in these topics, you must have already installed the IMS Recovery Solution Pack by completing the SMP/E installation process that is documented in the Program Directory for IMS Recovery Solution Pack for z/OS, GI10-8824-02, which is included with the product.

These topics are designed to help database administrators, system programmers, application programmers, and system operators perform these tasks:
- Understand the capabilities of the functions that are associated with the IMS Recovery Solution Pack
- Install and operate IMS Recovery Solution Pack
- Customize your IMS Recovery Solution Pack environment
- Diagnose and recover from IMS Recovery Solution Pack problems
- Use IMS Recovery Solution Pack 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 check the IMS Tools Product Documentation page for the most current version of this information:

Chapter 1. IMS Recovery Solution Pack overview

The IBM IMS Recovery Solution Pack for z/OS (also referred to as IMS Recovery Solution Pack) combines powerful IMS Tools products to provide all the capabilities that you need to backup and recover your IMS full-function, HALDB, and Fast Path databases.

Topics:
- “What's new in IMS Recovery Solution Pack”
- “IMS Recovery Solution Pack features and benefits” on page 2
- “IMS Recovery Solution Pack components” on page 3
- “IMS Recovery Solution Pack business scenarios” on page 6
- “Hardware and software prerequisites” on page 7
- “Service updates and support information” on page 8
- “Product documentation and updates” on page 9
- “Accessibility features” on page 11

What's new in IMS Recovery Solution Pack

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.

SC19-2902-02
- New topic: Chapter 3, “Initial product customization using IMS Tools Setup,” on page 15

SC19-2902-01
- New topic: “Removing the BMP pauser interface” on page 30
- New topic: “ACF2 command limiting table” on page 52
IMS Recovery Solution Pack features and benefits

The IMS Recovery Solution Pack can simplify and streamline the database backup and recovery for IMS full-function, HALDB, and Fast Path databases. It provides a complete set of high performance tools to back up, recover, rebuild indexes for, verify, and report on full-function, HALDB, and Fast Path databases.

IMS Recovery Solution Pack provides the following benefits:

- IMS Database Recovery Facility provides a streamlined approach to database recovery by recovering multiple database data sets in a single job step. It reduces the potential workload of having to run multiple jobs or job steps when recovering IMS databases by integrating with other products that can create new image copies, rebuild indexes, and validate the recovered databases.

- IMS Database Recovery Facility: Extended Functions provides the capability to identify problems in your environment that affect database recoverability. It can also create common recovery points for multiple databases and provides an interface to create recovery JCL through the use of the IMS Database Recovery Facility.

- IMS High Performance Change Accumulation Utility reduces recovery time by pre-processing log records and creating a merged file with accumulated database updates. The change accumulation file can be used by the recovery process and eliminates the need to process the log records at recovery time, which can save time and resources. It also allows you to process multiple change accumulation groups in a single job step, with a single pass of the IMS log data sets.

- IMS High Performance Image Copy reduces the unavailability time of databases by providing rapid image copy features and parallel processing and minimizes manual interventions. It also reduces operational and media costs by compressing and stacking the image copies.

- IMS Index Builder eliminates the need to create image copies and log updates to IMS index data sets by providing a quick and efficient method for rebuilding indexes. It also provides the ability to add new indexes to existing IMS databases as needed.
IMS Recovery Solution Pack components

The IMS Recovery Solution Pack provides an effective and efficient approach to recovering your IMS data quickly and accurately. It includes five tools that have been packaged as a single solution.

IMS Database Recovery Facility and IMS Database Recovery Facility Extended Functions have been merged and are provided in a common set of target and distribution libraries.

The following tools are also included in the IMS Recovery Solution Pack but are shipped in separate target and distribution libraries:

- “IMS High Performance Change Accumulation Utility”
- “IMS High Performance Image Copy” on page 4
- “IMS Index Builder” on page 4

These five tools are installed by following the steps in the Program Directory for IMS Recovery Solution Pack for z/OS, GI10-8824-00 and in these topics. All five tools must first be installed and customized before you can use the IMS Recovery Solution Pack.

IMS Database Recovery Facility and IMS Database Recovery Facility Extended Functions

By using IMS Database Recovery Facility, you can reduce operational complexity and the impact of database recovery on system resources. It simplifies your database recovery process by eliminating the need to run separate steps or jobs for related components.

IMS Database Recovery Facility Extended Functions is useful at both the local and disaster recovery site for identifying problems that can affect database recovery. At the disaster recovery site, it ensures that all the required resources are present and helps you prepare the RECON data sets to perform recoveries. At the local site, it can create common recovery points, check for problems that can affect database recovery, locate common recovery points for a group of databases, and generate JCL for the IMS Database Recovery Facility to perform a database recovery or create an incremental image copy.

IMS Database Recovery Facility allows you to perform the following tasks:

- Simultaneously recovers multiple database data sets, HALDB partitions, and fast path areas in a single job step
- Create new image copies, rebuild indices, rebuild ILDS, and validate recovered databases


IMS High Performance Change Accumulation Utility

IMS High Performance Change Accumulation Utility improves the performance of change accumulation merge operations by running multiple change accumulation groups in parallel and streaming the output to each group simultaneously. IMS HP Change Accumulation Utility provides the following functionality:
• Merges the most recent database changes quickly, safely, and accurately while reducing the I/O, CPU time and elapsed time that is required to build change accumulation data sets.

• Enables you to extract database updates with one pass of the data, which minimizes the need for manual intervention. By using your existing DBRC GENJCL statements, you can automatically generate the JCL required to run the tool.

Using IMS HP Change Accumulation Utility to pre-process logs and database updates reduces the amount of time that is required to perform a database recovery.

For more information, see the IMS Recovery Solution Pack: IMS High Performance Change Accumulation Utility User’s Guide.

**IMS High Performance Image Copy**

IMS High Performance Image Copy creates an as-is image copy of a database and recovers a physically damaged data set of an IMS database.

IMS HP Image Copy provides the same functions as the IMS standard utilities, which are the Database Image Copy utility (DFSUDMP0) and the Database Recovery utility (DFSURDB0), but with a simpler user interface. It can effectively replace the IMS standard utilities.

Additionally, it provides functions that are not provided by the IMS standard utilities, including the ability to create various types of image copies, generate a copy data set from the original image copy data set, and set site defaults for processes.

Integrates with the DFSMSdss DUMP and COPY interface to perform faster image copies with a reduced impact on the database that is being image copied.

For more information, see the IMS High Performance Image Copy for z/OS User’s Guide.

**IMS Index Builder**

IMS Index Builder helps streamline index creation, reorganization, maintenance and recovery. IMS Index Builder provides the following functionality:

• Enables you to build (or rebuild) IMS secondary indexes, Hierarchical Indexed Direct Access Method (HIDAM) primary indexes, and high availability large databases (HALDB) Indirect List Data Sets (ILDS)

• Supports full-function databases and partitioned HALDB

• Creates multiple indexes in one job step

• Rebuilds database indexes without having to unload and reload the primary data store

• Eliminates the need to image copy indexes because the indexes can be rebuilt instead of recovered from an image copy

For any supported hierarchical direct (HD) database and for HISAM databases, IMS Index Builder scans the existing physical database and builds IMS primary and secondary indexes. For non-partitioned databases, it creates one or more new secondary index databases. For secondary indexes and PSINDEXs, a full database reorganization and initial HALDB load are no longer necessary.
For more information, see the IMS Index Builder for z/OS User's Guide.
IMS Recovery Solution Pack business scenarios

This topic describes business scenarios that demonstrate how the IMS Recovery Solution Pack can help reduce your downtime and get your IMS systems back up and running.

Recovering from an application error

If an application error occurs, and point-in time recovery (PITR) is required, the first thing you need to determine is which application had the error and when that error occurred.

You can use the IMS Recovery Solution Pack to recover the affected databases. You can recover all databases in parallel, read multiple logs in one pass, and recover only committed data to the specified time. This sequence makes the entire PITR process fast and efficient.

You can also request that a new image copy is created for the recovered databases in the same step as the recovery, thus saving time and resources. Indexes can also be rebuilt during recovery instead of having to recover them.

Making an audit copy of your databases

You can use the IMS Recovery Solution Pack to produce an audit copy of your databases.

When used in combination, these tools enable you to produce copies without accessing production databases. You can build copies from image copies, change accumulations, and log data sets.

In addition, you can generate data set names by using a prefix or suffix, date, time, high-level qualifier, and literal.

Recovering data after a system failure

The last, but critical, piece of IMS Recovery Solution Pack is the ability to recover your data in the event of a disaster. A typical disaster recovery strategy is based on cost, the amount of time that it takes to recover compromised data, and the ability of your organization to absorb any permanent loss of data.

Typical disaster recovery strategies often involve sending image copies, change accumulations, logs, and RECONs to a remote site. To minimize the amount of data that needs to be sent, as well as the resulting expense and complexity, you can use change accumulation as input to create an incremental image copy and send this image copy to a remote site.

Regardless of the amount of IMS High Performance Image Copy data that is sent, the IMS Recovery Solution Pack enables you to restore your critical IMS data efficiently and effectively.
Hardware and software prerequisites

The tools that are provided in IMS Recovery Solution Pack have dependencies on IMS and on the components that are provided in IBM Tools Base for z/OS.

Installation requirements

- z/OS V1.9 (5694-A01) or later
- IBM Tools Base for z/OS, V1.5 (5655-V93)

Operational requirements

IMS Recovery Solution Pack is designed to operate with all supported releases of IMS.

Conditional operational requirements

The following tools are not required for the basic function, but are needed at run time for IMS Recovery Solution Pack to use specific functions:

- IMS High Performance Pointer Checker for z/OS, V3.1 (5655-U09) or IMS Database Solution Pack for z/OS, V2.1 (5655-DSP) for hash pointer checking
- IMS Fast Path Solution Pack for z/OS, V1.3 (5655-W14) for DEDB hash pointer checking
- IMS Library Integrity Utility, V2.2 (5655-U08) for verification of the DBD being used for recovery

Common tool requirements

The following common tools which are provided in IBM Tools Base are required by the IMS Recovery Solution Pack for z/OS:

- IMS Tools Generic Exits
- IMS Tools Knowledge Base
- IMS Tools Online System Interface

These common tools are not distributed with the IMS Recovery Solution Pack but are instead distributed with the IBM Tools Base. IBM Tools Base must be installed and configured before the IMS Recovery Solution Pack can be used.
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:

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

The IMS Tools Product Documentation web page provides current product documentation that you can view, print, and download. To locate publications with the most up-to-date information, refer to the following web page:


You can also access documentation for many IMS Tools from the IBM Knowledge Center:

https://www-01.ibm.com/support/knowledgecenter/

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

http://www.redbooks.ibm.com

The Data Management Tools Solutions website shows how IBM solutions can help IT organizations maximize their investment in IMS databases while staying ahead of today's top data management challenges:


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1. Go to http://www.ibm.com/support/mysupport
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.

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Your feedback is important in helping to provide the most accurate and high-quality information. If you have any comments about this book or any other IBM product documentation, use one of the following options:

- Use the online reader comment form, which is located at [http://www.ibm.com/software/data/rcf/](http://www.ibm.com/software/data/rcf/)
• Send your comments by email to comments@us.ibm.com. Include the name of the book, the part number of the book, the version of the product that you are using, and, if applicable, the specific location of the text you are commenting on, for example, a page number or table number.
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. Migration considerations

If you already have one or more of the tools that are included in the IMS Recovery Solution Pack, you might need to migrate those tools to the new environment.

IMS Recovery Solution Pack includes the functions and features that replace the following products:

- IMS Database Recovery Facility, V3.1
- IMS Recovery Expert, V1.1
- IMS High Performance Change Accumulation Utility, V1.4

In addition, IMS Recovery Solution Pack includes the following products:

- IMS Index Builder, V3.1
- IMS High Performance Image Copy, V4.2

The individual products that are delivered and packaged with IMS Recovery Solution Pack are compatible with the prior versions of these products, except IMS Database Recovery Facility. However, some changes or enhancements might have been made to the JCL samples that are included. It is recommended that you compare all new JCL and procedures with those currently in use.

**Important:** The IMS Recovery Solution Pack: IMS Database Recovery Facility is not compatible with previous versions of IMS Database Recovery Facility. If you have a previous version of IMS Database Recovery Facility, you must install IMS Recovery Solution Pack: IMS Database Recovery Facility in a separate library from the previous version. The IMS Recovery Solution Pack: IMS Database Recovery Facility contains enhancements that affect setup and usage, including major changes to the contents of the MAS, RSS, and IAX address spaces. To avoid any potential conflicts, the address spaces must be renamed and modified according to the samples provided in the IMS Recovery Solution Pack. The module names are not changed.

**Migration from older versions of IMS Tools Online System Interface, IMS Tools Generic Exits, and IMS Tools Knowledge Base**

Prior to the IMS Recovery Solution Pack, its component products may have required or optionally used releases of IMS Tools Online System Interface, IMS Tools Generic Exits, and IMS Tools Knowledge Base that are older than the versions that are required by the IMS Recovery Solution Pack. These common tools are now delivered with the IBM Tools Base.

For detailed migration considerations, see the *IBM Tools Base for z/OS: IMS Common Services User’s Guide*. 
Chapter 3. Initial product customization using IMS Tools Setup

IMS Tools Setup is a function that helps you quickly and efficiently perform the required post-SMP/E-installation customization process for the products included in the IMS Tools solution packs that you have installed. IMS Tools Setup is provided by IBM Tools Base Version 1 Release 5 and later releases.

What does IMS Tools Setup do?

After the selected IMS Tools solution pack products have been installed into SMP/E data sets, you must complete customization tasks for all the IMS Tools included in the packs in order to begin using the tools. The goal of IMS Tools Setup is to greatly ease the time and effort it takes to have IMS Tools products up and running in your environment.

The IMS Tools Setup function (HKTQSETU) provides a step-by-step structured process (ISPF) that partially automates many of the normally time-consuming manual customization tasks. IMS Tools Setup generates JCL members that you then submit as jobs, or perform as tasks, that will complete the customization process.

IMS Tools Setup is intended for initial product installations, first-time users, and product evaluations. IMS Tools Setup is not intended for maintenance purposes.

IMS Tools products that can use IMS Tools Setup

The following IMS Tools solution packs can make use of IMS Tools Setup:

- IBM IMS Database Solution Pack for z/OS
- IBM IMS Fast Path Solution Pack for z/OS
- IBM IMS Recovery Solution Pack for z/OS

IBM Tools Base components are also configured and customized during the IMS Tools Setup process. IBM Tools Base provides important supporting components and infrastructure that are required for the operation of many IMS Tools functions, such as storage repositories, autonomics, and interaction with IMS.

Starting IMS Tools Setup

The IMS Tools Setup function can be found in IBM Tools Base Version 1 Release 5 and later releases. You can start the function by executing the following REXX EXEC:

EXEC 'smpehlq.SHKTCEXE(HKTQSETU)' 'HLQ(smpehlq)'

The IMS Tools Setup ISPF panels provide an organized and logical approach to the customization tasks. The panels explain the operation and sequence of each member that is generated in the CUSTJCL data set. The correct JCL job and task operation order is very important.

Each panel contains embedded panel-context and individual field-context Help information. All information about using IMS Tools Setup is contained in the embedded Help. There is no separate user guide.
IMS Tools Setup output

IMS Tools Setup produces the following output:

- JCL to optionally combine all selected IMS Tools libraries
- JCL to APF-authorize load library(s) (dynamic and permanent)
- JCL to add MVS PPT entries to SYS1.PARMLIB (dynamic and permanent)
- JCL to add load modules to LPA (dynamic and permanent)
- JCL to add Subsystem entries to MVS (dynamic and permanent)
- JCL to add RACF security for all tools that require security
- Parameters (IMS Tools Generic Exits, IMS Tools Online System Interface, configuration members)
- JCL to create global options modules and members
- PROCs, address spaces, other required data sets
- DBDs, PSBs, ACBs, MDAs, DB Initialization for IVPs

Completing IMS Tools Setup

After you execute the HKTQSETU REXX EXEC, locate member $$READ in the generated CUSTJCL data set. This member explains the JCL members that were just generated for informational purposes only. The $$READ member contains a table of member names, the associated role types, and short descriptions.

Each of the generated JCL members begin with "#" and are named in the logical sequence of operation. Any members ending with "@" require manual steps. You must begin with the first #xxxx member and submit the JCL job or perform the task. After that job or task completes, you continue on to the next member and submit that JCL job or perform that task, and so forth.

The first few members are all SYSPROG related (APF, LPA, SSN, MVSPPT), followed by security related members, TPNS ADMIN related members, DBA related members, and others.

You must process all members in the correct order to complete the full customization task properly.

Each JCL member has its own descriptive comment section that explains what the member does and which group it might belong to.
Chapter 4. Customizing IMS Recovery Solution Pack

Before using any of the tools that are included in the IMS Recovery Solution Pack, all the tools must be installed and customized, including several common tools and services that are included in IBM Tools Base.

Customization using IMS Tools Setup is intended for initial product installations, first-time users, and product evaluations. IMS Tools Setup is not intended for maintenance purposes.

When using IMS Tools Setup is not appropriate for your situation, follow the complete manual customization instructions as outlined in this topic.

Topics:
• [“Installation and customization checklist” on page 18]
# Installation and customization checklist

This checklist summarizes the steps that are required to install and customize the tools that are included in the IMS Recovery Solution Pack.

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<thead>
<tr>
<th>Status</th>
<th>Task</th>
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<tbody>
<tr>
<td></td>
<td>&quot;1-Verifying IMS Recovery Solution Pack prerequisites” on page 19</td>
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<td>&quot;2-Configuring IMS Tools Generic Exits” on page 22</td>
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<td>&quot;3-Configuring IMS Tools Online System Interface” on page 23</td>
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<td>&quot;4-Configuring IMS Tools Knowledge Base” on page 24</td>
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<td></td>
<td>&quot;5-Performing MVS-related tasks” on page 26</td>
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<td>&quot;6-Installing and removing IMS usermods” on page 28</td>
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<td>&quot;7-Installing IMS Database Recovery Facility Extended Functions ISPF interface” on page 32</td>
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<td>&quot;8-Installing IMS HP Change Accumulation Utility ISPF interface” on page 35</td>
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<td>&quot;9-Performing security-related tasks” on page 36</td>
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<td></td>
<td>&quot;10-Creating a BPE configuration member” on page 53</td>
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<td></td>
<td>&quot;11-Updating IMS Database Recovery Facility sample members” on page 55</td>
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<td>&quot;12-Updating IMS HP Image Copy sample members” on page 57</td>
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<td>&quot;13-Updating IMS Index Builder sample members” on page 58</td>
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<td>&quot;14-Updating IMS HP Change Accumulation Utility sample members” on page 59</td>
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<td>&quot;15-Verifying IMS Online System initialization” on page 60</td>
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<td></td>
<td>&quot;16-Verifying the installation” on page 61</td>
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**Note:** An installation checklist is provided in the SFRXSAMP library in member FRXCHECK. The checklist is intended to assist you in the installation, but is not intended to be a comprehensive set of instructions.
1-Verifying IMS Recovery Solution Pack prerequisites

Before you can customize the tools that are included in the IMS Recovery Solution Pack, you must install these tools by completing the instructions that are in the product program directory.

The SMP/E installation process for the IMS Recovery Solution Pack is documented in the Program Directory for IMS Recovery Solution Pack for z/OS, GI10-8824-00. This process allocates and downloads the required target and distribution libraries and then installs the tools that are included in the IMS Recovery Solution Pack.

This process creates the libraries for the following tools:

- IMS Database Recovery Facility
- IMS Database Recovery Facility: Extended Functions
- IMS High Performance Change Accumulation Utility
- IMS High Performance Image Copy
- IMS Index Builder

Use the following table as a reference for the data sets that are created during the installation process. You can make a copy of this table and update it with your actual data set names.

The list of data set names are also included in the SFRXSAMP(FRXCHECK) member. You need to refer to these data sets occasionally during the remainder of the installation and customization process.

Table 1. IMS Recovery Solution Pack data set names

<table>
<thead>
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<th>Type</th>
<th>Name</th>
<th>Comments</th>
<th>Local DSN name</th>
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Table 1. IMS Recovery Solution Pack data set names (continued)

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<th>Type</th>
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<tr>
<td>PLIB</td>
<td>SFRXPENU</td>
<td>IMS Recovery Solution Pack ISPF panels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SHPCPLIB</td>
<td>IMS High Performance Change Accumulation Utility ISPF panels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SHKTPENU</td>
<td>IMS Tools KB ISPF panels</td>
<td></td>
</tr>
<tr>
<td>SAMP</td>
<td>SFRXSAMP</td>
<td>IMS Recovery Solution Pack PROC/JCL samples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SHPCSAMP</td>
<td>IMS High Performance Change Accumulation Utility PROC/JCL samples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SHPSSAMP</td>
<td>IMS High Performance Image Copy PROC/JCL samples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SHPSJCL0</td>
<td>IMS High Performance Image Copy IVPs and JCLIN.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIUICNTL</td>
<td>IMS Index Builder PROC/JCL samples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SIUPROC</td>
<td>IMS Index Builder PROC samples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SHKTSAMP</td>
<td>IMS Tools KB PROC/JCL samples</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SGLXSAMP</td>
<td>IBM Tools Base PROC/JCL samples (IMS Tools Generic Exit)</td>
<td></td>
</tr>
<tr>
<td>SLIB</td>
<td>SFRXSENU</td>
<td>IMS Recovery Solution Pack ISPF skeletons</td>
<td></td>
</tr>
<tr>
<td>TLIB</td>
<td>SFRXTENU</td>
<td>IMS Recovery Solution Pack ISPF tables</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SHKTENU</td>
<td>IMS Tools KB ISPF tables</td>
<td></td>
</tr>
</tbody>
</table>

**Install and configure IBM Tools Base**

Many of the tools in the IMS Recovery Solution Pack require the use of the common tools that are included in IBM Tools Base.

The following common tools are required:

- IMS Tools Generic Exits
- IMS Tools Knowledge Base
- IMS Tools Online System Interface
Before continuing with the installation of the IMS Recovery Solution Pack, you must complete the SMP/E installation and configuration for these common tools.

See the Program Directory for IBM Tools Base for z/OS, GI10-8819-00 for installation instructions. This process allocates and download the target and distribution libraries and perform the SMP/E installation of the tools included in IBM Tools Base.

After completing the SMP/E installation, see the following manuals to complete the installation and configuration of the required common tools:


After you have installed and configured the common tools, continue with the installation of the IMS Recovery Solution Pack.
2-Configuring IMS Tools Generic Exits

You must install and configure the IMS Tools Generic Partner Exit interface which is distributed as part of the IMS Tools Generic Exits. The IMS Tools Generic Partner Exit interface is a general-purpose interface that allows multiple exits to be defined and called. The IMS Tools Generic Partner Exit interface is required to operate the IMS Tools Online System Interface as well as the IMS Database Recovery Facility Extended Functions Recovery Point Create (RPCR) feature.

Before you begin

As part of the installation and configuration for the IMS Tools Generic Partner Exit, you might have already performed the following steps. However, if these steps have not yet been completed, you need to complete them now before continuing.

About this task

These instructions describe how to configure the IMS Tools Generic Exits.

Procedure

1. Create a unique GPRiii0 member for each IMS system in which IMS Tools Online System Interface is needed. iii is the 4-character IMS subsystem identifier.
2. APF-authorize the executable load libraries for IMS Tools Generic Exits.
3. Update your IMS control region JCL to include in the //STEPLIB concatenation the executable load libraries for IMS Tools Generic Exits.

What to do next

You can use the SFRXSAMP(FRXGPR) sample member to set up IMS Tools Generic Partner Exit configuration members for each IMS system. For detailed instructions on how to add a GPRssid0 or GPREXIT0 member the, see the IBM Tools Base for z/OS: IMS Tools Common Services User’s Guide.

Important:

- If you use any other user-defined or vendor partner exit that does not support IMS Tools Generic Exits, you must ensure that the libraries that contain the DFSPPUE0 exit are concatenated ahead of the SGLXLOAD and those exits must pass control to the next exit in the STEPLIB so that IMS Tools Generic Exits get control.
- The IMS Tools Generic Exits load library, SGLXLOAD, must be in front of the IMS Tools Online System Interface load library, SFOILOAD, in the IMS control region //STEPLIB concatenation.
3-Configuring IMS Tools Online System Interface

You must install and configure the IMS Tools Online System Interface. It is a
general-purpose IMS command interface that is distributed as part of IBM Tools
Base.

**About this task**

The IMS Tools Online System Interface is an IMS command interface that is used
by multiple products to issue commands to an IMS subsystem. The IMS Tools
Online System Interface is required by many of the functions included in the IMS
Recovery Solution Pack. The IMS Tools Online System Interface requires the use of
the IMS Tools Generic Partner Exit interface.

As part of the installation and configuration for the IMS Tools Online System
Interface, you might have already performed the following steps. However, if these
steps have not yet been performed, you need to complete them now.

**Procedure**

1. Verify your installation and configuration of the IMS Tools Generic Partner Exit
   interface.

2. Create a unique FOIssidP member for each IMS system in which IMS Tools
   Online System Interface is needed. ssid is the 4-character IMS subsystem
   identifier.
   Within this FOIssidP member, there is a 5-character maximum XCFGROUP
   name. This XCFGROUP name is used later in the installation process and
   contains a "TOI" prefix that is used to create the complete XCF group name.
   Record each XCFGROUP name to use later.

3. APF-authorize the executable load libraries for IMS Tools Online System
   Interface.

4. Update your IMS control region JCL to include in the //STEPLIB concatenation
   the executable load libraries for IMS Tools Online System Interface.
4-Configuring IMS Tools Knowledge Base

You must install and configure the IMS Tools Knowledge Base. It is a repository for reports and other information that is used by products in the IMS Recovery Solution Pack. It is distributed as part of the IBM Tools Base.

In this topic:

• “Defining IMS Recovery Solution Pack products to IMS Tools KB”
• “Defining RECONID records”

Defining IMS Recovery Solution Pack products to IMS Tools KB

IMS Tools Knowledge Base can be used by products to store output reports for archival and viewing. Many of the products in the IMS Recovery Solution Pack currently store reports into the IMS Tools KB. Before any reports can be stored, the products must first be defined to the IMS Tools KB.

Before you begin

Before you can execute JCL to add the product IDs to IMS Tools KB, make sure that the IMS Tools KB server is active and running. Record the name of the server for use later.

Procedure

1. Modify the SFRXSAMP(FRXITKB) sample member.
   This member has ADD statements for each product that is included in the IMS Recovery Solution Pack. If any of these products are already defined, the job still runs because the REPLACE option is specified.
2. Run the modified FRXITKB JCL to add the product IDs to IMS Tools KB.
   The JCL also lists the products that have been successfully added to IMS Tools KB. Run this JCL to confirm that the product IDs were successfully added to IMS Tools KB.
3. Run this job against each IMS Tools KB server where the products are executed.

What to do next

Although the SFRXSAMP(FRXITKB) sample member has a list of product IDs within the solution, if you want a complete list of all products that are supported by IMS Tools KB, see the IBM Tools Base for z/OS: IMS Tools Knowledge Base User’s Guide, SC18-9963-02.

Defining RECONID records

IMS Database Recovery Facility Extended Functions requires that certain information that is related to the execution environment is stored in the IMS Tools KB. This information is stored in elements called RECONID records.

Before you begin

Before you can add RECONID records, make sure that the IMS Tools KB server is active and running. Then, determine the sets of RECON data sets that need to be defined. A unique RECONID record is required for each set of IMS RECON data sets against which IMS Database Recovery Facility Extended Functions executes.
If you have multiple IMS Tools KB servers, you must define the RECONID records to the server that is active for the associated RECON environment. Record the server names for future purposes.

**Procedure**

1. Access the primary IMS Tools KB ISPF interface primary menu by entering the following command in TSO Option 6:
   
   ```
   EXEC 'your.hlq.SHKTCEXE(HKTZPRIM)' 'your.hlq'
   ```

2. Provide the following information on the primary panel:
   - Specify the IMS Tools KB server name.
   - Specify Y/N for HISTORY.

3. Choose Option 4 from the drop-down menu on the top-left side of the panel.

4. If the RECONID is not in the list of displayed RECONIDs, add a new entry by typing NEW on the command line.

5. Enter the following information to create a RECONID:
   - The 8-byte external name that is associated with the RECONID member. This value is user-defined but must be unique within this server.
   - The RECON1, RECON2, and RECON3 data set names.
   - The XCF group name that is used to communicate with IMS Tools Online System Interface in the IMS control regions.
   - The IMSPLEX name as defined to the RECON data sets, if present.
   - The RACF® security class to be used for securing IMS commands that are issued through the IMS Command (IMSCMD) interface.

6. Save the RECONID.

7. Repeat this process for each RECON environment that is associated with this server.
5-Performing MVS-related tasks

These tasks involve making changes to your MVS system to allow the IMS Recovery Solution Pack to operate with the required level of authority.

Adding entries to the MVS program properties table

Several of the tools that are included in the IMS Recovery Solution Pack require entries in the MVS program properties table (PPT) in order to operate.

Procedure

1. Use the statements in the SFRXSAMP(FRXPPT) sample member to update your SCHEDxx member of the SYS1.PARMLIB data set. The sample member contains the following entries:

   ```
   PPT PGMNAME(FRXSDR00) /* DRF */
   CANCEL /* PROGRAM CAN BE CANCELLED */
   KEY(7) /* PROTECT KEY ASSIGNED IS 7 */
   NOSWAP /* PROGRAM IS NON-SWAPPABLE */
   NOPRIV /* PROGRAM IS NOT PRIVILEGED */
   DSI /* REQUIRES DATA SET INTEGRITY */
   PASS /* CANNOT BYPASS PASSWORD PROTECTION */
   SYST /* PROGRAM IS A SYSTEM TASK */
   AFF(NONE) /* NO CPU AFFINITY */
   NOPREF /* NO PREFERRED STORAGE FRAMES */
   PPT PGMNAME(IROMAIN) /* IMSRE */
   CANCEL /* PROGRAM CAN BE CANCELLED */
   KEY(7) /* PROTECT KEY ASSIGNED IS 7 */
   NOSWAP /* PROGRAM IS NON-SWAPPABLE */
   NOPRIV /* PROGRAM IS NOT PRIVILEGED */
   DSI /* REQUIRES DATA SET INTEGRITY */
   PASS /* CANNOT BYPASS PASSWORD PROTECTION */
   SYST /* PROGRAM IS A SYSTEM TASK */
   AFF(NONE) /* NO CPU AFFINITY */
   NOPREF /* NO PREFERRED STORAGE FRAMES */
   PPT PGMNAME(IIUSTART) /* IIB */
   NOSWAP /* PROGRAM IS NON-SWAPPABLE */
   PPT PGMNAME(IIUBSCTL) /* IIB */
   NOSWAP /* PROGRAM IS NON-SWAPPABLE */
   ```

2. To activate the updated PPT, either:
   - Run the IPL (initial program load) again for the MVS system where you have identified SCHEDxx in the IAESYSyy IPL member.
   - Issue the MVS SET SCH= command specifying the suffix for the SCHEDxx member that was changed.

3. Repeat these steps for each MVS system on which the products run.

APF authorizing the product load libraries

The libraries that contain the IMS Recovery Solution Pack executable modules and any other libraries that are concatenated in the STEPLIB must be APF-authorized. If any libraries in the STEPLIB are not APF-authorized, the entire STEPLIB becomes unauthorized.

About this task

The following table indicates all the libraries that are associated with the IMS Recovery Solution Pack and that need to be APF-authorized. The actual library names depend on the data set names that you created for executing these products.
Refer to your recorded checklist of load library names in “1-Verifying IMS Recovery Solution Pack prerequisites” on page 19.

Table 2. Program libraries

<table>
<thead>
<tr>
<th>Library</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFRXLOAD</td>
<td>IMS Database Recovery Facility and IMS Database Recovery Facility Extended Functions</td>
</tr>
<tr>
<td>SIIULMOD</td>
<td>IMS Index Builder</td>
</tr>
<tr>
<td>SHPSLMD0</td>
<td>IMS High Performance Image Copy</td>
</tr>
<tr>
<td>SHPCLMD0</td>
<td>IMS High Performance Change Accumulation Utility</td>
</tr>
<tr>
<td>SGLXLOAD</td>
<td>IMS Tools Generic Exits</td>
</tr>
<tr>
<td>SFOILOAD</td>
<td>IMS Tools Online System Interface</td>
</tr>
<tr>
<td>SHKTLOAD</td>
<td>IMS Tools Knowledge Base</td>
</tr>
</tbody>
</table>

Procedure

1. Add the libraries listed in Table 2 to your MVS APF list as well as any other library that is specified in the STEPLIB of each batch utility job or IMS control region.

2. To activate the updated APF list, either IPL the MVS™ system or issue the MVS SET PROG command.

3. Repeat these steps for each MVS system on which you run the tools provided in the IMS Recovery Solution Pack.
6-Installing and removing IMS usermods

You must install IMS usermods for use with IMS Recovery Solution Pack. These usermods allow the IMS Recovery Solution Pack products to function properly. Without these usermods, some product features do not work.

Important: If you have IMS Program Restart Facility installed, use its interface and do not install the IMS Database Recovery Facility Extended Functions usermod. If you do not have IMS Program Restart Facility installed but you have IMS Online Reorganization Facility installed, use its interface and do not install the following BMP pauser interface usermod. If none of the other products usermods are installed, you must install the IMS usermods for the BMP Pauser Interface that is provided with IMS Recovery Solution Pack. The products mentioned here all include similar interfaces that are compatible with this usermod. However, you still need to install the CICS/ODBA Pauser Interface.

BMP pauser interface (DFSRRC00)

To allow the IMS Database Recovery Facility Extended Functions Recovery Point Create (RPCR) feature to function, you must install the BMP pauser interface. The RPCR feature can pause BMPs when attempting to deallocate a database.

When the RPCR feature attempts to deallocate a database, this usermod can pause a BMP at the next checkpoint and prevent any new BMPs from starting. Pausing a BMP allows the databases to be recovered by using the /DBR command and started by using the /STA command without manual intervention.

If you do not install the BMP pauser interface, RPCR cannot deallocate the database when a BMP holds the database that is being processed by RPCR, causing RPCR to fail.

If your site uses BMPs to access IMS databases, you must implement this interface for each IMS system. The BMP pauser interface is critical for the product to be able to create "Common Recovery Points." The BMPs must be restartable by IMS (XRST) and must use checkpointing (CHKPT). For full-function databases, a pseudo U3303 abend is issued and the BMP is automatically restarted after the brief pause.

For HALDB databases, the BMP is paused and no pseudo U3303 abend is issued.

Two methods of installing the BMP pauser interface are available. You need to understand both methods to determine which method to implement. "Installation method 1: Modifying the IMS region controller module” on page 29 is recommended because it does not require any BMP JCL changes.

<table>
<thead>
<tr>
<th>Installation Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Installation method 1: Modifying the IMS region controller module” on page 29</td>
<td>This method of installing is recommended because it does not require you to modify any BMP JCL. JCL changes are not required because the region controller is not renamed and it exists in your IMS RESLIB.</td>
</tr>
</tbody>
</table>
### Installation Method

<table>
<thead>
<tr>
<th>Installation Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Installation method 2: Editing the BMP JCL jobs”</td>
<td>To use this method, you need to edit all the BMP JCL jobs. This method requires that you make JCL changes to all the BMP jobs that access databases that are processed by the RPCR feature. Use this method if you do not want to modify the IMS region controller module.</td>
</tr>
</tbody>
</table>

### Installation method 1: Modifying the IMS region controller module

This method of installing is recommended because it does not require you to modify any BMP JCL. JCL changes are not required because the region controller is not renamed and it exists in your IMS RESLIB.

#### About this task

This method is implemented as a USERMOD to IMS. This method renames the existing region controller DFSRRC00 to DFSRRC99, and then installs a new DFSRRC00 front end. It also copies other DFSRRCxx modules: one for each supported release into the IMS RESLIB. Anytime the region controller is invoked, the front end calls the IMS-dependent modules, if needed, and then transfers control to the IMS region controller. This process ensures that the BMP pauser interface is always active.

If you have any other applications that relink the IMS region controller or use a different IMS region controller module for BMPs, consider using this method to link those modules and IMS Recovery Solution Pack modules.

#### Procedure

To install the BMP pauser interface by using method 1 (modifying the IMS region controller), modify and run the SFRXSAMP(IROBMP1) sample member to relink the IMS region controller.

### Installation method 2: Editing the BMP JCL jobs

To use this method, you need to edit all the BMP JCL jobs. This method requires that you make JCL changes to all the BMP jobs that access databases that are processed by the RPCR feature. Use this method if you do not want to modify the IMS region controller module.

#### About this task

- This method does not relink the DFSRRC00 module into any load library, not even IMS.RESLIB.
- If you do not modify all BMP jobs and steps, BMP pausing is not done for the BMPs for which you did not modify the JCL.

#### Procedure

1. Modify and run SFRXSAMP(IROBMP2) to link and create the IRORRC00 module.
2. Change all BMP JCL as follows:
   a. Add the load library that you used as your SYSLMOD in the IROBMP2 install job as the first data set in your STEPLIB concatenation. For example: 
      ```
      //STEPLIB DD DSN=your.userlib.containing.IRORRC00
      ```
b. Modify the IMS region controller execution module on the EXEC statement of each BMP step. For example:

```c
//stepname EXEC PGM=IRORRC00
```

instead of:

```c
//stepname EXEC PGM=DFSRRC00
```

**Removing the BMP pauser interface**

If necessary, you can remove the BMP pauser interface.

**Procedure**

To remove the BMP pauser interface, complete one of the following steps, depending on how the BMP pauser interface was installed:

- If the BMP pauser interface was installed by using "Installation method 1: Modifying the IMS region controller module" on page 29:
  1. Delete the existing DFSRRC00 member.
  2. Rename DFSRRC99 to DFSRRC00.
- If the BMP pauser interface was installed by using "Installation method 2: Editing the BMP JCL jobs" on page 29:
  1. In the modified BMP JCL, change the PGM=IRORRC00 EXEC statements to PGM=DFSRRC00.
  2. In the modified BMP JCL, remove the data set in your STEPLIB concatenation that points to the load library that was used as the SYSLMOD in the IROBMP2 install job.

**CICS/ODBA pauser interface**

To allow the IMS Database Recovery Facility: Extended Functions Recovery Point Create (RPCR) feature to function, you must install the CICS/ODBA interface in the IMS control region. This interface pauses CICS® and ODBA activity when RPCR is attempting to deallocate a database.

You need to determine if your site has CICS or ODBA access to IMS databases. If so, you need to complete this task for each IMS system. If you do not have CICS or ODBA access, you do not need to complete this task, however, doing so does not cause any problems or performance degradation. We recommend that you perform this task so that if CICS/ODBA access is added in the future, RPCR will be able to function properly.

There are two methods of installing the CICS/ODBA Interface. "Installation method 1: Using an SMP/E usermod" is the recommended method because it creates an SMP/E USERMOD to apply the necessary changes.

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Installation method 1: Using an SMP/E usermod&quot;</td>
<td>This method creates an SMP/E usermod and is the recommended method.</td>
</tr>
<tr>
<td>&quot;Installation method 2: Without using an SMP/E usermod&quot; on page 31</td>
<td>This method is intended for testing and implements the usermod without SMP/E.</td>
</tr>
</tbody>
</table>

**Installation method 1: Using an SMP/E usermod**

This method creates an SMP/E usermod and is the recommended method.
About this task

The file that is created in the SMPOUT DD is input to SMP/E. You need to apply this USERMOD to each IMS control region that has IMS Recovery Solution Pack installed. You can repeat this first job whenever you need to reinstall the USERMOD.

Procedure

To install the CICS/ODBA pauser interface by using method 1 (an SMP/E usermod), modify and run SFRXSAMP(IROCICS1).

Installation method 2: Without using an SMP/E usermod

This method is intended for testing and implements the usermod without SMP/E.

About this task

This method links the load module into the IMS Recovery Solution Pack load library (SFRXLOAD). Use this method for testing purposes only. It requires that the IMS Recovery Solution Pack load library is in the IMS control region //STEPLIB concatenation.

Procedure

To install the CICS/ODBA pauser interface by using method 2 (without using an SMP/E usermod), modify and run SFRXSAMP(IROCICS2).
This ISPF interface is used to parse the Recovery Point Identification (RPID) report and present information in an easy-to-use format. From this interface, you can generate IMS Database Recovery Facility JCL to recover IMS databases or create incremental image copies.

Two methods are available for installing this ISPF interface. These methods are located in the REXX EXECs that are shipped with the IMS Recovery Solution Pack in the SFRXEXEC data set:

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Method 1: Using LOGON procedures&quot;</td>
<td>Use this installation method when ISPF data sets are allocated through your logon procedure.</td>
</tr>
<tr>
<td>&quot;Method 2: Using dynamic allocation&quot; on page 33</td>
<td>Use this installation method when the SFRXEXEC library is not allocated as part of your logon procedure.</td>
</tr>
</tbody>
</table>

**Method 1: Using LOGON procedures**

Use this installation method when ISPF data sets are allocated through your logon procedure.

**About this task**

Using this install method eliminates the need to use the IROTXALC EXEC that is also located in your SFRXEXEC library.

This installation method requires that you add the ISPF libraries to your LOGON procedure.

**Procedure**

1. Add the ISPF libraries to your LOGON procedure. The following list shows the DD name with the data set name that you must specify. Replace `your.hlq` with the appropriate high-level qualifier (HLQ) that is associated with these data sets.

   - SYSEXEC
   - ISPEXEC
   - ISPLLIB
   - ISPMLIB
   - ISPMLIB
   - ISPMLIB
   - ISPMLIB

---

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2. Modify the IROTREXL REXX EXEC member in your SFRXEXEC library to tailor it to your environment. Follow the comments in the IROTREXL member that describe the modifications that can be made.

**Accessing the ISPF interface**

After installing the ISPF interface by using LOGON procedures, you can access the ISPF interface.

**Procedure**

1. Select EDIT or VIEW on a Recovery Point Identification (RPID) report.
2. Execute the IROTREXL edit macro from the command line to invoke the ISPF interface.

**Method 2: Using dynamic allocation**

Use this installation method when the SFRXEXEC library is not allocated as part of your logon procedure.

**About this task**

This installation method requires that you run the IROTXALC REXX EXEC to allocate the EXEC library, SFRXEXEC, to your TSO session. You must run this EXEC each time you logon to TSO and before you want to use this ISPF interface.

**Procedure**

1. Modify the IROTXALC and IROTREXL EXEC members. This step only needs to be performed the first time you access this ISPF interface by using this method:
   - Modify the IROTXALC EXEC member to include the appropriate high-level qualifier (HLQ) for SFRXEXEC. Follow the comments in the SFRXEXEC library IROTXALC member that describe the available modifications.
   - Modify the IROTREXL REXX EXEC member in your SFRXEXEC library to tailor it to your environment. Follow the comments in the IROTREXL member that describe the available modifications.
2. Execute the IROTXALC REXX EXEC according to one of the following methods. This step only needs to be performed once for each time you logon to TSO. Running this EXEC allocates the necessary ISPF data sets to your TSO user ID.
   - If you did not hardcode the high-level qualifier (HLQ) in your IROTXALC REXX EXEC, provide the HLQ parameter as follows:
     ```
     EXEC 'your.hlq.SFRXEXEC(IROTXALC) hlq(your.hlq)
     ```
   - If you hardcoded the HLQ in your IROTXALC REXX EXEC, eliminate the HLQ parameter as follows:
     ```
     EXEC 'your.hlq.SFRXEXEC(IROTXALC)'
     ```

**Accessing the ISPF interface**

After installing the ISPF interface by using dynamic allocation, you can access this ISPF interface.

**Procedure**

1. Select EDIT or VIEW on an Recovery Point Identification (RPID) report.
2. Execute the IROTREXL edit macro from the command line to invoke the ISPF interface.
8-Installing IMS HP Change Accumulation Utility ISPF interface

The IMS High Performance Change Accumulation Utility ISPF user interface allows you to manage the IMS High Performance Change Accumulation Utility environment for one or more change accumulation groups.

Before you begin

Before you run the ISPF user interface, ensure that the following libraries exist (see Table 1 on page 19 for the actual data set names at your location):

- yourhlq.SHPCCEXE (CLISTs)
- yourhlq.SHPCPLIB (Panels)
- yourhlq.SHPCMLIB (ISPF messages)
- yourhlq.SHPCLMDO (Programs)

The IMS High Performance Change Accumulation Utility ISPF user interface is designed so that you do not need to change your TSO logon procedure to include the IMS High Performance Change Accumulation Utility ISPF libraries.

Procedure

1. From ISPF main menu, select Option 6: Command.
2. From the ISPF Command Shell, enter a command string using the following syntax:
   
   \texttt{EX 'smphlq.SHPCCEXE(HPCC000) 'SMPHLQ(smphlq) HPCHLQ(hpchlq) <VOL(volser)> <PDSE>''}

   Here are the key words that are used to run the ISPF user interface:

   - \textit{smphlq} Specifies the high-level qualifier of your installation data set.
   - \textit{hpchlq} Specifies the high-level qualifier for work data sets required by the ISPF user interface.
   - \textit{volser} This optional parameter specifies the volume serial number of the DASD device on which the work data sets are allocated.
   - \textbf{PDSE} This optional parameter specifies that the partitioned data set extended (PDSE) data sets are to be used for the IMS High Performance Change Accumulation Utility work files. The default is to define the data sets as partitioned data sets (PDS). PDS data sets require periodic compression.

3. After the IBM copyright screen is displayed, press Enter to continue to the HPCA-ID/IMS Profile panel to configure the IMS High Performance Change Accumulation Utility environment.
9-Performing security-related tasks

The IMS Recovery Solution Pack requires specific RACF and security settings. You must ensure that all products have the necessary security authorizations in order for them to operate correctly.

Topics:
- “Data spaces” on page 37
- “JESSPOOL resource class” on page 38
- “Address spaces” on page 39
- “Defining RACF (or equivalent security) authorization for IMS commands” on page 48
- “Setting up IMS Index Builder stripe data set security” on page 51
- “ACF2 command limiting table” on page 52
Data spaces

Data spaces are used by IMS Database Recovery Facility and IMS High Performance Image Copy to hold data that is being processed or to pass data between multiple address spaces. Tool-specific keywords are used to control the use of the data spaces.

Your environment can restrict the use of data spaces. If your site restricts which tools can create and use data spaces, you need to authorize the following programs to allow the tools to function properly.

The following information pertains to the tools that use data spaces and the parameters that you can use to control their use.

IMS Database Recovery Facility
IMS Database Recovery Facility uses data spaces for spilling change accumulation and log records when there is not enough memory to hold the records.

The following programs need to be authorized for creating data spaces:

FRXSDR00
IMS Database Recovery Facility main program

FRXSDR10
IMS Database Recovery Facility Index Builder or DFSPREC0 address space program

You can control the size of each data space that is created by using the SPSIZE keyword. For more information about the use of this keyword, see the IMS Recovery Solution Pack: IMS Database Recovery Facility User’s Guide.

IMS High Performance Image Copy
IMS High Performance Image Copy uses data spaces to share control data among address spaces. The amount of space used is 128 KB plus an additional 8 KB for each DBDS being processed.

The following program needs to be authorized for creating data spaces:

FABJMAIN
IMS High Performance Image Copy main program
**JESSPOOL resource class**

You can use the JESSPOOL resource class to protect data sets which are written to spool.

The System Authorization Facility (SAF) is used by both JES2 and JES3 to restrict access to data stored in the spool data sets. If the JESSPOOL resource class is active when a job initiates, the Job Entry Subsystem (JES) interprets the JCL, and for any DD statements that use the spool space (for example, when SYSOUT= is specified), builds a temporary data set name that begins with `node.userid.jobname` where:

- **node** The network job entry (NJE) node ID of the JES2 or JES3 system.
- **userid** The SAF user ID that is associated with the job.
- **jobname** The job name associated with the job.

If you have the JESSPOOL resource class activated and protected so that the default access is NONE, you must create an SAF profile to grant the subordinate address spaces ALTER access to this class. The JESSPOOL resource class name is assigned at JCL interpretation time, occurring as the job enters the system. Therefore, the user ID that is associated with the subordinate address space is the job name, which is assigned by the system from the RACF started class.

For example, if you execute an IMS Database Recovery Facility job that starts a subordinate address space named FRXI0001, this job requires access to the JES spool data sets. To get access to the JES spool data sets, you need to grant ALTER access to a profile beginning with `node.FRXI0001`. 
Address spaces

Many of the tools included in the IMS Recovery Solution Pack use the multiple address space architecture.

A common example is the user or job scheduler initiating the master address space (MAS) by submitting a set of saved JCL. The MAS then initiates one or more subordinate address spaces (SAS) to perform the requested processing. In some cases, the SAS also initiates other subordinate address spaces.

IMS Database Recovery Facility Extended Functions address space considerations

IMS Database Recovery Facility Extended Functions consists of a single job that can be submitted by a user or a job scheduler, or initiated as a started task.

The job name is determined by the user. The authority is obtained from the user ID that is associated with the job. The user ID that is associated with the job requires the following authority to the listed data sets:

- CONTROL access to the RECON data sets.
- IMS command authority if the IMS Command interface is used.
- READ access to image copy, log, change accumulation, and database data sets.
- ALTER access to the RECON copy data sets if the RECON copy feature is used.

IMS HP Image Copy address space considerations

IMS High Performance Image Copy consists of a single job that can be submitted by the user or a job scheduler, or initiated as a started task.

The job name is determined by the user. The authority is obtained from the user ID that is associated with the job. The user ID that is associated with the job requires the following authority to the listed data sets:

- CONTROL access to the RECON data sets.
- READ access to log and database data sets.
- ALTER access to image copy data sets.

When IMS High Performance Image Copy is used to create a Fast Recovery Image Copy, using the FASTIC=(,COPY) command, the DFSMSdss processing executes in a separate system address space named IEESYSAS.

IMS Index Builder address space considerations

IMS Index Builder executes in a multiple address space environment. The main job can be submitted by the user or a job scheduler, or initiated as a started task.

The job name is determined by the user. The authority is obtained from the user ID that is associated with the job. IMS Index Builder can then initiate either of the following subordinate address spaces types, depending on the processing that is being performed:

IIUSORTS

The IMS Index Builder sort subordinate address space that is initiated as a started task. The name of the started task, by default, is IIUSORTS. However, the name can be changed in the IIURPRMS customization module by using the IIURDFTL SORTP parameter.

By default, IMS Index Builder uses the IIUBSRT procedure, found in the system procedure library to create the JCL for this started task. This
procedure name can be overridden in the IIURPRMS customization module using the IIURSORT parameter. However, changing this procedure affects all the created address spaces.

**IIUSCANS**

The IMS Index Builder scan address space which is initiated as a started task. The name of the started task, by default, is IIUSCANS. However, the name can be changed in the IIURPRMS customization module using the IIURDFLT SCAN parameter.

By default, IMS Index Builder uses the IIUBSRT procedure, found in the system procedure library to create the JCL for this started task. This procedure name can be overridden in the IIURPRMS customization module using the IIURSORT parameter. However, changing this procedure affects all the created address spaces.

**IIUAPIFC**

The IMS Index Builder IMS Database Recovery Facility API address space. It is initiated as a started task when IMS Database Recovery Facility initiates IMS Index Builder. The name of the started task, by default, is IIUAPIFC. However the name can be changed in the IIURPRMS customization module by using the IURDFLT APIP parameter.

IMS Index Builder uses the same procedure for creating both the IIUAPIFC and IIUSORTS address spaces.

All started tasks that are created by IMS Index Builder run with the same authority as the main job that was initiated. When IMS Index Builder initiates a started task, code that is executing in that address space creates a security control block that matches the one associated with the main job. This control block is swapped in the new address space so that it has the same level of authority as the main job. However, there is a short time in which the started task is running with default authority.

For details on this situation and potential problems, see “RACF considerations for subordinate address spaces” on page 45.

The user ID that is associated with the IMS Index Builder job needs the following authority to the listed data sets:

- CONTROL access to the RECON data sets
- READ access to database data sets
- ALTER access to index data sets

**IMS HP Change Accumulation Utility address space considerations**

IMS High Performance Change Accumulation Utility executes in a multiple address space environment.

The main job can be submitted by the user or by a job scheduler, or initiated as a started task. The job name is determined by the user. The authority is obtained from the user ID that is associated with the job.

IMS High Performance Change Accumulation Utility initiates the subordinate address spaces depending on the method specified for processing job tasks.
The following table describes the subordinate address spaces that can be directly initiated by IMS High Performance Change Accumulation Utility. It shows how the name is determined, how many can be started, and which JCL procedure is used to build the JCL.

<table>
<thead>
<tr>
<th>Method</th>
<th>Subordinate address space name</th>
<th>Number started</th>
<th>JCL procedure used</th>
</tr>
</thead>
</table>
| "Custom job processing" on page 42 | The job name is determined by HPCA-ID prefix plus 4-character numeric suffix. The prefix is determined by either:  
  - The PARM specification hpca-id on the EXEC statement  
  - The ID= hpca-id command value from HPCSYSIN | The number of address spaces is specified by the PARALLEL SORTS = command value from HPCSYSIN. The default value is 9. | The job that was written either to the PROCLIB or JOBLIB library that is specified in HPCAPROC DD. The job name is stored as either:  
  • hpca-id  
  • ID= prefix plus 0001 – 0nnn |
| "Standard job processing" on page 42 | The job name is determined by either:  
  - The PROC = name parameter on the EXEC PARM statement  
  - The PROCEDURE NAME= name command value from HPCSYSIN. | The number of address spaces is specified by the PARALLEL SORTS = command value from HPCSYSIN. The default value is 9. | An IMS High Performance Change Accumulation Utility defined member is added to the PROCLIB / JOBLIB libraries during installation. The member name must match the name value specified on either:  
  • PROC=  
  • PROCEDURE NAME=  
  The member name is used to start all subordinate address spaces. |
| "Started task control job processing" on page 43 | The job name is determined by either:  
  - The STC = name parameter on the EXEC PARM statement.  
  - The STC NAME= name command value from HPCSYSIN. | The number of address spaces is specified by the PARALLEL SORTS = command value from HPCSYSIN. The default value is 9. | An IMS High Performance Change Accumulation Utility defined member is added to a user library during installation. The member name must match the name value specified on either:  
  • STC=  
  • STC NAME=  
  The member name is used to start all subordinate address spaces. |
### Method Summary

<table>
<thead>
<tr>
<th>Method</th>
<th>Subordinate address space name</th>
<th>Number started</th>
<th>JCL procedure used</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Single address space job processing&quot; on page 43</td>
<td>No subordinate address spaces are created. Instead, each SORT process is an internal task in the main address space.</td>
<td>The number of internal tasks is specified by the PARALLEL SORTS = command value from HPCSYSIN. However, IMS High Performance Change Accumulation Utility adjusts this value for managing private storage. The default value is 3.</td>
<td>The internal task does not require a JCL procedure; however, the member name value on PROC= or PROCEDURE NAME= must specify HPCSTASK.</td>
</tr>
</tbody>
</table>

For more information about the listed parameters, see *IMS Recovery Solution Pack: IMS High Performance Change Accumulation Utility User’s Guide*.

All subordinate address spaces that are initiated by IMS High Performance Change Accumulation Utility require special RACF rules to be set up to allow the job to have the appropriate level of authority. For details about setting up the proper authority and potential problems, see "RACF considerations for subordinate address spaces" on page 45.

The following sections describe the four job processing methods and considerations for selecting an appropriate method for your environment:

- "Custom job processing"
- "Standard job processing"
- "Started task control job processing" on page 43
- "Single address space job processing" on page 43

**Custom job processing:**

The custom job processing method writes each PROC or JOB to a PROCLIB or JOBLIB library.

These libraries must be available to the z/OS master scheduler or to the Job Entry Subsystem (JES). Custom procedures provide the greatest degree of flexibility and security control, but have resource and authority requirements.

The user ID that is associated with the job requires the following authority:
- UPDATE authority for access to the PROCLIB or JOBLIB data set
- CONTROL access to the RECON data sets
- READ access to log data sets
- ALTER access to change accumulation data sets

**Standard job processing:**

For the standard job processing method, an IMS High Performance Change Accumulation Utility defined member is added to the PROCLIB and JOBLIB libraries during installation.

IMS High Performance Change Accumulation Utility does not write the procedures into a library. Instead, the definition of each step is recorded in the IMS High Performance Change Accumulation Utility control file. The control file is merged with the standard JCL using dynamic allocation when each CA sort is initiated.
Standard procedures require fewer resources and less authority for access but are more restricted than custom procedures in accommodating special situations.

The user ID that is associated with the job requires the following authorizations:
- READ authority for reading the member in the PROCLIB or JOBLIB data set
- CONTROL access to the RECON data sets
- READ access to log data sets
- ALTER access to change accumulation data sets

**Started task control job processing:**

The started task control (STC) job processing method provides features of both the custom and standard procedure methods.

The started task control (STC) job processing method provides features of both the custom and standard procedure methods. For STC job processing, procedures are written to a user PROCLIB.

Like the standard procedure method, a single member must be inserted into a system procedure library during installation. This single member is then used to start all subordinate address spaces by using the JCL that is stored in the procedure library.

As a result, this method provides the JCL flexibility that is associated with custom procedures, but has the lesser authority requirements that are associated with standard procedures.

The user ID that is associated with the job requires the following authorizations:
- READ authority for reading the member in the PROCLIB or JOBLIB data set
- CONTROL access to the RECON data sets
- READ access to log data sets
- ALTER access to change accumulation data sets

**Single address space job processing:**

The single address space (AS1) job processing method runs each CA group as a subtask within the control address space.

The advantages include a simplified setup, and fewer resource and security considerations. Access to a system PROCLIB is not required.

Some restrictions apply for single address space job processing, and not all environments can be supported.

The user ID that is associated with the job requires the following authorizations:
- CONTROL access to the RECON data sets
- READ access to log data sets
- ALTER access to change accumulation data sets

**IMS Database Recovery Facility address space considerations**

IMS Database Recovery Facility runs in a multiple address space environment. The main job can be submitted by the user or a job scheduler, or initiated as a started task.
The job name is determined by the user. The authority is obtained from the user ID that is associated with the job.

For database recovery processing, IMS Database Recovery Facility initiates a master address space that initiates one or more recovery sort subordinate address spaces. When any of the integrated auxiliary utilities are invoked during database recovery, IMS Database Recovery Facility also initiates one or more utility address spaces to perform the processing that is associated with that utility. The address spaces that can be directly initiated by IMS Database Recovery Facility are described in the following list. Table 3 provides details about the name and characteristics of each of these address spaces. All address spaces are initiated as started tasks.

**IMS Database Recovery Facility master address space**
This address space is the main address space, which controls the processing and functions that are being performed in the recovery job. It reads the necessary logs and change accumulation data sets and controls the initialization and termination of the subordinate address spaces.

**Recovery Sort Subordinate address space**
This address space processes and sorts log and change accumulation records and restores image copy data. It also provides the API that is necessary to invoke the services of IMS High Performance Image Copy and IMS High Performance Fast Path Utilities (DEDB pointer checker). Multiple recovery sort address spaces can be initiated.

**Index Builder Utility address space**
This address space is used to perform the processing that is associated with the IMS Index Builder. It rebuilds the non-HALDB primary and all secondary indexes for a database and initiates IMS Index Builder address spaces. Multiple Index Builder Utility address spaces can be initiated.

**DFSPREC0 Utility address space**
This address space is used to perform the processing that is associated with the IMS HALDB DFSPREC0 utility. It rebuilds the HALDB Primary Index data set and Index List data set. Multiple DFSPREC0 Utility address spaces can be initiated.

**Pointer Check Utility address space**
This address space is used to perform the processing that is associated with the IMS High Performance Pointer Checker (full-function pointer checker). Only a single Pointer Checker Utility address space is initiated.

The following table describes the subordinate address spaces that can be directly initiated by the IMS Database Recovery Facility. It shows how the name is determined, how many address spaces can be started, and which JCL procedure is used to build the JCL.

<table>
<thead>
<tr>
<th>Address space</th>
<th>Started task control (STC) name</th>
<th>Number started</th>
<th>JCL procedure used</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMS Database Recovery Facility master address space</td>
<td>Determined by the name on the job card</td>
<td>One master address space per recovery job</td>
<td>A default FRXMAS procedure is supplied.</td>
</tr>
</tbody>
</table>
Table 3. IMS Database Recovery Facility address space characteristics (continued)

<table>
<thead>
<tr>
<th>Address space</th>
<th>Started task control (STC) name</th>
<th>Number started</th>
<th>JCL procedure used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery Sort subordinate address space</td>
<td>DRFSORT if ASGNAME(Y)</td>
<td>The actual number is determined by the number of DBDSs that are being recovered and input image copies. The number is limited by the SORTPARM (NUM(x)) value.</td>
<td>The JCL procedure is specified by the DRFPROC() value. The default is FRXJCLSB.</td>
</tr>
<tr>
<td></td>
<td>ASPREF() prefix if ASGNAME(N)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index Builder Utility address space</td>
<td>IBPREF() prefix</td>
<td>One for each index that is being rebuilt</td>
<td>The JCL procedure is specified by the DRFIAX() value. The default is FRXJCLIP.</td>
</tr>
<tr>
<td></td>
<td>The default prefix is BDRF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DFSPREC0 Utility address space</td>
<td>PRPREF() prefix</td>
<td>One for each PHIDAM primary index or ILDS data set rebuilt</td>
<td>The JCL procedure is specified by the DRFIAX() value. The default is FRXJCLIP.</td>
</tr>
<tr>
<td></td>
<td>The default prefix is PDRF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pointer Checker Utility address space</td>
<td>PCPREF() prefix or PCJOBNM() value</td>
<td>One, regardless of the number of DBDs that are being checked.</td>
<td>The JCL procedure is specified by the PCPROCNM() value. If PCPREF() or PCJOBNM() is specified, FABPATHZ is used.</td>
</tr>
<tr>
<td></td>
<td>The default is FABPATH0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For more information about the listed parameters, see IMS Recovery Solution Pack: IMS Database Recovery Facility User’s Guide.

All started tasks that are created by IMS Database Recovery Facility run with the same authority as the main job that was initiated. When IMS Database Recovery Facility initiates a started task, the code that is running in that address space creates a security control block that matches the one that is associated with the main job. This control block is swapped in the new address space so that it has the same level of authority as the main job. However, for a short period of time, the started task is running with default authority.

For details about this situation and potential problems, see “RACF considerations for subordinate address spaces.”

**RACF considerations for subordinate address spaces**

You must assign a security identifier (for example, a user ID) to the subordinate address spaces that are directly initiated by the IMS Recovery Solution Pack products.

In this topic:

- “Defining RACF (or equivalent security) authorization for IMS commands” on page 48

All subordinate address spaces are initiated as started tasks. When a started task enters the system, the system attempts to locate an entry in the RACF STARTED class that matches the started task name. If an entry with that name is found, this ID is associated with the address space and all authority comes from this ID. If no entry is found, then the started task runs with a default level of authority that is
determined by the security rules that are in effect on the system. Generally, this default level does not allow the address space to function properly.

To ensure that the subordinate address spaces have the proper level of authority, you must define entries in the RACF STARTED class. Perform the steps as indicated for each product included in the IMS Recovery Solution Pack to ensure that all jobs run with the required level of authority.

**IMS Database Recovery Facility: Extended Functions**
Because this product runs in a single address space, no special steps must be taken for these jobs. The main address space runs with the authority of the user who submitted the job.

**IMS Index Builder and IMS Database Recovery Facility**
These products initiate subordinate address spaces as started tasks. The user ID that is associated with the master job is passed to all the subordinate address spaces so that they have the same level of authority.

The user ID of the subordinate address is obtained in two steps:
1. Before the product code is loaded into the subordinate address space and sets its security identity, the operating system attempts to use the user ID from the profile definitions in the STARTED class of the security system as the user ID for these started tasks.

   This user ID must have READ access for all of the data sets that are allocated in the //STEPLIB DD. If any of the data sets that are allocated in the //STEPLIB DD have a default access of NONE, you must grant the subordinate address spaces authority.

   To grant subordinate address space READ authority:
   a. Add an entry in the RACF STARTED class to give the subordinate address spaces access during this step by using the RDEFINE command.

      After the entry is added, the class must be refreshed by using the SETROPTS command, as shown in the following example:

      ```
      RDEFINE STARTED pfx.* STDATA(USER(userid))
      SETROPTS RACLIST(STARTED) REFRESH
      ```

      The variable `pfx.*` indicates the name that is associated with the subordinate address space started task. This class allows generic names to be defined. You must define an entry in the class for each prefix that is used by the products. For more information about the names that are associated with these address spaces and how they are derived, see “IMS Database Recovery Facility address space considerations” on page 43.

   **Attention:** Improper security system definitions results in errors when opening the STEPLIB during subordinate address space initialization. The subordinate address space can fail with an ABENDS913.

2. After the product code is loaded into the subordinate address space, the product determines the master address space user ID.

   The subordinate address space then changes its own user ID to match that of the master address space. The subordinate address space then runs with the same security authorities as the master address space.

**IMS High Performance Change Accumulation Utility**
These products initiate the subordinate address spaces as started tasks. Add an entry in the RACF STARTED class for each subordinate address
space that can be initiated. For more information about the names that are
associated with these address spaces and how they are derived, see “IMS
HP Change Accumulation Utility address space considerations” on page
40.

To allow the subordinate address spaces to run with the proper level of
authority, you must define an entry in the RACF STARTED class that the
system can associate with each subordinate address space by using the
RDEFINE command. After the entry is added, the class must be refreshed
by using the SETROPTS command, as shown in the following example:

```
RDEFINE STARTED pfx*.* STDATA(USER(userid))
SETROPTS RACLST(STARTED) REFRESH
```

The variable `pfx*.*` indicates the name that is associated with the
subordinate address space started task. This class allows generic names to
be defined. You must define an entry in the class for each prefix that is
used by the products.
Defining RACF (or equivalent security) authorization for IMS commands

You must define RACF (or equivalent security software) authorizations for the IMS Database Recovery Facility Extended Functions IMSCMD function to operate.

About this task

The IMS Database Recovery Facility Extended Functions IMSCMD function allows you to execute IMS commands through a batch job. IMS commands must be secured with RACF or other equivalent security software to control access to who can issue IMS commands.

There are three different options for securing IMS commands through this feature. The information about IMS command authorization is defined in the IMS Tools Knowledge Base RECONID record.

Procedure

In the IMSCMD Security field, which is located in the RECONID record, specify the type of security that you want to implement by entering one of these values:

NONE
No security authorization is performed. This value is intended for test environments only and should not be used in a secured environment. The security level of NONE allows anyone to issue any supported IMS command.

APPL
The RACF application (APPL) resource class is used for command security checking. This method uses the application resource class (APPL) to protect the IMS commands. The RACF Class field in the RECONID record indicates the specific application resource name, within the RACF APPL class, that is used for securing the IMS commands.

When you use the APPL resource class method, you must first define the application resource name (applname in the next example) to RACF. Define the application resource name to RACF by using the RDEFINE command, as shown in this example:

```
RDEFINE APPL applname UACC(NONE) AUDIT(NONE)
```

After you have defined the application resource name, your RACF administrator can permit users either READ or UPDATE levels of command authorization by using the PERMIT command, as shown in this example:

```
PERMIT applname CLASS(APPL) ID(userid) ACCESS(READ|UPDATE)
```

The userid specifies a particular RACF user or RACF group. ACCESS specifies either read-level access or update-level access. Read-level access allows a user to issue IMS commands that display IMS system information, and update-level access allows users to issue IMS commands that alter IMS system resources. The next table indicates which IMS commands are allowed and the corresponding level of access that is required to run them.

IMS
The IMS resource class is used for command security checking. This method uses the same IMS command security class that is used by the online IMS system. The RACF Class field in the RECONID record indicates the RACF security class that is used for securing IMS commands. This value must match the one that you specified to IMS using the
**RCLASS**= keyword on the SECURITY macro. This method allows you to use the same security class that is used by your online IMS control region.

**IMS commands required access levels for RACF APPL resource class authority**
IMS commands and their corresponding required access levels for RACF APPL resource class authority are shown here.

<table>
<thead>
<tr>
<th>Command</th>
<th>Access level required</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ACT</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/ALL</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/ASS</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/BRO</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/CHA</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/CHE</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/CLS</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/COM</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/CQC</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/CQQ</td>
<td>READ</td>
</tr>
<tr>
<td>/CQS</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/DBD</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/DBR</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/DEL</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/DEQ</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/DIA</td>
<td>READ</td>
</tr>
<tr>
<td>/DIS</td>
<td>READ</td>
</tr>
<tr>
<td>/END</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/EXC</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/EXI</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/FOR</td>
<td>READ</td>
</tr>
<tr>
<td>/IDL</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/LOC</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/LOG</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/LOO</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/MON</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/MSA</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/OPN</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/PST</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/PUR</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/QUI</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/RDI</td>
<td>READ</td>
</tr>
<tr>
<td>/REC</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/RMC</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/RMD</td>
<td>UPDATE</td>
</tr>
<tr>
<td>Command</td>
<td>Access level required</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>/RMG</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/RMI</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/RML</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/RMN</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/RST</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/SEC</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/SMC</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/SSR</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/STA</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/STO</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/SWI</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/TES</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/TRA</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/UNL</td>
<td>UPDATE</td>
</tr>
<tr>
<td>/VUN</td>
<td>UPDATE</td>
</tr>
</tbody>
</table>
Setting up IMS Index Builder stripe data set security

IMS Index Builder uses temporary data sets to pass data between the sort, scan, and master address spaces. These data sets exist only for the duration of the run.

Before you begin

When stripe data sets are used, the user ID that is associated with the master and subordinate address spaces requires ALTER access to these data sets. To ensure ALTER access, add a RACF DATASET profile with a universal access (UACC) of ALTER. If your security policies do not allow UACC(ALTER), you must add each user that runs IMS Index Builder to the profile access list of this DATASET, granting them ALTER access.

Important: By default, stripe data sets are allocated with the high-level qualifiers IU.U.STRIPE. You can override this default by using the IUURDFLT CLASS setting in the IUURPRMS parameter module. However, if you override the default high-level qualifiers, you must define a DATASET profile that corresponds to the qualifiers in the installation.

Procedure

To grant ALTER access to the data sets, complete one of the following steps:

• If your security policies allow UACC(ALTER), use the following RDEFINE command to add a single RACF DATASET profile with universal access of ALTER:
  
  RDEFINE 'IU.U.STRIPE.*' GEN UACC(ALTER)

• If you are unable to define this profile with UACC(ALTER), use the following PERMIT command to give each user ID ALTER access to the profile:
  
  PERMIT 'IU.U.STRIPE.*' GEN ID(user-id) ACCESS(ALTER)

Repeat this command for each user ID that requires access.
ACF2 command limiting table

If you use CA ACF2 as a security product, you might encounter the z/OS message IKJ5650I COMMAND XXXXXXX NOT FOUND when you attempt to run the IMS High Performance Change Accumulation Utility ISPF interface.

This message is issued because the CA ACF2 product classifies CLIST calls as commands. To prevent this error, add HPCAE000 to the CA ACF2 product command limiting table.
10-Creating a BPE configuration member

IMS Database Recovery Facility and IMS Database Recovery Facility Extended Functions are built on the Base Primitive Environment (BPE) architecture. BPE operates with internal default values, but you can also create your own configuration member if you want to alter these default values.

About this task

IMS Recovery Solution Pack supplies a sample configuration PROCLIB member for BPE system service functions in SFRXSAMP(FRXBPECF). This sample member contains default settings that you can use for all jobs. Specify the BPE configuration PROCLIB member on the EXEC statement by using the BPECFG= parameter in the PARM= string.

Procedure

1. Determine whether you want to create a single BPE PROCLIB member or multiple BPE PROCLIB members. You can create a separate PROCLIB member for each job, or you can create a single BPE PROCLIB member to be shared among all the jobs.
   - If you create a single BPE PROCLIB member to be shared, all the specifications that are related to BPE-owned resources, such as BPE trace tables, are the same for all the address spaces.
   - If you create multiple BPE PROCLIB members, you can specify different settings for BPE resources in each address space.

2. Create the BPE PROCLIB member or members. They must be fixed length with a minimum LRECL of 9.

3. Enter values for the following keywords:

   **LANG=**
   Use this keyword to request the BPE configuration member language. Currently, only ENU (U.S. English) is supported.

   **TRCLEV=**
   Use this keyword to define trace table information. Valid parameters are:

   **tablename**
   Specify the name of the trace table. Enter an asterisk (*) to set the default for all. Valid trace table names are:
   - AWE (for AWE server trace)
   - CBS (for Control Block Services trace)
   - CMD (for Command Services trace)
   - DISP (for Dispatcher trace)
   - LATC (for Latch trace)
   - SSRV (for System Services trace)
   - STGC (for Storage trace)

   **level**
   Specify the level of tracing. Valid entries are:
   - NONE
   - ERROR
   - LOW
   - MEDIUM
   - HIGH
component
Use this parameter to specify the component name that owns the trace table. For BPE traces, the component must be BPE.

PAGES=#pages
This optional parameter specifies the number of 4 KB pages to be allocated to this trace table.
11-Updating IMS Database Recovery Facility sample members

Create or modify the required sample members in the SFRXSAMP library for IMS Database Recovery Facility and IMS Database Recovery Facility Extended Functions.

To customize the members, follow the instructions that are provided in each sample member.

The following table lists the sample members are used to run each product that is distributed in the IMS Recovery Solution Pack sample library SFRXSAMP. These abbreviations are used in the table:

- **DRF** IMS Database Recovery Facility
- **DRF/XF** IMS Database Recovery Facility: Extended Functions
- **HPCA** IMS High Performance Change Accumulation Utility
- **HPIC** IMS High Performance Image Copy
- **ITKB** IMS Tools Base: IMS Tools Knowledge Base
- **IB** IMS Index Builder
- **TOSI** IMS Tools Online System Interface

<table>
<thead>
<tr>
<th>Sample member</th>
<th>Products</th>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRXGPR</td>
<td>DRF/XF, TOSI</td>
<td>DRF/XF and TOSI general partner exit configuration member</td>
<td>Config</td>
</tr>
<tr>
<td>FRXFOI</td>
<td>DRF, TOSI</td>
<td>TOSI configuration parameters</td>
<td>Config</td>
</tr>
<tr>
<td>FRXBPECF</td>
<td>DRF, DRF/XF</td>
<td>BPE configuration parameters</td>
<td>Config</td>
</tr>
<tr>
<td>FRXCAJCL</td>
<td>HPCA</td>
<td>IMS/CA skeleton JCL for the HPCA IVP</td>
<td>JCL</td>
</tr>
<tr>
<td>FRXITKB</td>
<td>DRF, DRF/XF, HPIC, IB, ITKB</td>
<td>Defines the products to ITKB</td>
<td>JCL</td>
</tr>
<tr>
<td>FRXDRF</td>
<td>DRF</td>
<td>DRF master address space</td>
<td>JCL</td>
</tr>
<tr>
<td>FRXMAS</td>
<td>DRF</td>
<td>DRF master address space procedure</td>
<td>PROC</td>
</tr>
<tr>
<td>FRXJCLIP</td>
<td>DRF</td>
<td>DRF utility address space</td>
<td>PROC</td>
</tr>
<tr>
<td>FRXJCLSB</td>
<td>DRF</td>
<td>DRF subordinate region</td>
<td>PROC</td>
</tr>
<tr>
<td>FRXDRFZZ</td>
<td>DRF</td>
<td>DRF configuration parameters</td>
<td>Config</td>
</tr>
<tr>
<td>FRXPATH0</td>
<td>DRF</td>
<td>DRF pointer checker procedure</td>
<td>PROC</td>
</tr>
<tr>
<td>FRXPATHZ</td>
<td>DRF</td>
<td>DRF pointer checker procedure</td>
<td>PROC</td>
</tr>
<tr>
<td>Sample member</td>
<td>Products</td>
<td>Description</td>
<td>Type</td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>-------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>IROBMP1</td>
<td>DRF/XF</td>
<td>DRF/XF BMP pause method 1</td>
<td>JCL</td>
</tr>
<tr>
<td>IROBMP2</td>
<td>DRF/XF</td>
<td>DRF/XF BMP pause method 2</td>
<td>JCL</td>
</tr>
<tr>
<td>IROCICS1</td>
<td>DRF/XF</td>
<td>DRF/XF CICS/ODBA pause method 1</td>
<td>JCL</td>
</tr>
<tr>
<td>IROCICS2</td>
<td>DRF/XF</td>
<td>DRF/XF CICS/ODBA pause method 2</td>
<td>JCL</td>
</tr>
<tr>
<td>IROCFG01</td>
<td>DRF/XF</td>
<td>DRF/XF configuration</td>
<td>Config</td>
</tr>
<tr>
<td>FRXIVPC1</td>
<td>HPCA</td>
<td>HPCA IVP</td>
<td>JCL</td>
</tr>
<tr>
<td>FRXIVPC2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRXIVPC3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRXIVPC4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRXIVPD1</td>
<td>DRF</td>
<td>DRF IVP</td>
<td>JCL</td>
</tr>
<tr>
<td>FRXIVPI1</td>
<td>HPIC</td>
<td>HPIC IVP</td>
<td>JCL</td>
</tr>
<tr>
<td>FRXIVPR1</td>
<td>DRF/XF</td>
<td>DRF/XF IVP</td>
<td>JCL</td>
</tr>
<tr>
<td>FRXIVPT1</td>
<td>TOSI</td>
<td>TOSI IMS command Batch IVP</td>
<td>JCL</td>
</tr>
<tr>
<td>FRXIVPX1</td>
<td>IB</td>
<td>IB IVP</td>
<td>JCL</td>
</tr>
</tbody>
</table>
12-Updating IMS HP Image Copy sample members

Create or modify the sample members in the SHPSSAMP library for IMS High Performance Image Copy.

The following table lists the sample members that are used to run IMS High Performance Image Copy:

<table>
<thead>
<tr>
<th>Sample member</th>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>FABJDFLJ</td>
<td>Global defaults</td>
<td>JCL</td>
</tr>
<tr>
<td>FABJEC</td>
<td>HASH IC</td>
<td>PROC</td>
</tr>
<tr>
<td>FABJICD1</td>
<td>FABJICS0 defaults 1</td>
<td>input</td>
</tr>
<tr>
<td>FABJICD2</td>
<td>FABJICS0 defaults 2</td>
<td>input</td>
</tr>
<tr>
<td>FABJCS0</td>
<td>Skeleton JCL for IC with HPIC Data Compression</td>
<td>JCLPDS</td>
</tr>
<tr>
<td>FABRVG</td>
<td>Skeleton JCL for IC Recovery</td>
<td>JCLPDS</td>
</tr>
<tr>
<td>FABPIC</td>
<td>IC function</td>
<td>PROC</td>
</tr>
</tbody>
</table>
13-Updating IMS Index Builder sample members

You can update the IMS Index Builder SIIUCNTL and SIIUPROC members.

You can create or modify the required IIUBSRT procedure in the SIIUPROC library, and you can modify the optional sample JCL members in SIIUCNTL to help you perform various IMS Index Builder functions.

The following table lists the sample members that are used to run IMS Index Builder:

<table>
<thead>
<tr>
<th>Sample library</th>
<th>Sample member</th>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIIUPROC</td>
<td>IIUBSRT</td>
<td>Required sort address space procedure</td>
<td>PROC</td>
</tr>
<tr>
<td>SIIUCNTL</td>
<td>IIUSMP01</td>
<td>Build all indexes by using IBSCAN</td>
<td>JCL</td>
</tr>
<tr>
<td></td>
<td>IIUSMP02</td>
<td>Build a selected secondary index by using IBSCAN</td>
<td>JCL</td>
</tr>
<tr>
<td></td>
<td>IIUSMP03</td>
<td>Build a selected secondary index by using DFSURWF1 input</td>
<td>JCL</td>
</tr>
<tr>
<td></td>
<td>IIUSMP04</td>
<td>Build a selected secondary index by using DFSURIDX input</td>
<td>JCL</td>
</tr>
<tr>
<td></td>
<td>IIUSMP05</td>
<td>Build all secondary indexes by using DFSURWF1 input</td>
<td>JCL</td>
</tr>
<tr>
<td></td>
<td>IIUSMP06</td>
<td>Build primary index</td>
<td>JCL</td>
</tr>
<tr>
<td></td>
<td>IIUSMP07</td>
<td>Build primary index by using an alternate primary index</td>
<td>JCL</td>
</tr>
<tr>
<td></td>
<td>IIUSMP08</td>
<td>Build HALDB primary index for a specific partition</td>
<td>JCL</td>
</tr>
<tr>
<td></td>
<td>IIUSMP09</td>
<td>Build HALDB ILDS for a specific partition</td>
<td>JCL</td>
</tr>
<tr>
<td></td>
<td>IIUSMP10</td>
<td>Create the IIURPRMS run time default parameters to be used</td>
<td>JCL</td>
</tr>
<tr>
<td></td>
<td>IIUSMP11</td>
<td>Limited APF authorization JCL</td>
<td>JCL</td>
</tr>
</tbody>
</table>
14-Updating IMS HP Change Accumulation Utility sample members

Create or modify the required IMS High Performance Change Accumulation Utility procedures and skeletons in the SHPCSAMP library. In addition, optional sample JCL members are available to help you perform various IMS High Performance Change Accumulation Utility functions.

The following table lists the sample members that are used to run IMS High Performance Change Accumulation Utility.

<table>
<thead>
<tr>
<th>Sample member</th>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPCSPROC</td>
<td>Execution JCL Method</td>
<td>PROC</td>
</tr>
<tr>
<td>HPCSSTC</td>
<td>Started Task Method</td>
<td>PROC</td>
</tr>
<tr>
<td>HPCPVERS</td>
<td>ISPF panel used to invoke IMS High Performance Change Accumulation Utility</td>
<td>PANEL</td>
</tr>
<tr>
<td>HPCSBAT0</td>
<td>Two-Step Batch Process</td>
<td>JCL</td>
</tr>
<tr>
<td>HPCSDIAG</td>
<td>Diagnostics input control file</td>
<td>Config</td>
</tr>
<tr>
<td>HPCSJOB</td>
<td>Standard procedure method sample JCL</td>
<td>JCL</td>
</tr>
<tr>
<td>HPCSMAIN</td>
<td>Extended batch process JCL</td>
<td>JCL</td>
</tr>
<tr>
<td>HPCSYSIN</td>
<td>Input control statement file</td>
<td></td>
</tr>
<tr>
<td>HPCSPASS</td>
<td>Independent DBRC JCL</td>
<td>JCL</td>
</tr>
<tr>
<td>HPCCAJCL</td>
<td>Skeleton JCL member used by the IMS High Performance Change Accumulation Utility main address space</td>
<td>JCL</td>
</tr>
</tbody>
</table>
15-Verifying IMS Online System initialization

Modifications are required in all the IMS subsystems that use IMS Tools Generic Exits, IMS Tools Online System Interface, and the Recovery Point Create (RPCR) feature. You must ensure that each online system is recycled with the required changes. A successful initialization is indicated by a series of messages.

The following sections contain examples of messages that you should see for each component and product.

IMS Tools Generic Exits initialization

If IMS Tools Generic Exits have been successfully installed in all the IMS control regions that use this interface, the following "GPR" messages will be issued in those IMS control regions:

GPR2926I IMS Tools Generic Partner Exit INITIALIZATION IN PROGRESS
GPR2926I PROCESSING PROCLIB MEMBER GPROPT0 imsii
GPR2926I PROCESSING PROCLIB MEMBER GPRimsi0 imsii
GPR2926I IMS Tools Generic Partner Exit INITIALIZATION COMPLETE

IMS Tools Online System Interface initialization

If the IMS Tools Online System Interface has been successfully installed in all IMS control regions that use this interface, the following messages will be issued in those control regions:

DFS0578I - READ SUCCESSFUL FOR DDNAME PROCLIB MEMBER = FOIimsiiP
FOI100I TOOLS ONLINE INTERFACE ENABLED; XCF GROUP=TOIxcfgr imsii

After these messages are issued, verify that your group names were configured properly:

• Ensure that the XCF GROUP= group name is the same name that is specified in the various tools that you have already configured.
• Ensure that all IMS subsystems that are supposed to be in the same group all have the same XCF GROUP= group name.

Recovery Point Create initialization

If the Recovery Point Create feature has been successfully installed in all the IMS control regions that use this product, the following "IRO" messages will be issued in those control regions:

IRO8100I Recovery Point Create initialization for imsii completed
16-Verifying the installation

After completing all the installation requirements, run the installation verification (IVP) jobs for each product in IMS Recovery Solution Pack.

These jobs verify that all installation tasks have been completed successfully and the IMS Recovery Solution Pack products are ready to use. You must have your modified IMS Online Systems active for all IVPs to work successfully.

The following table contains sample members for all IVP jobs. Edit each member by following the instructions within each member then run the jobs.

<table>
<thead>
<tr>
<th>IVP Member</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRXIVPD1</td>
<td>IMS Database Recovery Facility and IMS Tools Online System Interface</td>
</tr>
<tr>
<td>FRXIVPR1</td>
<td>IMS Database Recovery Facility Extended Functions and IMS Tools Online System Interface</td>
</tr>
<tr>
<td>FRXIVPC1</td>
<td>IMS High Performance Change Accumulation Utility</td>
</tr>
<tr>
<td>FRXIVPC2</td>
<td>IMS High Performance Change Accumulation Utility</td>
</tr>
<tr>
<td>FRXIVPC3</td>
<td>IMS High Performance Change Accumulation Utility</td>
</tr>
<tr>
<td>FRXIVPC4</td>
<td>IMS High Performance Change Accumulation Utility</td>
</tr>
<tr>
<td>FRXIVPI1</td>
<td>IMS High Performance Image Copy and IMS Tools Online System Interface</td>
</tr>
<tr>
<td>FRXIVPX1</td>
<td>IMS Index Builder</td>
</tr>
<tr>
<td>FRXIVPT1</td>
<td>IMS Tools Online System Interface</td>
</tr>
</tbody>
</table>
Chapter 5. Troubleshooting

Use these topics to diagnose and correct problems that you experience with IMS Recovery Solution Pack.

Topics:

- “How to look up message explanations” on page 64
- “Gathering diagnostic information” on page 65
How to look up message explanations

You can use several methods to search for messages and codes.

**Searching for messages on the web**

You can use any of the popular search engines that are available on the web to search for message explanations. When you type the specific message number or code into the search engine, you are presented with links to the message information in IBM Knowledge Center.
Gathering diagnostic information

Before you report a problem with IMS Recovery Solution Pack to IBM Software Support, you need to gather the appropriate diagnostic information.

Procedure

Provide the following information for all IMS Recovery Solution Pack problems:

- A clear description of the problem and the steps that are required to re-create the problem
- All messages that were issued as a result of the problem
- 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

Provide additional information based on the type of problem that you experienced:

For online abends, provide the following information:

- A screen capture 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 in batch processing, provide the following information:

- The complete job log
- Print output
- Contents of the data sets that were used during the processing
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