

IBM Db2 Analytics Accelerator for z/OS
Version 7.1.5

Stored Procedures Reference



Note

Before you use this information and the product it supports, read the information in “Notices” on page 239.

Sixth Edition, December 2018

This edition applies to version 7.1.5 of IBM Db2 Analytics Accelerator for z/OS (product number 5697-DA7), and to all subsequent releases and modifications until otherwise indicated in new editions. This edition replaces SH12-7084-04. Changes to this edition are marked with a vertical bar.

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About this book

This book provides information about the following subjects:

- Stored procedures of IBM® Db2® Analytics Accelerator for z/OS®
- Error handling
- Using client applications or batch processes to run these stored procedures
- Messages about errors and warnings that might be displayed as a result of running these stored procedures

Who should read this book?

This book is intended for Db2 for z/OS administrators, z/OS administrators, and application programmers who are entrusted with the following tasks:

- Running IBM Db2 Analytics Accelerator stored procedures to define and update tables as well as administer accelerators
- Operating Db2 for z/OS with an accelerator running on an IBM Integrated Analytics System or with Db2 Analytics Accelerator on Z
- User rights management with regard to the stored procedures for IBM Db2 Analytics Accelerator for z/OS
- Recovery from errors caused by these stored procedures

What's new in version 7?

IBM Db2 Analytics Accelerator for z/OS Version 7.1.0 is a newly designed product rather than a major upgrade. It runs on different, more powerful hardware, which allows unprecedented acceleration rates. It also comes with a new deployment option, which does not require external hardware, but runs exclusively in a dedicated LPAR on your existing IBM Z hardware.

- Common Db2 in-memory, columnar SQL engine with BLU acceleration and SQL compatibility improvements, for example:
 - Native support for the EBCDIC MBCS and GRAPHIC data types (instead of a conversion to UTF-8 as in earlier versions)
 - Acceleration of all types of correlated sub-queries (only small subset was offloaded in version 5), including table expressions with sideways references
 - Support for timestamps of precision 12 (these were truncated to precision 6 in earlier versions)
 - Native support for the FOR BIT DATA subtype, for all types of table encoding (EBCDIC, UNICODE, ASCII). This was available for EBCDIC only in earlier versions).
 - Native support for the TIMESTAMP value 24:00:00 (this was mapped to 23:59:59 in earlier versions)
 - Improved support for scalar functions that were previously not offloaded when applied to certain data types
 - Support for MIN, MAX, DAY, LAST_DAY, BIT*, TIMESTAMP_ISO, VARIANCE, and STDDEV with the UNIQUE clause
 - Support for the HEX function
 - Improved support for tables in mixed encoding
 - EBCDIC tables can be added to accelerator even if UNICODE tables are already present
 - Better time synchronization through use of system heartbeat
 - Improved accuracy for CURRENT_TIME, CURRENT_TIMESTAMP, and CURRENT_DATE special registers
- Smart Load, meaning that the SYSPROC.ACCEL_LOAD_TABLES stored procedures optimize the workload and the degree of parallelism for load jobs.
- New software update approach: Updates for the accelerator are not part of the z/OS installation package, but can be downloaded individually from IBM FixCentral, which significantly reduces the installation effort.
- New and changed stored procedures and interfaces:
 - SYSPROC.ACCEL_UPDATE_SOFTWARE2 replaces SYSPROC.ACCEL_UPDATE_SOFTWARE
 - The GetActivationLog sub-function extends SYSPROC.ACCEL_CONTROL_SYSPROC.ACCELERATOR, which allows you to monitor software activations.
 - New monitoring interface extensions for query details
 - SYSPROC.ACCEL_GET_QUERIES2 extends the SYSPROC.ACCEL_GET_QUERIES interface by returning query statements in a result set rather than in an output parameter of limited size. Query statements in the result set are not truncated if they exceed 128 bytes in length.

- SYSPROC.ACCEL_GET_QUERY_DETAILS2 retrieves query plan information from the remote database management system in separate result sets. The information is not combined with the query text anymore.
- SYSPROC.ACCEL_GET_QUERY_EXPLAIN returns the Db2 EXPLAIN information in a compressed, base64-encoded format.
- The following stored procedures can write IFCID392 audit traces:
SYSPROC.ACCEL_ADD_TABLES, SYSPROC.ACCEL_ALTER_TABLES,
SYSPROC.ACCEL_REMOVE_TABLES

Enhancements in version 7.1.5

See the release notes.

Enhancements in version 7.1.4

See the release notes.

Enhancements in version 7.1.3

See the release notes.

Enhancements in version 7.1.2

See the release notes.

Enhancements in version 7.1.1

See the release notes.

Stored procedures

IBM Db2 Analytics Accelerator for z/OS stored procedures are the administration interface for your accelerators. When you invoke a function from IBM Db2 Analytics Accelerator Studio, the corresponding stored procedure is called. In addition, IBM Db2 Analytics Accelerator for z/OS stored procedures can be run from the command line or be embedded in custom applications. The stored procedures provide functions that are related to tables and accelerators. All stored procedures commit the transactions that were triggered by the calling applications. The IBM Db2 Analytics Accelerator for z/OS stored procedures are presented here in alphabetical order.

The installation of the stored procedures is described in the *IBM Db2 Analytics Accelerator for z/OS: Installation Guide*.

“SYSPROC.ACCEL_ADD_ACCELERATOR2”
“SYSPROC.ACCEL_ADD_TABLES” on page 4
“SYSPROC.ACCEL_ALTER_TABLES” on page 7
“SYSPROC.ACCEL_CONTROL_ACCELERATOR” on page 10
“SYSPROC.ACCEL_GET_QUERIES” on page 19
“SYSPROC.ACCEL_GET_QUERIES2” on page 21
“SYSPROC.ACCEL_GET_QUERY_DETAILS” on page 22
“SYSPROC.ACCEL_GET_QUERY_DETAILS2” on page 24
“SYSPROC.ACCEL_GET_QUERY_EXPLAIN” on page 27
“SYSPROC.ACCEL_GET_TABLES_DETAILS” on page 28
“SYSPROC.ACCEL_GET_TABLES_INFO” on page 33
“SYSPROC.ACCEL_LOAD_TABLES” on page 38
“SYSPROC.ACCEL_REMOVE_ACCELERATOR” on page 49
“SYSPROC.ACCEL_REMOVE_TABLES” on page 50
“SYSPROC.ACCEL_SET_TABLES_ACCELERATION” on page 53
“SYSPROC.ACCEL_SET_TABLES_REPLICATION” on page 55
“SYSPROC.ACCEL_TEST_CONNECTION” on page 58
“SYSPROC.ACCEL_UPDATE_CREDENTIALS” on page 65
“SYSPROC.ACCEL_UPDATE_SOFTWARE2” on page 66
“The message parameter” on page 71
“Running stored procedures from a batch job” on page 72

Related information:



IBM DB2 Analytics Accelerator for z/OS: Installation Guide

SYSPROC.ACCEL_ADD_ACCELERATOR2

The stored procedure associates an accelerator with a Db2 subsystem or Db2 data-sharing group. The process is called pairing and is a mandatory configuration step; without it, an accelerator cannot be used.

Details

This stored procedure requires a valid pairing code that you need to provide as an input value. You obtain this code by using the IBM Db2 Analytics Accelerator Console. The process is described in the topic *Obtaining the pairing code for accelerator authentication* in the *IBM Db2 Analytics Accelerator Studio: User's Guide*. The pairing code can be valid for a period of up to 24 hours. Its use is not restricted to a particular Db2 subsystem. It is therefore valid only for the first SYSPROC.ACCEL_ADD_ACCELERATOR2 call after its creation, and is invalidated after this call even if the stored procedure did not run successfully.

A successful run of the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure results in the creation of an authentication token. This token is stored in a system table of the associated Db2 subsystem. For each IP address and port combination, there can be only one accelerator. The stored procedure refuses duplicate definitions. If the accelerator already contains data that is related to a Db2 subsystem or data sharing group and if this data is associated with the same location name, then this data is deleted during the stored-procedure run. The removal of old data ensures that a newly added accelerator is always “clean”.

Attention: If you restore a backup of the Db2 catalog that does not contain the most recent authentication token for an accelerator, the data on the accelerator becomes orphaned. The data cannot be recovered because a renewed pairing process will delete it.

Syntax

```
CALL SYSPROC.ACCEL_ADD_ACCELERATOR2
(accelerator_name,
 ip_address,
 port,
 pin,
 location,
 options,
 message);
```

Options description

accelerator_name

The name of the accelerator. The following restrictions are in place for this name:

- It must be unique within the Db2 subsystem or data sharing group.
- It must not consist of more than eight characters.
- Allowed characters are A-Z, 0-9.

The SYSACCEL.SYSACCELERATORS table contains the names of accelerators that are already defined.

ip_address

The IP address (IPv4 or IPv6) or DNS name of the virtual LAN (VLAN) that routes the network traffic to your accelerator.

port

The DRDA communication port of the chosen VLAN, that is, the numeric port or symbolic service that the VLAN uses to listen to requests.

pin

A four-digit number of temporary validity that you generate by using the IBM Db2 Analytics Accelerator Console.

location

The unique name of the accelerator in the SYSIBM.LOCATIONS table. If you do not specify a location name (value NULL), the value of *accelerator_name* is used.

Important:

- The name must not be listed in the SYSIBM.LOCATIONS table of the Db2 communications database for a remote location.
- The name must not consist of more than eight characters.
- Allowed characters are A-Z, 0-9.

options

An additional XML string that will allow you to specify options for the pairing process in future releases. Currently, you need not set this parameter.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with the result set. The result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Prerequisites

- For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF®).
- The name that you use as the value of the *accelerator_name* parameter must not pre-exist in the Db2 for z/OS catalog table SYSACCEL.SYSACCELERATEDTABLES.
- The location names of Db2 subsystems or data sharing groups that use the same accelerator must be unique and stable. To display the location name of a Db2 subsystem or data sharing group, run the following query:

```
SELECT CURRENT SERVER FROM SYSIBM.SYSDUMMYU
```

Important: If you must change a location name, first remove the accelerator by using the SYSPROC.ACCEL_REMOVE_ACCELERATOR stored procedure. After changing the name, redefine the accelerator.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 authorization
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure

- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Accessed data and systems

Each time you add an accelerator, the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure inserts a row in the SYSACCEL.SYSACCELERATORS catalog table in Db2 for z/OS. In addition, rows are inserted in the following tables of the Db2 communication database:

- SYSIBM.LOCATIONS
- SYSIBM.IPNAMES
- SYSIBM.USERNAMES

On the accelerator, the stored procedure permanently saves the authentication token, which is generated as a result of the pairing operation. It also creates the data structures that the Db2 subsystem requires for using the accelerator.

Related reference:

“The message parameter” on page 71

Appendix D, “Transcript of the SAQTSAMP(AQTSXSD1) data set member,” on page 169

Related information:

“AQT10402E” on page 110

SYSPROC.ACCEL_ADD_TABLES

Defines accelerator-shadow tables. The input consists of a list of existing Db2 for z/OS tables, which serve as the basis. The stored procedure is not suitable for creating accelerator-only tables.

Details

The accelerator-shadow tables are populated in a later step by the SYSPROC.ACCEL_LOAD_TABLES stored procedure. This later step provides the data that allows you to run accelerated queries.

In addition, the SYSPROC.ACCEL_ADD_TABLES stored procedure acknowledges the existence of the accelerator-shadow tables by writing corresponding entries to the SYSIBM.SYSACCELERATEDTABLES catalog table in Db2 for z/OS. Using the entries in this catalog table, Db2 for z/OS “knows” which queries it can route to an accelerator.

Each accelerator-shadow table will first be in *InitialLoadPending* state. This state indicates that you must load such a table with data and enable it before you can run accelerated queries against it.

Note: Tables or table columns that contain an edit procedure (EDITPROC) call are supported.

Restrictions

A table column is ignored, that is, not included in the definition of the accelerator-shadow table if one of the following conditions applies:

- The column uses a field procedure, that is, its value in the FLDPROC column of the SYSCOLUMNS table is 'Y'.
- The column uses the AS SECURITY LABEL attribute, that is, its value in the DEFAULT column of the SYSCOLUMNS table is 'L'.
- The data type of the column is not in the following list:
 - BIGINT
 - CHAR
 - DATE
 - DECIMAL
 - DOUBLE
 - FLOAT
 - GRAPHIC
 - INTEGER
 - REAL
 - SMALLINT
 - TIME
 - TIMESTAMP
 - VARCHAR
 - VARGRAPHIC
- Column-level access control is defined for the column, that is, SYSCOLUMNS(CONTROL_ID) is set to a value other than 0.

An accelerator-shadow table cannot be defined if one of the following conditions applies:

- The table is an accelerator-only table. These tables are created by the SQL statement CREATE TABLE ... IN ACCELERATOR. Because they already exist on an accelerator, they cannot be defined by this stored procedure. The stored procedure therefore fails if it encounters an accelerator-only table.
- The table is neither a base table, nor a *DB archive table*, that is, its value in the TYPE column of the SYSTABLES table is not 'T' or 'R'.
- The table uses a row-level security label, that is, its value in the SECURITY_LABEL column of the SYSTABLES table is 'R'.
- None of the table columns qualifies for query routing to an accelerator.
- Row-level access control is defined for the table, that is, its value in the CONTROL column of the SYSTABLES table is 'R' or 'B'.
- The table space of the table is encoded in single-byte EBCDIC or in ASCII and the CCSID is not supported by the accelerator.
- The table contains columns that use CCSID 1200 or CCSID 1208, but the corresponding table space is not encoded in UNICODE.
Queries against such tables cannot be routed to an accelerator because they would be queries in a mixed encoding, which is not supported.
- The length of one or more rows in the table exceeds the allowed maximum on the accelerator. This can happen if the table has two or more long columns of the data type VARCHAR FOR MIXED DATA.

Furthermore, if a table in the Db2 subsystem contains one or more columns of the type VARGRAPHIC or VARCHAR, and some of the column values exceed 16296 (VARGRAPHIC) or 16762 (VARCHAR) characters in length, the overlong values are truncated. Truncation also occurs under these conditions with VARCHAR FOR SBCS DATA columns encoded in UNICODE. The truncation increases the likelihood for deviating results. Warning AQT10086W is issued in cases like this.

Syntax

```
CALL SYSPROC.ACCEL_ADD_TABLES  
(accelerator_name,  
table_specifications,  
message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

table_specifications

An XML input string that lists the accelerator-shadow tables to be defined. This string must conform to the structure of the tableSpecifications element in the SAQTSAMP(AQTSXSD1) data set.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>  
<aqt:tableSpecifications xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"  
  version="1.0">  
  <table name="SALES" schema="BCKE">  
    <distributionKey>  
      <column name="STOREID" />  
      <column name="PRODUCTID" />  
    </distributionKey>  
  </table>  
  <table name="PRODUCT" schema="BCKE" /> <!-- sub-elements are optional -->  
</aqt:tableSpecifications>
```

This sample XML string defines the tables SALES and PRODUCT on the specified accelerator. Both tables belong to the BCKE schema. For the SALES table, a distribution key is selected, which consists of the STOREID and PRODUCTID columns. In addition, the CUSTOMERID and ORDERDATE columns are listed as organizing keys for the table. You can define a maximum of four columns in a distribution key. For more information about distribution keys, see *Distribution keys* in the *IBM Db2 Analytics Accelerator Studio: User's Guide*.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with the result set. The result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Prerequisites

- For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).
- The *accelerator_name* parameter must specify an accelerator name that is listed in the catalog tables of the product.
- The table names that you specify must exist in Db2 for z/OS.
- Accelerator-shadow tables must not yet exist for these tables.
- A table name must not appear more than once in the table specification.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 (needed for calling ADMIN_INFO_SYSPARM from the procedure)
- Authorization to run ADMIN_INFO_SYSPARM so that ZPARMs can be retrieved.
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Accessed data and systems

This stored procedure inserts a row in the IBM Db2 Analytics Accelerator catalog table SYSACCEL.SYSACCELERATEDTABLES in Db2 for z/OS. On the accelerator, it updates the IBM Db2 Analytics Accelerator catalog. If the accelerator does not yet contain tables, SYSPROC.ACCEL_ADD_TABLES creates a dashDB® database for the corresponding Db2 subsystem.

Results

After a successful run of the SYSPROC.ACCEL_ADD_TABLES stored procedure, you find the specified shadow tables on the accelerator, in *InitialLoadPending* state. For the various table states, refer to *Table states* in the *IBM Db2 Analytics Accelerator for z/OS: User's Guide*.

Related reference:

"The message parameter" on page 71

Appendix D, "Transcript of the SAQTSAMP(AQTSXSD1) data set member," on page 169

Appendix A, "Environment variables," on page 155

Related information:

"AQT10402E" on page 110

SYSPROC.ACCEL_ALTER_TABLES

Changes the distribution key or organizing keys for a table or a set of tables, including accelerator-only tables.

Details

To change the distribution key or organizing keys, a table on the accelerator must be in one of the following states:

- *InitialLoadPending*
- *Error*
- *Loaded*
- *Operational* (accelerator-only tables only)

In other words, do not call the procedure while a load operation or another ALTER TABLE operation is running on any of the tables in the specified set. To avoid interference with other ALTER TABLE and load operations, the *SchemaModificationInProgress* state is assigned to the tables in the set while SYSPROC.ACCEL_ALTER_TABLES is running.

After a successful completion, the tables are set to their previous states. If an error occurs during processing, the affected table is set to the *Error* state and the stored procedure returns an error message. Changes are not rolled back for already altered tables, and processing does not continue for the remaining tables. However, you can rerun the stored procedure with the same input after fixing the error.

Old keys remain valid until SYSPROC.ACCEL_ALTER_TABLES has run to completion. During an operation, the tables in the set can be queried as usual. Even concurrent queries are allowed.

The data types that can be used in distribution key columns are limited. Not all data types are supported. For more information, see *Specifying or changing a distribution key* in the *IBM Db2 Analytics Accelerator Studio: User's Guide*.

You can set or change a distribution key or organizing key for accelerator-only tables to speed up SELECT and INSERT FROM SELECT on these tables. A key change can succeed only if the table creation has been committed.

Syntax

```
CALL SYSPROC.ACCEL_ALTER_TABLES
(accelerator_name,
table_alter_specification,
message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

table_alter_specification

Specifies an XML input document that lists the tables or partitions to be updated. Any table on the accelerator that is not listed in the input XML document will not be updated.

Not only do you have to specify the keys that you want to add or change, but also those that you want to keep. Otherwise, the existing keys are removed. Also bear in mind that the key specification as a whole must differ from the existing specification. Else no action is taken on the corresponding tables in the list.

The XML content must conform to the structure of the *tableSpecifications* element in the SAQTSAMP(AQTSXSD1) data set. For information on how to specify the input XML string, follow the link to the element content in the appendix at the end of this topic.

To speed up query processing, you can specify a unique constraint (column or index with unique values) to be used internally. A unique constraint is

selectable if it was defined at the time the table was added. For details, see the description of the SYSPROC.ACCEL_ADD_TABLES stored procedure. To retrieve the name of an existing unique constraint, you can run the SYSPROC.ACCEL_GET_TABLES_INFO stored procedure.

Important:

- It is not possible at the moment to change an internal unique constraint once it has been selected.
- If you omit a unique constraint in the specification although such a constraint exists, you actually give instructions to remove the constraint.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with the result set. The result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Prerequisites

- For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).
- The *accelerator_name* parameter must specify an accelerator name that is listed in the catalog tables of the product.
- The tables must exist on the accelerator that the *accelerator_name* parameter specifies.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 (needed so that DSNWLIR can be used to run Db2 commands via the Db2 Instrumentation Facility Interface (IFI)).
- Authorization to run ADMIN_INFO_SYSPARM so that ZPARMs can be retrieved.
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Accessed data and systems

The SYSPROC.ACCEL_ALTER_TABLES stored procedure does not modify data in Db2 for z/OS. On the accelerator, it updates the IBM Db2 Analytics Accelerator

catalog and existing tables in the *Loaded* state.

Related reference:

"The message parameter" on page 71

Appendix D, "Transcript of the SAQTSAMP(AQTSXSD1) data set member," on page 169

Related information:

"AQT10402E" on page 110

SYSPROC.ACCEL_CONTROL_ACCELERATOR

For a particular accelerator, this stored procedure retrieves information about the version of the installed components and their status. This stored procedure offers several functions to control an accelerator. It allows you to set the trace level, reset it to its default, retrieve trace settings, the entire trace content or other information, as well as remove trace data from an accelerator. In addition, by running this stored procedure, you can obtain a list of tasks currently running on the accelerator as well as cancel these tasks.

Syntax

```
CALL SYSPROC.ACCEL_CONTROL_ACCELERATOR
(accelerator_name,
 command,
 result,
 message)
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

command

An XML input string that specifies the functions that you want to use. The string must conform to the structure of the controlCommand element in the SAQTSAMP(AQTSXSD1) data set. The *command* parameter is an input parameter, which is defined as a CLOB with a maximum size of 256 KB.

Each element is linked to a user-defined function, for which access rights can be set individually. This allows you to grant the right to run specific functions of the stored procedure selectively. If a user does not have the right to use a particular element, that is, is not allowed to run the user-defined function invoked by the element, a message similar to this one is returned in the output XML string:

```
<?xml version="1.0" encoding="UTF-8" ?>
<dwa:messageOutput xmlns:dwa="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.0">
  <message severity="error" reason-code="AQT10308I">
    <text>The user-defined function "DSNAQT.ACCEL_CONTROL_GETACCELERATORINFO"
      lacks EXECUTE authority for the caller of the stored procedure
      "SYSPROC.ACCEL_CONTROL_ACCELERATOR".
      This procedure was called with an input parameter value for
      "COMMAND" that requests the execution of the sub-function
      "getAcceleratorInfo".
    </text>
    <description>The requested sub-function within the stored procedure
      requires EXECUTE authorization on a separate user-defined function
      in Db2.
    </description>
    <action>Grant EXECUTE authority for the user-defined function to the
```

```

        caller of the stored procedure.
    </action>
</message>
</dwa:messageOutput>

```

XML Elements that can be used in the *command* parameter:

<cancelTasks>

Allows you to cancel a task that is running on the accelerator. The function requires the task ID as input. Provide the task ID in the <cancelTasks> element.

Example:

```

<?xml version="1.0" encoding="UTF-8" ?>
<aqt:controlCommand xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
version="1.0">
  <cancelTasks>
    <task id="24" />
  </cancelTasks>
</aqt:controlCommand>

```

<clearTraceData>

Deprecated. It can still be run to avoid compatibility issues with product version 5.1.0, but has no effect in connection with product version 7.1.0. In version 5.1.0, this sub-function is used to remove trace data from the accelerator, such that the result of the next <getTrace> request does not contain previously collected data. The following files are removed:

- Trace files (because new trace files are created)
- Core dumps

Example:

```

<?xml version="1.0" encoding="UTF-8" ?>
<aqttables:controlCommand
xmlns:aqttables="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.2" >

  <clearTraceData/>

</aqttables:controlCommand>

```

<getAcceleratorInfo>

Retrieves status information about the accelerator. This information includes software version numbers and accelerator state information. You can also set an optional attribute, includeEncryptionInfo = "true", which will include information about the encryption of data in motion. The information that is returned by the *result* output parameter is included in an XML element called acceleratorInfo, which is a child element of the root element controlResult. For more information, follow the link to the AQT SXSD1 data set at the end of this topic.

Example:

```

<?xml version="1.0" encoding="UTF-8" ?>
<aqttables:controlCommand
xmlns:aqttables="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.4" >

  <getAcceleratorInfo includeEncryptionInfo = "true" />

</aqttables:controlCommand>

```

The output looks similar to the XML block in the following example:

```

<?xml version="1.0" encoding="UTF-8" ?>
<aqt:controlResult
xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">

```

```

<acceleratorInfo state="Online"
authenticationTokenTimestamp="2017-11-24T08:39:40.545249Z"
currentAcceleratorTimestamp="2017-11-24T08:44:35.196719Z"
activeTraceProfile="DEFAULT" >

  <versionInformation>
    <component name="Accelerator" version="7.1.0.201711241547" />
    <component name="Accelerator container"
      version="ibmdashdb/local:v2.0.0-20171124-2243" />
    <component name="Access Server" version="11.4.10204" />
    <component name="Appliance software"
      version="1.0.0.0 [Build 20171124154706]" />
    <component name="BackendDBS" version="11.1.9.0
      [Build 1724041600]" />
    <component name="Linux Operating System"
      version="CentOS Linux release 7.2.1511 (AltArch)" />
    <component name="Replication BackendDBS JDBC Version" version="" />
    <component name="Replication DB2 JDBC Version" version="" />
    <component name="Replication Engine" version="11.4.0.Head_5432" />
  </versionInformation>

  <acceleratorSetting name="ENCRYPTION_AT_REST" value="enabled" />
  <acceleratorSetting name="ENCRYPTION_IN_MOTION" value="enabled" />
  <acceleratorSetting
    name="ENCRYPTION_IN_MOTION_CERTIFICATE_LIFETIME" value="90" />

  <acceleratorSetting name="MAX_NUM_CONCURRENT_RUNNING_QUERIES"
    value="100" />
  <acceleratorSetting name="SERIAL_NUMBER" value="4284629" />
  <acceleratorSetting name="SOFTWARE_UPDATE_APPLY" value="enabled" />
  <acceleratorSetting name="SOFTWARE_UPDATE_DEPLOY" value="enabled" />
  <acceleratorSetting name="SOFTWARE_UPDATE_LIST_DEPLOYED"
    value="enabled" />
  <acceleratorSetting name="SOFTWARE_UPDATE_REMOVE_DEPLOYED"
    value="enabled" />
  <acceleratorSetting name="LAST_REPLICATED_CHANGE_TIMESTAMP"
    value="2018-03-07 02:46:57.045000" />
  <acceleratorSetting name="REPLICATION_SUBSCRIPTION_NAME"
    value="DWAS45UY" />

  <replicationInfo state="STARTED"
    lastChangeTimestamp="2016-09-30T23:45:00.123456"
    latencyInSeconds="60">
    <sourceAgent insertCount="1" updateCount="2" deleteCount="3" />
    <targetAgent insertCount="11" updateCount="21" deleteCount="31"
      spilledRows="1234" spilledRowsApplied="234"/>
  </replicationInfo>

  <encryptionInformation>
    <encryptionOfDataInMotion>
      <certificates></certificates>
      <peers></peers>
    </encryptionOfDataInMotion>
  </encryptionInformation>

</acceleratorInfo>
</aqt:controlResult>

```

Notes:

- Naturally, the setting of the includeEncryptionInfo attribute can have an effect only if encryption of data in motion is enabled.
- The <replicationInfo> block is shown only if the incremental update function is enabled.

- The `lastChangeTimestamp` attribute in the `<replicationInfo>` block shows the last time that the incremental update status changed from *Started* to *Stopped* or vice versa.

<getAcceleratorTasks>

Retrieves a list of the tasks that are running on the accelerator. This information, especially the task IDs, can be used to cancel specific tasks. The information that is returned by the *result* output parameter is included in an XML element called `acceleratorTasks`, which is a child element of the root element `controlResult`. For more information, follow the link to the AQTSXSD1 data set at the end of this topic.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:controlCommand xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.2">
  <getAcceleratorTasks/>
</aqt:controlCommand>
```

<getActivationLog>

Retrieves information about previous software activations by the `SYSPROC.ACCEL_UPDATE_SOFTWARE2` stored procedure (`ActivateDeployedPackage` subcommand).

Software updates are usually activated asynchronously, that is, after the completion of the `SYSPROC.ACCEL_UPDATE_SOFTWARE2` stored procedure. If the accelerator can be reached after the update, but is not yet capable of performing all administration and query tasks, this subcommand allows you to have a look at the activation progress.

The input XML code must conform to the structure of the `controlCommand` element in the SAQTSAMP(AQTSXSD1) data set. The `<getActivationLog>` element must be specified. See the following example:

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:controlCommand
  xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">
  <getActivationLog />
</aqt:controlCommand>
```

<getReplicationEvents fromTimestamp="yyyy-mm-ddThh:mm:ss.μμμμμZ" toTimestamp="yyyy-mm-ddThh:mm:ss.μμμμμZ" minSeverity="INFORMATION">

Creates a report consisting of log information that was collected during incremental update activities. You can restrict the information to be returned by defining a timeframe using the `fromTimestamp` and `toTimestamp` attributes or by specifying the minimum severity of the information using the `minSeverity` attribute. This attribute can take on the following values (sorted by restrictiveness; most restrictive value first):

ERROR

All information whose severity is classed as *Error* or worse

WARNING

All information whose severity is classed as *Warning* or worse

INFORMATION

All information whose severity is classed as *Information* or worse

The information that is returned by the *result* output parameter is included in an XML element called `replicationEvents`, which is a child

element of the root element `controlResult`. For more information, follow the link to the AQT SXSD1 data set at the end of this topic.

Example: The output looks similar to this block of XML code:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:controlResult xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.1">
  <replicationEvents>
    <event id="123456" message="Something went terribly wrong.
      I'll cancel the subscription." originator="SourceAgent"
      time="2011-01-11T10:33:42.487678Z" severity="ERROR" />
    <event id="123453" message="Start the subscription 0815 now"
      originator="TargetAgent" time="2011-01-09T08:21:42.487678Z"
      severity="INFO" />
  </replicationEvents>
</aqt:controlResult>
```

<getTraceConfig>

Retrieves information about the trace configuration from the accelerator. This information includes:

- The currently active trace profile
- A list of all available trace profiles

The information that is returned by the *result* output parameter is included in an XML element called `traceConfig`, which is a child element of the root element `controlResult`. For more information, follow the link to the AQT SXSD1 data set at the end of this topic.

<getTraceData>

Retrieves diagnostic information for IBM support from the specified accelerator:

This information does not include trace information about stored procedures. Tracing for stored procedures is controlled by the *message INOUT* parameter.

The `<content>` element in the `<getTraceData>` element allows you to include or exclude certain types of information. The following values are supported:

Table 1. Possible values of the <content> element

Value	Description
ACCELERATOR	Collects accelerator and SQL engine logs, along with system diagnostics from the Docker container in which IBM Db2 Analytics Accelerator and the SQL engine run.
APPLIANCE	Collects system diagnostics from the physical environment of the Docker container, that is, the IBM Integrated Analytics System or the Secure Service Container LPAR for Db2 Analytics Accelerator on Z.

Example A: In the following example, the `<getTraceData>` element causes IBM Db2 Analytics Accelerator to return trace information for both, `ACCELERATOR` and `APPLIANCE`, in a result set:


```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:controlCommand xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
version="1.0">
  <getTraceData keepConfiguration="true">
    <content>ACCELERATOR</content>
    <content>APPLIANCE</content>
  </getTraceData>
</aqt:controlCommand>
```

Example B: This example uses the `<getTraceData>` element in the XML string submitted as the value of the *command* parameter and the `<trace>` element in the XML string submitted as the value of the *message* input parameter. The aim is to generate two result sets, one containing trace information about IBM Db2 Analytics Accelerator and the SQL engine, the other one containing trace information about the stored procedures:

XML string for the *command* parameter:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:controlCommand xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
version="1.0">
  <getTraceData keepConfiguration="true">
    <content>ACCELERATOR</content>
  </getTraceData>
</aqt:controlCommand>
```

XML string for the *message* input parameter:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:messageControl
xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">

  <traceConfig>
    <component name="PROCEDURE" level="DEBUG" />
  </traceConfig>

</aqt:messageControl>
```

<setTraceConfig>

Allows you to change the trace configuration of the accelerator. Trace profiles determine the accelerator components to be traced and the trace detail level. They also determine the approximate size of the compressed trace data when this data is gathered by the `getTraceData` function. Furthermore, a profile determines whether a trace record is immediately written to disk (flush) or if it is cached in memory for better performance. Trace profiles can be selected and activated. Furthermore, you can define new profiles and remove existing ones (see examples).

Several trace profiles are preconfigured on the accelerator. You can retrieve available trace profiles by using the `<getTraceConfig/>` element.

Example: The following XML code instructs the `SYSPROC.ACCEL_CONTROL_ACCELERATOR` stored procedure to remove a trace profile named `DEBUG_CONNECTIVITY`, add a new profile with the same name, and activate this new profile. The trace information that is collected by the `DEBUG_CONNECTIVITY` profile has a default verbosity level of `INFO`. The trace-file size is limited to 2 MB. Old trace information will not be overwritten when this limit is reached. When trace information about the `DRDA`, `CONTROLLER`, and `REPLICATION` components is collected, the verbosity level changes to `DEBUG`, which

means that all available information about these components will be collected. In addition, debug information will be collected from the accelerator.

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:controlCommand xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
version="1.0">

  <setTraceConfig>
    <removeTraceProfile name="DEBUG_CONNECTIVITY" />
    <addTraceProfile name="DEBUG_CONNECTIVITY" defaultLevel="INFO"
      traceFileSizeInMB="2" forceRecordFlush="false">
      <description>This is for debugging connectivity problems</description>
      <component name="DRDA" level="DEBUG" />
      <component name="CONTROLLER" level="DEBUG" />
      <component name="REPLICATION" level="DEBUG" />
    </addTraceProfile>
    <activateTraceProfile name="DEBUG_CONNECTIVITY" />
  </setTraceConfig>
</aqt:controlCommand>
```

Important: Using a trace profile other than the DEFAULT profile might lower the performance of the accelerator. Therefore, only use a different profile when instructed to do so by IBM support. Re-enable the DEFAULT profile when the support activities have been completed.

<startReplication/>

Starts the automatic transfer of data changes in Db2 for z/OS tables to the corresponding accelerator-shadow tables, provided that these tables have been enabled for incremental updates.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:controlCommand
xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">

  <startReplication/>

</aqt:controlCommand>
```

<stopReplication/>

Stops incremental updates.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:controlCommand
xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">

  <stopReplication/>

</aqt:controlCommand>
```

<waitForReplication/>

Suspends the execution of the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure until pending incremental updates are applied. These are updates that have been recorded in the DB2[®] log, but not yet propagated to the accelerator at the time that the stored procedure was called. When this option is used, the stored procedure does not return results before the relevant tables are in sync with the DB2 log at the time the stored procedure was called. This ensures that the result data returned by SYSPROC.ACCEL_CONTROL_ACCELERATOR is based on the data

matching this point in time. The incremental update function must have been started for this option to work properly.

You can specify an additional timeout attribute for this element (timeoutInSeconds). This prevents the execution of the stored procedure from being postponed endlessly, but has the adverse affect that you cannot be sure whether all pending updates have been applied. By default, this attribute is set to the value 0. Setting it to a value greater than 0 makes the stored procedure return results when the relevant data has been replicated, or after the passing of the specified period, even if incremental updates have not finished at that time.

Example: The following XML code delays the execution of the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure up to a maximum of ten minutes (600 seconds), which gives the incremental update function ten minutes to finish table synchronization. If the job cannot be completed during this period, the procedure returns results without waiting any longer for the incremental updates to finish.

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:controlCommand
  xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">

  <waitForReplication timeoutInSeconds="600" />

</aqt:controlCommand>
```

result

Status and version information as a result of using the <getAcceleratorInfo> element.

Depending on the input parameter, this output parameter returns the following information:

Table 2. Output returned by result parameter

Input parameter (value of command)	Output
<getTraceConfig/>	Current [®] trace configuration
<getAcceleratorInfo/>	Software version of IBM Db2 Analytics Accelerator for z/OS and internal status
<getAcceleratorTasks/>	List of the tasks running on the specified accelerator.
<getReplicationEvents/>	Report of incremental update activities

This input XML file must conform to the structure of the controlCommand element in the SAQTSAMP(AQTSXSD1) data set. If you do not use any of the input parameters in Table 2, the value of the *result* parameter is NULL.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

This stored procedure returns two result sets. If the sub-function <getTraceData> is used, the first result set contains the trace archive of the accelerator. If the sub-function is not used, the first result set will be empty. Each result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

First result set (ACCELERATOR_TRACE_CURSOR)

The cursor ACCELERATOR_TRACE_CURSOR identifies the first result set.

The information in the TRACEDATA column is used by IBM support for the analysis of error situations. It contains byte-encoded data. If the length of a value exceeds 32698 characters, it is split into multiple result set rows. The rows are concatenated in ascending order of SEQID.

Second result set (SP_TRACE_CURSOR)

The second result is empty or contains trace information about the execution of the stored procedure. It is identified by the cursor SP_TRACE_CURSOR.

The information in the TRACEDATA column is encoded in UTF-8. It is intended for analysis by IBM support. If the length of a value exceeds 32698 characters, it is split into multiple result set rows. The rows are concatenated in ascending order of SEQID.

Prerequisites

- For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).
- The *accelerator_name* parameter must specify an accelerator name that is listed in the catalog tables of the product.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 authorization (needed so that DSNWLIR can be used to run Db2 commands via the Db2 Instrumentation Facility Interface (IFI)).
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure
- If an output file or data-set location is specified:
Write access in RACF to the output data set for trace data or write access to the specified location in the z/OS UNIX file system.
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Accessed data and systems

The SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure reads the catalog tables of IBM Db2 Analytics Accelerator in your database management system.

The trace configuration is changed if you use the following elements that are defined in the controlCommand element of the SAQTSAMP(AQTSXSD1) data set:

- <setTraceConfig>
- <clearTraceData>
- <getTraceData>

In contrast, the trace configuration is not changed if you use the following elements:

- <getTraceConfig>
- <getAcceleratorInfo>

- <getAcceleratorTasks>
- <cancelTasks>

Related reference:

"The message parameter" on page 71

Appendix D, "Transcript of the SAQTSAMP(AQTSXSD1) data set member," on page 169

Related information:

"AQT10402E" on page 110

SYSPROC.ACCEL_GET_QUERIES

Deprecated (needed just for compatibility with product version 5). Wherever possible, use SYSPROC.ACCEL_GET_QUERIES2. The SYSPROC.ACCEL_GET_QUERIES stored procedure returns information about past queries and queries that are currently running on an accelerator. This includes information about queries against accelerator-only tables.

Details

The input XML string allows you to specify filtering conditions, determine the result order, and limit the number of results. Multiple filter conditions can be specified; a result is returned only if all conditions match.

All SQL statements in the resulting XML string are cut off after the first 128 bytes.

The SYSPROC.ACCEL_GET_QUERIES stored procedure returns only the queries that were run on the specified accelerator.

Syntax

```
CALL SYSPROC.ACCEL_GET_QUERIES
  (accelerator_name
   query_selection,
   query_list,
   message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

query_selection

An XML input string containing the filter conditions to be used. The string must conform to the structure of the querySelection element in the SAQTSAMP(AQTSXSD1) data set.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<dwa:querySelection
  xmlns:dwa="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">
  <!-- filter conditions are combined with AND -->
  <filter scope="completed"
    fromTimestamp="2010-01-01T10:45:00Z"
    toTimestamp="2010-01-01T12:45:00Z"
    minElapsedTimeSec="120"
```

```

        minExecutionTimeSec="60"
        user="BJONES" />
    <result order="elapsedTime" maxRows="100"/>
</dwa:querySelection>

```

query_list

An output XML string containing the query information extracted from the accelerator. The structure of this string conforms to that of the `queryList` element in the SAQTSAMP(AQTSXSD1) data set.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with the result set. The result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Prerequisites

- For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).
- The *accelerator_name* parameter must specify an accelerator name that is listed in the catalog tables of the product.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 authorization
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Related reference:

“The message parameter” on page 71

Appendix D, “Transcript of the SAQTSAMP(AQTSXSD1) data set member,” on page 169

Related information:

“AQT10402E” on page 110

SYSPROC.ACCEL_GET_QUERIES2

Replacement for SYSPROC.ACCEL_GET_QUERIES. The stored procedure returns information about past queries and queries that are currently running on an accelerator. This includes information about queries against accelerator-only tables.

Details

The input XML string allows you to specify filtering conditions, determine the result order, and limit the number of results. Multiple filter conditions can be specified; a result is returned only if all conditions match.

In contrast to its predecessor, SYSPROC.ACCEL_GET_QUERIES2 returns all SQL statements in full length.

The SYSPROC.ACCEL_GET_QUERIES2 stored procedure returns only the queries that were run on the specified accelerator.

Syntax

```
CALL SYSPROC.ACCEL_GET_QUERIES2
(accelerator_name
 query_selection,
 message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

query_selection

An XML input string containing the filter conditions to be used. The string must conform to the structure of the querySelection element in the SAQTSAMP(AQTSXSD1) data set.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<dwa:querySelection
  xmlns:dwa="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">
  <!-- filter conditions are combined with AND -->
  <filter scope="completed"
    fromTimestamp="2010-01-01T10:45:00Z"
    toTimestamp="2010-01-01T12:45:00Z"
    minElapsedTimeSec="120"
    minExecutionTimeSec="60"
    user="BJONES" />
  <result order="elapsedTime" maxRows="100"/>
</dwa:querySelection>
```

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure returns two result sets.

First result set (QUERY_INFO_CURSOR)

This result set includes an XML string that contains the query information

that was extracted from the accelerator. The structure of this string conforms to that of the queryList element in the SAQTSAMP(AQTSXSD1) data set.

The result set is identified by a cursor named QUERY_INFO_CURSOR. The result set rows consist of the following columns:

1. SEQID INTEGER
2. QUERYINFO VARCHAR(32698)

The information in the QUERYINFO column is concatenated in ascending order of the values in the SEQID column. The column information is encoded in UTF-8.

Second result set (SP_TRACE_CURSOR)

The second result is empty or contains trace information about the execution of the stored procedure. It is identified by the cursor SP_TRACE_CURSOR.

The information in the TRACEDATA column is encoded in UTF-8. It is intended for analysis by IBM support. If the length of a value exceeds 32698 characters, it is split into multiple result set rows. The rows are concatenated in ascending order of SEQID.

Prerequisites

- For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).
- The *accelerator_name* parameter must specify an accelerator name that is listed in the catalog tables of the product.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 authorization
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Related reference:

"The message parameter" on page 71

Appendix D, "Transcript of the SAQTSAMP(AQTSXSD1) data set member," on page 169

Related information:

"AQT10402E" on page 110

SYSPROC.ACCEL_GET_QUERY_DETAILS

Deprecated (SYSPROC.ACCEL_GET_QUERY_DETAILS2 should be used with product version 7.1.0 or later). Retrieves the details of a past query or a currently running query. The stored procedure was kept for compatibility reasons. This stored procedure also works for queries against accelerator-only tables.

Details

This stored procedure retrieves information about past or active queries from an accelerator. The output is returned in a result set because the amount of data can be quite large. The result set contains the original SQL statement that was processed on the accelerator and internal accelerator information about the query. Unlike most other IBM Db2 Analytics Accelerator for z/OS stored procedures, SYSPROC.ACCEL_GET_QUERY_DETAILS does not return the result in the message output parameter.

This means that the information is stored in a global temporary table in Db2 for z/OS. The global temporary table is created by the following SQL statement during the installation of the stored procedures:

```
CREATE GLOBAL TEMPORARY TABLE DSNAQT.ACCEL_QUERY_INFO  
(SEQID INTEGER, QUERYINFO VARCHAR(32698)) CCSID UNICODE)
```

The result set contains the SQL query code followed by a newline character and the plan text. All information is returned in a single, long VARCHAR string. If the length of this string exceeds 32698 characters, it is split into multiple result-set rows. To create a usable single string, the multiple result-set rows are concatenated in the order of the values in the SEQID column (ascending).

You can enable tracing for the SYSPROC.ACCEL_GET_QUERY_DETAILS stored procedure. If this is done, the trace information is also returned in a result set. Hence you might see two result sets. The first will always contain the query information whereas the second contains the trace information.

Syntax

```
CALL SYSPROC.ACCEL_GET_QUERY_DETAILS  
(accelerator_name,  
 plan_id,  
 message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

plan_id

The identifier (plan ID) of the query that you want to obtain details about. You can run the SYSPROC.ACCEL_GET_QUERIES stored procedure to obtain a list of these identifiers. The plan IDs of past or currently active queries are shown in the *query_list* output XML string.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure returns one or two result sets. Depending on the trace configuration in the *message* input parameter, the second result set might contain trace information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with this result set. It consists of the following columns:

- SEQID of type INTEGER

- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Prerequisites

For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 authorization
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Related reference:

"The message parameter" on page 71

Appendix D, "Transcript of the SAQTSAMP(AQTSXSD1) data set member," on page 169

Related information:

"AQT10402E" on page 110

"AQT10081E" on page 92

"AQT20101E" on page 146

SYSPROC.ACCEL_GET_QUERY_DETAILS2

The stored procedure retrieves the details of a past query or a currently running query. This stored procedure also works for queries against accelerator-only tables.

Details

This stored procedure retrieves information about past or active queries from an accelerator. The output is returned in a result set because the amount of data can be quite large. The result set contains the following information:

- Full SQL statement of the query, as it was routed to the accelerator
- Remote query execution plan in a compressed, base64-encoded format
- The internally used remote query execution plan in textual (db2exfmt) format

Syntax

```
CALL SYSPROC.ACCEL_GET_QUERY_DETAILS2
(accelerator_name,
 plan_id,
 message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

plan_id

The identifier (plan ID) of the query that you want to obtain details about. You can run the SYSPROC.ACCEL_GET_QUERIES2 stored procedure to obtain a list of these identifiers. The plan IDs of past or currently active queries are shown in the output XML string in the first result set of SYSPROC.ACCEL_GET_QUERIES2.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure returns four result sets:

First result set (QUERY_INFO_CURSOR)

This result set contains the original SQL statement. The result set is identified by a cursor named QUERY_INFO_CURSOR. The result set rows consist of the following columns:

1. SEQID INTEGER
2. QUERYINFO VARCHAR(32698)

The information in the QUERYINFO column is concatenated in ascending order of the values in the SEQID column. The column information is encoded in UTF-8.

Example:

Result set QUERY_INFO_CURSOR:

SEQID QUERYINFO

```
-----
0      SELECT '123456789 223456789 323456789 423456789
        523456789 623456789 723456789 823456789 923456789
        A23456789 B23456789 C23456789 D23456789 ', COUNT(*) FROM
        BCKE.TQRNGE2
```

Second result set (QUERY_PLAN_CURSOR)

This result set contains the remote query execution plan in compressed base64 format. The result set is identified by a cursor named QUERY_PLAN_CURSOR. It consists of the following columns:

1. SEQID INTEGER
2. PLAN VARCHAR(32698)

The information in the PLAN column is concatenated in ascending order of the values in the SEQID column. The column information is encoded in UTF-8.

Example:

Result set QUERY_PLAN_CURSOR:

SEQID PLAN

```
-----
0      UEsDBBQACAgIABVhfkoAAAAAAAAAAAAAAAAAAAAAAjAAAAAGFwSW5mb18
        yMDE3XzAzXzMwXzEyXzA4XzQyXzQ5NS5hcGV9WVVGHGzPXdzdfX
        Ho0iKlpcwluLu7U9ytUNx ...
```

Third result set (QUERY_PLANTEXT_CURSOR)

This result set contains the remote query execution plan in textual (db2exfmt) format. The result set is identified by a cursor named QUERY_PLANTEXT_CURSOR. It consists of the following columns:

1. SEQID INTEGER
2. PLAN VARCHAR(32698)

The information in the PLAN column is concatenated in ascending order of the values in the SEQID column. The column information is encoded in UTF-8.

Example:

Result set QUERY_PLANTEXT_CURSOR
SEQID PLAN

```
-----  
0      Connecting to the Database.  
        Db2 Universal Database Version 11.1, 5622-044  
        (c) Copyright IBM Corp. 1991, 2016  
        Licensed Material - Program Property of IBM  
        IBM DATABASE 2 Explain Table Format Tool
```

Fourth result set (SP_TRACE_CURSOR)

The fourth result is empty or contains trace information about the execution of the stored procedure. It is identified by the cursor SP_TRACE_CURSOR.

The information in the TRACEDATA column is encoded in UTF-8. It is intended for analysis by IBM support. If the length of a value exceeds 32698 characters, it is split into multiple result set rows. The rows are concatenated in ascending order of SEQID.

Prerequisites

For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 authorization
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Related reference:

"The message parameter" on page 71

Appendix D, "Transcript of the SAQTSAMP(AQTSXSD1) data set member," on page 169

Related information:

"AQT10402E" on page 110

"AQT10081E" on page 92

"AQT20101E" on page 146

SYSPROC.ACCEL_GET_QUERY_EXPLAIN

Retrieves Db2 EXPLAIN information about a query from an accelerator. This stored procedure also works for queries against accelerator-only tables.

Details

The EXPLAIN information can be used to generate and display an access plan graph for the query, which provides valuable information for query optimization.

To identify a query, the stored procedure checks the entries in DSN_QUERYINFO_TABLE. Make sure that this table exists in your Db2 subsystem before using the stored procedure. For information on how to create this table, see the *IBM Db2 Analytics Accelerator Studio: User's Guide*.

The SYSPROC.ACCEL_GET_QUERY_EXPLAIN stored procedure returns the EXPLAIN information in a result set, in the form of a base64-encoded, compressed archive.

You can enable tracing for the SYSPROC.ACCEL_GET_QUERY_EXPLAIN stored procedure. If this is done, the trace information is also returned in a result set. Hence you might see two result sets. The first will always contain the EXPLAIN information whereas the second contains the trace information.

Syntax

```
CALL SYSPROC.ACCEL_GET_QUERY_EXPLAIN
(query_number
 query_block_number,
 explain_time,
 explain_schema,
 message);
```

Options description

query_number

The number that identifies a query. The specified number must match an entry in the QUERY_NUMBER column of DSN_QUERYINFO_TABLE.

query_block_number

The number identifying the query block of the query.

explain_time

The time when the query was submitted. The specified number must match a timestamp in the EXPLAIN_TIME column of DSN_QUERYINFO_TABLE.

explain_schema

The table schema that DSN_QUERYINFO_TABLE belongs to.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure returns two result sets.

First result set (QUERY_INFO_CURSOR)

This result set includes the remote query execution plan in the format of a base64-encoded compressed archive.

The result set is identified by a cursor named QUERY_INFO_CURSOR. The result set rows consist of the following columns:

1. SEQID INTEGER
2. QUERYINFO VARCHAR(32698)

The information in the QUERYINFO column is concatenated in ascending order of the values in the SEQID column. The column information is encoded in UTF-8.

Second result set (SP_TRACE_CURSOR)

The second result is empty or contains trace information about the execution of the stored procedure. It is identified by the cursor SP_TRACE_CURSOR.

The information in the TRACEDATA column is encoded in UTF-8. It is intended for analysis by IBM support. If the length of a value exceeds 32698 characters, it is split into multiple result set rows. The rows are concatenated in ascending order of SEQID.

Prerequisites

For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 authorization
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

SYSPROC.ACCEL_GET_TABLES_DETAILS

Collects information about a set of tables with regard to data changes (data consistency). The set of tables can include accelerator-only tables.

Details

For tables partitioned by growth or by range, information is returned for each partition of the table. If the table is not partitioned, information is returned for the whole table. The information is returned in a result set.

Syntax

```
CALL SYSPROC.ACCEL_GET_TABLES_DETAILS  
  (accelerator_name,  
   table_set,  
   message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

table_set

A list of the tables that you want to process. The XML string that you specify as input for this parameter must conform to the structure of the tableSet element in the SAQTSAMP(AQTSXSD1) data set.

The tables must be accelerator-shadow tables that were defined by the SYSPROC.ACCEL_ADD_TABLES stored procedure, or accelerator-only tables. The same table name must not appear more than once in the table set.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:tableSet xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.0">
  <table name="SALES" schema="SCHM" />
  <table name="PRODUCT" schema="SCHM" />
</aqt:tableSet>
```

The sample XML code instructs the stored procedure to work on the SALES and PRODUCT tables.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure returns two result sets. Each result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

First result set (TABLES_DETAILS_CURSOR)

The first result set contains details about the detected table changes. It is identified by the cursor TABLES_DETAILS_CURSOR.

The table change information in the TRACEDATA column consists of an XML string. If the length of the string exceeds 32698 characters, it is split into multiple result set rows. The rows are concatenated in ascending order of SEQID.

Second result set (SP_TRACE_CURSOR)

The second result is empty or contains trace information about the execution of the stored procedure. It is identified by the cursor SP_TRACE_CURSOR.

The information in the TRACEDATA column is encoded in UTF-8. It is intended for analysis by IBM support. If the length of a value exceeds 32698 characters, it is split into multiple result set rows. The rows are concatenated in ascending order of SEQID.

Information in the first result set

This is basically change information (accelerator-shadow tables compared with original Db2 tables):

- Timestamp of last update for each table partition.

This information is returned in the `lastLoadTimestamp` attribute of the `changeInformation` element, which is a child element of the `tableSetDetails` element in the `SAQTSAMP(AQTSXSD1)` data set.

- Change category. The following categories exist:

NONE

Data changes did either not occur, or did occur, but information about these cannot be obtained. The changes might be due to an unusual event or error. It is recommended that you manually review the data changes and then reload the accelerator-shadow tables or partitions in question. The marker is mostly set if one of the following events took place:

- The REORG utility was run after the last load and the original table was not updated since then. The REORG utility resets the change indicators in the `SYSIBM.SYSTABLESPACESTATS` table so that changes cannot be detected. It is therefore recommended that you run REORG before you load or reload a table.
- A Db2 table was not modified, but another Db2 table in the same table space was.
- Relevant realtime statistics cannot be found in Db2 for z/OS. This happens, for example, if a table space was restored with the RECOVER utility, but the REORG utility was not run afterwards.

This information is returned in the `category` attribute of the `changeInformation` element, which is a child element of the `tableSetDetails` element in the `SAQTSAMP(AQTSXSD1)` data set.

RELOAD_RECOMMENDED

Data changes occurred that suggest a reload of the accelerator-shadow tables or partitions.

RELOAD_REQUIRED

The table or table partitions are out of sync. A reload is enforced.

UNKNOWN

Data changes occurred, but information about these cannot be obtained. The changes might be due to an unusual event or error. It is recommended that you manually review the data changes and then reload the accelerator-shadow tables or partitions in question. The marker is mostly set if REORG was run on a table space that is partitioned by growth and contains more than one partition. In cases like this, a reload is recommended.

This information is returned in the `category` attribute of the `changeInformation` element, which is a child element of the `tableSetDetails` element in the `SAQTSAMP(AQTSXSD1)` data set.

- Type of the data change (except when the change indicator is `NONE` or `UNKNOWN`). The following types of changes are detected:
 - SQL statements `INSERT`, `UPDATE`, `DELETE`, and `TRUNCATE TABLE`
 - Utility executions `LOAD RESUME`, `LOAD REPLACE` (for both `LOG YES` and `LOG NO`), and `RECOVER`
 - `ADD PARTITION` and `ROTATE PARTITION`
 - Partition boundary changes due to `ALTER TABLE` or `REORG REBALANCE` operations
 - Replacement of table data with data from a clone table (`EXCHANGE DATA` operation)

A corresponding value or indicator is returned in the type attribute of the changeInformation element, which is a child element of the tableSetDetails element in the SAQTSAMP(AQTSXSD1) data set.

If you add a column to a Db2 table or change a column definition, or drop a Db2 table and then re-create it, the corresponding accelerator-shadow table becomes invalid. You must therefore remove it from the accelerator and add it again before you can reload and use it for query acceleration.

- Approximate amount of data to be transferred during a reload in MB (except when the change indicator is UNKNOWN). The estimate is based on the most recent Db2 statistics. The newer the statistics, the more accurate the estimate will be.

Note: This figure is useful as a metric for reloads only if the corresponding table space contains just one table. If there are more tables, this figure gives you the total size of all tables in the table space.

This information is returned in the dataSizeInMB XML attribute of the changeInformation element, which is a child element of the tableSetDetails element in the SAQTSAMP(AQTSXSD1) data set.

The changeInformation element contains more attributes that return additional information. Follow the link to the transcript of the SAQTSAMP(AQTSXSD1) data set at the end of this topic for details.

Important: Accelerator-shadow tables in *InitialLoadPending* or *Error* state will always be reported as changed because they do not appear to be loaded.

Examples of the first result set (associated with TABLES_DETAILS_CURSOR)

The following sample result sets contain change information about a range-partitioned table. The entire information (XML) is written to the TABLES_DETAILS column in the result set table. The relevant information is found in the <part> elements.

Information about the change category is found in the category attribute of the <changeInformation> element. The other information is found in the other attributes of the same element. That is, the timestamp of the last load is in the lastLoadTimestamp attribute, the change type in the type attribute, and the amount of data to be transferred during a reload in the dataSizeInMB attribute. The sharedTablespace attribute tells you whether the table space is shared between multiple tables.

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:tableSetChanges xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
version="1.0"
  <table name="TEST_BY_RANGE" schema="MYDWA"/>

    <partInformation type="BY_RANGE"
      <column name="COL1"/>
    </partInformation>

    <part dbmsPartNr="2" logicalPartNr="1" endingAt="2011-10-31">
      <changeInformation category="RELOAD_RECOMMENDED"
        lastLoadTimestamp="2012-01-09T11:53:27.997141Z"
        type="DataChanged" sharedTablespace="false" dataSizeInMB="123"/>
    </part>

    <part dbmsPartNr="3" logicalPartNr="2" endingAt="2011-11-30">
      <changeInformation category="NONE"
        lastLoadTimestamp="2012-01-09T11:53:27.997141Z"
```

```

        sharedTablespace="false" dataSizeInMB="105"/>
    </part>

    <part dbmsPartNr="4" logicalPartNr="3" endingAt="2011-12-31">
        <changeInformation category="UNKNOWN"
            lastLoadTimestamp="2012-01-09T11:53:27.997141Z"
            type="ReorgWithNoSubsequentDataUpdate" sharedTablespace="false"
            dataSizeInMB="175" />
    </part>

    <part dbmsPartNr="1" logicalPartNr="4" endingAt="2011-01-31">
        <changeInformation category="RELOAD_REQUIRED"
            lastLoadTimestamp="2012-01-09T11:53:27.997141Z"
            type="PartitionAddedOrRotated" sharedTablespace="false"
            dataSizeInMB="142" />
    </part>
</table>

```

Restrictions

Data changes might not be detected correctly under the following conditions:

- Db2 table data was modified by a non-IBM utility.
- A Db2 table space was restored by the DSN1COPY utility.
- The table space of the SYSIBM.SYSTABLESPACESTATS table was stopped.
- Db2 for z/OS ended abnormally without being able to return real-time statistics.
- Furthermore, data changes might not be detected correctly under the following conditions:
 - DB2 table data was modified by a non-IBM utility.
 - A DB2 table space was restored by the DSN1COPY utility.
 - The table space of the SYSIBM.SYSTABLESPACESTATS table was stopped.
 - Db2 for z/OS ended abnormally without being able to externalize real-time statistics.
- The reported change information does not account for incremental updates. If data changes are detected for a table that is currently enabled for incremental updates, the reported change type (DataChangeInReplicatedTable) indicates that the changes might have already been transferred to the accelerator.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- Authorization to run the DISPLAY DATABASE command for the databases that hold the tables listed in the *table_specification* parameter
- Authorization to run the ACCESS DB command on the databases that the tables reside in (needed to refresh Db2 real-time statistics)
- MONITOR1 authorization
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Accessed data and systems

The SYSPROC.ACCEL_GET_TABLES_DETAILS stored procedure saves all runtime statistics to disk (if the required PTF is installed).

Related reference:

"The message parameter" on page 71

Appendix D, "Transcript of the SAQTSAMP(AQTSXSD1) data set member," on page 169

Related information:

"AQT10402E" on page 110

SYSPROC.ACCEL_GET_TABLES_INFO

For all or a subset of the tables on an accelerator, this stored procedure returns the XML specifications that were used to define these tables using the SYSPROC.ACCEL_ADD_TABLES stored procedure. In addition, this stored procedure returns status information about the specified tables including accelerator-only tables.

Syntax

```
CALL SYSPROC.ACCEL_GET_TABLES_INFO
(accelerator_name,
 table_set,
 message);
```

Options description*accelerator_name*

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

table_set

A list of the tables that you want to process. The XML string that you specify as input for this parameter must conform to the structure of the tableSet element in the SAQTSAMP(AQTSXSD1) data set.

The tables must be accelerator-shadow tables that were defined by the SYSPROC.ACCEL_ADD_TABLES stored procedure, or accelerator-only tables. The same table name must not appear more than once in the table set.

You can set this parameter to NULL, in which case the stored procedure returns information about all tables that are defined in the SYSACCEL.SYSACCELERATEDTABLES table or that are present on the specified accelerator. This allows you to detect orphaned or incompletely deleted tables, which are listed with an integrity status of *ViolatedOnAccelerator* or *ViolatedInDatabaseManagementSystem* in the TABLE_INFORMATION element of the result set. You cannot restore such tables, but the rests of such tables can be cleaned up by using the ACCEL_REMOVE_TABLES stored procedure.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:tableSet xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.0">
  <table name="SALES" schema="SCHM" />
  <table name="PRODUCT" schema="SCHM" />
</aqt:tableSet>
```

The sample XML code instructs the stored procedure to work on the SALES and PRODUCT tables.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

This stored procedure returns three result sets.

First result set (TABLE_INFO_SPEC_CURSOR)

The first result set contains a table specification that can be used as input for the *table_specification* parameter of the SYSPROC.ACCEL_ADD_TABLES stored procedure. The result set is identified by the cursor TABLE_INFO_SPEC_CURSOR. The result set can be empty if no tables exist or missing if an error occurred. It consists of the following columns:

- SEQID of type INTEGER
- TABLE_SPECIFICATION of type VARCHAR, with a maximum length of 32698 characters

The XML data in the TABLE_SPECIFICATION column conforms to the structure of the tableSpecifications element in the SAQTSAMP(AQTSXSD1) data set.

Second result set (TABLE_INFO_STATES_CURSOR)

The second result set contains status information about the set of tables on the accelerator. It is identified by the cursor TABLE_INFO_STATES_CURSOR. The result set can be empty if no tables exist or missing if an error occurred. It consists of the following columns:

- SEQID of type INTEGER
- TABLE_STATES of type VARCHAR, with a maximum length of 32698 characters

A loadStatus value of ArchivingInProgress indicates that Db2 for z/OS data is currently being archived on an accelerator. This state prevents load or update operations, incremental updates, or the changing of a distribution key or organizing keys at the same time.-->

Accelerator-only tables can be identified by their type attribute, whose value is always AcceleratorOnly, and by their loadStatus. The loadStatus value Operational is reserved for accelerator-only tables, and indicates that the table is ready for processing.

The stored procedure does not list or create output for a table if the creation of the accelerator-only table has not been committed. Likewise, the procedure might still list and produce output for a table whose removal has not been committed.

The output XML document conforms to the structure of the tableInformation element in the SAQTSAMP(AQTSXSD1) data set.

Third result set (SP_TRACE_CURSOR)

The third result is empty or contains trace information about the execution of the stored procedure. It is identified by the cursor SP_TRACE_CURSOR and consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

The information in the TRACEDATA column is encoded in UTF-8. It is intended for analysis by IBM support. If the length of a value exceeds

32698 characters, it is split into multiple result set rows. The rows are concatenated in ascending order of SEQID.

Example of first result set (TABLE_INFO_SPEC_CURSOR)

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqttables:tableSpecifications xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.0">
  <table name="CUSTOMER" schema="SPERA">

    </table>
    <table name="TIME24" schema="SPERA" /> <!-- sub-elements are optional -->
</aqttables:tableSpecifications>
```

What you see is the content or value of the *table_specifications* parameter that was used when you defined the table by using the SYSPROC.ACCEL_ADD_TABLES stored procedure. This example shows the original XML specifications for two tables, SALES and PRODUCT. Both tables belong to the BCKE schema.

Example of second result set (TABLE_INFO_STATES_CURSOR)

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:tableInformation xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.5">
  <table schema="SPERA" name="CUSTOMER">
    <status loadStatus="Loaded" type="Regular"
      accelerationStatus="1" integrityStatus="Unimpaired"
      replicationStatus="0" archiveStatus="0" />
    <statistics usedDiskSpaceInMB="5" skew="0" organizedPercent="0"
      lastLoadTimestamp="2018-03-09T08:23:19.710632Z"
      archiveDiskSpaceInMB="0" />
  </table>

  <table schema="SPERA" name="TIME242">
    <status loadStatus="ReplicationInProgress" type="Regular"
      accelerationStatus="1" integrityStatus="Unimpaired"
      replicationStatus="1" replicationDetails="Active"
      archiveStatus="0" />
    <statistics usedDiskSpaceInMB="8" skew="0.713489"
      organizedPercent="0"
      lastLoadTimestamp="2018-03-08T12:27:52.688616Z"
      capturePointTimestamp="2018-03-08T12:27:52.688616Z"
      archiveDiskSpaceInMB="0" />
  </table>

</dwa:tableInformation>
```

The example shows status information about two tables, CUSTOMER and TIME24.

The loadStatus of the SALES table is *Loaded*. The acceleration status is *1*, which means the table can be used for accelerated queries in its current state.

The integrity status is *Unimpaired*, meaning that the information about this table in the SYSACCEL.SYSACCELERATEDTABLES table in Db2 is consistent with the information about the same table in the catalog of the accelerator. Were the table not mentioned in the accelerator catalog, but marked as eligible for accelerated queries in the SYSACCEL.SYSACCELERATEDTABLES table, its integrity status would be *ViolatedOnAccelerator*. If, on the other hand, the table were listed on the accelerator, but not marked as eligible for accelerated queries, its status would be *ViolatedInDatabaseManagementSystem*. The latter can happen if rows were accidentally deleted from the SYSACCEL.SYSACCELERATEDTABLES table or if a

backup of the Db2 catalog was restored that did not contain the accelerator information at the time when the backup was created.

The table uses 5 MB of disk space. The skew value of 0 indicates an even distribution of rows across the processing nodes.

You can interpret the information about the TIME24 table analogously. The main difference is that this table is enabled for incremental updates. For that reason, the replicationEnabled attribute shows the value 1. The capturePointTimestamp attribute shows when the last update started.

Prerequisites

For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Messages

The following messages are likely to occur in connection with the SYSPROC.ACCEL_GET_TABLES_INFO stored procedure:

AQT1000I

Success message indicating that the stored procedure could provide the requested table information in the result sets.

AQT10076W

Information about tables in Db2 for z/OS and on the accelerator is out of sync. As a result, one or more tables cannot be detected on either side. To solve the problem, remove the tables in question from the accelerator and then redefine these if they still exist in the Db2 subsystem.

AQT10507W

Original tables were altered so that the column definitions in Db2 for z/OS and on the accelerator might be out of sync.

AQT10134E

The SYSPROC.ACCEL_GET_TABLES_INFO stored procedure failed because one or more of the specified tables are not found in the Db2 for z/OS catalog table SYSIBM.SYSACCELERATEDTABLES.

The following scenario shows you which messages to expect under which conditions.

Table 3. Disparate table sets in the database and on the accelerator

Database	Accelerator
T1	
T2	T2

Table 3. Disparate table sets in the database and on the accelerator (continued)

Database	Accelerator
	T3

Assume that you have the following set of tables in your database and on the accelerator:

In this case, you will receive the following messages, according to the input value of the *table_set* parameter:

Table 4. Error messages resulting from disparate table sets

Value of <i>table_set</i>	Output returned by <i>table_specifications</i> and <i>table_information</i> for tables	Messages
NULL	T1, T2, T3	AQT10000I Warning AQT10076W for table T1, which cannot be found on the accelerator Warning AQT10076W for table T3. The table exists on the accelerator, but since it has not been specified as input (<i>table_set</i> is NULL), AQT10076W is returned instead of AQT10134E.
T1	T1	AQT10000I Warning AQT10076W because table T1 cannot be found on the accelerator
T2	T2	AQT10000I
T3	No output	Error AQT10134E for table T3, which is not found in SYSIBM.SYSACCELERATEDTABLES
T4	No output	T4 does not exist at all. In cases like this, just error message AQT10134E is issued although this only indicates that the table is not found in SYSIBM.SYSACCELERATEDTABLES.

Related reference:

"The message parameter" on page 71

Appendix D, "Transcript of the SAQTSAMP(AQTSXSD1) data set member," on page 169

Related information:

"AQT10402E" on page 110

"AQT10076W" on page 90

"AQT10134E" on page 101

"AQT10507W" on page 117

SYSPROC.ACCEL_LOAD_TABLES

Loads data from the source tables in Db2 into the corresponding accelerator-shadow tables.

Details

The stored procedure supports the following load scenarios:

- Load of a previously defined accelerator-shadow table in *InitialLoadPending* state
- Reload of table partitions or non-partitioned accelerator-shadow tables only if the Db2 tables have been modified since the last load
- Complete update of the data in an already loaded accelerator-shadow table with more recent Db2 data
- Update of the data in selected partitions of range-partitioned accelerator-shadow tables, provided that the partitioning key and the partition boundaries have not changed
- Deletion of data in accelerator-shadow tables that originate from range-partitioned tables after a ROTATE PARTITION operation
- Addition of new partition data to existing accelerator-shadow tables after a ROTATE PARTITION operation or ADD PARTITION operation on range-partitioned tables in Db2
- Addition of data from partitions that were appended to partitioned-by-growth tables in Db2

Queries against already loaded accelerator-shadow tables go against the old data until the load operation is completed.

Generally, all table data is transferred to the accelerator during an initial load. Partial reloads are possible for range-partitioned tables and tables partitioned by growth. However, you must explicitly specify the partitions that you want to reload (update).

If the IBM Db2 Analytics Accelerator catalog in Db2 for z/OS does not indicate that a table has been defined on the specified accelerator or if accelerator-shadow tables are in a state that disallows a load operation, the SYSPROC.ACCEL_LOAD_TABLES stored procedure returns an error message and does not take any action. Valid states are:

- *InitialLoadPending*
- *Error*
- *Loaded*

If the stored procedure runs successfully, the state of all loaded accelerator-shadow tables is changed to *Loaded*.

During a load, IBM Db2 Analytics Accelerator automatically selects a suitable distribution key.

If the stored procedure fails, all table modifications are rolled back on the accelerator, and the accelerator-shadow tables return to their previous states (*InitialLoadPending*, *Error*, or *Loaded*) and the IBM Db2 Analytics Accelerator catalog remains unmodified.

A situation in which the tables are modified, but the timestamps of these tables do not change in the catalog can only occur if an error surfaces after the completion of

operations on the accelerator, but before the end of the stored-procedure run. The diverging timestamps in the catalog and on the accelerator have no functional consequences; the accelerator-shadow tables will contain the most recent data and will be available for processing.

Parallel processing

Partitions of a partitioned table (partitioned by range or by growth) and non-partitioned tables can be loaded in parallel. By default, up to four entities of both types (table partitions, non-partitioned tables, or a mixture of both) are loaded in parallel. You can change the default by setting the `AQT_MAX_UNLOAD_IN_PARALLEL` environment variable to a different value.

The order in which partitions or non-partitioned tables are loaded can vary and is not predictable. The reason is that before each run, the accelerator calculates how to distribute the items most efficiently to the available parallel threads. It is therefore very likely that the order will deviate from the order in which the entities are listed in the *table_load_specification*, which is the parameter used to specify the items to be processed.

If it is very important to you to know or keep the order, consider not to use parallel processing at all or to use an external loader. Such a loader can be called by using the `<externalTool>` element in connection with the `enforceTableLoadSequence` attribute in XML input for the *table_load_specification* parameter. See the following example:

```
<externalTool enforceTableLoadSequence="true" />
```

During execution, the stored procedure can increase or decrease the degree of parallelism at any time to optimize the performance of the current and of future load jobs. If that happens, indicating messages (AQT10418I and AQT10419I) are written to the SYSLOG. These messages are also returned by the stored procedure when processing has finished.

`SYSPROC.ACCEL_LOAD_TABLES` calls the Db2-supplied `SYSPROC.DSNUTILU` stored procedure, which unloads the data from the Db2 tables. The Workload Manager (WLM) policies might prohibit the invocation of `SYSPROC.DSNUTILU`, due to specific service class definitions or a current system overload.

In such a situation, `SYSPROC.ACCEL_LOAD_TABLES` allows you to try running `SYSPROC.DSNUTILU` again with a configurable timeout period between the retries. Before each retry, information about the `DSNUTILU` error 00E79002 is written to the WLM job log of the `SYSPROC.ACCEL_LOAD_TABLES` stored procedure. This gives operators suitable information for corrective actions (for example, running the **-STA SYSPROC.DSNUTILU** command or resuming the WLM application environment for `DSNUTILU`). You can configure the retries by setting the following environment variables, for example:

- `AQT_MAX_RETRIES_DSNUTILU=2`
- `AQT_SECONDS_BEFORE_RETRY_DSNUTILU=60`

These settings instruct `SYSPROC.ACCEL_LOAD_TABLES` to make three attempts at starting `DSNUTILU` and to wait for 60 seconds between the retries.

Additionally, you can set the `AQT_SKIP_UNLOAD_EMPTY_PARTS` environment variable to improve the performance of the load process. If this variable is set,

SYSPROC.ACCEL_LOAD_TABLES does not call the SYSPROC.DSNUTILU utility for empty partitions. The detection of empty tables and partitions relies on Db2 real-time statistics.

Important: If the <externalTool> element is used as part of the *table_load_specification* parameter for SYSPROC.ACCEL_LOAD_TABLES, the Db2 UNLOAD utility is always called, irrespective of the setting of this variable.

An auto-cleanup mechanism is in place. If SYSPROC.ACCEL_LOAD_TABLES was ended prematurely or abnormally, for example by the **-CAN THREAD** Db2 command, Db2 UNLOAD utilities that have been started by the stored procedure remain in the *STOPPED* state and related resources are left in the /tmp/aqtpipes/V7/<user> directory, where <user> is the ID that was used to start the stored procedure. During the next run of the SYSPROC.ACCEL_LOAD_TABLES stored procedure with the same user ID (for any table), the Db2 UNLOAD processes are ended, and the leftovers are deleted.

Restrictions

- You cannot invoke the SYSPROC.ACCEL_LOAD_TABLES procedure more than once for the same accelerator-shadow table at the same time. While the procedure is running, the state of all specified accelerator-shadow tables changes to *LoadInProgress*, which prevents the start of another instance of SYSPROC.ACCEL_LOAD_TABLES that works on the same tables. The stored procedure can be invoked again after a successful completion of the previous run. Otherwise, an error message is issued.
- You can only use this stored procedure to load or update accelerator-only tables if an external tool is employed for this task. If such a tool is not available, you must use the INSERT ... INTO TABLE ... IN ACCELERATOR SQL statement. For information on how to call external tools, see the example at the end of the description of the *table_load_specification* parameter.
- If you change the partitioning type of the table space of an accelerator-shadow table in Db2 for z/OS (for example, from *segmented* to *partitioned by growth*), you can no longer load the accelerator-shadow table. The operation will fail. Therefore, you must remove the table from the accelerator and redefine it after changing the partitioning type.

Multiple accelerators

If multiple accelerators are connected to the same Db2 subsystem and a table exists on more than one accelerator, you can load the various instances of this table in parallel, provided that the lock mode permits this (NONE and ROW do). Each accelerator contains a snapshot of Db2 data at the point of the last load operation. There is no mechanism that guarantees the consistency of the table data on all accelerators.

Syntax

```
CALL SYSPROC.ACCEL_LOAD_TABLES
(accelerator_name,
 lock_mode,
 table_load_specification,
 message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

lock_mode

Controls the protection level while accelerator-shadow tables are being loaded. The protection level ensures a consistent state of the data with respect to the specified entity. Valid values:

TABLESET

Protects the Db2 source tables of to-be-loaded accelerator-shadow tables against changes during the load operation.

Data availability

Newly loaded data becomes available for queries when the load job has been finished for the entire table set.

Error behavior

If an error occurs while loading one of the tables in the set, the load job for that table is aborted, and the job proceeds with the next table in the set. Message AQT20121E is issued in case of a load error.

TABLE

Protects just the Db2 source table of the accelerator-shadow tables that is currently being loaded.

Data availability

Newly loaded data in a table becomes available for queries when the load job for that table has been finished and when the entire operations has moved on to the next table in the set.

Error behavior

If an error occurs while loading one of the tables in the set, the load job for that table is aborted, and the job proceeds with the next table in the set. Messages:

- Message AQT20121E is returned if the load of all tables in the set failed.
- Message AQT10420W is issued for each single table after a failure to load that table

PARTITIONS

Protects the original Db2 table-space partition of the accelerator-shadow table partition to be loaded against changes during the load. With this setting, a non-partitioned table is always locked completely.

Data availability

Newly loaded data in a table partition becomes available for queries when the load job for that partition has been finished and when the entire operations has moved on to the next partition or table.

Error behavior

If an error occurs while loading a table partition, the load job for that partition is aborted, and the job proceeds with the next partition to be loaded. An error has no effect on other partitions or tables to be loaded; the job continues. Messages:

- Message AQT20121E is returned if the load of all tables or all partitions of a partitioned table in the set failed.

- Message AQT10421W is issued for each partition after a failure to load that partition.

Special cases

To avoid partially loaded tables, lock mode TABLE is applied during an initial load, even if you specified lock mode PARTITIONS. For details, see the description of lock mode TABLE.

If the reload of a partition that is enabled for incremental updates fails, incremental updates are disabled for the entire table even if the reload of the other table partitions succeeded.

NONE

No locking at all. However, only committed data is loaded into the accelerator-shadow tables because the Db2 data is unloaded with isolation level CS and SKIP LOCKED DATA.

Data availability

Data availability is the same as for lock mode PARTITIONS.

Error behavior

The error behavior is the same as for lock mode PARTITIONS.

ROW

Protects at least the row or page that is being loaded against updates. Whether a row, a page, or an entire table is locked is determined by the LOCKSIZE defined for the table space of the source tables. (For more information, see the Db2 documentation for the CREATE TABLESPACE command. You find a link at the end of this topic.) When lock mode ROW is set, DB2 data is unloaded at isolation level CS (cursor stability), but in contrast to lock mode NONE, rows locked by an application are not skipped. This is the recommended choice if incremental updates are enabled for the tables to be loaded.

The lock mode **Row** ensures that all incremental update changes not yet applied are written to a spill queue, which is emptied after the load. This means that changes that occurred before the setting of the capture point are applied at a later time.

To avoid deadlocks during the draining of the spill queue, set the table space of the source tables to LOCKSIZE ROW. For more information, see *Continuous incremental updates* in the *IBM Db2 Analytics Accelerator for z/OS: Installation Guide*.

If you want to use this lock mode in a different context, contact IBM support before doing so.

Data availability

Data availability is the same as for lock mode PARTITIONS.

Error behavior

The error behavior is the same as for lock mode PARTITIONS.

table_load_specification

An XML input string that lists the accelerator-shadow tables to be loaded. The string must conform to the structure of the tableSetForLoad element in the SAQTSAMP(AQTSXSD1) data set. A table name must not occur more than once in the input string.

For *range-partitioned tables* and *tables partitioned by growth*, it is possible to update only the data in selected partitions. This is done by specifying a partition list in the XML input string. Other tables are always completely

reloaded. An error is returned if a partition list is specified for a table that is neither range-partitioned, nor partitioned by growth.

You specify partitions by their logical or physical partition numbers, separated by commas (,). Ranges can be specified by using a colon (:) between the range boundaries. The range boundaries are inclusive. Using negative values, you can specify partitions by counting backwards from the upper end of the entire range of partition numbers. In this context, -1 is used to identify the last partition of a table. In a sorted sequence of partition numbers, the position of a partition in the sequence can be determined according to the following formula:

$$(\text{number of last partition}) + 1 - n$$

where n is the number of partitions to be deducted from the upper end.

Table 5. Examples of specifications for partitions and partition ranges

XML specification for partitions	Description
<partitions>1</partitions>	Includes only the first partition
<partitions>1:10</partitions>	Includes the first 10 partitions of a table
<partitions>-10:-1</partitions>	Includes the last 10 partitions of a table
<partitions>1:-11</partitions>	Includes all partitions except for the last 10
<partitions>1,10:13,-1</partitions>	Includes the partitions 1, partitions 10 through 13, and the last partition of a table

Example A:

```
<?xml version="1.0" encoding="UTF-8" ?>
<dwa:tableSetForLoad xmlns:dwa="http://www.ibm.com/xmlns/prod/dwa/2011"
  usePhysicalPartitionNumbers="true" version="1.0">
  <table name="SALES" schema="BCKE">
    <!-- explicitly specified partition numbers -->
    <partitions>1,5:10,20</partitions>
  </table>
  <table name="CUSTOMER" schema="BCKE" >
    <!-- negative partition numbers count from the end, -1 is the last
      element example for "all partitions except last 10" -->
    <partitions>1:-11</partitions>
  </table>
  <table name="ORDER2009" schema="BCKE">

  </table>
</dwa:tableSetForLoad>
```

The sample XML string lists three accelerator-shadow tables to be loaded: SALES, CUSTOMER, and ORDER2009. For the SALES table, the partitions 1, 5 through 10, and 20 are loaded.

All partitions of the CUSTOMER table are loaded, except for the last 10 partitions. Assume that this table has 20 partitions. According to the formula, this gives you $20 + 1 - 11 = 10$.

The behavior is different for ORDER2009: Because partitions are not specified, the stored procedure loads just the partitions that have changed in the original Db2 table (newly added partitions or changed partition boundaries).

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqttables:tableSetForLoad
  xmlns:aqttables="http://www.ibm.com/xmlns/prod/dwa/2011">
```

```

version="1.1">
  <table name="SALES" schema="BCKE" >
    <partitions>1,5:10,20</partitions>
  </table>
  <table name="CUSTOMER" schema="BCKE"
    detectChanges="PARTITION" />
  <table name="PRODUCT" schema="BCKE" />
</aqttables:tableSetForLoad>

```

The sample XML string lists three accelerator-shadow tables to be loaded or reloaded: SALES, CUSTOMER, and PRODUCT. Assume that these tables are partitioned by range.

The SALES table contains a <partitions> element, which lists the partitions to be loaded. These are the partitions with the IDs 1, 5, 6, 7, 8, 9, 10, and 20. If partitions were added as the result of an ADD or ROTATE operation, then these partitions will also be loaded.

For the CUSTOMER table, the detectChanges attribute is set to PARTITION, but a partition list has not been specified, so only tables that were added by an ADD or ROTATE operation since the last load will be loaded.

For the PRODUCT table, neither the detectChanges attribute, nor a partition list has been specified, so all partitions are loaded or reloaded.

The <externalTool> element is not intended for users or administrators, but for tool vendors who use the SYSPROC.ACCEL_LOAD_TABLES stored procedure, but have replaced the DB2 UNLOAD utility (DSNPROC.DSNUTILU) with another application. The element allows the tool vendor to specify the name of the tool and the processing order of the tables.

Example:

```

<?xml version="1.0" encoding="UTF-8" ?>
<aqttables:tableSetForLoad
  xmlns:aqttables="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.2">
  <externalTool name="IBM DB2 Analytics Accelerator Loader for z/OS,
    V1.1 (5639-OLA)" enforceTableLoadSequence="true" />
    <table name="UNPARTITIONED3" schema="TEST" />
    <table name="PARTITIONED4" schema="TEST" />
  </aqttables:tableSetForLoad>

```

In this example, the <externalTool> element specifies IBM Db2 Analytics Accelerator Loader for z/OS as the external tool. The attribute setting enforceTableLoadSequence="true" ensures that the tables are loaded in the order in which they are listed in the *tableSetForLoad* input XML document.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Automatic detection of modified data

The SYSPROC.ACCEL_LOAD_TABLES stored procedure can detect modified data automatically and then reload only the tables or partitions that have changed since the last load. This is useful if you want to run an automated batch process repeatedly that refreshes the data in your accelerator-shadow tables at regular intervals, for example daily, and you do not know which data has changed in Db2. Through a special attribute in the XML input, you can synchronize your accelerator data and at the same time ensure that just a minimum amount of data is transferred during the process.

You can set the detectChanges to the following values:

detectChanges="DATA"

Basically, this setting causes a reload of partitions or entire tables if changes were detected in the original partitions or tables since the last load.

detectChanges="PARTITION"

Basically, this setting causes a load or reload of partitions on the accelerator that were added or rotated in Db2 for z/OS since the last load.

However, the actual effect of these settings also depends on the table type and whether a partition list has been specified, so the outcome is not always straightforward. See the following table:

Table 6. Effect of the detectChanges attribute in connection with other settings

Attribute setting	Partition list specified	Table type	Effect
Not set or empty value	No	Partitioned by range	Full table reload
		Partitioned by growth	Full table reload
		Non-partitioned	Full table reload
	Yes	Partitioned by range	Reload of selected partitions plus added or rotated partitions
		Partitioned by growth	Reload of selected partitions plus added or rotated partitions
		Non-partitioned	Error AQT10403E (invalid attribute combination)
detectChanges="DATA"	No	Partitioned by range	Reload of changed partitions including added or rotated partitions
		Partitioned by growth	Reload of changed partitions including added or rotated partitions
		Non-partitioned	Full table reload if changes were detected
	Yes	Partitioned by range	Reload of changed partitions including added or rotated partitions. Warning AQT10148W (partition list ignored)
		Partitioned by growth	Reload of changed partitions including added or rotated partitions. Warning AQT10148W (partition list ignored)
		Non-partitioned	Error AQT10403E (invalid attribute combination)

Table 6. Effect of the detectChanges attribute in connection with other settings (continued)

Attribute setting	Partition list specified	Table type	Effect
detectChanges="PARTITION"	No	Partitioned by range	(Re)load of just the added or rotated partitions
		Partitioned by growth	(Re)load of just the added or rotated partitions
		Non-partitioned	Error AQT10403E (invalid attribute combination)
	Yes	Partitioned by range	Reload of selected partitions plus added or rotated partitions
		Partitioned by growth	Reload of selected partitions plus added or rotated partitions
		Non-partitioned	Error AQT10403E (invalid attribute combination)

Important:

- Accelerator-shadow tables in *InitialLoadPending* or *Error* state are always fully reloaded.
- You cannot specify a partition list for non-partitioned tables.
- Partitions that have been removed from the beginning of a range-partitioned table due to a ROTATE operation are automatically detected and deleted from the corresponding accelerator-shadow table.
- All partition changes in range-partitioned tables except for ADD and ROTATE lead to an error if you try to reload the corresponding accelerator-shadow tables.
- The forceFullReload attribute is deprecated because detectChanges="PARTITION".without partition list has the same effect as forceFullReload="false", and omitting the detectChanges attribute and a partition list has the same effect as forceFullReload="true".
- A partial reloading (reloading of selected or just the changed partitions) is not yet possible for incrementally updated tables. Therefore, to use SYSPROC.ACCEL_LOAD_TABLES on such tables, do not specify the detectChanges attribute or a partition list. This means that the entire table is reloaded.

Example

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqttables:tableSetForLoad
  xmlns:aqttables="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.1">
  <table name="UNPARTITIONED3" schema="TEST" detectChanges="DATA"/>
  <table name="PARTITIONED4" schema="TEST" detectChanges="PARTITION"/>
</aqttables:tableSetForLoad>
```

Suppose that the table UNPARTITIONED3 is a non-partitioned table, and that PARTITIONED4 is partitioned by range. The accelerator-shadow table of the non-partitioned table will be fully reloaded if changes were detected since the last load. The accelerator-shadow table of the partitioned table will be reloaded only if partitions were added or rotated since the last load. The table will not be fully reloaded. Only the new partitions will be added.

If very short synchronization intervals are required, such as periods of minutes for example, consider using the incremental update function of IBM Db2 Analytics Accelerator.

SYSPROC.ACCEL_LOAD_TABLES in connection with the detectChanges="DATA" setting invokes the same change detection mechanism as the SYSPROC.ACCEL_GET_TABLES_DETAILS stored procedure. That is, SYSPROC.ACCEL_LOAD_TABLES reloads all partitions or non-partitioned tables for which SYSPROC.ACCEL_GET_TABLES_DETAILS returns a change category other than NONE. The following restrictions apply:

- Under specific conditions, for example if table data was modified by a non-IBM utility, table changes might not be correctly detected. In such a case, you must manually reload the affected partitions or the entire accelerator-shadow table.
- If the detection of data changes is not possible, that is, in cases where the SYSPROC.ACCEL_GET_TABLES_DETAILS stored procedure returns the change category UNKNOWN, tables or partitions are reloaded even if the accelerator data is still in sync with the original Db2 data.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with the result set. The result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Prerequisites

- For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).
- The *accelerator_name* parameter must specify an accelerator name that is listed in the catalog tables of the product.
- The accelerator-shadow table must exist on the accelerator that the *accelerator_name* parameter specifies.
- Because SYSPROC.ACCEL_LOAD_TABLES starts one or more instances of SYSPROC.DSNUTILU, DSNUTILU must be installed and configured properly on z/OS. This includes a correct setup of the WLM application environment for Db2-supplied stored procedures and IBM Db2 Analytics Accelerator stored procedures. For more information, see *Defining WLM performance goals for IBM Db2 Analytics Accelerator for z/OS stored procedures in the IBM Db2 Analytics Accelerator for z/OS: Installation Guide*.
- To avoid naming conflicts on z/OS, do not run Db2 utilities whose names start with AQT at the same time as this stored procedure.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure

- MONITOR1 authorization
- Authorization to read the original Db2 base tables of the accelerator-shadow tables that are listed in the *table_load_specification* parameter
- Authorization to run the ACCESS DB command on the databases that the tables reside in (needed to refresh Db2 real-time statistics)
- Authorization to execute the RUNSTATS utility on the databases that contain the tables to be loaded, such as the STATS authorization.
- Authorization to run ADMIN_INFO_SYSPARM so that ZPARMs can be retrieved.
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure (UNIX System Services pipes are created in this directory)
- Privilege to connect to Db2 for z/OS via RRSAP.

Important: If you want to grant the required Db2 privileges to secondary authorization IDs, for example groups, make sure that the Db2 SIGNON exit is correctly configured for the use of such IDs. The default SIGNON exit in Db2 for z/OS does not accept secondary authorization IDs. You must therefore use a sample SIGNON exit for this purpose, that is, DSN3SSGN or an equivalent. For more information, see Using secondary IDs for sign-on requests.

- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Accessed data and systems

The SYSPROC.ACCEL_LOAD_TABLES stored procedure locks Db2 objects as defined by the *lock_mode* parameter. After a successful load of all accelerator-shadow tables, it changes the value of the REFRESH_TIME column for these tables in the SYSACCEL.SYSACCELERATEDTABLES catalog table of Db2 for z/OS.

Messages that indicate a change in the degree of parallelism (AQT10418I and AQT10419I) are written to the SYSLOG. You can suppress the logging of these messages by *commenting out* the following line in the AQTENV data set:

```
AQT_DO_SYSLOGGING = SET
```

On the accelerator, the stored procedure updates the IBM Db2 Analytics Accelerator catalog and, in case of an initial load, creates corresponding accelerator-shadow tables.

The dynamic statement cache in Db2 is invalidated for initial loads. All plans that are affected by the cache invalidation must therefore be rebuilt by Db2. This might increase the preparation time of the affected queries slightly because a new plan must be prepared during the first execution of a query. This, however, is a onetime operation. For all subsequent preparations of the same query, the dynamic statement cache can be used again. The initial prolongation of the preparation time is in most cases more than outweighed by the reduction that sets in when successfully accelerated queries are submitted repeatedly because such queries are immediately routed to the accelerator.

Related reference:

“The message parameter” on page 71

Appendix A, “Environment variables,” on page 155

Appendix D, “Transcript of the SAQTSAMP(AQTSXSD1) data set member,” on page 169

Related information:

Defining WLM performance goals for IBM DB2 Analytics Accelerator for z/OS stored procedures

“AQT10201E” on page 106

“AQT10402E” on page 110



CREATE TABLESPACE

SYSPROC.ACCEL_REMOVE_ACCELERATOR

Removes an accelerator from the system configuration.

Details

The removal includes Db2 catalog entries for the accelerator and all accelerator data that is related to the corresponding Db2 subsystem.

Syntax

```
CALL SYSPROC.ACCEL_REMOVE_ACCELERATOR
(accelerator_name,
message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with the result set. The result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Prerequisites

- For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).
- Tables must have been deleted from the accelerator before SYSPROC.ACCEL_REMOVE_ACCELERATOR is run. The SYSACCEL.SYSACCELERATEDTABLES catalog table must be void of entries for the specified accelerator, that is, the SYSPROC.ACCEL_GET_TABLES_INFO stored procedure must return an empty list.

- It must be possible to contact the specified accelerator. Otherwise, it is not removed.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 authorization
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Accessed data and systems

This stored procedure removes entries (rows) pertaining to the specified accelerator from the IBM Db2 Analytics Accelerator catalog table SYSACCEL.SYSACCELERATORS and from the following tables in the Db2 communications database:

- SYSIBM.LOCATIONS
- SYSIBM.IPNAMES
- SYSIBM.USERNAMES

Entries pertaining to the specified accelerator are removed from the SYSACCEL.SYSACCELERATORS table of the catalog only if all tables have been removed from the accelerator before, and no more tables exist.

Related reference:

“The message parameter” on page 71

Appendix D, “Transcript of the SAQTSAMP(AQTSXSD1) data set member,” on page 169

Related information:

“AQT10402E” on page 110

SYSPROC.ACCEL_REMOVE_TABLES

Removes (drops) accelerator-shadow tables, but not accelerator-only tables and deletes the corresponding entries from the IBM Db2 Analytics Accelerator catalog in Db2 for z/OS.

Details

The procedure first removes tables from the accelerator, then the corresponding entries from the SYSACCEL.SYSACCELERATEDTABLES catalog table. In case of an error, such as an only partial removal of a table, you can rerun the procedure.

Attention:

- In general, the SYSPROC.ACCEL_REMOVE_TABLES stored procedure removes tables regardless of their state. This means that running operations (table load, for example) will be interrupted and ended prematurely. Running queries will be canceled.
- As indicated at the beginning, this stored procedure does not remove accelerator-only tables. The reason is that after removing it from the accelerator, a table without data is left in Db2. Such a table cannot be used anymore. Therefore, you must run the Db2 DROP command to remove an accelerator-only table.

There is one exception though: If the accelerator does not receive information about the committal of a DROP TABLE statement, an orphaned accelerator-only table remains. You can use SYSPROC.ACCEL_REMOVE_TABLES to remove such orphaned tables. To identify such tables, you can run the SYSPROC.ACCEL_GET_TABLES_INFO stored procedure. The output of this procedure lists such tables with a type of (acceleratorOnly) and an integrity status of (ViolatedInDatabaseManagementSystem).

If, on the contrary, an accelerator-only table is orphaned in Db2 for z/OS, you must submit a DROP TABLE statement to remove the leftovers. Such a situation can occur if a table creation has been committed, but the information flow (DRDA connection) between Db2 and the accelerator has been disrupted. In this case, the table creation on the accelerator is rolled back, leaving an orphaned table in Db2. Again, you can identify such tables by running the SYSPROC.ACCEL_GET_TABLES_INFO stored procedure. In the output, such tables are listed with a type of (acceleratorOnly) and an integrity status of (ViolatedOnAccelerator).

- The stored procedure always attempts to delete a table from the specified accelerator, even if it is not listed in the catalog or does not exist in Db2 for z/OS because it is the only way to remove (the rests of) tables for which the SYSPROC.ACCEL_GET_TABLES_INFO stored procedure returns an integrity status of *ViolatedInDatabaseManagementSystem*.
- The stored procedure continues with a warning if a table is not found on the accelerator or in the SYSACCEL.SYSACCELERATEDTABLES table.
- In the (unlikely) case of an error, the stored procedure ends. Tables that have already been removed at this point cannot be restored (no rollback). Tables that were not yet processed at the time of the error are not removed. Rerun the stored procedure to remove these tables. As you do this, warnings will be issued for the tables that have already been removed before the error occurred.

Syntax

```
CALL SYSPROC.ACCEL_REMOVE_TABLES
(accelerator_name,
 table_set,
 message);
```

Options description*accelerator_name*

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

table_set

A list of the tables that you want to process. The XML string that you specify as input for this parameter must conform to the structure of the

<aqttables:tableSet ... > or <aqttables:tableSetForRemove ... > element in the SAQTSAMP(AQTSXSD1) data set. The latter allows you to specify the force="true" option.

The tables must have been defined by the SYSPROC.ACCEL_ADD_TABLES stored procedure. The same table name must not appear more than once in the table set.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:tableSetForRemove xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.0">
  <table name="SALES" schema="SCHM" />
  <table name="PRODUCT" schema="SCHM" />
</aqt:tableSetForRemove>
```

The sample XML code instructs the stored procedure to work on the SALES and PRODUCT tables.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with the result set. The result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Messages

The following messages are likely to occur in connection with the SYSPROC.ACCEL_REMOVE_TABLES stored procedure:

AQT10076W

Is returned, along with a success message, if a table could only be found on the accelerator or in the Db2 for z/OS catalog table SYSIBM.SYSACCELERATEDTABLES.

The orphaned table or catalog entry is not removed, but processing for the other tables continues.

AQT10077W

If a table could neither be found on the accelerator, nor in the Db2 for z/OS catalog table SYSIBM.SYSACCELERATEDTABLES.

Processing for the other tables continues after such a warning.

AQT10411E

Is returned if you try to remove an accelerator-only table by using SYSPROC.ACCEL_REMOVE_TABLES.

Prerequisites

- For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).
- The *accelerator_name* parameter must specify an accelerator name that is listed in the catalog tables of the product.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 authorization
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Accessed data and systems

The SYSPROC.ACCEL_REMOVE_TABLES stored procedure deletes rows from the SYSACCEL.SYSACCELERATEDTABLES catalog table in Db2 for z/OS.

On the accelerator, it updates the IBM Db2 Analytics Accelerator catalog and removes dashDB tables. If the last table is removed from the accelerator, the dashDB database is also removed (dropped).

Related reference:

"The message parameter" on page 71

Appendix D, "Transcript of the SAQTSAMP(AQTSXSD1) data set member," on page 169

Related information:

"AQT10402E" on page 110

"AQT10076W" on page 90

"AQT10077W" on page 90

SYSPROC.ACCEL_SET_TABLES_ACCELERATION

Enables or disables query acceleration for accelerator-shadow tables by changing their state. The state is reflected in the corresponding IBM Db2 Analytics Accelerator system tables and determines whether Db2 routes a query to an accelerator.

Details

Technically, the SYSPROC.ACCEL_SET_TABLES_ACCELERATION stored procedure sets a flag in the ENABLE column of the SYSACCEL.SYSACCELERATEDTABLES catalog table in Db2 for z/OS.

Only accelerator-shadow tables in the following states can be enabled for query acceleration:

- *Loaded*
- *UpdateInProgress*

If a table cannot be enabled, the stored procedure stops processing, so that the remaining tables will not be enabled either.

In contrast, enabled tables can always be disabled, no matter what their current state is. A disablement does not affect already running queries. The setting takes effect only on queries that have not yet started.

An accelerator-shadow table can be enabled for query acceleration on multiple accelerators. If all the tables that are relevant for a query are loaded and enabled on more than one accelerator, Db2 for z/OS selects one of the possible candidates for executing the query.

The query routing process does not care whether the data in the tables is up-to-date. Therefore, if you enable tables on multiple accelerators, you are responsible for keeping the data in sync because any accelerator might be chosen for query execution.

Restrictions

You cannot use this stored procedure on accelerator-only tables because these tables are always enabled for query acceleration, and this cannot be changed. The data of an accelerator-only table exists on an accelerator only. Thus, the alternative to process a query in DB2 does not exist. And to use this type of table for queries that are not accelerated does not make sense.

Syntax

```
CALL SYSPROC.ACCEL_SET_TABLES_ACCELERATION
(accelerator_name,
 on_off,
 table_set,
 message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

on_off

Enables or disables query acceleration for one or more accelerator-shadow tables. When set to "ON", this parameter enables the specified tables. When set to "OFF", the specified tables are disabled.

table_set

A list of the tables that you want to process. The XML string that you specify as input for this parameter must conform to the structure of the tableSet element in the SAQTSAMP(AQTSXSD1) data set.

The tables must be accelerator-shadow tables that were defined by the SYSPROC.ACCEL_ADD_TABLES stored procedure, or accelerator-only tables. The same table name must not appear more than once in the table set.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:tableSet xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.0">
  <table name="SALES" schema="SCHM" />
  <table name="PRODUCT" schema="SCHM" />
</aqt:tableSet>
```


The sample XML code instructs the stored procedure to work on the SALES and PRODUCT tables.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with the result set. The result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Prerequisites

For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Related reference:

"The message parameter" on page 71

Appendix D, "Transcript of the SAQTSAMP(AQTSXSD1) data set member," on page 169

"What to do after changing a table or table space in Db2 for z/OS" on page 81

Related information:

"AQT10402E" on page 110

SYSPROC.ACCEL_SET_TABLES_REPLICATION

Enables or disables incremental updates for one or more accelerator-shadow tables. The stored procedure is not suitable for accelerator-only tables.

You can start the update of accelerator-shadow tables with changed data when the tables have been loaded.

Incremental updates can only be enabled for accelerator-shadow tables in the *InitialLoadPending* or *Loaded* state. If you try to run the

SYSPROC.ACCEL_SET_TABLES_REPLICATION stored procedures on tables in another state, the operation ends immediately and no tables are enabled.

If you enable an already loaded table, the following steps are carried out:

1. The data in the accelerator-shadow table is deleted.
2. The accelerator-shadow table is reset to the *InitialLoadPending* state.
3. Query acceleration is turned off for the table.

Hence a reload of the accelerator-shadow table is required before the incremental update process sets in again. This mechanism was introduced to guarantee data consistency. If data changes occurred after the last load of the table, but before its enablement for incremental updates, these changes would not be captured and propagated to the accelerator.

Attention:

- Tables to be included must have a unique constraint (primary key or primary index). If that is not the case, IBM Db2 Analytics Accelerator adds a hidden column with unique values to the accelerator-shadow table. This column, called *informational unique constraint*, serves as the primary key or primary index.
- When lock mode ROW is set, Db2 data is unloaded at isolation level CS (cursor stability). Whether a row, a page, or an entire table is locked is determined by the LOCKSIZE defined for the table space of the source tables. To avoid deadlocks during the draining of the spill queue, set this table space to LOCKSIZE ROW if you want to use lock mode ROW for your incrementally updated tables.
- If you update Db2 for z/OS tables by running the LOAD utility rather than an INSERT, UPDATE, or DELETE operation, you must set the following parameters (for the LOAD utility):
 - SHRLEVEL CHANGE
 - LOG YES

Otherwise, the changes that were made by the LOAD utility are not detected by the incremental update function, and will thus not be reflected in your accelerator-shadow tables.

- With the introduction of IBM Db2 Analytics Accelerator for z/OS Version 3.1, the Db2 attribute DATA CAPTURE is added to the tables on an accelerator. The attribute can carry the value Y or N (default), for *yes* or *no*. When incremental updates are enabled for a table, the DATA CAPTURE attribute of the table is set to the value Y. Once set, this attribute value persists, even if the table is disabled at a later time. Bear this in mind, especially if you run applications that use the DATA CAPTURE attribute.
- You might have to reload or even remove tables from an accelerator after the execution of an ALTER TABLE or ALTER TABLESPACE statement in Db2 for z/OS. For more information, see *What to do after changing a table or table space in Db2 for z/OS*. You find a **Related reference** link at the end of this topic.
- IBM InfoSphere® Data Replication for z/OS uses a metadata table called DMMD_SIGNALS . This table is a kind of an interface for the entire process. There is absolutely no reason to select it for incremental updates. Ensure that you do not select it inadvertently as doing so will lead to unpredictable and unwanted side-effects.

Restrictions:

- It is not possible to enable tables if the table name or the schema name contains GB18030 characters (Simplified Chinese) of Unicode plane 2 (U+20000-U+2FFFF: Supplementary Ideographic Plane). Trying to do so results in an error.

- You cannot enable incremental updates for accelerator-only tables because this type of table has no data in Db2 that could be propagated to an accelerator.

Syntax

```
CALL SYSPROC.ACCEL_SET_TABLES_REPLICATION
( accelerator_name,
  on_off,
  table_set,
  message
);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

on_off

The value ON enables incremental updates for all accelerator-shadow tables that are specified by the *table_set* parameter. The value OFF does the opposite.

table_set

A list of the accelerator-shadow tables that you want to process. The same table must not appear more than once in the table set. The XML string that you specify as input for this parameter must conform to the structure of one of the following elements in the SAQTSAMP(AQTSXSD1) data set:

Examples:

tableSet

See this piece of sample XML code, which instructs the stored procedure to work on the SALES and PRODUCT tables:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:tableSet xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.0">
  <table name="SALES" schema="BCKE" />
  <table name="PRODUCT" schema="BCKE" />
</aqt:tableSet>
```

tableSetForSetTablesReplication

The tableSetForSetTablesReplication element is an extension of tableSet. It allows you to set an attribute (overrideExistingKeys), which, as the name suggests, allows you to override certain settings. This leads to an overall performance improvement for earlier product versions. If you only use this or a later product version, you can ignore this element.

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqt:tableSetForSetTablesReplication
  xmlns:aqt="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0"
  overrideExistingKeys="true">
  <table name="SALES" schema="BCKE" />
  <table name="PRODUCT" schema="BCKE" />
</aqt:tableSetForSetTablesReplication>
```

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace

information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with the result set. The result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Accessed data and systems

As a result of calling the SYSPROC.ACCEL_SET_TABLES_REPLICATION stored procedure, IBM InfoSphere Data Replication for z/OS carries out certain steps to enable incremental updates on the accelerator.

In addition, the stored procedure updates the IBM Db2 Analytics Accelerator for z/OS catalog on the accelerator.

Related reference:

“What to do after changing a table or table space in Db2 for z/OS” on page 81

SYSPROC.ACCEL_TEST_CONNECTION

Tests the connection between a Db2 subsystem and an accelerator. A pairing or authentication of the accelerator is not required before running this procedure.

Details

The SYSPROC.ACCEL_TEST_CONNECTION stored procedure allows you to check:

- Whether the mainframe computer can contact (ping) the accelerator over the network
- Whether the network path from Db2 to the accelerator has been properly configured
- Whether the connection between the Db2 subsystem and the accelerator works after the pairing process
- The data transfer rate (network speed) between Db2 and the accelerator
- The versions of software components on a particular accelerator and other information

Syntax

```
CALL SYSPROC.ACCEL_TEST_CONNECTION
(diagnostic_specification,
 diagnostic_output,
 message);
```

Options description

diagnostic_specification

An XML input string that specifies which tests are to be run. The XML string must conform to the structure of the `diagnosticCommand` element in the SAQTSAMP(AQTSXSD1) data set. The string can contain several XML elements. Each of these elements starts a certain test. You can run all the tests separately. If more than one test is specified and one of them fails, the remaining tests are completed. The tests are carried out in the same order as listed here:

<ping ip="ip_address" />

Tests the IP connection between the stored procedures and a specific accelerator. For this test, the **ping** command in IBM UNIX System Services is used.

<connect accelerator="name" />

Tests the connectivity including authenticated access between the stored procedures and a specific accelerator. The stored procedure uses the handshake mechanism and the data of the Communications database and the SYSACCEL.SYSACCELERATORS table.

<mtupath ip="ip_address" port="number" />

Tests the validity of the maximum transmission unit (MTU) that has been chosen for the network path between the z/OS system and the accelerator. The MTU is the largest possible unit of data that can be sent on a given physical medium in a single frame. This test can also be used for installation verification. In addition to the IP address, specify the DRDA port number (1400 by default).

<networkSpeed [...] />

Tests the data transfer rate of the network connecting the z/OS system and the accelerator. Use this test to analyze network performance bottlenecks that might be the cause of load performance problems. Specify the following attributes:

- The name of the accelerator (`accelerator = "name"`)
- The total size of the data chunk to be tested (`totalNumberBytes="value"`). Set this to a value of 10000000 (10 MB) or higher.
- The size of the individual data units that make up the total data size (`dataBatchSize="size"`). Set this to a value of 320000 or higher.
- The number of parallel connections (`parallelConnections="number"`). Set this to the value of the AQT_MAX_UNLOAD_IN_PARALLEL environment variable. The `totalNumberBytes` value is multiplied by this value. The product is the total number of bytes that are transferred between Db2 for z/OS and the accelerator throughout the test.
- An identifier for the sample (`seed="identifier"`). You can use any value that is easily recognizable, for example 12345.

<version [...] />

Returns the version and other information about the software that is installed on an accelerator. You can submit the version element with different attributes:

<version ip="ip_addr" port="1400" />

This XML string can be used to probe an accelerator that has not yet been authenticated for use with a Db2 subsystem or data sharing group (no pairing). Since a name has not been registered yet, you must provide the IP address and the network port.

<version accelerator="name" />

This XML string can be used to probe an authenticated (paired) accelerator.

diagnostic_output

The XML output string that contains the test results. The structure of this string conforms to that of the `diagnosticOutput` element in the SAQTSAMP(AQTSXSD1) data set. If all tests were completed successfully, the stored procedure returns SQL code 0 and message AQT10000I. If one or more tests fail, you receive an error SQL code and message AQT10075E.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with the result set. The result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Example A

The following XML input string (value of the *diagnostic_specification* parameter) instructs the stored procedure to test the IP connectivity, connectivity with authenticated access, MTU settings, and the network performance:

```
<?xml version="1.0" encoding="UTF-8" ?>
<aqttables:diagnosticCommand
xmlns:aqttables="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">
  <ping ip="10.101.8.100" />
  <connect accelerator="TESTACC1" />
  <mtupath ip="10.101.8.100" port="1400" />
  <networkSpeed accelerator="TESTACC1" totalNumberBytes="1000000000"
dataBatchSize="320000" parallelConnections="4" seed="12345"/>
</aqttables:diagnosticCommand>
```

The output looks similar to the following XML block (the output changes frequently and might not be exactly as shown here) :

```
<?xml version="1.0" encoding="UTF-8" ?>
<testConnect:diagnosticOutput
xmlns:testConnect="http://www.ibm.com/xmlns/prod/dwa/2011"
version="1.0">

  <diagnostics action="ping" success="true">
```

CS V1R13: Pinging host 10.101.8.100

Ping #1 response took 0.000 seconds.
Ping #2 response took 0.000 seconds.
Ping #3 response took 0.000 seconds.
Ping #4 response took 0.000 seconds.

Ping test returned with rc: 0

</diagnostics>

<diagnostics action="connect" success="true">
</diagnostics>

<diagnostics action="networkSpeed" success="true">

Server output:

----- Thread performance counters -----

++++ Performance counter: thread0 +++++

thread-0: Total data received:	1000000000 bytes
thread-0: Single buffer size:	320000 bytes
thread-0: Receive calls:	3125
thread-0: Elapse time for receive calls:	3651 ms
thread-0: Send buffer size:	262144 bytes
thread-0: Receive buffer size:	16777216 bytes
thread-0: Transfer rate:	261.209070503 MB/sec

++++ Performance counter: thread1 +++++

thread-1: Total data received:	1000000000 bytes
thread-1: Single buffer size:	320000 bytes
thread-1: Receive calls:	3125
thread-1: Elapse time for receive calls:	3747 ms
thread-1: Send buffer size:	262144 bytes
thread-1: Receive buffer size:	16777216 bytes
thread-1: Transfer rate:	254.516764453 MB/sec

++++ Performance counter: thread2 +++++

thread-2: Total data received:	1000000000 bytes
thread-2: Single buffer size:	320000 bytes
thread-2: Receive calls:	3125
thread-2: Elapse time for receive calls:	3576 ms
thread-2: Send buffer size:	262144 bytes
thread-2: Receive buffer size:	16777216 bytes
thread-2: Transfer rate:	266.687448659 MB/sec

++++ Performance counter: thread3 +++++

thread-3: Total data received:	1000000000 bytes
thread-3: Single buffer size:	320000 bytes
thread-3: Receive calls:	3125
thread-3: Elapse time for receive calls:	3702 ms
thread-3: Send buffer size:	262144 bytes
thread-3: Receive buffer size:	16777216 bytes
thread-3: Transfer rate:	257.61056629 MB/sec

-----Overall performance counter -----

Number of sender threads:	4
Total number of bytes received:	4000000000 bytes

```

Total elapse time for receiving data: 3747 ms

Transfer rate End-to-End: 1018.06705781 MB/sec

----- Connector details -----

DRDA socket connector details:

Socket details

socket number: 25

.
.
.

Total performance counter:

@perf: Single thread buffer size: 320000 bytes
@perf: Number of sender threads: 4
@perf: Total number of bytes sent: 4000000000 bytes
@perf: Total elapse time for send calls with ack: 3.74664 sec
@perf: Transfer rate: 1067623542.06 bytes/sec

Test finished.

</diagnostics>

<diagnostics action="mtupath" success="true">

z/OS max segment size: 8952 byte

Accelerator max segment size: 8952 byte

Accelerator -> z/OS ping output:

PING 10.101.8.103 (10.101.8.103) 8952(8980) bytes of data.

8960 bytes from 10.101.8.103: icmp_seq=1 ttl=64 time=0.171 ms
8960 bytes from 10.101.8.103: icmp_seq=2 ttl=64 time=0.194 ms
8960 bytes from 10.101.8.103: icmp_seq=3 ttl=64 time=0.176 ms
8960 bytes from 10.101.8.103: icmp_seq=4 ttl=64 time=0.166 ms
8960 bytes from 10.101.8.103: icmp_seq=5 ttl=64 time=0.170 ms
8960 bytes from 10.101.8.103: icmp_seq=6 ttl=64 time=0.181 ms
8960 bytes from 10.101.8.103: icmp_seq=7 ttl=64 time=0.188 ms
8960 bytes from 10.101.8.103: icmp_seq=8 ttl=64 time=0.170 ms
8960 bytes from 10.101.8.103: icmp_seq=9 ttl=64 time=0.179 ms
8960 bytes from 10.101.8.103: icmp_seq=10 ttl=64 time=0.182 ms

---10.101.8.103 ping statistics ---

10 packets transmitted, 10 received, 0% packet loss,
time 9001ms
rtt min/avg/max/mdev = 0.166/0.177/0.194/0.017 ms


z/OS -> Accelerator ping output:
CS V1R13:
Pinging host 10.101.8.100

Ping #1 response took 0.000 seconds.
Ping #2 response took 0.000 seconds.
Ping #3 response took 0.000 seconds.
Ping #4 response took 0.000 seconds.

```



```

Ping #5 response took 0.000 seconds.
Ping #6 response took 0.000 seconds.
Ping #7 response took 0.000 seconds.
Ping #8 response took 0.000 seconds.
Ping #9 response took 0.000 seconds.
Ping #10 response took 0.000 seconds.

```

Socket details

```
socket number: 0
```

```
.
.
.
```

```
TCP option - maximum segment size for outgoing
TCP packets: 8952 byte
```

```
TCP option - no delay: yes
IP option - time to live: 0
```

```
IP option - multicast time to live: 0
```

```
IP option - multicast packets should be looped back to the local
sockets: no
```

```
Ping returned with rc: 0
```

```

</diagnostics>
</testConnect:diagnosticOutput>

```

Note that in this case, the success attribute always carries the value "true".

If, on the other hand, the tests did not run successfully, the output might look like this:

```

<?xml version="1.0" encoding="UTF-8" ?>
<aqttables:diagnosticOutput
  xmlns:aqttables="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.0">
  <diagnostics action="ping" success="false">
    CS V1R10: Pinging host 9.152.1.154
    Ping #1 timed out
    Ping #2 timed out
    Ping #3 timed out
    Ping #4 timed out
  </diagnostics>
</aqttables:diagnosticOutput>

```

In this case, the IP connectivity test failed (success="false"). The specified accelerator is unreachable.

Example B

The <version> element is used in the XML input string (value of the *diagnostic_specification* parameter) :

```

<?xml version="1.0" encoding="UTF-8" ?>
<aqttables:diagnosticCommand
  xmlns:aqttables="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">
  <version ip="162.108.0.102" port="1400"/>
</aqttables:diagnosticCommand>

```

The output looks similar to the following extract:

```

<?xml version="1.0" encoding="UTF-8" ?>
<testConnect:diagnosticOutput
  xmlns:testConnect="http://www.ibm.com/xmlns/prod/dwa/2011"
  version="1.0">
<diagnostics action="version" success="true">
<accelerator>
  <versionInformation>
    <component name="Accelerator" version="7.1.0.201711071105" />
    <component name="Access Server" version="" />
    <component name="BackendDBS" version="11.1.9.0 [Build 1709041600]" />
    <component name="Linux Operating System" version="CentOS Linux
      release 7.4.1708 (Core)" />
  </versionInformation>
  <DRDAProtocolLevel>AQT_0000000000060001_0000000000000041_7800000000000000
  </DRDAProtocolLevel>
  <highestSupportedCompatibilityLevel>65</highestSupportedCompatibilityLevel>
</accelerator><storedProcedure>
  <versionInformation>
    <component name="version" version="7.1.0" />
    <component name="interface-version" version="65" />
    <component name="build-label" version="20171109-0814" />
    <component name="build-timestamp" version="2017-11-09 09:21:21" />
    <component name="build-platform" version="OS/390 SCLM 25.00 04 2827" />
    <component name="support-level" version="5" />
  </versionInformation>
  <DRDAProtocolLevel>AQT_0000000000060001_0000000000000041_6000000000000000
  </DRDAProtocolLevel>
  <highestSupportedCompatibilityLevel>65</highestSupportedCompatibilityLevel>
  <setting name="AQT_MAX_UNLOAD_IN_PARALLEL" value="4" />
  <setting name="AQT_MAX_RETRIES_DSNUTILU" value="2" />
  <setting name="AQT_SECONDS_BEFORE_RETRY_DSNUTILU" value="60" />
  <setting name="AQT_QUOTEFIX1026" value="SET" />
  <setting name="AQT_SKIP_VALIDATE_XML" value="SET" />
  <setting name="AQT_UTILITY_TMP" value="ISOV2.&USERID..AQT.&UNIQ." />
  <setting name="AQT_RTS_EXTERNALIZATION_AUTH_FAILURE" value="ERROR" />
  <setting name="AQT_DO_SYSLOGGING" value="SET" />
  <setting name="AQT_KEEPIDLE_INTERVAL" value="60" />
</storedProcedure>

```

Prerequisites

For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- MONITOR1 authorization
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
- RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Related concepts:

“Error handling” on page 77

Related reference:

“The message parameter” on page 71

Appendix D, “Transcript of the SAQTSAMP(AQTSXSD1) data set member,” on page 169

Related information:

“AQT10402E” on page 110

“AQT10075E” on page 89

SYSPROC.ACCEL_UPDATE_CREDENTIALS

Changes the authentication token that Db2 and the stored procedures use to communicate with an accelerator.

Use this stored procedure if you must comply with security policies that require a regular change of all authentication information, such as passwords. You can run the **<getAcceleratorInfo>** command of the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure to return a timestamp that verifies regular changes of authentication information.

Tip: Updating the authentication token does not affect subsequent operations of the accelerator, but queries running at the same time might fail occasionally. It is therefore recommended that you disable the accelerator before you call the SYSPROC.ACCEL_UPDATE_CREDENTIALS stored procedure.

Syntax

```
CALL SYSPROC.ACCEL_UPDATE_CREDENTIALS  
(accelerator_name,  
message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace information about the stored procedure execution. A cursor named SP_TRACE_CURSOR is associated with the results set. The result set consists of the following columns:

- SEQID of type INTEGER
- TRACEDATA of type VARBINARY, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the TRACEDATA column in ascending order of the values in the SEQID column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Prerequisites

- For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).

- Updating the credentials requires an accelerator that was successfully added to the system configuration by running the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure (successful pairing process).

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- EXECUTE on the stored procedure
- EXECUTE on the SYSACCEL.* packages
- MONITOR1 authorization
- Read/write and execute access to the /tmp directory for the user who calls the stored procedure
- RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.

Related reference:

“The message parameter” on page 71

Appendix D, “Transcript of the SAQTSAMP(AQTSXSD1) data set member,” on page 169

Related information:

“AQT10402E” on page 110

SYSPROC.ACCEL_UPDATE_SOFTWARE2

Transfers software updates from the z/OS UNIX file system (z/FS) to an accelerator, lists available software versions, activates versions that are available on an accelerator, and removes obsolete software packages from an accelerator.

Details

Update packages to be transferred by the SYSPROC.ACCEL_UPDATE_SOFTWARE2 stored procedure must be located on an IBM Z server or in a Global Temporary Table (GTT). Both targets can be addressed when you download packages from IBM Fix Central.

If you prefer to install, transfer, and activate software updates by running this stored procedure rather than the corresponding functions in IBM Db2 Analytics Accelerator Studio, you must extract the hash value for each package from the checksum files and submit the hash value as part of the XML input string for the stored procedure.

Download packages on IBM Fix Central usually come with a checksum file for every supported algorithm. Supported algorithms are SHA256, SHA1 and MD5. The corresponding files on IBM Fix Central are:

- sha256sums.txt
- sha1sums.txt
- md5sums.txt

Any of these files contains one line for each package. Every line consists of two values. The first value is the hash used for verification (the value you have to extract); the second value is the corresponding package name.

You can set the AQT_HOST_PACKAGE_DIRECTORY environment variable in the AQTENV data set to specify the default location for update packages. The variable must

specify an absolute directory path. The SYSPROC.ACCEL_UPDATE_SOFTWARE2 stored procedure looks into this directory only. Subdirectories are not searched.

Specifying a path on the hostPackageDirectory attribute in the XML input string (value of the *update_command* parameter), you can override the environment variable setting. The stored procedure then "disregards" the default settings in the AQTENV data set.

More than one version can be transferred at a time. However, you cannot install more than one version on the same accelerator. This implies that you can also not switch between different versions.

If an error occurs during a package transfer, the erroneous package and all subsequent packages will not be transferred.

The stored procedure internally sets the accelerator to the *Quiesced* state before a new version is activated. Running queries and administration tasks are completed before this is done.

During the activation or rollback of a software update, the TCP/IP connection between the stored procedure and the accelerator is interrupted (in most cases, this does not apply to updates of the Access Server or the replication engine for incremental updates). To verify that the version change was successful, the stored procedure tries to reconnect to the accelerator. A timeout mechanism is in place in case the accelerator takes too long to respond.

If SYSPROC.ACCEL_UPDATE_SOFTWARE2 cannot activate the specified version, it reactivates the version that was previously used. Thus, the stored procedure will always be able to reconnect to a running accelerator.

Finally, SYSPROC.ACCEL_UPDATE_SOFTWARE2 calls SYSPROC.ACCEL_CONTROL_ACCELERATOR with the **GetActivationLog** subcommand. The log that is produced shows the versions of the installed software packages and progress information about running installations. Mind that an installation might involve a downtime of the accelerator, during which such a log cannot be produced.

Syntax

```
CALL SYSPROC.ACCEL_UPDATE_SOFTWARE2
(accelerator_name,
update_command,
update_result,
message);
```

Options description

accelerator_name

The unique name of the accelerator. This accelerator must have been defined by the SYSPROC.ACCEL_ADD_ACCELERATOR2 stored procedure.

update_command

An XML input string that initiates the code transfer to the accelerator, instructs the stored procedure to list available software versions on an accelerator, in the proper z/FS directory, or change the active software version. The string must conform to the structure of the softwareUpdate element in the SAQTSAMP(AQTSXSD1) data set. Use the following XML elements to start the sub-functions of the stored procedure:

<listDeployedPackages>

To list the software versions (transferred packages) that are currently available on an accelerator.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<dwa:softwareUpdate
  xmlns:dwa="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.1">
  <listDeployedPackages/>
</dwa:softwareUpdate>
```

<listZPackageDirectory>

To list the software packages that are currently available in the zFS of your z/OS data server. You can use the output of this option as input for the <deployPackage> option.

Example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<dwa:softwareUpdate
  xmlns:dwa="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.1">
  <listZPackageDirectory hostPackageDirectory="/u/download/fixCentral" />
</dwa:softwareUpdate>
```

This input string instructs the SYSPROC.ACCEL_UPDATE_SOFTWARE2 stored procedure to list available software packages in the /u/download/fixCentral directory of the zFS. The value of hostPackageDirectory is an absolute path (starting from the root directory). If hostPackageDirectory was not set, the stored procedure would list available update packages in the directory that the AQT_HOST_PACKAGE_DIRECTORY environment variable points to. This variable is set in the AQTENV data set.

<deployPackage>

To transfer one or more packages from the zFS of your z/OS data server to the accelerator. This option does not produce any output.

Example A:

```
<?xml version="1.0" encoding="UTF-8" ?>
<dwa:softwareUpdate
  xmlns:dwa="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">
  <deployPackage
    fileName="iias-1.0.3.0-20171120090514b50_accelerator.tar.gz"
    source="FILE"
    hash="ce07195b659e75f4e1db43552860070061f156a98bb37b672b101ba6e3ddf30c"
    algorithm="SHA256" />
</dwa:softwareUpdate>
```

In this example, an update package called iias-1.0.3.0-20171120090514b50_accelerator.tar.gz is transferred from the host package directory in the zFS (as set by the HOST_PACKAGE_DIRECTORY environment variable) to the specified accelerator.

Example B:

```
<?xml version="1.0" encoding="UTF-8" ?>
<dwa:softwareUpdate
  xmlns:dwa="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">
  <deployPackage
    fileName="iias-1.0.3.0-20171120090514b50_accelerator.tar.gz"
```

```

        source="GTT"
        hash="ce07195b659e75f4e1db43552860070061f156a98bb37b672b101ba6e3ddf30c"
        algorithm="SHA256" />
</dwa:softwareUpdate>

```

In this example, an update package that was stored in a global temporary table is transferred to the specified accelerator.

<activateDeployedPackage>

To activate a particular package:

Example:

```

<?xml version="1.0" encoding="UTF-8" ?>
<dwa:softwareUpdate
  xmlns:dwa="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.0">
  <activateDeployedPackage fileName="SailfishFin1.rpm"/>
</dwa:softwareUpdate>

```

The XML code in this example instructs SYSPROC.ACCEL_UPDATE_SOFTWARE2 to activate a software package named SailfishFin1.rpm.

<removeDeployedPackage>

To remove a particular software package (version) from an accelerator

Example:

```

<dwa:softwareUpdate
  xmlns:dwa="http://www.ibm.com/xmlns/prod/dwa/2011" version="1.1">
  <removeDeployedPackages>
    <package
      fileName="ias-1.0.3.0-20171112090514b50_accelerator.tar.gz"/>
  </removeDeployedPackages>
</dwa:softwareUpdate>

```

The XML code in this example instructs SYSPROC.ACCEL_UPDATE_SOFTWARE2 to remove the package ias-1.0.3.0-20171112090514b50_accelerator.tar.gz.

You can only remove packages that are not active anymore. That is, if a package to be removed is still active, you must first activate a different package or version.

update_result

An XML output string that is created as a result of using the <listDeployedPackages> or <listZPackageDirectory> element in the *update_command* input string.

For <listDeployedPackages> and <listZPackageDirectory>, the output parameter conforms the structure of the <softwareUpdate> element in the SAQTSAMP(AQTSXSD1) data set. For all other functions, this output parameter is NULL.

Example:

```

<?xml version="1.0" encoding="UTF-8" ?>
<dwa:softwareUpdateResult version="1.0">
  <ZPackageDirectoryListing directoryName="/u/download/fixCentral">
    <deployablePackage source="FILE"
      fileName="ias-1.0.3.0-20171112090514b50_accelerator.tar.gz"
      fileSizeInBytes="913042363"
      hash="7de0b93ed997941dd1b6cde2c87625b2afd7b72759a5631c86bbc6c4aee61e82"
      algorithm="SHA256" />
    <deployablePackage source="FILE"

```

```

        fileName="ias-1.0.3.1-20171214060618b60_accelerator.tar.gz"
        fileSizeInBytes="9530186651"
        hash="3412b93ed997941dd1b6cde2c87625b2afd7b72759a5631c86bbc6c4aee61e82"
        algorithm="SHA256" />
    </ZPackageDirectoryListing>
</dwa:softwareUpdateResult>

```

This XML code is the result of using the `<listZPackageDirectory>` command as input. It lists two packages in the host package directory:

- `ias-1.0.3.0-20171112090514b50_accelerator.tar.gz`
- `ias-1.0.3.1-20171214060618b60_accelerator.tar.gz`

It is assumed that this directory is `/u/download/fixCentral`.

message

For the description, follow the appropriate link under **Related reference** at the end of this topic.

Result sets

The stored procedure always returns one result set. Depending on the trace configuration in the *message* input parameter, this result set might contain trace information about the stored procedure execution. A cursor named `SP_TRACE_CURSOR` is associated with the result set. The result set consists of the following columns:

- `SEQID` of type `INTEGER`
- `TRACEDATA` of type `VARBINARY`, with a maximum length of 32698 characters

An XML trace file is created by concatenating all values in the `TRACEDATA` column in ascending order of the values in the `SEQID` column. IBM support often requests such a file for error analysis. The file is encoded in UTF-8.

Prerequisites

- For the user ID that calls the stored procedures on z/OS, you must define an OMVS segment in the Resource Access Control Facility (RACF).
- The *accelerator_name* parameter must specify an accelerator name that is listed in the catalog tables of the product.

Authorizations for z/OS

On z/OS, the user ID under which this stored procedure is run must have the following privileges:

- `EXECUTE` on the stored procedure
- `EXECUTE` on the `SYSACCEL.*` packages
- `MONITOR1` authorization
- Read/write and execute access to the `/tmp` directory for the user who calls the stored procedure
- For the functions **listZPackageDirectory** and **deployPackage**: Read access to the directory that the `AQT_HOST_PACKAGE_DIRECTORY` environment variable points to.
- `RACF ACCESS(READ)` on the data set that contains the `AQTENV` file in the started task procedure of the Workload Manager (WLM) environment.
- Sub-commands of the `update_command` option might require further authorizations.

Accessed data and systems

The SYSPROC.ACCEL_UPDATE_SOFTWARE2 stored procedure reads the IBM Db2 Analytics Accelerator for z/OS catalog tables in your database management system.

In addition, it executes requests on the accelerator. This might include a reboot of the IBM Db2 Analytics Accelerator for z/OS server.

Related reference:

"The message parameter"

Appendix D, "Transcript of the SAQTSAMP(AQTSXSD1) data set member," on page 169

Related information:

"AQT10402E" on page 110

The message parameter

The message parameter is used by all IBM Db2 Analytics Accelerator stored procedures. It serves as an input parameter and as an output parameter.

The message parameter is always used as an output parameter and produces an XML string with information about the success or failure of a stored-procedure run.

You can use the message parameter as an input parameter for the following purposes:

- To control the trace behavior and write trace information about the stored procedure to a result set or file. To do so, you specify an input XML string that uses the <traceConfig> element:

Example A:

```
<?xml version= "1.0" encoding= "UTF-8" ?>
<spctrl:messageControl xmlns:spctrl = "http://www.ibm.com/xmlns/prod/dwa/2011"
  version = "1.2" >
  <language>en_US</language> <!-- currently ignored -->
  <traceConfig location = "/tmp/spcreate.trace" keepTrace = "true"
    traceFileSizeInMB = "10" >
    <component name = "PROCEDURE" level = "DEBUG" />
  </traceConfig>
</spctrl:messageControl>
```

If you use this example, stored-procedure trace information is written to the /tmp/spcreate.trace file in the z/OS UNIX file system (zFS) because the location attribute is set to this value. The trace file is allowed to grow to a size of 10 MB. When this size is exceeded, the oldest entries are removed from the trace file to free up space for the newest entries. The trace information will not be deleted after the stored-procedure run (keepTrace=True). The information is collected with a detail level of DEBUG.

Example B:

```
<?xml version= "1.0" encoding= "UTF-8" ?>
<spctrl:messageControl xmlns:spctrl = "http://www.ibm.com/xmlns/prod/dwa/2011"
  version = "1.2" >
  <language>en_US</language> <!-- currently ignored -->
  <traceConfig location = "/u/myTraceDirectory/"
```

```

        keepTrace = "onError" traceFileSizeInMB = "10" >
        <component name = "PROCEDURE" level = "DEBUG" />
    </traceConfig>
</spctrl:messageControl>

```

In contrast to the previous example, the trace information is written to the /u/myTraceDirectory/ directory. A file name has not been specified, so the default name is chosen. The trace information is deleted if no error occurs. If an error causes the procedure to fail, the trace information is kept at the specified location(keepTrace=onError).

Tip: In an automated setup, it is favorable to configure tracing for stored procedures as shown in **Example B**, that is:

- Specify a writable location, for example location="/u/someDirectory/" so that the trace information is written to a file. Trace files are much easier to read and interpret than result sets.

You can also specify location="GENERATED". In this case, the trace file is written to the /tmp directory of the z/OS UNIX file system. The file name will be chosen at random.

- Keep trace files in case of errors only by using the keepTrace="onError" attribute on the message input parameter of the stored procedures.

The input string must conform to the structure of the <messageControl> element in the SAQTSAMP(AQTSXSD1) data set. The message parameter is defined as an INOUT character large object (CLOB) with a maximum size of 64 KB.

Important: NULL, an empty string, or space characters are allowed as an input value for the message parameter. In this case, the stored procedure uses a default value.

Running stored procedures from a batch job

To administer IBM Db2 Analytics Accelerator for z/OS by using the MVS™ job control language (JCL), the stored procedures must be called from a z/OS environment. You can achieve this by using one of the methods presented here.

“Using the Db2 command line processor from UNIX System Services”

“Using the DSN Db2 command processor for TSO” on page 74

Using the Db2 command line processor from UNIX System Services

To start a batch job, you can use the Db2 command line processor from UNIX System Services. In this case, the z/OS BPXBATCH utility is used to invoke the command line processor.

Before you begin

Make sure that the following conditions apply:

- The Db2 libraries for IBM Db2 Analytics Accelerator for z/OS have been installed.
- The IBM Db2 Analytics Accelerator for z/OS stored procedures have been installed.
- The Db2 command line processor has been installed.

Note: The Db2 command line processor is a Java™ application that requires IBM Data Server drivers for JDBC.

- The accelerator has been successfully added to the Db2 subsystem from IBM Db2 Analytics Accelerator Studio.

About this task

To create a suitable batch job with minimum effort, you can copy and customize one or more of the Db2 command-line scripts and UNIX System Services shell scripts that are included in the SAQTSAMP data set.

Procedure

1. Create a separate Db2 command line processor properties-file for the user who will run the batch job. Make sure that the user uses this properties file, for example by adding the CLPPROPERTIESFILE environment variable to the .profile of this user. Remove read access to this file for everybody else. This way, you can safely add a connection alias for the accelerator network connection to the properties file, including the password. Use the following syntax to add this information to the properties file:

```
<connection_alias>=<db2host>:<db2port>/<db2location>,<uid>,<password>
```

where

<db2host>

Is the host name or IP address of the IBM Z server on which Db2 runs

<db2port>

Is the port for network connections between the Db2 command-line client and the Db2 host. To identify the Db2 port, run the following Db2 command:

```
- <ssid> DIS DDF
```

where <ssid> is the Db2 subsystem ID.

<db2location>

Is the location of the Db2 subsystem that is supposed to interact with an accelerator.

<uid>

Is the ID of the user running the batch job

<password>

The password of the user running the batch job

2. Copy the following Db2 command-line scripts or UNIX System Services shell scripts and JCLs. The scripts are included in the SAQTSAMP data set, which is delivered with IBM Db2 Analytics Accelerator for z/OS.
 - AQTSCI02
 - AQTSJI02
 - AQTSSCHK
 - AQTSSCPY
 - Sample XML input strings depending on the stored procedures that you want to test. For example, AQTSTXTCO is a sample XML input string for the SYSPROC.ACCEL_TEST_CONNECTION stored procedure. The SAQTSAMP data set contains such sample XML input strings for most IBM Db2 Analytics Accelerator for z/OS stored procedures.

For a description, follow the **Related reference** link at the end.

3. Customize the following scripts according to your needs:

- AQTSCI02
- AQTJSI02
- AQTSCCHK

Note: AQTSSCHK checks the number of successful stored procedure calls. If you change the number of calls in AQTSCI02, you must also change it in AQTJSI02 because AQTJSI02 passes this number to AQTSCCHK as the number of calls to check for.

- Members containing sample XML input strings, such as AQTSTXCO.
4. Submit AQTJSI02. AQTJSI02 uses AQTSSCPY to copy AQTSCI02 and various XML files to the /tmp/ivp directory in the z/OS UNIX file system, starts the command line processor with the copied files as input, and finally runs AQTSSCHK to verify the output.

Related reference:

Appendix C, “Members of SAQTSAMP,” on page 165

Using the DSN Db2 command processor for TSO

You can also start the batch job from the DSN Db2 command processor for Time Sharing Option (TSO). With the RUN subcommand of the processor, you can start an application that contains SQL CALL statements invoking the stored procedures.

Before you begin

Make sure that the following conditions apply:

- The Db2 libraries for IBM Db2 Analytics Accelerator for z/OS have been installed.
- The IBM Db2 Analytics Accelerator for z/OS stored procedures have been installed.
- The z/OS XL C/C++ compiler has been installed.
- The accelerator has been successfully added to the Db2 subsystem from IBM Db2 Analytics Accelerator Studio.
- The Db2 for z/OS JCL procedure DSNHC is available and is properly configured.

About this task

To create a suitable batch job with minimum effort, you can copy and customize the sample JCL members, which are included in the SAQTSAMP data set. The SAQTSAMP data set is delivered as part of the product.

Procedure

1. Copy the following job members of the SAQTSAMP data set:
 - AQTJSI03
 - AQTSCALL
2. Customize the copies as needed, that is, replace the !SAQTSAMP! and !SAMPDBRM! placeholders with appropriate data-set names. AQTSCALL is a sample application program in the C programming language. A single invocation of AQTSCALL calls a single stored procedure. You specify the procedure to be called by providing one of the input parameters in Table 7 on page 75.

Table 7. Input parameters for AQTSCALL

Input parameter	Called stored procedure
ADDTABLES	SYSPROC.ACCEL_ADD_TABLES
ALERTABLES	SYSPROC.ACCEL_ALTER_TABLES
CTRLACCEL	SYSPROC.ACCEL_CONTROL_ACCELERATOR
LOADTABLES	SYSPROC.ACCEL_LOAD_TABLES
REMOVETABLES	SYSPROC.ACCEL_REMOVE_TABLES
SETTABLES	SYSPROC.ACCEL_SET_TABLES_ACCELERATION
TESTCON	SYSPROC.ACCEL_TEST_CONNECTION

The AQTSCALL program reads the input for the stored procedures from the DD names AQTP1, AQTP2, AQTP3 and AQTP4 for up to four input parameters. The DD names are defined in the AQTJSI03 job, which calls the sample application. Depending on the SQLSTATE that is set by the stored procedures, the AQTJSI03 job ends with one of the following return codes:

Table 8. Return codes of AQTJSI03

Return code	Description
0	Success
4	Warning
8	Error
16	Call failed or information could not be returned

AQTJSI03 is a sample JCL that compiles and links the C program AQTSCALL and that invokes it as a subcommand of DSN. It contains a sample invocation for each stored procedure. Instructions on how to customize AQTJSI03 are included in the header.

3. Submit AQTJSI03.

What to do next

For future invocations of AQTSCALL, remove the compile, link and binds steps from the AQTJSI03 job before submitting it the next time. If, at some point, you really need to recompile the AQTSCALL program, proceed as follows:

1. Remove the data sets that were created by AQTJSI03.

Remember: During customization, you replaced the placeholders !SAQTSAMP! and !SAMPDBRM! with actual data-set names.

2. Resubmit the AQTJSI03 job.

Related reference:

Appendix C, “Members of SAQTSAMP,” on page 165

Error handling

The SQL CALL statement invoking a stored procedure returns an *sqlstate* field value, an *sqlcode* field value, and diagnostic information (*sqlerrmc*) in the SQL communication area (SQLCA).

You find error information in the MESSAGE output parameter only. It cannot be deduced from the *sqlstate* or the *sqlcode*. The *sqlcode* value is always +466 and the *sqlstate* value is always 0100C because result sets are returned by the procedures unless the procedure ends prematurely.

Table 9. Result set characteristics by stored procedure

Name	Cursor name of result set	Result set columns and data types
SYSPROC.ACCEL_ADD_ACCELERATOR2	SP_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_ALTER_TABLES	SP_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_ADD_TABLES	SP_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_CONTROL_ACCELERATOR Note: This stored procedure returns a result set if you specify the <getTraceData> element in the XML input value of the <i>command</i> parameter to obtain trace information about an accelerator.	ACCELERATOR_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_GET_QUERIES	QUERY_INFO_CURSOR	SEQID INTEGER QUERYINFO VARCHAR(32698)
SYSPROC.ACCEL_GET_QUERIES2	QUERY_INFO_CURSOR	SEQID INTEGER QUERYINFO VARCHAR(32698)
SYSPROC.ACCEL_GET_QUERY_DETAILS	QUERY_INFO_CURSOR	SEQID INTEGER QUERYINFO VARCHAR(32698)

Table 9. Result set characteristics by stored procedure (continued)

Name	Cursor name of result set	Result set columns and data types
SYSPROC.ACCEL_ GET_QUERY_DETAILS2	<ol style="list-style-type: none"> 1. Cursor name of first result set: QUERY_INFO_CURSOR 2. Cursor name of second result set: QUERY_PLAN_CURSOR 3. Cursor name of third result set: QUERY_PLANTEXT_CURSOR 4. Cursor name of fourth result set: SP_TRACE_CURSOR 	<ol style="list-style-type: none"> 1. First result set: SEQID INTEGER QUERYINFO VARCHAR(32698) 2. Second result set: SEQID INTEGER PLAN VARCHAR(32698) 3. Third result set: SEQID INTEGER PLAN VARCHAR(32698) 4. Fourth result set: SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_ GET_QUERY_EXPLAIN	QUERY_INFO_CURSOR	SEQID INTEGER QUERYINFO VARCHAR(32698)
SYSPROC.ACCEL_ GET_TABLES_DETAILS	<ol style="list-style-type: none"> 1. Cursor name of first result set: TABLES_DETAILS_CURSOR 2. Cursor name of second result set: SP_TRACE_CURSOR 	<ol style="list-style-type: none"> 1. First result set: SEQID INTEGER TABLES_DETAILS VARCHAR(32698) 2. Second result set: SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_ GET_TABLES_INFO Note: This stored procedure returns at least two result sets when run successfully (without errors).	<ol style="list-style-type: none"> 1. Cursor name of first result set: TABLES_INFO_SPEC_CURSOR 2. Cursor name of second result set: TABLES_INFO_STATES_CURSOR 3. Cursor name of third result set: SP_TRACE_CURSOR 	<ol style="list-style-type: none"> 1. First result set: SEQID INTEGER TABLE_SPECIFICATION VARCHAR(32698) 2. Second result set: SEQID INTEGER TABLES_STATES VARCHAR(32698) 3. Third result set: TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_ LOAD_TABLES	SP_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_ REMOVE_ACCELERATOR	SP_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_ REMOVE_TABLES	SP_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_ SET_TABLES_ACCELERATION	SP_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)

Table 9. Result set characteristics by stored procedure (continued)

Name	Cursor name of result set	Result set columns and data types
SYSPROC.ACCEL_ SET_TABLES_ REPLICATION	SP_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_ TEST_CONNECTION	SP_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_ UPDATE_CREDENTIALS	SP_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)
SYSPROC.ACCEL_ UPDATE_SOFTWARE2	SP_TRACE_CURSOR	SEQID INTEGER TRACEDATA VARBINARY(32698)

Related information:



Description of SQLCA fields

What to do after changing a table or table space in Db2 for z/OS

In a number of cases, an ALTER TABLE or ALTER TABLESPACE statement in Db2 for z/OS does not involve maintenance work on your accelerator-shadow tables. There are cases, however, in which it does. See which steps you might have to take.

NOT Programming Interface information

ALTER TABLE

- If a column was added, changed, or deleted by an ALTER TABLE operation on a Db2 table, queries against this table are not accelerated if they reference the new, changed, or deleted column (reason code 14). Therefore, you must complete the following steps after an ALTER TABLE operation:

1. Remove the corresponding accelerator-shadow table from all accelerators on which it is defined.

In most cases, a REORG operation is not required before the table can be redefined on the accelerator. However, a REORG is required in the following cases, although this seems to be just a recommended action, as the advisory *REORG-pending* (AREO) state suggests:

- The ALTER TABLE operation added a column.
- The ALTER TABLE operation changed column data types.
- The ALTER TABLE operation dropped columns in *Db2 11 for z/OS*.

2. Redefine the table on the accelerators from which you previously removed it.
3. Load the redefined table on all accelerators.
4. Enable query acceleration for the redefined table on all accelerators.

ALTER TABLESPACE

If a table space was changed in Db2 for z/OS (ALTER TABLESPACE), and the tables of that table space also exist on an accelerator, actions are required under the following conditions:

- If the maximum number of partitions has changed (MAXPARTITIONS), you only have to reload the new or changed partitions. It is not required to reload existing partitions that have not changed.
- If a table space was changed from *segmented* to *partitioned by growth*, you must remove the accelerator-shadow tables of that table space from all accelerators, then redefine and re-prepare these for accelerated queries. Follow steps 1 through 4 to do that.

End of NOT Programming Interface information

Messages

The messages that might appear when you run IBM Db2 Analytics Accelerator for z/OS stored procedures are listed here in numerical order.

AQT10000I The operation was completed successfully.

Explanation: Success message for the XML MESSAGE output parameter of each stored procedure.

AQT10001I **Product version:** *version*, **Build label:** *buildLabel*, **Build timestamp:** *buildTimeStamp*, **Build platform:** *buildPlatform*, **Support level:** *supportLevel*, **DRDA protocol level:** *communicationProtocolLevel*

Explanation:

version Version of the IBM Db2 Analytics Accelerator for z/OS stored procedure

buildLabel

Build label of the stored procedure

buildTimeStamp

Time of the build

buildPlatform

Platform on which the procedures were built

supportLevel

The support level of the stored procedure

communicationProtocolLevel

DRDA protocol level of the stored procedure

Problem determination: To include version information about IBM Db2 Analytics Accelerator for z/OS in the MESSAGE output parameter as shown in the message text, you can set the version attribute in the XML MESSAGE input parameter for any IBM Db2 Analytics Accelerator for z/OS stored procedure. To do so, set the versionOnly attribute to the value true.

AQT10002W Warnings were issued during this operation, but a corresponding output message could not be generated. The highest severity code was: *highestSeverity* Additional diagnostic data: *additionalDiagnostic*

Explanation:

highestSeverity

The highest internal severity code that was issued during the stored-procedure run

additionalDiagnostic

Additional diagnostic data

Problem determination: This message is issued when the generation of an output message failed although the stored procedure could complete the requested operation. This indicates that warnings, but not errors, have been issued during the operation.

User action: Contact IBM support.

AQT10003E An error caused the operation to fail. A corresponding output message could not be generated. The highest severity code was: *highestSeverity* Additional diagnostic data: *additionalDiagnostic*

Explanation:

highestSeverity

The highest internal severity code that was issued during the run of the stored procedure

AQT10004W • AQT10052W

additionalDiagnostic

Additional diagnostic data

Problem determination: This message is issued when the requested operation could not be executed and when the generation of a corresponding output message failed.

User action: Contact IBM support.

AQT10004W A few warnings could not be included in the MESSAGE output. The number of skipped warnings is *numberOfSkippedWarnings*.

Explanation:

numberOfSkippedWarnings

The number of warnings that could not be written to the output message

Problem determination: This message is issued as part of the MESSAGE output if some of the warnings issued could not be included in the very same output due to size limitations (64K bytes).

User action: Check the warnings that are actually included in the output. If these warnings indicate a situation that requires further analysis, rerun the stored procedure with a trace level of DEBUG. This will cause all warnings to be written to a trace file.

AQT10005W A character in the MESSAGE output parameter was substituted due to an XML 1.0 character set violation.

Problem determination: This message is issued as part of the MESSAGE output to indicate the replacement of an invalid XML 1.0 character in the output.

User action: Check the warnings that are included in the output. Substituted bytes are replaced with an asterisk (*). If the warnings indicate a situation that requires further analysis, rerun the stored procedure with a trace level of DEBUG. This causes all warnings to be written to a trace file.

AQT10050E An internal error occurred on the *acceleratorName* **accelerator:** *diagnosticMessage*

Explanation:

acceleratorName

Name of the accelerator

diagnosticMessage

Diagnostic information returned by the accelerator

Problem determination: This error occurs when an unhandled error was detected on the accelerator. Additional information is returned in the diagnostic message.

User action: If this message was returned by the SYSPROC.ACCEL_LOAD_TABLES stored procedure, you might receive the message 04E-00E4007abend LOC=DSNUT101.DSNUGSDA for those Db2 UNLOAD utilities processes or threads that have already unloaded data to the accelerator. You can ignore this message and delete the corresponding dump files.

AQT10052W The *acceleratorName* rejected the cancelation request for the *taskId* task. Reason: *cancelationErrorReason*.

Explanation:

acceleratorName

Name of the accelerator

taskId ID of the task that could not be canceled

cancelationErrorReason

Diagnostic information from the accelerator (internal message that explains why the cancelation failed)

Problem determination: This warning occurs when it is not possible to cancel a task. The task might no longer exist because it finished recently or the accelerator might have refused the cancelation. In either case, the accelerator remains unchanged and operations continue.

User action: Check the list of running tasks and make sure that a task with the reported ID really exists.

AQT10053W A task *taskId* of type *taskType* is running on the accelerator *acceleratorName* using table *tableSchema.tableName*. The operation ACCEL_REMOVE_TABLES is completed, but the identified concurrent task may fail due to that.

Explanation:

acceleratorName

Name of the accelerator that was accessed

tableSchema

Schema name of the table that was removed

tableName

Name of the table that was removed

taskId ID of the concurrent accelerator task that is using the table

taskType

Type of the concurrent accelerator task that is using the table

Problem determination: This warning occurs when you drop an accelerator table that is still used by a process or task. The table will be dropped, but the task or process might fail thereafter.

User action: No action required. You can ignore error messages that are issued by related processes running in parallel.

AQT10055E One or more tables prevent the removal of the *acceleratorName* accelerator because they have not been removed or are still listed in the SYSACCEL.SYSACCELERATEDTABLES catalog table of your Db2 subsystem (database). In this particular case, the tables were found in or on the *existOnSide*.

Explanation:

acceleratorName

Name of the accelerator

existOnSide

Table location, that is, ACCELERATOR or DATABASE

Problem determination: Remaining tables or orphaned catalog entries prevent the removal of an accelerator.

User action: Follow these steps:

1. Find the remaining tables or orphaned catalog entries by running the SYSPROC.ACCEL_GET_TABLES_INFO stored procedure.
2. Run the SYSPROC.ACCEL_REMOVE_TABLES stored procedure or the corresponding function in IBM Db2 Analytics Accelerator Studio to remove these tables and entries.
3. Remove the accelerator by running the SYSPROC.ACCEL_REMOVE_ACCELERATOR stored procedure or the corresponding function in IBM Db2 Analytics Accelerator Studio.

AQT10061W The maximum size of compressed trace data that is specified in the *traceProfileName* trace profile for the *acceleratorName* accelerator has been changed from *userSpecifiedSize* MB to *adjustedSize* MB.

Explanation:

acceleratorName

Name of the accelerator that the trace information is written to

traceProfileName

Name of the trace profile

userSpecifiedSize

Maximum size of the compressed trace file as specified by the user in the trace profile

adjustedSize

Adjusted size of the compressed trace file

Problem determination: This warning occurs when the allowed maximum size of compressed trace data, as specified in the trace profile, has been modified because it was outside the allowed limits, or because no size limit

was specified in the profile. The maximum size in the trace profile is the total data size in MB for accelerator traces that can be returned by the **getTraceData** command of the the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure.

User action: Check the file size that is displayed by the adjustedSize parameter in the warning. The next time that you specify a trace profile, choose a bigger size than this.

AQT10062W The accelerator was added succesfully. Since it had been added to the same Db2 subsystem before, obsolete data from this subsystem (*dbmsSystemName*) was found on the accelerator. This obsolete data has been deleted during the process.

Explanation:

dbmsSystemName

Location name of the Db2 subsystem that the accelerator is added to

Problem determination: An accelerator can be added only once to a Db2 subsystem. To add it again, it must have been removed before. However, there are situations in which an accelerator was not properly removed, but the authentication token and other information that is required for using the accelerator is missing from the Db2 catalog tables. When this information has disappeared from the catalog tables, the accelerator can be added again. However, it probably contains data that was unloaded from the Db2 subsystem at an earlier time. Since the original authentication token is lost, the data cannot be accessed anymore. Adding the accelerator once more to the Db2 subsystem removes the orphaned data and thus allows you to start over from a clean setup. This warning just indicates that obsolete data from the Db2 subsystem was found on the accelerator and has been deleted.

User action: No action required. Add and load tables to the accelerator as needed.

AQT10064E The stored procedure cannot connect to the *acceleratorName* accelerator because the authentication failed. Diagnostic information: *reasonText*.

Explanation:

acceleratorName

Name of the accelerator

reasonText

Additional diagnostic information about the authentication failure

Problem determination: This exception occurs when an authentication problem prevents the DRDA component running inside a stored procedure from connecting to the accelerator. This can occur in connection with any IBM Db2 Analytics Accelerator for z/OS stored procedure.

User action:

- Check whether the catalog tables in the Db2 communication database were accidentally modified or replaced with a backup after adding the accelerator. If this is the case, restore the catalog tables to the correct state.
- If this exception occurred very shortly after the authentication token was renewed by the SYSPROC.ACCEL_UPDATE_CREDENTIALS stored procedure, or by the equivalent function in IBM Db2 Analytics Accelerator Studio, rerun the stored procedure or repeat your action in IBM Db2 Analytics Accelerator Studio.

AQT10065W A trace profile with the name *traceProfileName* already exists on the *acceleratorName* accelerator. The existing profile was not changed.

Explanation:

acceleratorName

Name of the accelerator

traceProfileName

Name of the trace profile that already exists in the catalog

Problem determination: This warning occurs when a trace profile cannot be created or changed on an accelerator because a trace profile with the same name already exists.

User action: Change the name of the new trace profile or remove the existing trace profile.

AQT10066W A trace profile with the name *traceProfileName* does not exist on the *acceleratorName* accelerator, and therefore could not be removed.

Explanation:

acceleratorName

Name of the accelerator

traceProfileName

Name of the trace profile that does not exist in the catalog

Problem determination: This warning occurs when a trace profile cannot be removed because it is not listed in the catalog of the accelerator.

AQT10067W The trace profile *traceProfileName* cannot be removed from the *acceleratorName* accelerator because it is a predefined (system) profile rather than a user-defined profile.

Explanation:

acceleratorName

Name of the accelerator

traceProfileName

Name of the trace profile that cannot be removed

Problem determination: This warning is issued when you try to remove a predefined trace profile from an accelerator. Predefined trace profiles cannot be removed.

AQT10068W The previously active trace profile *removedTraceProfileName* has been removed from the *acceleratorName* accelerator. For that reason, the *activeTraceProfileName* profile is used as the active profile.

Explanation:

acceleratorName

Name of the accelerator

removedTraceProfileName

Name of the previously active trace profile, which has been removed

activeTraceProfileName

Name of the new active trace profile

Problem determination: This warning is issued when the accelerator resorts to the default trace profile because the previously active profile has been removed.

AQT10069E The trace profile *traceProfileName* could not be created on the *acceleratorName* accelerator because an incorrect trace level *levelName* was specified.

Explanation:

acceleratorName

Name of the accelerator

traceProfileName

Name of the trace profile with an incorrect trace level

levelName

The incorrect trace level

Problem determination: This error occurs when you specify an incorrect trace level for the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure. You might have misspelled the trace level or accidentally specified a level that does not exist.

User action: Correct the trace level in the COMMAND input parameter for the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure.

AQT10070E The trace profile *traceProfileName* could not be created on the *acceleratorName* accelerator because an incorrect trace component name *componentName* was specified.

Explanation:

acceleratorName

Name of the accelerator

traceProfileName

Name of the trace profile in which the unknown component is defined

componentName

Name of the wrong or unknown trace component

Problem determination: This error occurs when you specify an incorrect trace component for the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure. You might have misspelled the component name or accidentally specified a component that does not exist.

User action: Correct the trace component name in the COMMAND input parameter for the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure.

AQT10071E The accelerated table *tableSchemaName.tableName* for the accelerator *acceleratorName* is in *currentTableState* state, which does not allow the attempted operation. Diagnostic information: *operation: diagnosticHintOperation*

Explanation:

tableSchemaName

Schema name of the table that is out of sync

tableName

Name of the table that is out of sync

acceleratorName

Name of the accelerator

currentTableState

Current table state, which prevents the execution of the operation

diagnosticHintOperation

Diagnostic information about the failed operation

Problem determination: This error occurs when the state of an accelerator table prohibits a certain type of operation. For the SYSPROC.ACCEL_SET_TABLES_ACCELERATION(ON) operation, the allowed states are Loaded and UpdateInProgress.

User action: Make sure that all tables involved are in a state that permits the operation. Then retry running the procedure. To run SET_TABLES_ACCELERATION(ON) successfully, call SYSPROC.ACCEL_LOAD_TABLES before. You cannot run SYSPROC.ACCEL_SET_TABLES_ACCELERATION(ON) successfully as long as SYSPROC.ACCEL_LOAD_TABLES is executing an initial load. You must wait for the completion of the initial load.

AQT10072E Query acceleration cannot be enabled for the *tableSchemaName.tableName* table on the *acceleratorName* accelerator because it is already enabled on another accelerator named *dupAcceleratorName*.

Explanation:

tableSchemaName

Schema name of the table that is enabled on another accelerator

tableName

Name of the table that is enabled on another accelerator

acceleratorName

The specified accelerator (accelerator on which the operation could not be executed)

dupAcceleratorName

The other accelerator that already contains an enabled copy of the table

Problem determination: This error occurs when you try to enable query acceleration for a table that exists on

multiple accelerators and has already been enabled on one of these accelerators.

User action: Disable query acceleration for the table on the accelerator that you do not want to use from IBM Db2 Analytics Accelerator Studio or by running the SYSPROC.ACCEL_SET_TABLES_ACCELERATION stored procedure with the value OFF. Then enable the table on the proper accelerator.

AQT10073W The accelerator *acceleratorName* was added to a Db2 subsystem, but the system date or time of the subsystem differs from the system date or time of the accelerator. The system date and time of the *referenceTimeSubsystemName* subsystem serves as a reference for the accelerator. A time difference imposes limitations on the use of certain SQL statements.

Explanation:

referenceTimeSubsystemName

Name of the Db2 subsystem that sets the reference time

acceleratorName

Name of the accelerator

Problem determination: The system time and date of an accelerator must be in sync with the system time and date of the Db2 subsystem to which it is attached. Otherwise queries that include time-related SQL expressions, such as CURRENT_DATA, CURRENT_TIME, and CURRENT_TIMESTAMP, cannot be processed correctly. If multiple database subsystems are attached to the same accelerator, all these subsystems must use the same date and time settings. A violation of this rule might lead to unexpected query results.

User action: The easiest solution is to avoid queries that contain SQL expressions such as CURRENT_DATA, CURRENT_TIME, or CURRENT_TIMESTAMP. If this is not possible, remove the accelerator from all subsystems with different time settings. Then align the date and time settings of the Db2 subsystems with those of the accelerator. Finally, re-add the accelerator.

AQT10074W The stored procedure and the accelerator use different versions of the DRDA protocol (*releaseLevelProcedure* for the stored procedure and *releaseLevelAccelerator* for the accelerator).

Explanation:

releaseLevelProcedure

The version of the DRDA protocol that is supported by the stored procedure

releaseLevelAccelerator

The version of the DRDA protocol that is supported by the accelerator

Problem determination: This warning occurs when the protocol versions of a stored procedure and an accelerator are not compatible.

User action: Make sure that your accelerator is updated to the same or a higher PTF level than the stored procedures that you are using. When you upgrade your system, you must transfer and activate a new software version on the accelerator before you can activate the corresponding load libraries for the stored procedures. When you downgrade the accelerator by activating an older software version, you must also switch to a corresponding older version of the stored procedures.

AQT10075E The *failingTest* test failed.

Explanation:

failingTest

The name of the test that failed. Possible names:

- *ping*
- *connect*
- *mtupath*
- *networkSpeed*
- *version*

Problem determination: This error occurs when a test fails that was started by the SYSPROC.ACCEL_TEST_CONNECTION stored procedure.

User action: See the output (value of the diagnostic_output parameter) of the

SYSPROC.ACCEL_TEST_CONNECTION stored procedure for details.

AQT10076W The *tableSchema.tableName* table on accelerator *acceleratorName* cannot be found in the catalog of the *unknownOnSide* or has been altered, such that the table definitions on the accelerator are not longer in synch with the definitions in the database.

Explanation:

tableSchema

Schema that the out-of-sync table belongs to

tableName

Name of the table that is out of sync

acceleratorName

Name of the accelerator

unknownOnSide

Catalog that does not list a table with the specified name (ACCELERATOR or DATABASE).

Problem determination: The Db2 catalog table SYSACCEL.SYSACCELERATEDTABLES and the information in the accelerator catalog are out of sync with regard to the specified table. This might have been caused by a restore operation or a modification of the original Db2 table.

User action:

- If the warning was issued while the SYSPROC.ACCEL_REMOVE_TABLE stored procedure was running, do not take any action. The inconsistency has already been removed.
- If the warning was issued while the SYSPROC.ACCEL_GET_TABLE_INFO stored procedure was running, check if columns were added to or modified in the original table after it was defined on the accelerator. In this case, remove the table from the accelerator and define it again.
- In all other cases, check the SYSACCEL.SYSACCELERATEDTABLES table for recent modifications or restore operations to determine the cause of the inconsistency. If possible, restore the latest state of the table. If this is not possible, remove the accelerator table (using SYSPROC.ACCEL_REMOVE_TABLES) and redefine it (using SYSPROC.ACCEL_ADD_TABLES).

AQT10077W The *tableSchema.tableName* table is unknown on the *acceleratorName* accelerator.

Explanation:

tableSchema

Schema name of the table that does not exist

tableName

Name of the table that does not exist

acceleratorName

Name of the accelerator

Problem determination: A table cannot be removed because it cannot be found in the catalog of the accelerator. This table is ignored so that the processing of the other tables can continue.

User action: No action necessary.

AQT10078E The value *value* for the *columnName* column of type *columnDataType* in table *tableSchema.tableName* (partition ID: *partID*) is not supported by the product: *diagnosticText*

Explanation:

tableSchema

Name of the schema that the table belongs to

tableName

Name of the table

columnName

Name of the affected table column

columnDataType

Data type of the column in which the unsupported value was found

value Value that cannot be processed by the accelerator

partID Logical ID of the partition in which the table resides

diagnosticText

Optional diagnostic information with details about the error.

Problem determination: A value in a Db2 table is not supported by the product. Displayed in the error message is a short extract of the full value. The first part (before the square brackets) shows the last 10 correct bytes. The square brackets indicate the point of error. The brackets contain the first 10 illegal or unsupported bytes, which makes it easier for you to locate the point of error and analyze its cause. Because the value is not supported, you cannot load a table that contains this value. The error occurs, for example, in the following cases:

- A Db2 string value contains invalid UTF-8 sequences in a CHAR column.
- A Db2 floating point value exceeds the exponent range for IEEE single precision in a REAL column.

User action:

- Change the values in the original Db2 tables to close nearby values that will not influence the results too much.
- Alternatively, remove the table that cannot be loaded from the accelerator. You might receive a message similar to 04E-00E4007 abend LOC=DSNUT101.DSNUGSDA for those Db2 UNLOAD utilities that have already unloaded data to the accelerator. You can ignore this message and delete the corresponding dump files.

AQT10079E The *tableSchema.tableName* in the Db2 subsystem with the location name *locationName* has too many organizing keys. The table can have *maxNumOrganizingKeyColumns* organizing keys at most, but *numOrganizingKeyColumns* keys have been specified. The limit has been exceeded.

Explanation:

locationName

Location name identifying the Db2 subsystem to which the table belongs

tableSchema

Schema name of the table that uses the organizing keys

tableName

Name of the table that uses the organizing keys

numOrganizingKeyColumns

Number of organizing keys that were specified for the table

maxNumOrganizingKeyColumns

Allowed maximum number of organizing keys

Problem determination: The table has too many organizing keys.

User action: Specify fewer organizing keys so that the limit is not exceeded.

AQT10080E The distribution key for table *tableSchema.tableName* in the database system with the location name *locationName* can have *maxNumDistributionKeyColumns* columns at most. However, *numDistributionKeyColumns* columns have been specified. The limit has been exceeded.

Explanation:

locationName

Location name identifying the Db2 subsystem to which the table belongs

tableSchema

Schema name of the table that uses the distribution key

tableName

Name of the table that uses the distribution key

numDistributionKeyColumns

Number of specified distribution key columns

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maxNumDistributionKeyColumns

Allowed maximum number of distribution key columns

Problem determination: The distribution key has too many columns.

User action: Reduce the number of columns in the distribution key so that the limit is not exceeded.

AQT10081E A plan with an ID of *planid* cannot be found on the accelerator.

Explanation:

planid The plan ID that was specified for the stored procedure could not be found on the accelerator

Problem determination: The specified plan ID is unknown on the accelerator.

User action: Rerun the SYSPROC.ACCEL_GET_QUERIES stored procedure to obtain the most recent plan ID.

AQT10082E The schema of the *tableSchema.tableName* table was changed after adding the table to this accelerator: *details*.

Explanation:

tableSchema

Schema name of the affected table

tableName

Name of the affected table

details Exception details

Problem determination: This exception occurs when a column definition was changed or a column was added or removed from a table by an ALTER TABLE statement after adding the table to an accelerator.

User action:

1. Remove the table from the accelerator.
2. Re-add the table to the accelerator.
3. Rerun the stored procedure that returned the error.

AQT10083W The Netezza debug configuration failed when executing the commands *nzCommands*. The error output for the commands was *nzOutput*.

Explanation:

nzCommands

Shell commands that were called on the Netezza® host

nzOutput

Standard error (stderr) output of the shell commands

Problem determination: This warning is issued when an accelerator trace profile could not set the specified debug level on the Netezza host.

User action:

1. Use only the predefined trace profiles or profiles that were provided by IBM support.
2. If the problem also occurs in connection with predefined or IBM-supplied trace profiles, report the problem to IBM support.

AQT10084W The *acceleratorName* accelerator was removed from the Db2 subsystem that sets the reference time for accelerators. From now on, the accelerator uses the time of the *newReferenceTimeSubsystemName* subsystem as the reference time. This might impose restrictions on the use of certain SQL statements.

Explanation:

newReferenceTimeSubsystemName

Name of the Db2 subsystem that now provides the reference time for the accelerators

acceleratorName

Name of the accelerator

Problem determination: The system date and time of an accelerator must be in sync with the system date and time of the database subsystems to which it is attached. Otherwise queries that contain expressions like `CURRENT_DATA`, `CURRENT_TIME`, or `CURRENT_TIMESTAMP` cannot be processed correctly. If an accelerator is attached to multiple subsystems, the subsystem to which it was added first sets the reference time. Ideally, the system dates and times of all subsystems that use an accelerator are the same. If an accelerator is attached to subsystems with different date and time settings, and the accelerator is removed from the subsystem that sets the reference time, one of the other subsystems takes over, that is, sets the reference time for the accelerator. This might lead to different query results if your queries contain any of the SQL expressions mentioned before.

User action: The easiest solution is to avoid queries that use SQL expressions such as `CURRENT_DATA`, `CURRENT_TIME`, or `CURRENT_TIMESTAMP`. If this is not possible, remove the accelerator from subsystems with different date and time settings.

AQT10086W Values in the *columnName* column of the *tableSchema.tableName* table were cut off when the table was loaded on the accelerator. *numberOfTruncations* values were truncated.

Explanation:*tableSchema*

Schema name of the table that was loaded

tableName

Name of the table that was loaded

columnName

Name of the column in which values were truncated

numberOfTruncations

Number of truncations

Problem determination: The truncation is due to the fact that in Db2 for z/OS, `VARCHAR` values consist of up to 32704 characters, and `VARGRAPHIC` values of up to 16352 characters, whereas their `NVARCHAR` equivalent on the Netezza host allows a maximum of 16000 characters only. If values were truncated and the column is used in a query, the accelerator will not return the same query results as Db2 for z/OS.

AQT10088W The *tableSchema.tableName* table was loaded or updated successfully on the accelerator, but the `REFRESH_TIME` column of the `SYSACCEL.SYSACCELERATEDTABLES` catalog table could not be updated. **Diagnostic information:** *diagnosticText*

Explanation:*tableSchema*

Schema name of the table that was loaded

tableName

Name of the table that was loaded

*diagnosticText*Diagnostic information indicating why the `REFRESH_TIME` column could not be updated.

Problem determination: The table was successfully loaded, but the timestamp for this event could not be updated in the `SYSACCEL.SYSACCELERATEDTABLES` catalog table in Db2. The next time you run the `SYSPROC.ACCEL_LOAD_TABLES` stored procedure on the same table, another attempt is made to update the timestamp.

AQT10089W The following problem occurred during the migration of the accelerator catalog: *description*.

Explanation:*description*

Description of the migration problem

Problem determination: A problem was encountered during the migration (update) of the accelerator metadata. An auto-correction is in place for problems of this type.

User action: If you are interested in the corrective actions that were taken by the accelerator, see the information in the problem description.

AQT10091W Tried to add the *tableSchema.tableName* table to the *acceleratorName* accelerator, but the data type of the following columns is not supported: *columnList*

Explanation:

acceleratorName

Name of the accelerator

tableSchema

Name of the table schema

tableName

Name of the table

columnList

Comma-separated list of all columns in the current table whose data type is not supported

Problem determination: This warning occurs if you want to add a table to the accelerator, but the table contains one or more columns whose data type is not supported by IBM Db2 Analytics Accelerator for z/OS. To check the data type compatibility, IBM Db2 Analytics Accelerator for z/OS reads the entries in the SYSIBM.SYSCOLUMNS catalog table of Db2 for z/OS. For example, CHAR FOR BIT DATA and ROWID are not supported. See *Conditions that prevent query routing to an accelerator* in the *IBM Db2 Analytics Accelerator for z/OS: User's Guide* for information about supported data types.

AQT10096E The stored procedure cannot obtain required information from the *acceleratorName* accelerator (reference accelerator). **Diagnostics:** *diagnostics*

Explanation:

acceleratorName

Name of the accelerator

diagnostics

Forwarded error description

Problem determination: Various causes might lead to this exception. See the diagnostic information for details. It seems that you are trying to save already archived partition data on an accelerator that is different from the accelerator that the data was moved to in the first place. However, to complete this operation, the stored procedure requires information from the target accelerator of the first move (reference accelerator). This information cannot be obtained.

User action: Make sure that the reference accelerator is online.

AQT10100E The value NULL was specified for the *parameterName* parameter of the stored procedure, but NULL is not a valid value for this parameter.

Explanation:

parameterName

Name of the parameter for which NULL was used as a value

Problem determination: This error occurs when SQL NULL has been used as a parameter value although NULL is not allowed. In most error situations of this kind, NULL was used by default because the caller of the stored procedure omitted a value that was mandatory in the given context.

User action: Specify a valid parameter value.

AQT10101E The *value* value is not valid for the *parameterName* parameter.

Explanation:

parameterName

Name of the parameter whose value is incorrect

value The incorrect value

Problem determination: This error indicates that an incorrect input parameter value was passed to a stored procedure.

User action: Correct the incorrect input value.

AQT10102E The *value identifier* is incorrect for an identifier of the *type* type. The error condition is: *condition*. The identifier can take on a maximum length of *maxLength*.

Explanation:

condition

Describes the error. The following error conditions are possible:

TOO_LONG

The *identifier* is too long.

TOO_SHORT

The *identifier* is not long enough.

NOT_EXISTS

An object with the specified name (*identifier* value) does not exist in the Db2 subsystem.

ABSOLUTE_PATH_REQUIRED

The path that was specified as the value of the *identifier* is not an absolute path, but an absolute path is required.

type

Type of the incorrect identifier. The following types are possible:

DATABASE

The problem was caused by the Db2 subsystem name.

ACCELERATOR

The problem was caused by the accelerator name.

LOCATION

The problem was caused by the location name of the accelerator.

ACCELERATEDTABLE

The problem was caused by a table name used on the accelerator.

SCHEMA

The problem was caused by a schema name.

TABLE

The problem was caused by a Db2 table name.

COLUMN

The problem was caused by a column name.

TABLESPACE_QUALIFIER

The problem was caused by the qualifier of a table-space name.

TABLESPACE

The problem was caused by a table-space name.

PATH

The problem was caused by an zFS file path name.

identifier

The incorrect identifier value

maxLength

Allowed maximum length of the identifier

Problem determination: This error occurs when an input parameter of a stored procedure contains an invalid identifier value. This happens, for example, if the accelerator name is too long. The incorrect value can be a database name, an accelerator name, a schema name, a location name, a table name, a column name, a table-space qualifier, a table-space name or a path in a z/OS UNIX file system (zFS).

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User action: Specify a correct identifier value.

AQT10103E The value *value* is incorrect for the *name* environment variable, which is of the *type* type. Error condition: *condition*. Additional diagnostic information: *additionalDiagnostic*

Explanation:

value Value of the environment variable

name Name of the environment variable

type Type of the incorrect value. The following types can be used:

NUMBER

The expected value of the environment variable is a number.

PATH

The expected value is a file path or directory path in the z/OS UNIX file system (zFS).

condition

Describes the error. The following conditions are possible:

NOT_ALLOWED

The value is forbidden.

INVALID_NUMBER

The value is not a valid number.

ZERO_NOT_ALLOWED

The value must be greater than zero.

ABSOLUTE_PATH_REQUIRED

The specified zFS path is not an absolute path, but an absolute path is expected.

PATH_NOT_ACCESSIBLE

The specified zFS path cannot be found or cannot be read.

additionalDiagnostic

Additional diagnostic information

Problem determination: This error occurs when an environment variable that is used by a stored procedure contains an invalid value, for example, a string where a number is expected.

User action: Specify a correct value in the AQTENV data set. If you use the ISPF editor, make sure to use the NUM 0FF setting. Otherwise, automatically inserted line numbers are appended to the values of the environment variables.

AQT10105E The *dataType* data type is used by the *columnName* column in the *schemaName.tableName* table. Columns with this data type cannot be used in distribution keys or as organizing keys.

Explanation:

schemaName

Name of the schema that the table with the column in question belongs to

tableName

Name of the table that the column belongs to

columnName

Name of the column for which an unsupported data type has been defined

dataType

Name of the unsupported data type

Problem determination: This error occurs when a user has specified a column with an unsupported data type as an organizing key or as a distribution key column.

User action: Select a different column as an organizing key or distribution key column or remove the key definition from the table specification.

AQT10109E A table with the name *schemaName.tableName* was specified more than once.

Explanation:

schemaName

Name of the schema that the duplicate table belongs to

tableName

Name of the duplicate table

Problem determination: This error occurs when one and the same table occurs multiple times in an input parameter. Table names must be unique within a set of tables. This affects the following parameters:

- *table_specification* (SYSPROC.ACCEL_ADD_TABLES)
- *table_load_specification* (SYSPROC.ACCEL_LOAD_TABLES)
- *table_set* (SYSPROC.ACCEL_REMOVE_TABLES, SYSPROC.ACCEL_GET_TABLES_INFO, and SYSPROC.ACCEL_SET_TABLES_ACCELERATION)

User action: Remove the duplicate table name from parameter value and rerun the stored procedure.

AQT10114E The *tableSchema.tableName* table is of the type *tableType*, which is not a base table type. Only base tables are supported.

Explanation:

tableSchema

Name of the schema that the unsupported table belongs to

tableName

Name of the unsupported table

tableType

Type of the unsupported table

Problem determination: This error occurs when a table that is referenced in an accelerated table set is not a base table. Only base tables (as opposed to other tables, such as views, auxiliary tables or XML tables) are supported.

User action: Remove all tables that are not base tables from the table set and rerun the stored procedure.

AQT10115W The support level of the stored procedure that was used to add the *schemaName.tableName* table (*tableSupportLevel*) is higher than the support level of the stored procedure currently processing the table. The stored procedure that is currently in use can only handle tables that were added by a stored procedure at support level *highestSupportLevelAllowed* or lower.

Explanation:

schemaName

Schema name of the table that was created with a newer version

tableName

Name of the table that was created with a newer version

tableSupportLevel

The support level of the table

highestSupportLevelAllowed

The highest support level that the stored procedure can handle

Problem determination: This error occurs when a table was added to the accelerator with a newer version of the IBM Db2 Analytics Accelerator for z/OS stored procedures. The current version cannot handle these tables because it does not support the same range of data types or other features.

User action: Check if an installation problem with the currently used stored procedure exists, for example, in the STEPLIB section of the WLM application environment. After correcting the problem, rerun the last operation with the most recent version of the stored procedure. If you want to continue using the currently installed (older) version of the stored procedure, remove the problematic table from the accelerator and re-add it by using the corresponding older version of SYSPROC.ACCEL_ADD_TABLES.

AQT10116E The output location for the trace file is missing (empty string). Specify a valid file name or data-set name.

Problem determination: This error occurs when an empty string was specified as the value of the *outputLocation* XML attribute in the COMMAND input parameter.

User action: Specify a file name in the *outputLocation* XML attribute of the COMMAND input parameter and rerun the stored procedure.

AQT10118E The pairing code *givenPassword* is incorrect or has expired.

Explanation:

givenPassword

The specified pairing code

Problem determination: This error occurs when the accelerator refuses a pairing code because it is incorrect or has expired.

User action: Try to add the accelerator again with a newly generated (valid) pairing code.

AQT10120E An accelerator with the name *acceleratorToCreate* could not be added to the Db2 subsystem because the name already exists.

Explanation:

acceleratorToCreate

Name of the accelerator

Problem determination: This exception occurs when an accelerator cannot be added to a Db2 subsystem because the name of the accelerator already exists in the system tables of the subsystem.

User action: Specify a different accelerator name.

AQT10121E The PARTITIONS value for the *schemaName.tableName* table, which was specified as the value of the *parameterName* parameter for the SYSPROC.ACCEL_LOAD_TABLES stored procedure, contains an error. The error is at position *offset* of the value string *value*.

Explanation:

parameterName

Name of the parameter for which an incorrect PARTITIONS value was specified (table_load_specification)

schemaName

Name of the schema that the table belongs to

tableName

Name of the table for which an incorrect PARTITIONS value was specified

offset

The position of the error in the value string of the PARTITIONS element

value

The PARTITIONS value in which the error was found

Problem determination: This error occurs when the PARTITIONS element of the input XML string for the SYSPROC.ACCEL_LOAD_TABLES stored procedure contains incorrect PARTITIONS values for a table. The XML input string is specified as the value of the table_load_specification parameter. The error message gives you information about the position of the error in the PARTITIONS element.

User action: Correct the PARTITIONS value.

AQT10122E The *parameterName* parameter of the stored procedure specifies invalid partitions *partitions* for the *schemaName.tableName* table.

Explanation:

parameterName

Name of the parameter in which the invalid partition numbers were found

schemaName

Name of the schema that the table belongs to

tableName

Name of the affected (partitioned) table

partitions

The invalid partition numbers that were found

Problem determination: This exception occurs when the **table_load_specification** parameter of the SYSPROC.ACCEL_LOAD_TABLES stored procedure contains a logical partition number for a table partition that does not exist in Db2.

User action: Remove the invalid partition numbers from the **table_load_specification** parameter and rerun the SYSPROC.ACCEL_LOAD_TABLES stored procedure.

AQT10123E The *schemaName.tableName* table uses the *feature* feature, which is not supported by IBM Db2 Analytics Accelerator for z/OS.

Explanation:

schemaName

Name of the schema that the table with the unsupported feature belongs to

tableName

Name of the table with the unsupported feature

feature Type of the feature that is not supported (descriptive string)

Problem determination: This error occurs when the table that you want to add to an accelerator uses a Db2 feature that is not supported by IBM Db2 Analytics Accelerator for z/OS.

User action: Remove the table with the unsupported feature from the table set and rerun the stored procedure.

AQT10124E Your Db2 subsystem does not permit to write trace information to the standard output stream (STDOUT).

Problem determination: This error occurs if your Db2 subsystem does not permit to write trace data to the standard output stream (STDOUT).

User action: Do not request the output to be directed to STDOUT. Modify the MESSAGE input parameter of the stored procedure accordingly.

AQT10126E The *acceleratorName* accelerator is a virtual accelerator that cannot be used by this stored procedure.

Explanation:

acceleratorName

The specified accelerator

Problem determination: This error occurs when a stored procedure calls a virtual accelerator. IBM Db2 Analytics Accelerator for z/OS stored procedures cannot run on or in connection with virtual accelerators. Virtual accelerators are for gathering EXPLAIN information only, that is, information that helps you decide whether it makes sense to accelerate a query.

User action: Make sure that your stored procedures call regular accelerators only.

AQT10127E The value of the *parameterName* parameter contains an invalid character at position *positionOfInvalidCharacter*. **Diagnostic information:** *diagnosticInfo*.

Explanation:

parameterName

Name of the parameter

positionOfInvalidCharacter

Position of the first invalid character in the input parameter value. Note that this is the character position, which is not necessarily identical to the byte position.

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diagnosticInfo

The hexadecimal UTF-16 representation of the invalid character

Problem determination: This error occurs when an input parameter value of a stored procedure contains a character that is not allowed by the XML 1.0 specification. The invalid character makes it impossible to return the wrong value in the XML message output parameter.

User action: Correct the input value.

AQT10128E The value *parameterValue* of the *parameterName* parameter contains a forbidden character at position *positionOfInvalidCharacter*.

Explanation:

parameterName

Name of the affected parameter

parameterValue

Parameter value that contains the forbidden characters

positionOfInvalidCharacter

Position of the first forbidden character in the parameter value (accelerator name)

Problem determination: This error occurs when the accelerator name that is specified as an input value for the SYSPROC.ACCEL_ADD_ACCELERATOR stored procedure contains forbidden characters. Note: Only the first forbidden character is identified in the error message. There might be more.

User action: Correct the parameter value. Allowed characters are A-Z, 0-9.

AQT10129E The *componentName* component does not exist or is unknown. Hence events or errors related to this component cannot be traced.

Explanation:

componentName

Specified component name

Problem determination: This error occurs when the MESSAGE input parameter contains an invalid XML component name.

User action: Check and correct the component names in the MESSAGE input parameter.

AQT10130E The accelerator could not be added to the Db2 subsystem because the *acceleratorConflict* accelerator uses the same IP address (*iPConflict*) and port (*portConflict*).

Explanation:

acceleratorConflict

The name of the accelerator that uses an identical IP address and port

iPConflict

The duplicate IP address

portConflict

The duplicate port

Problem determination: All accelerators of a Db2 subsystem must have unique IP addresses and ports.

User action: Check whether the existing accelerator with the same IP address and port is the one that you wanted to add. If not, assign a unique IP address and port to the new accelerator.

AQT10131E The *tableSchema.tableName* table resides in the *tablespaceQualifier.tablespaceName* table space, which is unavailable or cannot be accessed for the requested operation. The status of this table space in the Db2 catalog table SYSIBM.SYSTABLESPACE (output of the Db2 command DISPLAY DATABASE SPACENAM) is *tablespaceStatus*.

Explanation:

tableSchema

Name of the schema that the table in the unavailable table space belongs to

tableName

Name of the table in the unavailable table space

tablespaceQualifier

Name of the database containing the unavailable table space

tablespaceName

Name of the unavailable table space

tablespaceStatus

Status of the table space that is unavailable to the requested function according to the SYSIBM.SYSTABLESPACE catalog table or the output of the DISPLAY DATABASE SPACENAM command.

Problem determination: This error occurs when a table is listed in a table set for accelerator processing, but the table-space status of this table does not permit the requested operation.

User action: Remove the affected tables from the table set and rerun the stored procedure or make the table space available again, for example by running the REORG command to remove a status of AREO.

AQT10132E An accelerator with the name *acceleratorToCreate* could not be added to the Db2 subsystem because a remote location with the name *locationToCreate* already exists.

Explanation:

acceleratorToCreate

The specified accelerator name

locationToCreate

The specified location name

Problem determination: This exception occurs when an accelerator cannot be defined in the system tables of the Db2 subsystem because a remote location with the same name already exists.

User action: Specify a different location name for the accelerator.

AQT10133E The *acceleratedTableSchema.acceleratedTableName* table cannot be added twice to the *acceleratorName* accelerator. An entry already exists in the catalog table SYSACCEL.SYSACCELERATEDTABLES.

Explanation:

acceleratorName

The specified accelerator

acceleratedTableSchema

The specified schema

acceleratedTableName

The specified table name

Problem determination: This exception occurs when you try to add a table more than once to the same accelerator.

User action: Consider dropping the table or modify the table set (table_specification parameter) for the SYSPROC.ACCEL_ADD_TABLES stored procedure.

AQT10134E The *acceleratedTableSchema.acceleratedTableName* table does not exist on the *acceleratorName* accelerator.

Explanation:

acceleratedTableSchema

Name of the table schema

acceleratedTableName

Name of the table

acceleratorName

Name of the accelerator

Problem determination: This error occurs when a table is specified in an input table set, but not listed as a table for accelerated queries in the SYSACCEL.SYSACCELERATEDTABLES catalog table. A possible reason is that the table has just been defined by a concurrent run of the SYSPROC.ACCEL_ADD_TABLES stored procedure, which has not yet ended.

User action: If the table is part of a set of tables that is just being added to the accelerator, wait until the table definition process has ended and then rerun the stored procedure that returned the error. In all other cases, take one of the following actions:

1. Remove the table from the input table set and rerun the stored procedure.
2. Add the table to the accelerator and rerun the stored procedure.

AQT10135E The DSN_QUERYINFO_TABLE was not found in the *schemaName* schema.

Explanation:

schemaName

Name of the schema

Problem determination: This error occurs when the DSN_QUERYINFO_TABLE, which is needed to obtain EXPLAIN information, does not belong to the specified schema.

User action: Make sure that DSN_QUERYINFO_TABLE exists in the specified schema (see the Db2 documentation on the data-definition language (DDL), the *IBM Db2 Analytics Accelerator Studio: User's Guide* or the online help of IBM Db2 Analytics Accelerator Studio for information on how to create this table). Then rerun the stored procedure.

AQT10136E A query matching the search criteria QUERYNO=*queryno* AND QBLOCKNO=*qblockno* AND EXPLAIN_TIME=*explaintime* was not found in *schemaName*.DSN_QUERYINFO_TABLE.

Explanation:

schemaName

Name of the specified schema. This must be the schema that DSN_QUERYINFO_TABLE belongs to.

queryno

Number that identifies a query. This number must exist in the QUERYNO column of DSN_QUERYINFO_TABLE.

qblockno

Number that identifies the query block of the query. This number must match the QBLOCKNO value of the query in DSN_QUERYINFO_TABLE, (in the same row as the corresponding QUERYNO value).

explaintime

Time needed to obtain EXPLAIN information about a query. This time must match the time value of the query in the EXPLAIN_TIME column of DSN_QUERYINFO_TABLE (in the same row as the corresponding QUERYNO value).

Problem determination: This error occurs when a matching query could not be found in the DSN_QUERYINFO_TABLE.

User action: Make sure that the values for queryno, qblockno, and explaintime identify an existing query (all values must match the values in a single row of DSN_QUERYINFO_TABLE). Then rerun the stored procedure.

AQT10137E The query with QUERYNO=*queryno* AND QBLOCKNO=*qblockno* AND EXPLAIN_TIME=*explaintime* in *schemaName*.DSN_QUERYINFO_TABLE is not suitable for acceleration because its REASON_CODE is *reasoncodeValue* and its TYPE is *typeValue*.

Explanation:

schemaName

Name of the schema that DSN_QUERYINFO_TABLE belongs to

queryno

Query number (QUERYNO value) in DSN_QUERYINFO_TABLE.

qblockno

QBLOCKNO value of the query in DSN_QUERYINFO_TABLE.

explaintime

EXPLAIN_TIME value of the query in DSN_QUERYINFO_TABLE.

typeValue

TYPE value of the query in DSN_QUERYINFO_TABLE. The expected value is A (with trailing blanks).

reasoncodeValue

REASON_CODE value of the query in the DSN_QUERYINFO_TABLE. The expected value is 0.

Problem determination: This error occurs when a row identifying a query in DSN_QUERYINFO_TABLE does not relate to a query that is suitable for acceleration. Suitable queries have a REASON_CODE of 0 and a TYPE value of A.

User action: Check the *queryno*, *qblock_no*, and *explain_time* values and make sure that these relate to a query that can be accelerated. Then rerun the stored procedure.

AQT10138E The *identifier* value for identifier type *type* contains an illegal character at position *positionOfInvalidCharacter*.

Explanation:

type Type of the incorrect name (that is, schema name, table name, and so on)

identifier

The illegal character in the name

positionOfInvalidCharacter

Position of the first illegal character in the name

Problem determination: This error occurs when a schema name, table name, or column name contains a character that is not allowed on the accelerator. For example, backslashes or double quotation marks are not allowed.

User action: Replace the illegal characters with characters that are allowed on the accelerator. To maintain compatibility with inhouse Db2 queries, you can insert a view that maps the changed names to the original names.

AQT10139E The *tableSchema.tableName* table does not contain any column that is suitable for query acceleration.

Explanation:

tableSchema

Name of the schema name that the specified table belongs to

tableName

Name of the specified table

Problem determination: The specified table cannot be used for accelerated queries because none of its columns fulfills the conditions. For more information, see *Conditions for query acceleration* in the *IBM Db2 Analytics Accelerator Studio: User's Guide*.

User action: Do not add this table to an accelerator.

AQT10141E The range-partitioned table *tableSchema.tableName* cannot be loaded because the partitioning ranges are not known.

Explanation:

tableSchema

Schema name of the table

tableName

Name of the table

Problem determination: A range-partitioned table cannot be loaded because the boundaries or limits of the partitions are unknown. This happens if ranges have not been defined, because a partitioning index is missing.

User action: 1. Define partitioning ranges for the table by creating the partitioning index. 2. Re-try the SYSPROC.ACCEL_LOAD_TABLES operation.

AQT10142E An accelerator with the name *acceleratorToCreate* could not be added to the Db2 subsystem because the SYSACCEL.SYSACCELERATEDTABLES catalog table contains entries for tables on an accelerator with the same name.

Explanation:

acceleratorToCreate

Name of the accelerator

Problem determination: This exception occurs when table definitions exist in the the SYSACCEL.SYSACCELERATEDTABLES catalog table, although the accelerator that these tables belong to has already been deleted. This is most likely the result of an incomplete manual cleanup.

User action: Remove the orphaned table entries from SYSACCEL.SYSACCELERATEDTABLES or specify a different accelerator name.

AQT10143E An unsupported version *specifiedLevel* of the IBM Db2 Analytics Accelerator stored procedures was specified in the **compatibilityLevel** element of the message input parameter. The latest supported version is *currentLevel*.

Explanation:

specifiedLevel

Compatibility level that was specified in the message input parameter

currentLevel

Latest supported version

Problem determination: This exception occurs when an invalid value was specified for the **compatibilityLevel** element of the message input parameter of a stored procedure. For backward compatibility, specify a version not older than the earliest and not newer than the latest supported version.

User action: Specify a valid value or remove the **compatibilityLevel** element from the message input parameter.

AQT10147E The *tableSchema.tableName* table resides in the *tablespaceQualifier.tablespaceName* table space, whose status is NOT LOGGED. You cannot enable incremental updates for such a table (the table cannot be enabled for replication).

Explanation:

tableSchema

Name of the schema that the affected table belongs to

tableName

Name of the affected table

tablespaceQualifier

Name of the database containing the affected table

tablespaceName

Name of the table space of the affected table

Problem determination: This error occurs when you want to enable incremental updates for a table, but logging is not enabled for activities that affect the table space of this table. Table changes can only be replicated if they can be written to the log of the table space.

User action: Enable logging for the table space by using the ALTER TABLESPACE SQL statement.

AQT10148W The partition list that was specified as part of the input XML parameter was ignored because a value of *attributeValue* for the *attributeName* attribute does not permit the use of a partition list.

Explanation:

attributeName

Name of the XML attribute

attributeValue

Value of the XML attribute

Problem determination: If you specify `forceFullReload='true'` or `detectChanges='DATA'` for a table to be loaded, you cannot use a partition list because in these cases, the partitions to be loaded are determined by the accelerator.

User action: Determine the most important goals of the operation. Then adjust the XML input parameter accordingly by changing the attribute values, removing the attributes, or removing the partition list from the input XML parameter.

AQT10149E The *tableSchema.tableName* table has an incomplete definition according to its entry in the Db2 catalog table SYSIBM.SYSTABLES.

Explanation:

tableSchema

Name of the schema that the table in the unavailable table space belongs to

tableName

Name of the table in the unavailable table space

Problem determination: This error occurs when a table is listed in a table set for accelerator processing, but the table definition is not complete. Only tables with complete definitions can be used.

User action: To solve this error, take one of the following actions:

- Remove all tables with incomplete definitions from the table set and rerun the stored procedure.
- Try to understand the reasons for the incomplete definitions by looking at the corresponding entries in the TABLESTATUS column of the SYSIBM.SYSTABLES catalog table. If you can eliminate the causes, remove the incompletely defined tables from the accelerator and re-define these. Finally, rerun the stored procedure.

AQT10151E The *tableSchema.tableName* table cannot be defined on an accelerator because it uses multiple encoding schemes.

Explanation:

tableSchema

Schema name of the affected table

tableName

Name of the affected table

Problem determination: The specified table contains columns that use encoding schemes other than the encoding scheme of the table space because they were created with an explicit CCSID clause. Queries that reference this table will always have to address these different encoding schemes in the SQL. Such queries do not qualify for acceleration.

AQT10200E The operation operation failed. Error information: *sqlError*. The unsuccessful operation was initiated by the following statement: *sqlStatement*.

Explanation:

operation

A keyword that identifies the failed operation. The following keywords exist:

- CONNECT
- COMMIT
- ROLLBACK
- SAVEPOINT
- SELECT
- DELETE
- MERGE
- INSERT
- UPDATE
- DECLARE_TEMP_TABLE
- OPEN_CURSOR
- PREPARE
- DESCRIBE
- CLOSE_CURSOR

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- FETCH
- EXECUTE_IMMEDIATE
- API
- CALL
- ASSOCIATE_LOCATOR
- ALLOCATE_CURSOR

sqlError SQL error information that describes the error and lists the error tokens

sqlStatement

SQL statement or API call that caused the problem

Problem determination: This error occurs when an unexpected error from an SQL statement or API call, such as DSNRLI in Db2 for z/OS, is encountered. Details about the error are part of the message, for example, the SQL code and the SQL message.

User action: Look up the reported SQL code in the documentation of your database management system and try to correct the error.

AQT10201E Information about the *acceleratorName* accelerator in the IBM Db2 Analytics Accelerator for z/OS catalog tables is inconsistent.

Explanation:

acceleratorName

Name of the affected accelerator

Problem determination: This error occurs when inconsistent information about an accelerator is found in the IBM Db2 Analytics Accelerator for z/OS catalog tables in the Db2 subsystem. Example: An accelerator is listed in the SYSACCEL.SYSACCELERATORS table, but a corresponding entry cannot be found in the SYSIBM.LOCATIONS table. This error must not be confused with a situation in which the accelerator server cannot be reached.

User action:

1. Remove all entries pertaining to the affected accelerator from the IBM Db2 Analytics Accelerator for z/OS catalog tables in your Db2 subsystem.
2. Add the accelerator again by using IBM Db2 Analytics Accelerator Studio or by running the SYSPROC.ACCEL_ADD_ACCELERATOR stored procedure. Make sure to use the same name as before.

AQT10202S The *acceleratorName* accelerator cannot be contacted over the network. Additional diagnostic data: *additionalDiagnostic*

Explanation:

acceleratorName

Name of the affected accelerator

additionalDiagnostic

Additional diagnostic data

Problem determination: This error occurs when a connection to an accelerator could not be established. This might indicate that:

- A network problem exists between your Db2 subsystem and the accelerator.
- The IP addresses or port numbers that are stored in the Db2 subsystem are wrong.
- The accelerator is not running.

User action:

1. Check the configuration of the network between your Db2 subsystem and the accelerator.
2. Verify that the entries in the system tables SYSACCEL.SYSACCELERATORS, SYSIBM.LOCATIONS, SYSIBM.IPNames, and SYSIBM.USERNames are correct.

AQT10205S An internal processing error occurred in the stored procedure. Diagnostic information: *errorMessage*

Explanation:*errorMessage*

Additional diagnostic information about the error.

Problem determination: This error occurs when IBM Db2 Analytics Accelerator for z/OS encounters an unknown internal error.

AQT10206E The *operation* operation on the *fileName* file, data set, or pipe failed. Diagnostic information: *diagnosticMessage*

Explanation:*fileName*

Name of the file, data set, or pipe that causes the problem

operation

Operation that was attempted on the file, data set or pipe. The following operations are possible:

ALLOCATE

File, data set, or pipe allocation failure (z/OS only)

DEALLOCATE

File, data set, or pipe deallocation failure (z/OS only)

OPEN_EXISTING

Error while opening an existing file, data set, or pipe

OPEN_NEW

Error while opening a new file, data set, or pipe

OPEN

Error while opening a new or existing file, data set, or pipe

CLOSE

Error while closing a file, data set, or pipe

READ

Error while reading from a file, data set, or pipe

WRITE

Error while writing to a file, data set, or pipe

DELETE

Error while deleting a file, data set, or pipe

RENAME

Error while renaming a file, data set, or pipe

STATS

Error while collecting statistics of a file, data set, or pipe

SEEK

Error while looking for of a certain position in a file, data set, or pipe

SYNC

Error while synchronizing a file, data set, or pipe with a file on disk

UNKNOWN

Unknown error

diagnosticMessage

Additional diagnostic information.

Problem determination: This error occurs when a file, data set, or pipe cannot be accessed. The cause of the error depends on the type of operation. For example: invalid file names or insufficient access rights.

User action: Check the diagnostic information.

AQT10207E The current status of the accelerator does not permit to perform the requested operation. Additional diagnostic information: *diagnosticMessage*

Explanation:*diagnosticMessage*

Additional diagnostic information

Problem determination: This error occurs when the status of an accelerator does not permit the execution of the requested operation. For example, you might want to load a table set, but the status of the accelerator is *Maintenance*, which indicates that a software update is running at the same time.

User action: Check the status of the accelerator by running the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure with the **getInfo** parameter. If possible, bring the status of the accelerator to *online* to make it possible to run the operation that was previously denied.

AQT10300E A string could not be converted from the coded character set identifier (CCSID) *sourceCcsid* to CCSID *targetCcsid*. The z/OS Unicode Conversion Services (UCS) returned error code *returnCode* and reason code *reasonCode*. The error class is *error*.

Explanation:

error Type of the error. The following types of errors exist:

sourceCcsid

CCSID in which the original string is encoded.

targetCcsid

CCSID to which the string should have been converted.

returnCode

Return code received from z/OS Unicode Conversion Services (UCS). If a return code is not available, 0 is returned.

reasonCode

Reason code received from UCS. If a return code is not available, 0 is returned. The availability of a reason code depends on the return code.

Problem determination: This error occurs when the UCS could not convert a string from one CCSID or code page to another.

User action:

1. Look up the return code and the reason code in the UCS documentation.
2. Verify a correct setup of UCS.

AQT10301E An error occurred in the *interfaceName* service of your database management system (DBMS). The return code is *returnCode*. The reason code is *reasonCode*. Additional diagnostic information: '*additionalInfo*'

Explanation:*interfaceName*

Name of the service that returned the error

returnCode

Return code received from the service

reasonCode

Reason code reported by the service

additionalInfo

Additional diagnostic information

Problem determination: This error occurs when a problem is reported by a service of the database management system.

User action: If the problem was reported by the DSNTIAR service or the DSNRLI service, you, as a user, cannot analyze and solve the problem. Contact IBM support in such a case. If the problem was reported by the DSNUTILU

service, check the diagnostic information that was output by the DSNUTILU stored procedure and try to solve the problem.

AQT10302E The SYSPROC.ADMIN_INFO_SYSPARM stored procedure could not retrieve the ZParms of the Db2 subsystem. Possible reasons: insufficient privileges of the user who invoked the stored procedure (MONITOR1 is required), IFI errors, or SQL errors in the SYSPROC.ADMIN_INFO_SYSPARM stored procedure. Additional diagnostic information from ADMIN_INFO_SYSPARM: *additionalInfo*

Explanation:

additionalInfo

Additional diagnostic information reported by ADMIN_INFO_SYSPARM that describe the IFI error or SQL error that is encountered.

Problem determination: This error occurs when the ADMIN_INFO_SYSPARM stored procedure, which retrieves the ZParms of the current Db2 subsystem, fails to return valid results. Possible reasons are internal errors in ADMIN_INFO_SYSPARM (like failures to issue the respective IFI calls) or insufficient privileges of the caller.

User action: Ask your system administrator to check the privileges of the caller or resolve the errors in the IFI call.

AQT10303E The 'location' data set cannot be allocated dynamically by the stored procedure. The allocation failed with return code *returnCode*, error code *errorCode* and reason code *reasonCode*.

Explanation:

location Data set location (file name)

returnCode

Return code received from the dynalloc function

errorCode

Error code returned by the MVS dynamic allocation functions

reasonCode

Information code returned by the MVS dynamic allocation functions

Problem determination: This exception occurs when a data set for a stored procedure could not be allocated dynamically on z/OS. In the context of the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure, this usually means that there is not enough disk space for a data set big enough to hold the trace data to be saved.

User action: Look up the reason code in the MVS dynalloc documentation and eliminate the cause of the allocation failure.

AQT10304W An error occurred during the invalidation of the Db2 Dynamic Statement Cache after loading a table. The return code is *returnCode*. The following diagnostic information was returned by the DSNUTILU utility, which was used to invalidate the cache: *additionalInfo*

Explanation:

returnCode

Return code received from DSNUTILU

additionalInfo

Additional diagnostic information from DSNUTILU

Problem determination: This warning occurs when the loading of tables succeeded, but the invalidation of the dynamic statement cache failed for the processed tables.

User action: Invalidate the dynamic statement cache manually. The statement that you have to use for this action is shown in the diagnostic information that was returned by the DSNUTILU utility.

AQT10308E The caller (user ID) of the *storedProcedureSchemaDotName* stored procedure is not authorized to run the user-defined function *udfSchemaDotName* (missing EXECUTE authority). The value of the *storedProcedureParameterName* input parameter requests an execution of the subfunction *functionXMLElement*. The *udfSchemaDotName* function checks whether a user is authorized to run this subfunction.

Explanation:

udfSchemaDotName

Name of user-defined function that was run to check the authorization for the subfunction

functionXMLElement

Name of the subfunction that the caller of the stored procedure must not execute.

storedProcedureParameterName

Name of the parameter whose value indicates that the use of the indicated subfunction is not authorized.

storedProcedureSchemaDotName

Name of the stored procedure that was invoked

Problem determination: Running the requested subfunction of the stored procedure requires EXECUTE authorization for a separate user-defined function in Db2 for z/OS.

User action: Grant EXECUTE authority for the user-defined function to the caller of the stored procedure.

AQT10400E An internal XML processing error of the type *xmlError* occurred. Information from the XML parser: '*errorMessage*'. Context information from the calling stored procedure: *errorContext*.

Explanation:

xmlError

Possible error types during XML processing

errorMessage

Additional information about the error from the XML parser

errorContext

Additional information about the error context in the stored procedure

Problem determination: This error message is displayed when an internal XML processing error has occurred. Do not confuse this with the error that occurs when an invalid XML document cannot be parsed because it does not conform to the corresponding XML schema.

AQT10402E The XML document cannot be validated and parsed correctly because it does not conform to the corresponding XML schema. Error *xercesError* was detected in line *lineNumber*, column *columnNumber* of the following XML document: *partialXmlDocument*.

Explanation:

xercesError

Error message returned by the XML parsing component

lineNumber

Number of the line containing the error

columnNumber

Number of the column containing the error

partialXmlDocument

The first 400® characters of the XML document containing the error

Problem determination: This error occurs when an XML document cannot be parsed and validated because the document does not conform to the corresponding XML schema. The error message contains information about the position of the error.

User action: If you use an XML document as input for a stored procedure, use the error information in the message to correct the error.

AQT10403E The value (XML document) of the *parameterName* parameter is invalid because it contains an invalid attribute combination in the *elementName* XML element. The following attribute combination is not allowed: 'attributeNameA=\"attributeValueA\"' and 'attributeNameB=\"attributeValueB\"'.

Explanation:

attributeNameA

Name of the first attribute

attributeValueA

Value of the first attribute

attributeNameB

Name of the second attribute

attributeValueB

Value of the second attribute

elementName

Name of the element containing the invalid attribute combination

parameterName

Name of the parameter containing the invalid XML input document

Problem determination: This error occurs when an XML document provided as input to a stored procedure cannot be validated because the document contains an XML element with an invalid combination of attributes or attribute values. The error message contains information about the XML element and its attributes.

User action: Use the error information in the message to correct the error.

AQT10407E The operation cannot be executed on the table *tableSchema.tableName* because the table is in a transition state on the accelerator.

Explanation:

tableSchema

Name of the schema that the table belongs to

tableName

Name of the table containing the partitions

Problem determination: This warning indicates that the table on the this accelerator is not in sync with the same table on other accelerators. Therefore, certain operations are not allowed.

User action: Verify if the transition state was set by a RESTORE operation by looking at the ARCHIVE column of the table. If the ARCHIVE value is 'X', partitions were restored on another accelerator. In this case, the table must be removed from the current accelerator because its data is obsolete. After removing the table, it can be added again and the operation can be executed.

AQT10411E The *acceleratedTableSchema.acceleratedTableName* table cannot be removed from the *acceleratorName* accelerator because it is an accelerator-only table. You can only drop such tables by using a Db2 DROP TABLE statement.

Explanation:

acceleratorName

Name of accelerator on which the affected table resides

acceleratedTableSchema

Name of the table schema

acceleratedTableName

Name of the affected table

Problem determination: The SYSPROC.ACCEL_REMOVE_TABLES stored procedure does not remove accelerator-only tables.

User action: Remove the table by using a Db2 DROP TABLE statement rather than the

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SYSPROC.ACCEL_REMOVE_TABLES stored procedure or the **Remove** function in IBM Db2 Analytics Accelerator Studio.

AQT10412E The *acceleratedTableSchema.acceleratedTableName* table cannot not be used as input to the stored procedure *procedureName* because it is an accelerator-only table.

Explanation:

procedureName

The name of the stored procedure that does not allow an operation on an accelerator-only table

acceleratedTableSchema

The specified schema

acceleratedTableName

The specified table name

Problem determination: Accelerator-only-tables are not allowed as input to the stored procedure.

User action: Remove accelerator-only table from the input tables set of the stored procedure.

AQT10413E The Db2 real-time statistics could not be externalized. Diagnostic information: *diagnosticInfo*.

Explanation:

diagnosticInfo

Diagnostic information about the cause of the issue.

Problem determination: The real-time statistics could not be externalized, that is, could not be written from the system memory to the real-time statistics table. This means that the newly gathered statistics do not contribute to the metrics that support processing decisions. If processing continues, the decisions will be based on obsolete and therefore inaccurate data.

User action:

1. Analyse the diagnostic information in the message text. Ensure that the user (ID) who runs the stored procedure has the right to invoke the Db2 command -ACCESS DATABASE (ACCESS DB).
2. Check whether the value of the AQT_RTS_EXTERNALIZATION_AUTH_FAILURE environment variable is appropriate.

AQT10414W The Db2 real-time statistics could not be externalized because the user is not authorized to invoke the Db2 command -ACCESS DATABASE (ACCESS DB). Processing continues because the AQT_RTS_EXTERNALIZATION_AUTH_FAILURE environment variable is set to WARNING.

Problem determination: The real-time statistics could not be externalized, that is, could not be written from the system memory to the real-time statistics table. This means that the newly gathered statistics do not contribute to the metrics that support processing decisions. Processing continues because the AQT_RTS_EXTERNALIZATION_AUTH_FAILURE environment variable is set to the value WARNING, but processing decisions will be based on obsolete and therefore inaccurate data. This might cause unwanted side-effects (see the description of AQT_RTS_EXTERNALIZATION_AUTH_FAILURE in the *Stored Procedures Reference*).

User action: No action is required.

AQT10415W Db2 column statistics are not available for the *acceleratedTableSchema.acceleratedTableName* table. The absence of appropriate statistics will prevent an automatic creation of organizing keys.

Explanation:

acceleratedTableSchema

Schema name of the affected table

acceleratedTableName

Name of the affected table

Problem determination: As long as column statistics are missing, organizing keys cannot be automatically created. As a result, incremental updates might be applied inefficiently.

User action: You can ignore this message unless you want to create organizing keys automatically during the initial load of the table and have enabled the corresponding function on the IBM Db2 Analytics Accelerator Console. In this case, run the Db2 RUNSTATS utility to collect the missing statistics.

AQT10416I Accelerator *acceleratorName* has started a load with *loadParallelismGoal* parallel threads. The load has the unique identifier *loadTaskId*.

Explanation:

acceleratorName

Name of the accelerator

loadTaskId

Unique identifier of the load task on the accelerator

loadParallelismGoal

Number of parallel threads

Problem determination: This message indicates the beginning of a load process on the specified accelerator. If the environment variable AQT_DO_SYSLOGGING is set, this message is written to the system log (SYSLOG) of the connected z/OS system.

User action: No action is required.

AQT10417I The *acceleratorName* accelerator has completed load task *loadTaskId*.

Explanation:

acceleratorName

Name of the accelerator

loadTaskId

Unique identifier of the load task on the accelerator

Problem determination: This message indicates the completion of a load process on the accelerator. If the environment variable AQT_DO_SYSLOGGING is set, this message is written to the system log (SYSLOG) of the connected z/OS system. The message does not indicate whether the load failed or succeeded.

User action: No action is required.

AQT10418W Load task *loadTaskId* on accelerator *acceleratorName* is executed with fewer parallel threads than configured. *loadParallelismGoal* threads have been configured, but only *loadParallelismCurrent* threads are running.

Explanation:

acceleratorName

Name of the accelerator

loadTaskId

Unique identifier of the load task on the accelerator

loadParallelismGoal

Configured number of parallel threads

loadParallelismCurrent

Actual number of parallel threads

Problem determination: The load job is carried out with fewer parallel threads than intended. Too many concurrent load jobs, including those that serve other connected Db2 subsystems, might be the reason.

User action: The load continues, but the processing time will increase. The number of threads increases automatically when free resources become available again. To manually increase the number of threads for this particular job, identify and cancel other concurrently running load jobs on the accelerator.

AQT10419W The number of parallel threads for load task *loadTaskId* on accelerator *acceleratorName* has increased again. *loadParallelismGoal* threads have been configured. *loadParallelismCurrent* threads are running.

Explanation:

acceleratorName

Name of the accelerator

loadTaskId

Unique identifier of the load task on the accelerator

loadParallelismGoal

Configured number of threads

loadParallelismCurrent

Actual number of threads

Problem determination: The number of parallel threads executing this load job has been increased again because the total number of concurrent load jobs went down. An automatic increase occurs only if the number of threads was reduced before.

User action: No action is required.

AQT10420E Load task *loadTaskId* on accelerator *acceleratorName* could not load the *tableSchema.tableName* table. The table was not loaded because: *notLoadedCause*.

Explanation:

acceleratorName

Name of the accelerator

loadTaskId

Unique identifier of the load task on the accelerator

tableSchema

Schema name of the affected table

tableName

Name of the affected table

notLoadedCause

Reason why the table could not be loaded

Problem determination: A particular table could not be loaded. This does not necessarily mean that none of the specified tables were loaded. This message is only displayed if lock mode TABLE, PARTITIONS, ROW, or NONE is used.

User action:

1. Find the faulty table and remove the cause of the failure.
2. Start a new load for this table only.

AQT10421E Load task *loadTaskId* on accelerator *acceleratorName* could not load the partition *partition* of the *tableSchema.tableName* table. The partition was not loaded because: *notLoadedCause*.

Explanation:

acceleratorName

Name of the accelerator

loadTaskId

Unique identifier of the load task on the accelerator

tableSchema

Schema name of the affected table

tableName

Name of the affected table

partition

Number (identifier) of the affected physical partition

notLoadedCause

Reason why the partition could not be loaded

Problem determination: A particular partition of a table could not be loaded. This does not necessarily mean that none of the specified tables or partitions were loaded. This message is only displayed if lock mode PARTITIONS, ROW, or NONE is used.

User action:

1. Find the faulty partition and remove the cause of the failure
2. Start a new load for this partition only.

AQT10429E The network connection from the z/OS IP address *sourceIP* to the accelerator IP address *targetIP* does not allow the transfer of data messages with a large payload (portion of the user data in a network packet).

Explanation:

sourceIP

IP address of the z/OS LPAR that communicates with the accelerator.

targetIP IP address of the accelerator

Problem determination: This message indicates that the MTU size or the MTU path discovery not configured properly for the network path between the z/OS LPAR and the accelerator. Large TCP/IP packets might get lost on their way. The loss goes unnoticed. This might in turn lead to communication problems and deadlock situations. As a possible consequence, stored procedure calls do not return anything to the caller.

User action: With the help of your network administrator, validate the configuration of all network components from the z/OS LPAR to the accelerator including switches, routers, and gateways in-between. Make sure that the MTU size is set properly, that the switches do not drop network packets, and that MTU path discovery is enabled on the switches. If your switches do not support this feature, make sure that all components use the same MTU size.

AQT10500W Result sets could not be opened due to an error. None of the result sets associated with the stored procedure is returned.

Problem determination: This warning indicates that it is no use trying to process the result sets because they cannot be opened.

User action:

1. Let applications that call the stored procedure skip result set processing.
2. Take the user actions suggested in additional messages describing the problem.

AQT10501E The *procSchema.procName* stored procedure is incorrectly defined in DB2. The *parameterName* parameter of type *parameterType* was not found.

Explanation:

procSchema

Schema name of the stored procedure

procName

Name of the stored procedure

parameterName

Name of the expected parameter in the CREATE PROCEDURE DDL statement.

parameterType

Type of the expected parameter in the CREATE PROCEDURE DDL statement.

Problem determination: An expected stored-procedure parameter was not found.

User action:

- Make sure that the DDL statement for the stored procedures are correct. (These are usually set by the installer program AQTTRIN, except for remote wrapper stored procedures)
- Define at least the message output parameter as a CLOB with a size of 64K.
- Regarding remote wrapper procedures, contact the DDL provider for instructions.
- For procedures supplied with the product, verify that these were installed correctly. If so, contact IBM support.

AQT10502W Wrong value *unicodeSortOrderValue* for UNICODE_SORT_ORDER. The value BinaryUTF8 is taken instead.

Explanation:

unicodeSortOrderValue

Ignored UNICODE_SORT_ORDER value

Problem determination: This warning indicates that the stored procedure should not be called with a UNICODE_SORT_ORDER value other than BinaryUTF8.

User action: To avoid this warning, specify BinaryUTF8 as the value of UNICODE_SORT_ORDER.

AQT10503E The accelerator could not be contacted. Diagnostic information with details about the connectivity problem: *errorMessage*

Explanation:

errorMessage

Additional diagnostic information about the error

Problem determination: This exception occurs if the version of an accelerator cannot be determined because the accelerator cannot be contacted.

User action: The diagnostic information in the message text gives you more details about the error. It might have occurred because the input to the stored procedure was incorrect. Check if the network address and the port number are correct.

AQT10504W The *tableSchema.tableName* table can not be removed because it is still enabled for query acceleration. Disable query acceleration before you remove the table.

Explanation:

tableSchema

Schema name of the affected table

tableName

Name of the affected table

Problem determination: You cannot remove a table if it is still enabled for query acceleration unless you run the SYSPROC.ACCEL_REMOVE_TABLES stored procedure with the force option. In doing so, however, you will end currently running queries prematurely.

User action: Either:

1. Disable query acceleration for the table.
2. Rerun the SYSPROC.ACCEL_REMOVE_TABLES stored procedure.

Or:

Run the SYSPROC.ACCEL_REMOVE_TABLES stored procedure with the force option.

AQT10505W The *tableSchema.tableName* table cannot be removed because the data of one or more of its partitions has been archived on an accelerator. Restore the data to these partitions before you remove the table.

Explanation:

tableSchema

Schema name of the irremovable table

tableName

Name of the irremovable table

Problem determination: You cannot remove a table if data from one or more of its partitions has been archived on an accelerator. Removing such a table without restoring the data is possible only if you run the SYSPROC.ACCEL_REMOVE_TABLES stored procedure with the force option. In doing so, however, you forfeit the chance of an easy recovery.

User action: Recommended:

1. Make sure that all archiving operations from this table have been completed.
2. Restore the archived partition data by using the appropriate function in IBM Db2 Analytics Accelerator Studio or by running the SYSPROC.RESTORE_ARCHIVE_TABLES stored procedure.
3. Remove the table from the accelerator.

Not recommended: If you are sure that you want to remove the table from the accelerator without restoring the data, you can run the SYSPROC.ACCEL_REMOVE_TABLES stored procedure with the force option. Note that if you need to restore the data after that, you must complete the following steps:

1. Manually reset the state of the affected Db2 table space to read/write.
2. Manually recover the archived data from the Db2 image copies that were created at the time when the data was archived.

AQT10506S The data set referenced by the statement DD:AQTDEF6 cannot be opened or is empty.

Problem determination: The data set referenced by the statement DD:AQTDEF6 cannot be found or the data set is empty.

User action: Make sure that the data set exists, that it is readable, and that it contains valid XML code that conforms to the corresponding XML schema.

AQT10507W At least one column of the *tableSchema.tableName* table has been altered, added, or removed in Db2 for z/OS after defining the table on the *acceleratorName* accelerator.

Explanation:

tableSchema

Schema name of the affected table

tableName

Name of the affected table

acceleratorName

Name of the accelerator

Problem determination: This exception occurs when a column definition was changed or a column was added or removed from a table by an ALTER TABLE statement after adding the table to an accelerator.

User action:

1. Remove the table from the accelerator.
2. Re-add the table to the accelerator.

AQT10508E An unsupported stored procedure or sub-function of a procedure has been called by IBM Db2 Analytics Accelerator for z/OS version *version: unsupportedFunction*

Explanation:

unsupportedFunction

Name or description of the unsupported procedure or function.

version Version of the stored procedure

Problem determination: This exception occurs when an unsupported stored procedure or sub-function has been called.

User action: The function is not supported and cannot be used with version of the stored procedure.

AQT10509E In the input parameter (XML string) of the SYSPROC.ACCEL_TEST_CONNECTION stored procedure, the version element, which is a sub-element of the diagnosticCommand element, contains an invalid combination of attributes. That is, the 'accelerator' attribute is used together with the 'ip' or 'port' attribute. For details, see: *errorMessage*.

Explanation:

errorMessage

Additional diagnostic information about the error.

Problem determination: This error occurs if you run the SYSPROC.ACCEL_TEST_CONNECTION stored procedure with the DIAGNOSTIC_SPECIFICATION parameter and if the value of this parameter (an XML string) contains an invalid combination of attributes.

User action: Use the 'accelerator' attribute only, or both, the 'ip' and 'port' attributes.

AQT10510E The threads could not be started within the timeout period of *timeout* seconds.

Explanation:

timeout Timeout period in seconds

Problem determination: This error occurs if the SYSPROC.ACCEL_LOAD_TABLES or the SYSPROC.ACCEL_TEST_CONNECTION stored procedure cannot start parallel threads within the given timeout period. A timely start might be prevented by a high system workload with concurrent operations.

User action: Rerun the procedure operation when the system utilization is lower.

AQT10511W The *packageFileName* package was deployed (copied) without an integrity check because you neither specified a hash value for comparison, nor an algorithm or method for the hash verification.

Explanation:

packageFileName

Name of the unchecked package file

Problem determination: The integrity of the package could not be checked after deploying the file, such that a future activation step might fail.

User action: No action is required at this point. If the activation of the package fails, remove the package and deploy it again.

AQT10512E The accelerator listening on port *usedPort* at IP address *usedAddress* is running on the *platform* platform. The stored procedure SYSPROC.ACCEL_ADD_ACCELERATOR2 did not find the license module *member*, which entitles you to use that platform.

Explanation:

usedAddress

Network address used to contact the accelerator

usedPort

Port number used to contact the accelerator

platform

Hardware platform the accelerator is running on

member License module (member of SAQTMOD) containing the hardware-specific license

Problem determination: This error occurs if a hardware-specific license module is missing from the SAQTMOD data set of your installation. The license module is needed to operate an accelerator on that particular hardware.

User action: Check your installation on z/OS. You must install the entitlement FMID for the platform of the accelerator.

AQT10513I The external load utility function *callbackFunctionName* ended with return code *returnCode* and the following message: *message*. Context: *diagnosticInformation*.

Explanation:

callbackFunctionName

Name of the external load utility function

diagnosticInformation

Additional information about the context

returnCode

Return code issued by the external load utility function

message Message issued by the external load utility function

Problem determination: An external load utility function called by SYSPROC.ACCEL_LOAD_TABLES issued a return code and a message. This message might contain important information or instructions.

User action: Follow the instructions in the message (if any).

AQT10514W The external load utility function *callbackFunctionName* ended with return code *returnCode* and the following warning: *message*. Context: *diagnosticInformation*.

Explanation:

callbackFunctionName

Name of the external load utility function

diagnosticInformation

Additional information about the context

returnCode

Return code issued by the external load utility function

message Message issued by the external load utility function

Problem determination: An external load utility function called by SYSPROC.ACCEL_LOAD_TABLES issued a return code and a warning.

User action: Heed the warning, as it might hint at unwanted circumstances or side-effects.

AQT10515E The external load utility function *callbackFunctionName* ended with return code *returnCode* and the following error message: *message*. Context: *diagnosticInformation*.

Explanation:

callbackFunctionName

Name of the external load utility function

diagnosticInformation

Additional information about the context

returnCode

Return code issued by the external load utility function

message Message issued by the external load utility function

Problem determination: An external load utility function called by SYSPROC.ACCEL_LOAD_TABLES issued a return code and an error message.

User action:

1. Use the information in the message to eliminate the error.
 2. Rerun the SYSPROC.ACCEL_LOAD_TABLES stored procedure.
-

AQT19000I The AQTTRIN program was started for Db2 subsystem *subsystemId* Db2 for z/OS version *db2Version*, mode *(systemMode)*

Explanation:*subsystemId*

Name of the Db2 subsystem

db2Version

Version of Db2

systemMode

Current Db2 mode. Possible values are: CMn Conversion mode, where n represents the Db2 version that you migrate from. NFM New-function mode

Problem determination: This message is returned when the AQTTRIN program starts. It gives you the Db2 version and the processing mode of the Db2 subsystem that the program is connected to.

User action: No action is required.

AQT19001I The AQTTRIN program reports an internal error at location *locationName* because an unexpected object of the type *objectType* was encountered. The name of this object is *objectName*.

Explanation:*locationName*

Diagnostic information that identifies the function that was involved in the error.

objectType

Type of the object

objectName

The name of the object, which can be a specific name or a qualified name.

Problem determination: The program ended because an unexpected object was encountered.

User action: Check the maintenance level of the AQTRIN program. Update the program to the newest level if necessary. If the problem persists, contact IBM support.

AQT19002I The AQTTRIN program received the unexpected SQL code *sqlCode* from the SQL statement *sqlRequest*.

Explanation:*sqlCode* SQL code (a numeric value that hints at the cause of the SQL error)*sqlRequest*

All or part of the SQL statement that was issued. Long statements are truncated.

Problem determination: The AQTTRIN program received an unexpected SQL code while it was processing an SQL statement. Processing ended for that reason.

User action: Examine the standard SQLCA diagnostic messages and output in the SYSPRINT output log at the point of failure to determine the cause of the error. Correct the error and rerun the program.

AQT19003I AQTTRIN has encountered an error in the following control statement: *dd = ddName*, *error = errorText*, *line = lineNumber*, *statement = errorStatement*

Explanation:*ddName* The name of the data definition (DDL) statement.*errorText*

Additional information about the error. Possible values: - CONTROL STATEMENT HAS AN INVALID FORMAT - ROUTINE NAME HAS AN INVALID FORMAT - CONTROL STATEMENT EXCEEDS 720 BYTES - NO VALUE FOUND FOR THE FIRST|SECOND|THIRD PARAMETER OR ONE OR MORE CONTROL STATEMENTS WAS NOT SEPARATED BY A BLANK LINE - ONLY ONE PARAMETER FOUND - ACTUAL PARAMETERS: x, EXPECTED PARAMETERS: y - UNEXPECTED PARAMETER parameter-name FOUND -

CONTROL STATEMENT FOR routine-name NOT SUPPORTED - CONTROL STATEMENT FOR
routine-name ALREADY PROCESSED - CONTROL STATEMENT FOR routine-name NOT FOUND

lineNumber

The location (line number) of the error.

errorStatement

The control statement that caused the error.

Problem determination: AQTTRIN, the configuration program for routines that are supplied by IBM Db2 Analytics Accelerator, encountered an error while it was processing a configuration control statement.

User action: See the faulty control statement at the indicated line in the input, which was allocated by the specified data definition statement. Analyze and correct the problem. Then resubmit the AQTxxxxx job to resume processing.

AQT19004I The AQTTRIN program has successfully created the *objectType* *objectName* object.

Explanation:

objectType

Type of the object

objectName

Name of the object, which is a specific name or a qualified name: object-name is a specific name SPECIFIC
NAME name object-name is a qualified name qualifier.name

Problem determination: The AQTTRIN program has successfully created the SQL object.

User action: No action is required.

AQT19005I The AQTTRIN program has skipped *processingType* processing of the *objectType*, *objectName* object for the following reason: *reasonText*

Explanation:

processingType

Attempted SQL operation

objectType

Type of the object

objectName

Name of the object, which is a specific name or a qualified name: object-name is a specific name SPECIFIC
NAME name object-name is a qualified name qualifier.name

reasonText

This operation requires Db2 to be run in new-function mode.

Problem determination: The AQTTRIN program could not complete SQL processing for the indicated object.

User action: If you receive reason code 10, run the job again after Db2 has entered the new-function mode. Otherwise, no action is required.

AQT19006I The authorization IDs *authorizationIds* were granted *accessType* access on the *objectType* *objectName* object.

Explanation:

accessType

Authorization or access that was granted

objectType

Type of the object

objectName

Name of the object

authorizationIds

The authorization IDs to which access was granted.

Problem determination: The AQTTRIN program has granted access on one or more objects to one or more authorization IDs as indicated in the message.

User action: Verify that the granted access is appropriate for each of the authorization IDs. If the access is not appropriate, modify the GRANTTO parameter of the configuration control statement for each stored procedure or user-defined function that requires a different access list. Then resubmit the AQTTIJSP job.

AQT19007I The AQTTRIN program has dropped (deleted) the *objectType*, *objectName* object.

Explanation:

objectType

Type of the object

objectName

Name of the object, which is a specific name or a qualified name: object-name is a specific name SPECIFIC NAME name object-name is a qualified name qualifier.name

Problem determination: The indicated object has been dropped (deleted). The AQTTRIN program drops existing objects only if the program runs in REINSTALL mode or REINITIALIZE mode.

User action: No action is required.

AQT19008I The AQTTRIN program has set the Workload Manager (WLM) environment for the *routineType* *objectName* object to *environmentName*.

Explanation:

routineType

The type of routine: user-defined function or stored procedure.

objectName

Name of the object, which is a specific name or a qualified name: object-name is a specific name SPECIFIC NAME name object-name is a qualified name qualifier.name

environmentName

Name of the Workload Manager (WLM) environment.

Problem determination: A WLM environment has been assigned to a stored procedure or user-defined function as shown.

User action: Verify that the assigned WLM environment is appropriate for the stored procedure or function. If the WLM environment is inappropriate, modify the WLMENV parameter of the configuration control statement for each stored procedure or user-defined function that requires to be run in a different environment. Then resubmit the AQTTIJSP job.

AQT19009I The AQTTRIN request to bind a package for collection ID *collectionId*.*packageName* succeeded with return code *returnCode*. The owner of the package is *packageOwner*.

Explanation:

returnCode

Return code of the command

collectionId

Collection ID of the bound package

packageName

Name of the bound package

packageOwner

Name (user ID) of the package owner

Problem determination: A bind job was completed for the indicated package.

User action: No action is required.

AQT19010I AQTTRIN *requestType* **plan request for *packageName* failed with return code *returnCode*.**

Explanation:

requestType

The type of request: BIND PACKAGE, BIND PLAN, FREE PACKAGE, or FREE PLAN.

packageName

Name of the package that could not be bound or freed

returnCode

Numeric value that indicates the reason for the failure.

Problem determination: The requested operation was rejected by Db2. See the diagnostic messages that were issued before this message.

User action: Check the diagnostic messages from Db2. Correct the problem. Then resubmit the AQTTRIN request.

AQT19011I One or more of the submitted input parameters are invalid. Reason code = *reasonCode*, text = *reasonText*

Explanation:

reasonCode

The reason code describes the cause of the error:

Reason code = 1

The number of parameters is incorrect. The text of the reason code suggests that fewer or more parameters were submitted than expected, where:

number-passed

The number of submitted parameters

number-expected

The number of expected parameters

Reason code = 2

A required parameter is missing. Text of the reason code:

REQUIRED PARAMETER *parameter-name* WAS NOT PASSED

where *parameter-name* is the name of the expected parameter, which was not provided.

Reason code = 3

An unknown parameter was submitted. Text of the reason code:

UNRECOGNIZED PARAMETER *parameter-name* WAS PASSED

where *parameter-name* is the name of the submitted parameter that was not expected.

Reason code = 4

One of the parameter values is invalid. Text of the reason code:

THE VALUE FOR PARAMETER *parameter-name* IS NOT VALID

where *parameter-name* is the name of the parameter with the invalid value.

Reason code = 5

The routine specified in the DD:SYSIN statement is not a valid Db2-supplied routine. Text of the reason code:

schema.routine-name IS NOT A VALID Db2-SUPPLIED ROUTINE

where *schema.routine-name* is the qualified name of the invalid routine.

Reason code = 6

The same parameter was specified two or more times. Text of the reason code:

'PARAMETER *parameter-name* WAS PASSED MORE THAN ONCE.'

Reason code = 7

The length or size of the submitted statement exceeds the allowed maximum number of bytes. Text of the reason code:

'STATEMENT EXCEEDS number-of-bytes BYTES'

where number-of-bytes denotes the byte limit.

reasonText

Text that comes with the reason code

Problem determination: The program encountered an error as it attempted to process the input parameters in the PARM parameter or the SYSIN DD statement.

User action: Correct the problem and run the program again.

AQT19013I The AQTTRIN program for the Db2 versions *supportedVersion1* and *supportedVersion2* cannot be run on Db2 version *db2Version*.

Explanation:

supportedVersion1

The first supported version of Db2.

supportedVersion2

The second supported version of Db2.

db2Version

The Db2 version.

Problem determination: The maintenance levels of the AQTTRIN program and Db2 do not match. This happens, for example, if, during the migration to a new Db2 version, the program was run on a member of a Db2 data sharing group whose maintenance level is lower than that of the program. To run members of a data sharing group at different maintenance levels is called coexistence. It is a common practice.

User action: If you have a Db2 data sharing group with coexisting members, run the program on a member that has been migrated to the latest version. If this is not possible, make sure that the load library that is specified for program execution in the JOBLIB or STEPLIB statement is at the same maintenance level as Db2.

AQT19014I The AQTTRIN program reported a *fileOperation* file error for the DD:*ddName* statement. Diagnostic text: *diagnosticText*

Explanation:

fileOperation

The file operation during which the error occurred, that is, OPEN, READ, WRITE, or CLOSE

ddName The name of the data definition (DDL) statement

diagnosticText

Additional diagnostic information about the error, as provided by the IBM Language Environment®.

Problem determination: The program detected an error in the data set that was allocated to the data definition statement.

User action: Correct the error as suggested in the diagnostic information.

AQT19015I The preview option was specified for the AQTTRIN program. Therefore, the *installType* action was not carried out. An installation JCL job was generated and stored in the *storedLocation* member.

Explanation:

installType

Type of the installation job

storedLocation

Contains the name of the data set and the name of the JCL member in which the generated installation job was stored.

Problem determination: The Db2-supplied routines and supporting objects were not installed, configured, or bound to the system because the preview option was specified. To generate a JCL that contains the actual SQL and BIND statements that eventually install the Db2-supplied routines, you must specify a DD statement with the name JCLOUT in the JCL. If you want to know which objects you must include for processing, see the detailed report in SYSPRINT.

User action: See the report in SYSPRINT. Modify the AQTTIJSP installation job so that it includes the required objects. Then rerun the job without the preview option or submit the generated JCL.

AQT19025I The preview option of the AQTTTRIN program was specified. Therefore, the *installType* action was not carried out.

Explanation:

installType

Type of installation

Problem determination: The Db2-supplied routines and supporting objects were not installed, configured, or bound to the system because the preview option was specified. You find details about this job in SYSPRINT.

User action: See the report in SYSPRINT. Modify the AQTTIJSP installation job so that it includes the required objects. Then rerun the job without the preview option.

AQT19033I The AQTTTRIN installation program ended with return code *returnCode*.

Explanation:

returnCode

The most severe return code encountered at any time during processing.

Problem determination: Batch processing ended abnormally.

User action: If the return code is 4 or higher, look for other messages that might explain the cause of the warning or failure. Proceed as instructed by the message.

AQT19052I The authorization ID *authorizationId*, is not a Db2 installation system administrator ID. The authorization of the submitted ID is insufficient.

Explanation:

authorizationId

Specified authorization ID

Problem determination: The authorization ID, which was specified in the AUTHID parameter for the program, is not a Db2 installation system administrator ID. However, the authorization of such an ID is required if stored procedures or user-defined functions must be marked as system-defined procedures or functions. This is the case here.

User action: Change the value of the AUTHID parameter so that it provides a Db2 installation system administrator ID. Then run the AQTTIJSP job again.

AQT19053I The AQTTTRIN program was unable to process the IFI read request for IFCID 106. Return code: *returnCode*, reason code: *reasonCode*, bytes that were not moved to the instrumentation facility communications area (IFCA): *bytesRemaining*

Explanation:

returnCode

Return code from IFI

reasonCode

Reason code from IFI

bytesRemaining

Number of bytes that did not fit in the return area and therefore still remains in the buffer

Problem determination: The AQTTTRIN program tried a synchronous read of IFCID trace record 106, but received

an unexpected return code from the Db2 Instrumentation Facility Interface (IFI).

User action: To find the cause of the error, check the return code and the reason code for information about the IFCARC1 and IFCARC2 values in the instrumentation facility communications area (IFCA). Correct the error. Then rerun the AQTTIJSP job.

AQT19054I One or more objects of the AQTTRIN program must be updated. The update might require the rebinding of packages that reference these objects.

Problem determination: Run in preview mode, the AQTTRIN program found one or more objects that must be updated. However, the program cannot determine whether packages that refer to these objects will become invalid as a result of the update. If this is the case, you must rebind these packages.

User action: If the ABIND subsystem parameter is set to NO and you want to use the generated JCL job to install or update the Db2-supplied routines, resubmit the AQTTIJSP installation job with the MODE(INSTALL-PREVIEW) option. This identifies invalid packages that must be rebound and generates corresponding BIND statements. Finally, run these BIND statements. If the ABIND subsystem parameter is set to YES, or if you run the AQTTIJSP job without the preview option, no action is required because in either case, Db2 for z/OS rebinds invalidated packages automatically.

AQT19400I The job was completed successfully (SQL code 0).

Problem determination: You might see warnings (SQLWARN indicators) although the job could be completed successfully.

User action: You can ignore the warnings. No action is required.

AQT19909I The AQTTRIN bind plan request succeeded with return code *returnCode* for the *packageName* package with owner *packageOwner*.

Explanation:

returnCode

Return code of the command

packageName

Name of the bound package

packageOwner

Owner (ID) of the bound package

Problem determination: The bind request has been carried out successfully.

User action: No action is required.

AQT19910I The AQTTRIN *requestType* request for the *collectionId.packageName* package failed with return code *returnCode*.

Explanation:

requestType

Type of the request: BIND PACKAGE, BIND PLAN, FREE PACKAGE, or FREE PLAN

collectionId

Collection ID of the package that could not be bound or freed

packageName

Name of the package that could not be bound or freed.

returnCode

A numeric value that indicates the reason for the failure

Problem determination: The request was rejected by Db2. Diagnostic messages have been issued in addition to this message.

User action: Check the diagnostic Db2 messages to identify the problem. Correct the problem and resubmit the request.

AQT20001W A plan with an ID of *planID* cannot be found for SQL statement *statementID* with statement text *statement* on the acceleratorName accelerator.

Explanation:

statementID

The accelerator ID of the SQL statement for which a corresponding plan file cannot be found

planID The Netezza ID of the plan file that does not exist

statement

The original SQL statement

acceleratorName

Name of the accelerator

Problem determination: This message indicates that a query was processed by an accelerator, but the corresponding plan information can no longer be retrieved. The plan might have been deleted from the accelerator. Query plans are kept for a limited time only. Newer queries take precedence over older queries, so that the oldest plans are deleted after some time.

User action: Rerun the query to collect fresh plan information.

AQT20003W ATTENTION: Potential risk of data loss. A unique constraint, such as a primary key or unique index, is not defined for the *tableSchema.tableName* table. If multiple rows are inserted into a Db2 table, all or a subset of these might end up as a single row in the corresponding accelerator-shadow table. Similarly, a deletion of one row from the original table, might result in the deletion of multiple rows from the accelerator-shadow table. This leads to inconsistent tables on either side, meaning that incorrect query results are returned by the accelerator. Therefore, do not enable incremental updates for this table unless you know for sure that it does not contain duplicate rows. Another problem with tables of this type is that queries and incremental updates might take much longer.

Explanation:

tableSchema

Schema name of the affected table

tableName

Name of the affected table

Problem determination: Without a unique constraint, all columns of a table are used to identify a table row. There might be multiple rows with exactly the same column values. If that is the case, inserting the same row twice results in the insertion of only one row into the accelerator-shadow table. A deletion of one row from a Db2 for z/OS table, on the other hand, will cause the deletion of all rows with the same values from the corresponding accelerator-shadow table. This is because the duplicate rows cannot be differentiated. The consequence are inconsistent tables, which means that queries on the accelerator do not run on the same data as in Db2. This leads to incorrect results. The absence of a unique constraint also means that the identification of table rows takes longer because the entire table must be scanned. For large tables, this might result in a poor query and update performance.

User action: To add a unique constraint to the table, follow these steps:

1. Disable incremental updates for the table.
2. Remove the accelerator-shadow table.
3. In Db2, define the unique constraint.
4. Redefine the accelerator-shadow table.
5. Enable incremental updates for the redefined table.
6. Load the redefined table.

AQT20004W The *tableSchema.tableName* table is enabled for replication, but has no unique constraint that matches one or more of its organizing keys. This lack might cause incremental updates to be applied very slowly to the table. The unique constraints are: *uniqueConstraints*. The organizing keys are: *organizingKeys*.

Explanation:

AQT20006E • AQT20009E

tableSchema

Schema name of the table that is being modified and still in use by some other task

tableName

Name of the table that is being modified and still in use by some other task

uniqueConstraints

Unique constraints on the table

organizingKeys

Organizing keys on the table

Problem determination: A large number of row updates or deletions cannot be applied efficiently because the absence of an organizing key that matches one or more of the table's unique constraints requires a scan of the entire table. The identification of the rows to be updated thus takes longer.

User action: 1) Disable replication (incremental updates) for the affected table. 2) Define the organizing keys for the table in such a way that one or more of the keys match a unique constraint. 3) Re-enable replication for the table.

AQT20006E At least one of the tables that are to be loaded with lock mode *lockMode* is enabled for incremental updates. To prevent inconsistencies between the source tables in Db2 for z/OS and the tables on the accelerator, tables that are enabled for incremental updates must be loaded with lock mode TABLESET. Lock mode ROW is also allowed but imposes special restrictions.

Explanation:

lockMode

Lock mode used for table loads

Problem determination: A capture point for incremental updates is set at the end of a load operation. Updates to the source tables that occurred before the setting of the capture point are not propagated as incremental updates, which causes Db2 source tables and accelerator tables to be out of sync. To avoid a situation like this, you must use a lock mode that prevents updates of the source tables until the capture point is set during a load. If you cannot tolerate the Db2 lock scope implied by lock mode TABLESET, you can also use lock mode ROW. However, this requires incremental updates to be stopped during the load and additional measures to guarantee data consistency.

User action: Load the tables with lock mode TABLESET.

AQT20007E The *acceleratorName* is in the 'currentState' state, which does not allow a *attemptedOperation* operation.

Explanation:

acceleratorName

Name of the affected accelerator

currentState

Current replication state

attemptedOperation

Attempted operation that failed due to the replication state

Problem determination: The current replication state does not allow the attempted operation. For example, the state might be in the process of being changed, or incremental updates are not enabled for the Db2 subsystem.

User action: If incremental updates are disabled for the affected Db2 subsystem, enable these from the IBM Db2 Analytics Accelerator Configuration Console. If incremental updates are currently being started or stopped, wait for the operation to complete, then retry running the operation.

AQT20009E Operation *operation* failed: *errorMessage*

Explanation:

operation

ID of the incremental update operation that reported the error.

errorMessage

An error message generated by the incremental-update automation component.

Problem determination: Mostly, this error is connected with incremental update operations. A common cause is a structural change (DDL change) in one of the affected tables since the last successful operation. For example, a column or a constraint might have been added to a table in Db2. In such a case, incremental update process fail or queries can no longer be routed to an accelerator.

User action:

1. Retry running the requested operation.
2. If the problem persists and incremental updates are involved, look at the last replication event message in the list to diagnose its cause. Click the Get Events link in IBM Db2 Analytics Accelerator Studio to display the list of replication event messages. If incremental updates can be ruled out, try to find the cause of the error by just looking at the diagnostic information in this error message or the error log in IBM Db2 Analytics Accelerator Studio.
3. Identify the tables that have caused a problem.
4. Stop all incremental update processes that these tables are part of.
5. Remove the tables from all accelerators.
6. Redefine the tables.
7. Enable incremental updates for the redefined tables.
8. Load the redefined tables.

If the problem is not connected with incremental update processes, complete just steps 1, 2, 3, 5, 6, and 8.

If you cannot identify the tables or cannot solve the problem by following the previous steps, contact IBM support.

AQT20010E Replication can not be started on the *acceleratorName* accelerator until at least one table is enabled for replication and loaded.

Explanation:

acceleratorName

Name of the accelerator

Problem determination: You can only start replication if at least one table is enabled for replication and loaded, that is, the #Replication Since# column in the GUI must show a timestamp value.

User action: Enable at least one table for replication and load it, then start replication.

AQT20011W The following columns of the *tableSchema.tableName* table contain TIME values that were converted from 24:00:00 to 23:59:59 or TIMESTAMP values whose time part was converted from 24:00:00.000000 to 23:59:59.999999: *columnNames*. Hence query results returned by the accelerator might differ from those that Db2 for z/OS returns.

Explanation:

tableSchema

Schema name of the table that contains TIME or TIMESTAMP columns with converted values

tableName

Name of the table that contains TIME or TIMESTAMP columns with converted values

columnNames

Names of the TIME or TIMESTAMP columns

Problem determination: In earlier product versions before version 4 PTF-2, a Db2 TIME value 24:00:00 or a TIMESTAMP value whose time portion is 24:00:00.000000 cannot be loaded on the accelerator. By default, such values cause a conversion error, but the accelerator can be configured to convert these values or value portions to 23:59:59 or 23:59:59.999999. This warning informs you that such a conversion took place while the table was being loaded.

User action:

- Consider upgrading the product to version 4 PTF-2 or later.
- You can also modify the original values in Db2 for z/OS to avoid this warning and guarantee result consistency, but this is no longer recommended.

AQT20012W Incremental updates have been enabled for the *tableSchema.tableName* table. To guarantee the consistency of the original Db2 table and its counterpart on the accelerator, this table has been reset to InitialLoadPending state, which requires a reload of the entire table. Without this reload, you cannot run accelerated queries or start incremental update processes for this table.

Explanation:*tableSchema*

Schema name of the affected table

tableName

Name of the affected table

Problem determination: If incremental updates are enabled for a loaded table, there might be pending changes that occurred after the last load. The incremental update process does not propagate such changes to the corresponding accelerator tables because changes are not registered by the process before the capture point is set. The capture point, however, is set when the incremental update process starts. So there might be changes that go unnoticed. To avoid such a condition, loaded tables are reset to InitialLoadPending state when they are enabled for replication, which requires a fresh reload of the table data before the incremental update process begins. This ensures that no table changes go unnoticed.

User action: Reload the table.

AQT20013E Task *canceledTaskID* of type *taskType* has been canceled by task *canceledTaskID* of type *canceledTaskType* for the following reason: *cancelReason*.

Explanation:*canceledTaskID*

Unique identifier of the canceled task

taskType

Type of the canceled task

cancelReason

Reason for the task cancellation

canceledTaskID

Identifier of the task that caused the cancellation

canceledTaskType

Type of the task that caused the cancellation

Problem determination: This error occurs when a user cancels an accelerator task from IBM Db2 Analytics Accelerator Studio or by running the SYSACCEL.ACCEL_CONTROL_ACCELERATOR stored procedure. This error also occurs when a task is canceled by another, conflicting task. For example, removing a table from the accelerator leads to the cancellation of any other operation on the table happening at the same time.

User action: If you want to prevent other users from canceling a task, adjust the execution privileges for the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure.

AQT20014I The following data was transferred to the *tableSchema.tableName* table: Scope: *scope*, number of rows: *numRows*, amount of data: *dataSizeInMB* MB, time: *timeInSeconds* seconds.

Explanation:*tableSchema*

Schema name of the affected table

tableName

Name of the affected table

scope

Scope of the data that was transferred (full table or selected partitions)

numRows

Number of rows that were transferred

dataSizeInMB

Amount of data that was transferred

timeInSeconds

Time that was needed to transfer the data

Problem determination: This message, which is issued for each transaction of the same type, reports information about the table data that was transferred by the SYSPROC.ACCEL_LOAD_TABLES stored procedure.

AQT20015I No data was transferred for table *tableSchema.tableName*.

Explanation:

tableSchema

Schema name of the table that was skipped

tableName

Name of the table that was skipped

Problem determination: You want to load or move a table, but no data is transferred to the accelerator. This can happen if the detectChanges='DATA' attribute is specified for the SYSPROC.ACCEL_LOAD_TABLES stored procedure, but table changes cannot be detected or if the data of the specified partitions has been moved to an accelerator by the High Performance Storage Saver (HPSS).

User action: No action required.

AQT20016W An error occurred during the re-enablement of incremental updates for the Db2 subsystem with the location name *locationName*. You must enable incremental updates for a Db2 subsystem from the IBM Db2 Analytics Accelerator Configuration Console before you can update tables incrementally. The technical description of the error is: *errorXML*

Explanation:

locationName

Location name identifying the Db2 subsystem to be enabled for incremental updates (replication)

errorXML

A technical description of the error that is generated by the replication automation component.

Problem determination: When incremental updates are enabled for a Db2 subsystem and all tables have been removed from the the connected accelerator, incremental updates are disabled and the replication state changes to 'Configured'. As soon as new tables are defined on the accelerator, an attempt is made to re-enable incremental updates by using the previous configuration. This operation can fail, for example, if the capturing agent of IBM InfoSphere Data Replication for z/OS is not started or if the password of the Db2 user who configured incremental updates for the subsystem has changed.

User action: Re-enable incremental updates for the Db2 subsystem from the IBM Db2 Analytics Accelerator Configuration Console. No action is required if you do not want to resume the incremental update process.

AQT20018E The replication service cannot confirm that all changes were applied to the *accelerator* accelerator. Reason: *reasonID*.

Explanation:

accelerator

Name of the affected accelerator.

reasonID

Reason why the replication service was not able to confirm

Problem determination: The replication service cannot confirm that all data changes were applied to the accelerator. Possible reasons: 1: The user-specified timeout period has elapsed. 2: An internal error has occurred.

User action: 1) Check which of the indicated reasons applies. 2) Increase the timeout value or contact IBM support.

AQT20020E The Db2 credentials for incremental updates are invalid. Update the Db2 credentials of user *userName* in Db2 subsystem *locationName*.

Explanation:

locationName

Location name identifying the Db2 subsystem

userName

Db2 user name that is used for incremental update processes

Problem determination: The Db2 user name or the password of the user ID that is used by IBM Db2 Analytics Accelerator for z/OS for incremental updates is invalid or has expired.

User action:

1. From the IBM Db2 Analytics Accelerator Console, update the Db2 credentials of the user that is mentioned in the error message.
2. Restart the incremental update process.

AQT20021E A table could be loaded successfully, but a subsequent incremental update operation on this table failed. Message: *errorMessage*

Explanation:

errorMessage

An error message generated by the incremental-update automation component.

Problem determination: An incremental update operation failed after a successful load operation, probably because incremental updates were not enabled for the table. However, the table remains in LOADED state, which means that it can be used for accelerated queries.

User action: Try to enable incremental updates for the table.

AQT20022E Incremental updates could not be enabled for the *acceleratorName* accelerator because the following script is missing: *scriptName*

Explanation:

acceleratorName

Name of the accelerator

scriptName

Name of the missing script

AQT20023E Incremental updates could not be enabled for the *acceleratorName* accelerator because the following script returned an error: *scriptName*

Explanation:

acceleratorName

Name of the accelerator

scriptName

Name of the failed script

AQT20024E The data of partition *partition* of the *tableSchema.tableName* table cannot be archived because a restore operation is in progress for the same partition or did not run to completion. A restore operation must be completed successfully before the partition data can be archived again.

Explanation:

tableSchema

Schema name of the affected table

tableName

Name of the affected table

partition

Number of the physical partition that cannot be archived

Problem determination: You cannot archive partition data with the High Performance Storage Saver (HPSS) if the same data is being restored at the same time, or if a restore process for the same data has failed before it could be completed. You can run the SYSPROC.ACCEL_GET_TABLES_DETAILS stored procedure to find all archiving or restore operations that did not run to completion, and must therefore be fixed.

User action:

1. Rerun the SYSPROC.ACCEL_RESTORE_ARCHIVE_TABLES stored procedure for the indicated partition to complete the restore operation.
2. If this fails, run SYSPROC.ACCEL_GET_TABLES_DETAILS procedure to list all failed archiving and restore operations. Try to analyze and fix the error.
3. If this does not help, remove the indicated partition from the XML input list of the SYSPROC.ACCEL_ARCHIVE_TABLES stored procedure or do not select it for HPSS processing in IBM Db2 Analytics Accelerator Studio.

AQT20025E The data of partition *partition* of the *tableSchema.tableName* table cannot be restored because an archiving operation is in progress for the same partition or has failed before it could be completed. it has started, but not completed, archive processing. An archiving operation must be completed successfully before the partition data can be restored.

Explanation:

tableSchema

Schema name of the affected table

tableName

Name of the affected table

partition

Number of the physical partition that cannot be restored

Problem determination: You cannot restore partition data if the same data is being archived at the same time, or if an archiving process has failed before it could be completed. You can run the SYSPROC.ACCEL_GET_TABLES_DETAILS stored procedure to find all archiving or restore operations that did not run to completion, and must therefore be fixed.

User action:

1. Rerun the SYSPROC.ACCEL_RESTORE_MOVE_TABLES stored procedure or the corresponding function in IBM Db2 Analytics Accelerator Studio for the indicated partition to complete the archiving operation.
2. If this fails, run SYSPROC.ACCEL_GET_TABLES_DETAILS procedure to list all failed archiving and restore operations. Try to analyze and fix the error.
3. If this does not help, remove the indicated partition from the XML input list of the SYSPROC.ACCEL_RESTORE_ARCHIVE_TABLES stored procedure or do not select it for HPSS processing in IBM Db2 Analytics Accelerator Studio.

AQT20026E The *operation* operation cannot be carried out because the version of the stored procedure is incompatible with the current version of the accelerator. To run this operation, install version *minimumRequiredVersion* or later of the stored procedures. The version of the stored procedures must never be higher than the software version of the accelerator; the software version of the currently active accelerator is *currentAcceleratorVersion*.

Explanation:

operation

Operation that should have been completed by the stored procedure

minimumRequiredVersion

Minimum stored-procedure version that is required for compatibility with the accelerator.

currentAcceleratorVersion

Software version of the currently active accelerator

AQT20028W • AQT20034E

Problem determination: Your combination of stored procedure and accelerator software versions does not support the requested operation. To archive partition data on a version 4.1.x accelerator, the stored procedures must also be upgraded to version 4.1.x.

User action: Upgrade your stored procedures to the same program-temporary-fix (PTF) level as the accelerator.

AQT20028W One or more archived partitions of the *tableSchema.tableName* table ending at *limitKeys* can no longer be found in Db2 for z/OS and will therefore be deleted from the accelerator. You might want to delete the following image copies of these partitions, which cannot be used anymore:
backupImageNames

Explanation:

tableSchema

Schema name of the affected tables

tableName

Name of the affected table

limitKeys

Limit keys identifying the partitions

backupImageNames

Obsolete image copies

Problem determination: The data of one or more partitions has been archived on an accelerator before the partitions were deleted or modified in Db2 for z/OS (for example by an ALTER TABLE ROTATE PARTITION statement), so that the limit keys used for moving the data no longer identify the original Db2 data. In such a case, the archived partitions are deleted from the accelerator when the SYSPROC.ACCEL_ARCHIVE_TABLES stored procedure or the corresponding function in IBM Db2 Analytics Accelerator Studio is called the next time for the same table. The image copies that were created when the data was archived cannot be restored anymore because the table definition has changed. You can therefore delete the corresponding data sets.

User action: Consider deleting the specified image copies.

AQT20032W A migration of the accelerator from version *currentVersion* (current version) to version *targetVersion* (target version) is not permitted. Reason: *description*

Explanation:

targetVersion

Target version

currentVersion

Current version

description

Reason why a migration from the current version to the target version is not permitted

Problem determination: This warning occurs when a check of IBM Db2 Analytics Accelerator catalog indicates that a migration to the target version would lead to compatibility problems. For example, a backward migration from version 4.x.x to version 3.x.x is only allowed if all archived partitions have been archived or restored completely.

User action: The description might suggest corrective actions after which you can successfully complete the operation.

AQT20034E The query contains *numParameterMarkers* parameter markers or special registers and therefore cannot be explained.

Explanation:

numParameterMarkers

The number of parameter markers or special registers in the query to be explained

Problem determination: You cannot extract Db2 Explain information about a query from an accelerator if the query contains parameter markers or special registers.

User action: Revise the query and replace the parameter markers or special registers with literals, for example dummy values.

AQT20044E You are trying to load *numReplicatedTablesToLoad* tables that are enabled for incremental updates, but the limit is *limit*.

Explanation:

numReplicatedTablesToLoad

Number of tables to be loaded

limit

Maximum number of tables that can be loaded

Problem determination: There is a limit on the number of tables enabled for incremental updates that can be loaded in a single load operation. This limit was exceeded, so the load operation does not begin.

User action: Specify fewer incremental-update-enabled tables for the load operation.

AQT20045W The table *schemaName.tableName* cannot be added to the database with the location name *locationName* because the database has been removed from the catalog.

Explanation:

locationName

Location name of the database system that is removed

schemaName

Schema name of a table to be added to the removed database

tableName

Name of a table to be added to the removed database

Problem determination: You can only define new tables using the SYSPROC.ACCEL_ADD_TABLES stored procedure or create new accelerator-only tables if the pairing between Db2 for z/OS is intact and has not been removed or is about to be removed.

User action: Ensure that a pairing between Db2 for z/OS and the accelerator exists. Then repeat the operation.

AQT20046W Tables originating from the Db2 subsystem with the location name *systemLocationName* were still on the accelerator when the pairing between Db2 and the accelerator was removed. These *numTables* tables were also deleted from the accelerator.

Explanation:

systemLocationName

Location name of the Db2 subsystem that the tables originated from

numTables

Number of tables that still existed on the accelerator when it was removed

Problem determination: This warning occurs when the command or stored procedure to remove an accelerator is executed although tables still exist on the accelerator. This might happen if a table is defined just at the time when the accelerator is being removed. Note that all such tables are removed.

User action: No action is required. You can ignore the error messages that are issued by related processes running in parallel.

AQT20047E The detectChanges=DATA attribute must not be specified for loading the *schemaName.tableName* table because an external loader is employed.

Explanation:

schemaName

Schema name of the table to be loaded

tableName

Name of the table to be loaded

AQT20048E • AQT20050E

Problem determination: The load operation involves an external load utility and the data source might not be Db2. The Db2 run-time statistics cannot be used to determine reliably whether a partition or table has changed and must therefore be reloaded on the accelerator.

User action: Do not specify detectChanges=#DATA#.

AQT20048E The accelerator-only table *schemaName.tableName* can only be loaded with the append-only option.

Explanation:

schemaName

Schema name of the accelerator-only table to be loaded

tableName

Name of the accelerator-only table to be loaded

Problem determination: Load operations on accelerator-only tables can only append new data. Existing data cannot be replaced.

User action: Set the attribute loadAppend=#true# in the XML load specification.

AQT20049E Task *maintenanceTaskID* of type *maintenanceTaskType* has switched the system into maintenance mode, which prevents the current task *taskID* of type *taskType* from doing the same.

Explanation:

taskID ID of the task that requests the maintenance mode

taskType

Type of the task requests the maintenance mode

maintenanceTaskID

ID of the task that currently works in maintenance mode

maintenanceTaskType

Type of the task that currently works in maintenance mode

Problem determination: Another task has already reserved the maintenance mode for the system. This mode cannot be given to more than one task at the same time.

User action:

1. Wait until the other maintenance task has finished.
 2. Retry the operation.
-

AQT20050E Task *taskID* of type *taskType* cannot switch the system into maintenance mode within *timeOut* ms because the following other tasks are still running: *blockingTasks*.

Explanation:

taskID ID of the task that requests the maintenance mode

taskType

Type of the task that requests the maintenance mode

timeOut

Timespan required to reach the desired state (in ms)

blockingTasks

List of the tasks that block the switch into maintenance mode

Problem determination: The system cannot be switched into maintenance mode within the given timespan because at least one other task exists that claims the maintenance mode for itself.

User action: 1. Wait until the other tasks have finished, or cancel those tasks. 2. Retry the operation.

AQT20051E The *columnName* column of the *tableSchema.tableName* table was dropped from the Db2 subsystem after the table was defined on the accelerator.

Explanation:

tableSchema

Schema name of the affected table

tableName

Name of the affected table

columnName

Name of the affected table column

Problem determination: This exception occurs when a column dropped from a table after the table was defined on an accelerator.

User action: 1. Remove the table from the accelerator. 2. Redefine the table on the accelerator. 3. Rerun the stored procedure that returned the error.

AQT20052E The *tableSchema.tableName* table cannot be defined on the accelerator because the row length exceeds the limit of *rowLengthLimit* bytes.

Explanation:

tableSchema

Schema name of the table that could not be created in the database on the accelerator

tableName

Name of the table that could not be created in the database on the accelerator

rowLengthLimit

Maximum row length in bytes permitted by the database on the accelerator

Problem determination: The rows of the table that you want to define are longer than the allowed maximum (in bytes).

User action: Change the columns widths of the table in Db2 for z/OS so that the resulting row length fits the allowed maximum.

AQT20053E The *tableSchema.tableName* table on the '*acceleratorName*' accelerator uses the unsupported CCSID *ccsid*.

Explanation:

acceleratorName

Name of the accelerator

tableSchema

Schema name of the table that uses an unsupported CCSID

tableName

Name of the table that uses an unsupported CCSID

ccsid

The unsupported CCSID

Problem determination: The specified single-byte coded character set identifier (CCSID) for the table is not supported by IBM Db2 Analytics Accelerator for z/OS. Therefore, you cannot define the table on the accelerator.

User action: Use a supported CCSID.

AQT20054W The load process for the *tableSchema.tableName* table detected invalid bytes sequences in the load data. This affected *numberDiscardedRows* rows, which have been discarded during the process.

Explanation:

tableSchema

Schema name of the table that contains the invalid UTF-8 characters

tableName

Name of the table that contains the invalid UTF-8 character

numberDiscardedRows

Number of discarded rows

Problem determination: The load process for the specified table detected invalid bytes sequences (like invalid UTF-8 characters) in the load data. The load process was completed, but the rows containing the invalid characters were discarded. Be aware that the table data on the accelerator now differs from the data in the corresponding Db2 table. Therefore, the results of a query can vary, depending on where it is executed (accelerator or Db2 for z/OS).

User action: 1. Replace the invalid characters in the original Db2 table with valid ones. 2. Reload the corresponding accelerator table. 3. Review processes or applications programs that might have inserted the invalid bytes sequences. IBM can help you identify the numbers of the discarded rows in the accelerator trace information.

AQT20055W The numbers of distinct values in each column of the *schemaName.tableName* table, which are required for the selection of an organizing key, could not be determined.

Explanation:

schemaName

Schema name of the table that was supposed to provide the organizing key

tableName

Name of the table that was supposed to provide the organizing key

Problem determination: The number of distinct values in a table column is the decisive factor for its suitability as an organizing key. It was not possible to determine this number for each table column. An organizing key was therefore not created.

User action: 1. Run the Db2 utility RUNSTATS to generate up-to-date statistics for the estimated number of distinct values in each column, also known as COLCARD. 2. Disable incremental updates for the table and then re-enable these. 3. Retry the load operation.

AQT20056E The call-home function could not be enabled because an internal error occurred.

User action: Contact IBM support.

AQT20057E The call-home function could not be disabled because an internal error occurred.

User action: Contact IBM support.

AQT20060W Entries were excluded from the query history because the QUERY_LIST output parameter of the SYSPROC.ACCEL_GET_QUERIES stored procedure cannot contain more than *maxMessageSize* bytes of data. This maximum was exceeded. Therefore, only *retrievedNumSQLStatementEntries* entries out of *requestedNumSQLStatementHistoryEntries* have been included in the retrieved query history.

Explanation:

maxMessageSize

Maximum allowed size for the XML document of the SQL statement history (in bytes)

requestedNumSQLStatementHistoryEntries

Requested (total) number of SQL statement history entries

retrievedNumSQLStatementEntries

Number of actually retrieved entries of the SQL statement history

Problem determination: The maximum size of the output list was exceeded, and therefore, some entries had to be excluded from the query history. Entries that show up at the top are preserved, and later entries that exceeds the limit are included.

User action: Use a more restrictive filter so that the number of output entries fits the allowed maximum size. Change the filter by altering the values in the 'query_selection' parameter of the stored procedure, or the settings of the View and Show drop-down lists in the query history section of the Accelerator view in IBM Db2 Analytics Accelerator Studio.

AQT20061E The load specification specifies the XML attributes `detectChanges=detectChanges` and `forceFullReload=false` for the incremental-update-enabled table `schemaName.tableName`. This is not permitted.

Explanation:

schemaName

Schema name of the table

tableName

Name of the table

detectChanges

Explicit or default setting for the detectChanges XML attribute

Problem determination: The XML load specification for incremental-update-enabled tables must set the attributes for change detection or a full-table reload to guarantee that updates cannot be lost during the load on those partitions that are not being loaded.

User action: Repeat the load operation with `detectChanges="DATA"` or `forceFullReload=true` in the XML load specification for the table.

AQT20062E A procedure package with the name *packageName* already exists. Its version is *existingVersion*. Another procedure package with the same name (and version *newVersion*) cannot be added.

Explanation:

packageName

Name of the procedure package

existingVersion

Version of the already existing package

newVersion

Version of the package to be added

Problem determination: A procedure package with the given name already exists on the accelerator. Therefore, you cannot add a package with the same name.

User action:

1. Remove the existing package.
2. Add the new package.

AQT20063E A procedure package with the name *packageName* does not exist.

Explanation:

packageName

Name of the procedure package

Problem determination: A procedure package with the given name does not exist on the accelerator. Therefore, you cannot refer to it.

User action: Correct the package name or install the package.

AQT20064E A procedure package with the name *packageName* has already been enabled for the Db2 subsystem with the location name *locationName*. It cannot be enabled again without disabling it before.

Explanation:

packageName

Name of the procedure package

locationName

Location name of the Db2 subsystem

Problem determination: A procedure package with the given name has already been enabled for the Db2 subsystem. Therefore, you cannot enable it again.

User action: Change the name of the procedure package or disable it before you enable it again.

AQT20067E The *clientProcedureName* stored procedure cannot be executed because a package that contains this stored procedure was not installed on the accelerator.

Explanation:

clientProcedureName

Name of the client stored procedure to be executed

Problem determination: Each stored procedure to be executed on the accelerator must be installed from a procedure package. The given stored procedure was not installed in this way.

User action: 1. Install the procedure package that contains this stored procedure on the accelerator. 2. Try again to execute the stored procedure.

AQT20068E The *clientProcedureName* stored procedure cannot be executed because the *packageName* procedure package was not enabled for a Db2 subsystem with the name *locationName*.

Explanation:

clientProcedureName

Name of the client stored procedure to be executed

packageName

Name of the procedure package

locationName

Location name of the Db2 subsystem

Problem determination: A stored procedure can only process tables that come from the Db2 subsystem for which the stored procedure has been enabled. This is not the case for the given stored procedure and the package that it was delivered in.

User action: 1. Enable the procedure package for the above-mentioned Db2 subsystem. 2. Try again to execute the stored procedure.

AQT20069E The *clientProcedureName* stored procedure from the *packageName* package failed on the accelerator. Error message: *errorMessage*.

Explanation:

clientProcedureName

Name of the client stored procedure to be executed

packageName

Name of the procedure package

errorMessage

Error message

Problem determination: A problem was encountered during the execution of the stored procedure. The error message contains details about this problem.

User action: 1. Eliminate the cause of the error. Contact the vendor of the procedure package if necessary. 2. Try again to execute the stored procedure.

AQT20070E The execution of the *clientProcedureName* stored procedure from the *packageName* package failed because the metadata in the XML document could not be validated and processed. The following validation error was reported during the execution: *errorMessage* in metadata of document *xmlDocument*.

Explanation:

clientProcedureName

Name of the client stored procedure to be executed

packageName
Name of the procedure package

errorMessage
Error message that was issued after validating the XML document that was generated by the DESCRIBE procedure

xmlDocument
XML document that was generated by the DESCRIBE procedure

Problem determination: The stored procedure could not be executed because an error occurred as the accelerator tried to validate the metadata that it received from the procedure package.

User action: Contact the vendor of the procedure package.

AQT20071E Running the stored procedure with the name *clientProcedureName* from procedure package *packageName* created the accelerator-only table *schemaName.tableName*. The *columnName* column of that table uses the unsupported data type *dataType*.

Explanation:

clientProcedureName
Name of the client stored procedure to be executed

packageName
Name of the procedure package

schemaName
Schema name of the accelerator-born table

tableName
Name of the accelerator-born table

columnName
Name of the column in the accelerator-born table

dataType
Data type of the column

Problem determination: The execution of the stored procedure on an accelerator led to the creation of a new table, which contains a column with an unsupported data type. Therefore, all actions that were taken by the stored procedure are undone.

User action: Contact the vendor of the procedure package.

AQT20072E A load of the *tableSchema.tableName* table requires Netezza Performance Server (NPS) version *requiredNPSVersion*.

Explanation:

tableSchema
Schema name of the table that contains invalid UTF-8 characters

tableName
Name of the table that contains invalid UTF-8 characters

requiredNPSVersion
Required version of the Netezza Performance Server (NPS®) software

Problem determination: A table contains UTF-8 characters that were not supported until recent. To be able to process these characters, you need the indicated NPS version or an even higher version.

User action: Upgrade your NPS software on the accelerator.

AQT20081E Operation *operation*, which was supposed to transfer *numBytes* bytes on TCP/IP socket *socket*, failed because the connection to the remote machine at IP address *remoteIPAddress* and port *remotePort* has been closed unexpectedly. Reason: *errorNumber*.

Explanation:

socket Socket number

operation
Operation that failed as a result of the closed connection

numBytes
Number of bytes to be processed by the operation

remoteIPAddress
IP address of the remote machine

remotePort
Port number of the remote machine

errorNumber
Error number

Problem determination: The TCP/IP operation failed because the remote machine closed the connection unexpectedly. The cause is probably a connection problem or an internal protocol error.

User action: Verify the proper functioning of the network connection. If the network connection is OK, contact IBM support.

AQT20082E Operation *operation*, which was supposed to transfer *numBytes* bytes on TCP/IP socket *socket*, failed because the connection to the remote machine at IP address *remoteIPAddress* and port *remotePort* has been closed by a regular shutdown. *numAlreadyProcessedBytes* bytes could be processed until the shutdown.

Explanation:

socket Socket number

operation
Operation that failed as a result of the closed connection

numBytes
Number of bytes to be processed by the operation

remoteIPAddress
IP address of the remote machine

remotePort
Port number of the remote machine

numAlreadyProcessedBytes
Number of bytes that could be sent and received

Problem determination: The TCP/IP operation failed because the connection was shut down. The cause is probably a connection problem or an internal protocol error.

User action: Verify the proper functioning of the network connection. If the network connection is OK, contact IBM support.

AQT20083E Operation *operation*, which was supposed to transfer *numBytes* bytes on TCP/IP socket *socket* to the remote machine at IP address *remoteIPAddress* and port *remotePort* could not be completed within the time allotted (*timeoutInSeconds* seconds). *numAlreadyProcessedBytes* bytes could be processed until the connection broke off.

Explanation:

socket Socket number

operation

Operation that failed as a result of the closed connection

numBytes

Number of bytes to be processed by the operation

remoteIPAddress

IP address of the remote machine

remotePort

Port number of the remote machine

numAlreadyProcessedBytes

Number of bytes that could be sent and received

timeoutInSeconds

Timeout period that was exceeded

Problem determination: The TCP/IP operation could not be completed within the time allotted. The cause is probably a connection problem or an internal protocol error.

User action: Verify the proper functioning of the network connection. If the network connection is OK, contact IBM support.

AQT20084E Operation *operation*, which was supposed to transfer *numBytes* bytes on TCP/IP socket *socket* to the remote machine at IP address *remoteIPAddress* and port *remotePort*, was interrupted. *numAlreadyProcessedBytes* bytes could be processed until the interruption.

Explanation:

socket Socket number

operation

Operation that was interrupted

numBytes

Number of bytes to be processed by the operation

remoteIPAddress

IP address of the remote machine

remotePort

Port number of the remote machine

numAlreadyProcessedBytes

Number of bytes that could be sent and received

Problem determination: The TCP/IP operation was interrupted, for example because the task was canceled.

AQT20085E Socket *socket* could not be connected to the remote machine at IP address *remoteIPAddress* and port *remotePort*. Reason: *error*.

Explanation:

socket Socket number

remoteIPAddress

IP address of the remote machine

remotePort

Port number of the remote machine

error Error message indicating the reason for the failure; (error number mapped to a string)

Problem determination: A TCP/IP connection could not be established. The error message explains why.

User action: Correct the problem and retry the operation.

AQT20086E The communication protocol flow was broken by the *peerType* because an error happened at the end of the network communication.

Explanation:

peerType

Cause of the communication failure

Problem determination: This internal error message is accompanied by other messages indicating the cause of the error

User action: Check the accompanying messages to find the cause of the error and resolve the problem.

AQT20087E The communication protocol flow is broken because the unexpected network message *receivedNetworkMessage* was received although message *expectedNetworkMessage* was expected.

Explanation:

expectedNetworkMessage

Expected network message

receivedNetworkMessage

Received network message

Problem determination: This internal error points to a protocol violation between the communicating machines.

User action: Contact IBM support.

AQT20088W An internal warning occurred on the '*acceleratorName*' accelerator: *diagnosticMessage*

Explanation:

acceleratorName

Name of the accelerator

diagnosticMessage

Diagnostic information returned by the accelerator

Problem determination:

AQT20089E A distributed commit between the stored procedure and the server failed for the following reason: *diagnosticMessage*

Explanation:

diagnosticMessage

Reason why the distributed commit failed

Problem determination: A distributed commit between the stored procedure and the server failed for the indicated reason.

User action: Contact IBM support.

AQT20090E Enter a location name. The location name must not be an empty string.

Problem determination: This error occurs if you do not specify a location name (the location name is an empty string).

User action: Try to add the accelerator again. This time, provide a location name.

AQT20091W The Db2 subsystem or data sharing group with the location name *removedTimeReferenceSystemLocationName*, which acted as the time reference system for the accelerator, has been removed. The new time reference system is the Db2 subsystem or data sharing group with the location name *newReferenceTimeLocationName*.

Explanation:

newReferenceTimeLocationName

Location name of the new time reference system

removedTimeReferenceSystemLocationName

Location name of the previous time reference system

Problem determination: This warning occurs when the time reference system changes.

User action: No action necessary

AQT20092E The load request failed because the following error occurred: *reasonText*

Explanation:

reasonText

Root exception message

Problem determination: This error occurs if a load request fails and no tables were loaded with data.

User action: Run the load job again. If the problem persists, contact IBM support.

AQT20093E A table named *tableSchema.tableName* cannot be found in the Db2 subsystem or data sharing group with the location name *locationName*.

Explanation:

locationName

Location name of the Db2 subsystem or data sharing group that is supposed to contain the table

tableSchema

Schema name of the table that cannot be found

tableName

Name of the table that cannot be found

AQT20094E The option *invalidContentOption* was specified in a request to save trace data, but that option is unknown.

Explanation:

invalidContentOption

Content flag that is not compatible with others in the list

Problem determination: The request to save trace data cannot be processed because an unknown content option (*invalidContentOption*) was used.

User action: Remove the invalid option *invalidContentOption* and repeat the operation.

AQT20095E You specified the option *invalidContentOption* in a request to save trace data, but that option is not compatible with other options in *contentOptionList*.

Explanation:

invalidContentOption

Incompatible content option flag

contentOptionList

List of all content options used

Problem determination: Restrictions apply when you specify a combination of content options in a request to save trace data. One of these restrictions was violated when you specified option *invalidContentOption* together with other options in the list (*contentOptionList*).

User action: Remove the option *invalidContentOption*. Use this option individually in a separate request to save trace data, so that it cannot conflict with the other options.

AQT20096E EXPLAIN information about this query could not be obtained. Diagnostic information: *exceptionText*

Explanation:

exceptionText

Detailed exception text returned by the EXPLAIN service

Problem determination: The inability to retrieve EXPLAIN information can have a number of reasons. The database system can be offline, the SQL statement might be invalid, or a table, view or column referenced by the query no longer exists on the accelerator.

User action:

1. Verify that the accelerator is online.
2. Verify that all tables referenced by the query still exist on the accelerator.
3. Review the diagnostic information in this message to diagnose the problem.

AQT20097E The component responsible for managing incremental updates did not finish the execution of a command within the timeout period.

Problem determination: This internal error most likely indicates a temporary overload situation on the accelerator.

User action: Check the states of your incrementally updated tables. If tables are in unexpected states, take action to change the table states, so that the operation can be executed successfully.

AQT20098E The request-issuing component did not receive a reply within the timeout period.

Problem determination: This internal error most likely indicates a temporary overload situation on the accelerator.

User action: Check the overall system status. Take compensating action if a system component is in an unexpected state.

AQT20099E An interaction between two components failed due to the following reason: *diagnosticMessage*

Explanation:

diagnosticMessage

Reason why the interaction failed

Problem determination: An interaction between two components failed for reasons indicated in the diagnostic text.

User action: Contact IBM support.

AQT20100E The name of an already existing file (*fileName*) was specified in the **SYSPROC.ACCEL_SOFTWARE_UPDATE2 deployPackage** command. The file already exists in the target directory on the accelerator.

Explanation:

fileName

Name of the already existing file

Problem determination: The name of a file to be transferred with the **SYSPROC.ACCEL_SOFTWARE_UPDATE2 deployPackage** command must be unique and the file must not yet exist in the transfer directory on the accelerator.

User action: You might cancel the operation because you need not deploy the same file twice. If you want to redeploy the same file, rename it in the source directory or remove the existing file from the accelerator by using the **SYSPROC.ACCEL_SOFTWARE_UPDATE2 removeDeployedPackages** command before you transfer it to the accelerator.

AQT20101E The file integrity could not be verified for the *fileName* file. The file was transferred using the **SYSPROC.ACCEL_SOFTWARE_UPDATE2 deployPackage** command. The hash value *callerHash* that was provided does not match the hash value computed on the accelerator. Checksum output of the accelerator: *computedHash*

Explanation:

fileName

Name of the file that failed the checksum integrity test

callerHash

The provided checksum value

computedHash

The checksum computed on the accelerator

Problem determination: When a file is transferred to an accelerator by the SYSPROC.ACCEL_SOFTWARE_UPDATE2 stored procedure, a checksum is computed to verify the integrity of the file. This checksum does not match the checksum provided by you or the calling application.

User action: Retry the file transfer. If the error persists, check the validity of the file in the source directory. The checksum file might contain an invalid checksum. For example, verify that the binary option was used when the file was downloaded to the source location. Also verify that a valid checksum*.txt file was placed in the source directory.

AQT20102W The file *fileName* could not be removed because it was not found.

Explanation:

fileName

File name of the package to be removed

Problem determination: You tried to remove a package file, but that file was not found. Either the specified file name is incorrect, or the file has already been removed by another command that was issued around the same time.

User action: Check the file name. If the file name was correct, but the file does no longer exist, ignore this warning.

Tip: To retrieve the list of files that can be removed, run this command: **CALL SYSPROC.ACCEL_UPDATE_SOFTWARE2(listDeployedPackages)**

AQT20103W The file *fileName* could not be extracted. Diagnostic information: *diagnostics*

Explanation:

fileName

Name of the package to be deployed

diagnostics

Diagnostic information

Problem determination: You tried to transfer a package file, but the file could not be extracted. The file has been saved on the accelerator, but can not be installed by the software update function.

User action: Make sure that you have used a valid software update file. Remove the transferred file from the accelerator and retry, or open a service request to help you diagnose the problem, so that you can install the update manually. **Tip:** To remove the file from the accelerator, run this command: **CALL**

SYSPROC.ACCEL_UPDATE_SOFTWARE2(removeDeployedPackages)

AQT20104E A unique constraint, such as a primary key or unique index, is not defined for the *tableSchema.tableName* table. During an insertion, data consolidation might merge multiple rows into just one row, or the deletion of one row might cause the deletion of multiple rows from the accelerator table. Incorrect query results will be the consequence. Another problem with tables of this type is that queries and incremental updates take much longer. That's why it is not allowed to enable this table for incremental updates.

Explanation:

tableSchema

Schema name of the affected table

tableName

Name of the affected table

Problem determination: Without a unique constraint, all columns of a table are used to identify a single table row.

There might be multiple rows with exactly the same column values. In this case, inserting the same row multiple times results in the insertion of just one row at the target. In addition, the deletion of one row from a Db2 for z/OS table might entail the deletion of all rows with the same values from the corresponding accelerator-shadow table because duplicate rows cannot be differentiated. This leaves you with inconsistent tables, which inevitably leads to incorrect query results from the accelerator. The absence of a unique constraint also means that the identification of table rows takes longer because the entire table must be scanned. For large tables, this might result in a poor query and update performance. That's why it is not allowed to enable this table for incremental updates.

User action: To add a unique constraint to the table, follow these steps:

1. Remove the table from the accelerator.
2. In Db2, define a unique constraint.
3. Redefine the table on the accelerator.
4. Enable incremental updates for the redefined table.
5. Load the redefined table.

AQT20105E A stored procedure or sub-function of a procedure has been called that is not supported for this type of accelerator: *unsupportedFunction*

Explanation:

unsupportedFunction

Name or description of the unsupported procedure or function

Problem determination: The product supports different deployment modes and platforms with a uniform application programming interface (API). Some functions, however, are only supported in specific deployment modes or on specific platforms. This exception occurs if you run a function that is not supported in the current deployment mode or on the current platform of this accelerator.

User action: The function is not supported and cannot be used for this accelerator. Check the documentation for the supported functions in this deployment mode or on this platform.

AQT20106E An invalid file name was specified in the `SYSPROC.ACCEL_SOFTWARE_UPDATE2 activateDeployedPackage` command. File Name: *fileName*.

Explanation:

fileName

Name of the already existing file

Problem determination: The `SYSPROC.ACCEL_SOFTWARE_UPDATE2` stored procedure can transfer any file to an accelerator, but only files that have been identified as valid software updates can be installed. The file name that you specified was not identified as a valid software update package.

User action: Use the `SYSPROC.ACCEL_SOFTWARE_UPDATE2 listDeployedPackages` command to display a list of software packages that can be activated. If you have not yet transferred a valid software update package to the accelerator, use the `SYSPROC.ACCEL_SOFTWARE_UPDATE2 deployPackage` command. Some packages must be installed manually. For these, refer to the instructions that came with the package or contact IBM support.

AQT20107E The component responsible for software updates did not finish the execution of the command *command* within the timeout period of *timeout* milliseconds.

Explanation:

command

Unfinished software update command

timeout Maximum wait time in seconds

Problem determination: The `SYSPROC.ACCEL_SOFTWARE_UPDATE2 activateDeployedPackage` was invoked to install new software on the accelerator. The operation did not finish within the timeout period. This internal error most likely indicates a temporary overload situation on the accelerator.

User action: This error indicates a temporary problem. Retry the operation. If the problem persists, contact IBM support.

AQT20108E The `SYSPROC.ACCEL_SOFTWARE_UPDATE2 activateDeployedPackage` command failed for product version *version*. The accelerator is not ready for the installation. The prerequisite check failed with the following messages: *message* Diagnostic information 1: *stdout* Diagnostic information 2: *stderr*

Explanation:

version The software version that was specified in the `activateDeployedPackage` command.

message Additional description of the error

stdout Diagnostic information

stderr Diagnostic information

Problem determination: The `SYSPROC.ACCEL_SOFTWARE_UPDATE2 activateDeployedPackage` command was invoked to install new software on the accelerator. Before the software is installed, the status of the accelerator and the necessary installation prerequisites are checked. This check failed.

User action: If the error information indicates a temporary problem, retry the `SYSPROC.ACCEL_SOFTWARE_UPDATE2` command. If the problem persists, contact IBM support.

AQT20109E The `SYSPROC.ACCEL_CONTROL_ACCELERATOR getActivationLog` command failed. An installation log was not found. Diagnostic message: *message*

Explanation:

message Additional description of the error

Problem determination: The `SYSPROC.ACCEL_CONTROL_ACCELERATOR getActivationLog` command was invoked to retrieve the latest information from the installation log, but an installation log was not found.

User action: If you have never installed a software update before, this error is expected. If you have already installed or tried to install software packages, but still run into this error, contact IBM support.

AQT20121E The load request failed because the following error occurred: *reasonText*

Explanation:

reasonText

Root exception message

Problem determination: This error occurs if a load request fails, and no tables were loaded with data.

User action:

1. Run the load job again.
2. If the problem persists, contact IBM support.

Troubleshooting

In the following sections, you find descriptions of known IBM Db2 Analytics Accelerator for z/OS problems. The author and the development team have tried to provide a solution wherever possible. However, a solution might be unavailable because the cause of a problem cannot be clearly identified. This is mostly the case if multiple causes can lead to the same symptom. It can also be that a solution has not yet been found. In such cases, contact IBM support.

Important: During a customer session with IBM support, system parameters might be changed. For the parameter changes to take effect, a restart of an accelerator is often required. In such situations, the accelerator will be unavailable for operational tasks until it has come back online.

NOT Programming Interface information

“No CEEDUMPs”

“SQL code -471 referring to a function in the DSNAPT schema”

“Finding the trace file after a stored procedure failure” on page 152

No CEEDUMPs

You cannot find a CEEDUMP although a signal was caught while you were running an IBM Db2 Analytics Accelerator for z/OS stored procedure.

Symptoms

A signal was caught while running an IBM Db2 Analytics Accelerator for z/OS stored procedure, but a CEEDUMP has apparently not been produced.

Causes

Missing configuration settings.

Resolving the problem

To analyze problems that cause the stored procedure to end abnormally or stop with a signal, a CEEDUMP is required. The JCL startup procedure for the Workload Manager (WLM) application environment of the IBM Db2 Analytics Accelerator for z/OS stored procedure allows you to specify a location for a CEEDUMP.

Important: Make sure that the JCL startup procedure for the Workload Manager (WLM) application environment of the IBM Db2 Analytics Accelerator for z/OS stored procedure contains a DD statement for CEEDUMP.

SQL code -471 referring to a function in the DSNAPT schema

You receive a message with SQLCODE= -471 and reason code 00E79002 when trying to run the internal function DSNAPT.ACCEL_READFILE3.

Symptoms

You see an error message that is similar to the following:

```
DSNT408I SQLCODE = -471, ERROR: INVOCATION OF FUNCTION OR PROCEDURE
DSNAPT.ACCEL_LIST_SOFTWARE FAILED DUE TO REASON 00E79002
DSNT418I SQLSTATE = 55023 SQLSTATE RETURN CODE
```

```

DSNT415I SQLERRP = DSNX9GPL SQL PROCEDURE DETECTING ERROR
DSNT416I SQLERRD = -40 0 0 -1 0 0 SQL DIAGNOSTIC INFORMATION
DSNT416I SQLERRD = X'FFFFFFFFD8' X'00000000' X'00000000' X'FFFFFFFF'
X'00000000' X'00000000' SQL DIAGNOSTIC INFORMATION

```

Causes

In addition to externally published stored procedures in the SYSPROC schema, IBM Db2 Analytics Accelerator for z/OS employs user-defined functions internally. These functions are included in the DSNAPT schema and serve the following purposes:

- Reading temporary trace files from IBM Db2 Analytics Accelerator for z/OS stored procedures (function DSNAPT.ACCEL_READFILE3)
- Checking available stored-procedure interface versions (function DSNAPT.ACCEL_GETVERSION)

If such a function was stopped for some reason (for example by a database administrator), the end-user who has triggered the execution of the internal function sees a Db2 error -471 00E79002.

Resolving the problem

1. From your Db2 subsystem, check the function status by using the following command:
-DIS FUNCTION SPECIFIC (DSNAPT.*)
2. If the function is not in the state STARTED, start it with the following command:
-STA FUNCTION SPECIFIC (DSNAPT.*)

The trace information that was supposed to be delivered to the caller of the stored procedure in a Db2 result set has been kept in its temporary location (/tmp by default). Thus you can still transfer this information after restarting the stopped function.

Finding the trace file after a stored procedure failure

Read how you can find the incomplete trace file after a stored procedure failure. Generally, if a stored procedure ends unexpectedly, the trace file or trace information is not returned to IBM Db2 Analytics Accelerator Studio.

Symptoms

Trace information that would help you analyze the failure of the stored procedure is missing.

Causes

The interrupted stored procedure run has not reached the stage where the trace information or trace file is returned to IBM Db2 Analytics Accelerator Studio.

Environment

Trace information for each stored procedure call is stored in the /tmp folder of the z/OS UNIX file system (zFS) file unless a different location has been specified. When the stored procedure run is completed successfully, the trace file is transferred to IBM Db2 Analytics Accelerator Studio, from where it can be accessed by the user who has started the function that resulted in the stored procedure call. After the transfer, the trace file in the /tmp folder is deleted.

The naming schema for stored procedure trace files is aqt-trace-<date>-<time>-<sp_name>-XXXXXX, where:

aqt-trace-20171113-1028-ACCEL_TEST_CONNECTION-ghbHxQ

<date>

The date on which the trace file was written, in the format YYYYMMDD.

<time>

The time at which the trace file was written, in the format hhmm.

<sp-name>

The name of the stored procedure that the trace information is about.

XXXXXX

A unique identifier consisting of numbers and characters

Example:

aqt-trace-20171113-1028-ACCEL_TEST_CONNECTION-ghbHxQ

Note: In the /tmp folder, you find all incomplete trace files. These can be the result of erroneous and currently active stored procedure runs.

Resolving the problem

1. Make a note of the time stamp that is shown when IBM Db2 Analytics Accelerator reports the failure of the stored procedure, for example:
20170216-1457
2. Connect to the zFS of z/OS by using a command-line FTP client.
3. After the logon, change to the /tmp folder:
cd /tmp
4. Enter ls -l to show all files in this folder.
5. Look for a stored procedure trace file with a time stamp similar to the one you took down, for example:
aqt-trace-20171113-1028-ACCEL_TEST_CONNECTION-ghbHxQ
6. Enter bin to switch to binary mode.
7. Enter the following command:
get <trace file name>

where <trace file name> stands for the name of the trace file.

Note: To receive all stored-procedure trace-files, you can enter the following command:

mget aqt-trace-*

8. Enter quit to exit the FTP program.

The downloaded trace file is in UTF-8 encoding. You can view it in a text editor.

End of NOT Programming Interface information

Appendix A. Environment variables

The job control language (JCL) for the configuration of the Workload Manager (WLM) environment for IBM Db2 Analytics Accelerator stored procedures contains a data definition (DD) "AQTEENV". This data definition includes a data set in which environment variables are defined. These variables control the behavior of some stored procedures.

Important:

- When editing the AQTEENV data set with an ISPF editor, make sure not to use the NUM ON option. Otherwise the line numbers of the columns from 72 to 80 become part of the variable values. Also, do not insert blanks before or after the equals sign and make sure that you do not have trailing blanks at the end of the line.

The AQTEENV data set is made available to the stored procedures by the RUN OPTION 'ENVAR("_CEE_ENVFILE_S=DD:AQTEENV")', which is set in the CREATE PROCEDURE statement for each procedure. If a line in the AQTEENV data set matches the pattern *NAME=VALUE*, the environment variable *NAME* is set to *VALUE*. For more information, follow the **Related information** link at the end.

- Make sure that the permissions for the AQTEENV data set include read access for all users who execute stored procedures. Otherwise, the environment variable settings do not take effect and corresponding error messages are written to the system log.
- After modifying settings in the AQTEENV data set, refresh the WLM environment so that the changes can take effect.
- When upgrading to a new release, always use the AQTEENV sample that is provided with the new version as a template for your own AQTEENV data set. This ensures that you do not set obsolete environment variables and specify all mandatory new variables that were introduced with the new release.

You can set or override environment variables temporarily on a per-call basis. Settings will be valid only for the duration of a stored-procedure call. For more information, follow the link to the description of the *message* parameter under **Related reference** at the end of this topic.

AQT_HOST_PACKAGE_DIRECTORY

Update packages can be downloaded to and transferred from a directory in the UNIX file system (z/FS) of your z/OS data server or from a workstation. If a z/FS directory is used, you must set AQT_HOST_PACKAGE_DIRECTORY to an absolute path to point to the directory containing the update packages because IBM Db2 Analytics Accelerator Studio and the SYSPROC.ACCEL_UPDATE2 stored procedure look for update packages in this directory. Most update packages must be downloaded from IBM Shopz or from IBM Fix Central. In the following steps, they are transferred to the accelerator, from where they are deployed and activated. There might be packages that you cannot install by yourself, but require the help of IBM support. For these types of updates, you must open a service request first. See *Opening a service request* in the *IBM Db2 Analytics Accelerator for z/OS: Installation Guide* for more information.

AQT_DO_SYSLOGGING

Causes messages about the start and the completion of load operations to be written to the SYSLOG of the z/OS LPAR in which the

SYSPROC.ACCEL_LOAD_TABLES stored procedure runs. Messages contain the name of the accelerator, the task number of the load jobs, and information about the reduction or increase of parallel processing threads (up to the limit set by AQT_MAX_UNLOAD_IN_PARALLEL). The variable is set by default (AQT_D0_SYSLLOGGING=SET). To suppress these messages, comment out this line.

AQT_KEEPIDLE_INTERVAL

Specifies an interval that determines for how long a TCP/IP connection can be idle before keep-alive-packages are sent to the connected accelerator. The stored procedures build TCP/IP connections to the accelerator. To avoid connection failures caused by implicit connection closures, routers, or VPN (virtual private network) tunnels, TCP sends keep-alive-packages or probes after a period of time during which the network was idle. This is necessary to keep the connections up during long running load operations.

This setting affects all stored procedures and overwrites the KEEPALIVEOPTIONS settings for the TCP/IP stack that is specified in the Worload Manager (WLM) environment of the IBM Db2 Analytics Accelerator stored procedures. By default, the interval is set to 60 seconds. If the setting should turn out to be the source of problems, change the value or disable the mechanism entirely by commenting out the corresponding line in the AQTENV data set.

Note that socket connections between the stored procedures and the accelerator are also configured to send keep-alive-packages, and that the NO_DELAY and NON_BLOCKING options are set for the sending of these packages.

AQT_MAX_RETRIES_DSNUTILU

Determines how many times the SYSPROC.ACCEL_LOAD_TABLES stored procedure tries to call DSNUTILU if the attempt failed in the first place with SQL code -471 and reason code 00E79002 (timeout error). The default value is 2.

AQT_MAX_UNLOAD_IN_PARALLEL

The maximum number of parallel DSNUTILU invocations used by the SYSPROC.ACCEL_LOAD_TABLES stored procedure when loading data from a partitioned Db2 table. Increasing the value leads to a better performance, provided that enough processors are available to handle additional parallel processes. Note also that increasing the value of AQT_MAX_UNLOAD_IN_PARALLEL to more than 8 might not increase the throughput any further. The default value is 4.

AQT_QUOTEFIX1026

Converts Turkish characters that would otherwise cause errors during table load operations. This variable is set by default (AQT_QUOTEFIX1026=SET).

AQT_RTS_EXTERNALIZATION_AUTH_FAILURE

Determines the behavior if the Db2 command -ACCESS DATABASE (ACCESS DB) is called by a stored procedure, but cannot be invoked because the user who runs the stored procedure lacks the proper authorization. Possible values:

ERROR (default)

Processing stops and an error message is displayed.

WARNING

Processing continues, but a warning is displayed at the end of the process. There will be just one generic warning.

IGNORE

Processing continues without a warning or error message.

AQT_SECONDS_BEFORE_RETRY_DSNUTILU

Specifies the interval in seconds between DSNUTILU calls (retries). By default, this interval is set to 60 seconds.

AQT_SKIP_UNLOAD_EMPTY_PARTS

Suppresses invocations of the Db2 UNLOAD utility (DSNUTILU) when SYSPROC.ACCEL_LOAD_TABLES was called to load an accelerator-shadow table or partition, but the Db2 source table or partition is empty. This improves the performance of the load process. The detection of empty tables relies on Db2 real-time statistics.

Important: If the `<externalTool>` element is used as part of the *table_load_specification* parameter for SYSPROC.ACCEL_LOAD_TABLES, the Db2 UNLOAD utility is always called, irrespective of the setting of this variable.

AQT_SKIP_VALIDATE_XML

Skips the validation of XML code when it is returned in result sets or output parameter strings. The omission of this step leads to a better performance, especially when large result sets are returned. To disable this setting (turn XML validation on), comment out the line in the AQTENV data set.

AQT_SORTDEVT

Specifies the device type to use when sorting temporary data sets dynamically. This setting is used by the sort program when an IBM Db2 Analytics Accelerator stored procedure sends a request to a Db2 Utility that includes a sort job like this.

AQT_UTILITY_TMP

Specifies a template for the generation of unique temporary data-set names to be used by Db2 utilities. For example, several IBM Db2 Analytics Accelerator stored procedures invoke Db2 utilities, which in turn create temporary data sets with the user ID of the stored-procedure caller as the high-level qualifier. If you do not want this to happen, you can set AQT_UTILITY_TMP to generate a different name. The syntax is:

```
AQT_UTILITY_TMP = &USERID..AQT.&UNIQ.
```

where

&USERID.

ID of the user who runs the stored procedure

&UNIQ.

Causes the creation of a unique identifier

The specification needs to resolve to valid and unique data-set names. To ensure uniqueness, always make the &UNIQ. variable part of the template value. The string AQT is a constant.

TZ Sets the correct timezone for stored procedures running in the WLM address space that has been configured for IBM Db2 Analytics Accelerator. The setting affects the formatting of timestamps in trace files.

Related reference:

"The message parameter" on page 71

Related information:



TCP_KeepAlive socket option



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Specifying how long utilities wait for resources

Appendix B. Required access rights

The following table lists the access rights that are required for calling IBM Db2 Analytics Accelerator stored procedures successfully (the user who installs or binds the stored procedures requires different access rights; for more information, see the *IBM Db2 Analytics Accelerator for z/OS: Installation Guide*).

Important: Each stored procedures requires write access to the /tmp directory in the z/OS UNIX file system (zFS) on z/OS if tracing is turned on for the procedure.

Table 10. Access rights by stored procedure

Stored procedure	Required access rights
<ul style="list-style-type: none">• SYSPROC.ACCEL_ADD_ACCELERATOR2	<ul style="list-style-type: none">• EXECUTE on the stored procedure• MONITOR1 authorization• Read/write and execute access to the /tmp directory for the user who calls the stored procedure• RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.• RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.
<ul style="list-style-type: none">• SYSPROC.ACCEL_ADD_TABLES	<ul style="list-style-type: none">• EXECUTE on the stored procedure• MONITOR1 (needed for calling ADMIN_INFO_SYSPARM from the procedure)• Authorization to run ADMIN_INFO_SYSPARM so that ZPARMs can be retrieved.• RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.• RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.
SYSPROC.ACCEL_ALTER_TABLES	<ul style="list-style-type: none">• EXECUTE on the stored procedure• MONITOR1 (needed so that DSNWLIR can be used to run Db2 commands via the Db2 Instrumentation Facility Interface (IFI)).• Authorization to run ADMIN_INFO_SYSPARM so that ZPARMs can be retrieved.• RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.• RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Table 10. Access rights by stored procedure (continued)

Stored procedure	Required access rights
<ul style="list-style-type: none"> SYSPROC.ACCEL_CONTROL_ACCELERATOR 	<ul style="list-style-type: none"> EXECUTE on the stored procedure MONITOR1 authorization (needed so that DSNWLIR can be used to run Db2 commands via the Db2 Instrumentation Facility Interface (IFI)). Read/write and execute access to the /tmp directory for the user who calls the stored procedure If an output file or data-set location is specified: Write access in RACF to the output data set for trace data or write access to the specified location in the z/OS UNIX file system. RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment. <p>By element: In addition to the general authorizations, the use of COMMAND parameter input elements requires the right to execute a particular user-defined function. This allows you to grant execution rights individually for each element.</p> <p><cancelTasks> EXECUTE on DSNAQT.ACCEL_CONTROL_CANCELTASKS</p> <p><clearTraceData> EXECUTE on DSNAQT.ACCEL_CONTROL_CLEARTRACEDATA</p> <p><getAcceleratorInfo> EXECUTE on DSNAQT.ACCEL_CONTROL_GETACCELERATORINFO</p> <p><getAcceleratorTasks> EXECUTE on DSNAQT.ACCEL_CONTROL_GETACCELERATORTASKS</p> <p><getActivationLog> EXECUTE on DSNAQT.ACCEL_CONTROL_GETACTIVATIONLOG</p> <p><getReplicationEvents> EXECUTE on DSNAQT.ACCEL_CONTROL_GETREPLICATIONEVENTS</p> <p><getTraceConfig> EXECUTE on DSNAQT.ACCEL_CONTROL_GETTRACECONFIG</p> <p><getTraceData> EXECUTE on DSNAQT.ACCEL_CONTROL_GETTRACEDATA</p> <p><setTraceConfig> EXECUTE on DSNAQT.ACCEL_CONTROL_SETTRACECONFIG</p> <p><startReplication> EXECUTE on DSNAQT.ACCEL_CONTROL_STARTREPLICATION</p> <p><stopReplication> EXECUTE on DSNAQT.ACCEL_CONTROL_STOPREPLICATION</p> <p><waitForReplication> EXECUTE on DSNAQT.ACCEL_CONTROL_△ WAITFORREPLICATION</p>

Table 10. Access rights by stored procedure (continued)

Stored procedure	Required access rights
<ul style="list-style-type: none"> • SYSPROC.ACCEL_GET_QUERIES • SYSPROC.ACCEL_GET_QUERIES2 	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • MONITOR1 authorization • Read/write and execute access to the /tmp directory for the user who calls the stored procedure • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.
<ul style="list-style-type: none"> • SYSPROC.ACCEL_GET_QUERY_DETAILS • SYSPROC.ACCEL_GET_QUERY_DETAILS2 	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • MONITOR1 authorization • Read/write and execute access to the /tmp directory for the user who calls the stored procedure • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.
SYSPROC.ACCEL_GET_QUERY_EXPLAIN	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • MONITOR1 authorization • Read/write and execute access to the /tmp directory for the user who calls the stored procedure • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.
<ul style="list-style-type: none"> • SYSPROC.ACCEL_GET_TABLES_DETAILS 	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • Authorization to run the DISPLAY DATABASE command for the databases that hold the tables listed in the <i>table_specification</i> parameter • Authorization to run the ACCESS DB command on the databases that the tables reside in (needed to refresh Db2 real-time statistics) • MONITOR1 authorization • Read/write and execute access to the /tmp directory for the user who calls the stored procedure • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.
<ul style="list-style-type: none"> • SYSPROC.ACCEL_GET_TABLES_INFO 	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Table 10. Access rights by stored procedure (continued)

Stored procedure	Required access rights
<ul style="list-style-type: none"> • SYSPROC.ACCEL_LOAD_TABLES 	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • MONITOR1 authorization • Authorization to read the original Db2 base tables of the accelerator-shadow tables that are listed in the <i>table_load_specification</i> parameter • Authorization to run the ACCESS DB command on the databases that the tables reside in (needed to refresh Db2 real-time statistics) • Authorization to execute the RUNSTATS utility on the databases that contain the tables to be loaded, such as the STATS authorization. • Authorization to run ADMIN_INFO_SYSPARM so that ZPARMs can be retrieved. • Read/write and execute access to the /tmp directory for the user who calls the stored procedure (UNIX System Services pipes are created in this directory) • Privilege to connect to Db2 for z/OS via RRSAP. <p>Important: If you want to grant the required Db2 privileges to secondary authorization IDs, for example groups, make sure that the Db2 SIGNON exit is correctly configured for the use of such IDs. The default SIGNON exit in Db2 for z/OS does not accept secondary authorization IDs. You must therefore use a sample SIGNON exit for this purpose, that is, DSN3SSGN or an equivalent. For more information, see Using secondary IDs for sign-on requests.</p> <ul style="list-style-type: none"> • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.
<ul style="list-style-type: none"> • SYSPROC.ACCEL_REMOVE_ACCELERATOR 	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • MONITOR1 authorization • Read/write and execute access to the /tmp directory for the user who calls the stored procedure • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.
<ul style="list-style-type: none"> • SYSPROC.ACCEL_REMOVE_TABLES 	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • MONITOR1 authorization • Read/write and execute access to the /tmp directory for the user who calls the stored procedure • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.

Table 10. Access rights by stored procedure (continued)

Stored procedure	Required access rights
<ul style="list-style-type: none"> • SYSPROC.ACCEL_SET_TABLES_ACCELERATION 	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.
SYSPROC.ACCEL_SET_TABLES_REPLICATION	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.
<ul style="list-style-type: none"> • SYSPROC.ACCEL_TEST_CONNECTION 	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • MONITOR1 authorization • Read/write and execute access to the /tmp directory for the user who calls the stored procedure • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • RACF ACCESS(READ) on the data set that contains the AQTDEF6 file in the started task procedure of the Workload Manager (WLM) environment.
<ul style="list-style-type: none"> • SYSPROC.ACCEL_UPDATE_CREDENTIALS 	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • EXECUTE on the SYSACCEL.* packages • MONITOR1 authorization • Read/write and execute access to the /tmp directory for the user who calls the stored procedure • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment.
SYSPROC.ACCEL_UPDATE_SOFTWARE2	<ul style="list-style-type: none"> • EXECUTE on the stored procedure • EXECUTE on the SYSACCEL.* packages • MONITOR1 authorization • Read/write and execute access to the /tmp directory for the user who calls the stored procedure • For the functions listZPackageDirectory and deployPackage: Read access to the directory that the AQT_HOST_PACKAGE_DIRECTORY environment variable points to. • RACF ACCESS(READ) on the data set that contains the AQTENV file in the started task procedure of the Workload Manager (WLM) environment. • Sub-commands of the update_command option might require further authorizations.

Appendix C. Members of SAQTSAMP

The SAQTSAMP data set contains various samples for installing, configuring or running the product's stored procedures. The following table lists all these members and provides brief descriptions of their functions.

NOT Programming Interface information

Table 11. Members of the SAQTSAMP data set

Member name	Function
AQTENV	Default environment variable settings for the stored procedures.
AQTDEF6	<p>Default trace specification and other settings for the message input parameter. The default input is used when stored procedures are called with a NULL value or empty string in the message input parameter. The sample uses a verbosity level of INFO for all stored procedure calls and specifies that the traces are to be kept in a specific directory if the procedure ends with an error.</p> <p>To use this member, you must add an appropriate DD statement (DD AQTDEF6) to the JCL that starts the Workload Manager (WLM) environment for IBM Db2 Analytics Accelerator stored procedures.</p>
AQTSCALL	Sample application program in the C programming language with embedded SQL CALL statements for calling IBM Db2 Analytics Accelerator stored procedures.
AQTSCI01	<p>Db2 command line processor script that calls the following stored procedures in the order indicated:</p> <ol style="list-style-type: none">1. SYSPROC.ACCEL_REMOVE_TABLES (returns only the version of the stored procedure)2. SYSPROC.ADMIN_INFO_SYSPARM3. SYSPROC.ADMIN_COMMAND_Db2(-DIS ACCEL)4. SYSPROC.ADMIN_COMMAND_Db2(-DIS GROUP)5. SYSPROC.DSNUTILU(UNLOAD)

Table 11. Members of the SAQTSAMP data set (continued)

Member name	Function
AQTSCI02	<p>Db2 command line processor script that calls the following stored procedures and Db2 commands in the order indicated:</p> <ol style="list-style-type: none"> 1. SYSPROC.ACCEL_ADD_ACCELERATOR for the initial setup <p>Running this stored procedure requires a valid pairing code. You must therefore edit AQTSCI02 so that a valid pairing code is provided when SYSPROC.ACCEL_ADD_ACCELERATOR is invoked.</p> <p>Important: In the sample script, the call of this stored procedure has been commented out. To activate the call, you must uncomment the corresponding line.</p> <ol style="list-style-type: none"> 2. SYSPROC.ACCEL_TEST_CONNECTION 3. SYSPROC.ACCEL_ADD_TABLES 4. SYSPROC.ACCEL_GET_TABLES_INFO 5. SYSPROC.ACCEL_LOAD_TABLES <p>To enforce a reload of the accelerator-shadow tables and enable these for query acceleration:</p> <ol style="list-style-type: none"> 1. SYSPROC.ACCEL_LOAD_TABLES 2. SYSPROC.ACCEL_SET_TABLES_ACCELERATION(ON) <p>To execute the query:</p> <ol style="list-style-type: none"> 1. START -ACCEL 2. Query execution 3. SYSPROC.ACCEL_GET_QUERIES 4. STOP -ACCEL <p>To check various other functions:</p> <ol style="list-style-type: none"> 1. SYSPROC.ACCEL_REMOVE_TALBES 2. SYSPROC.ACCEL_CONTROL_ACCELERATOR (including the various subfunctions) 3. SYSPROC.ACCEL_REMOVE_ACCELERATOR <p>Important: In the sample script, the call of this stored procedure has been commented out. To activate the call, you must uncomment the corresponding line.</p> <p>Note: This script requires customization.</p>
AQTSJI00	JCL that collects information about required IBM Db2 Analytics Accelerator databases and tables.
AQTSJI01	JCL that calls the Db2 command line processor for verifying IBM Db2 Analytics Accelerator stored procedures without an accelerator.
AQTSJI02	JCL that calls all verification steps one-by-one. For a successful completion, a running and connected accelerator is required.
AQTSJI03	JCL that compiles, links, and invokes the AQTSCALL sample program, which calls IBM Db2 Analytics Accelerator stored procedures. For a successful completion of the job, a running accelerator is required.

Table 11. Members of the SAQTSAMP data set (continued)

Member name	Function
AQTSSCHK	<p>UNIX System Services shell script that checks the output of Db2 command line processor scripts containing IBM Db2 Analytics Accelerator stored procedure calls. If BPXBATCH is used to call this script, as in the AQTJSI02 member, the return code of this job step is determined by the MESSAGE output parameters of the stored procedures. Divide this return code by 256 to determine the severity of an error:</p> <p>0 All stored procedures that were called returned information messages</p> <p>4 Warning (return code 1024)</p> <p>8 Error (return code 2048)</p> <p>12 Severe (return code 3072)</p>
AQTSSCPY	<p>UNIX System Services shell script that copies SAQTSAMP members to the /tmp/ivp directory in the z/OS UNIX file system.</p> <p>Note: Db2 command line processor scripts cannot be run from a data set.</p>
AQTSXADD	XML definition of a simple table specification (<tableSpecifications> element). This XML code can be used as input for the SYSPROC.ACCEL_ADD_TABLES stored procedure.
AQTSXALT	XML definition of a table specification as input for the SYSPROC.ACCEL_ALTER_TABLES stored procedure.
AQTSXCN0	XML code for the deletion of collected trace data. The XML code is used as the value of the COMMAND parameter of the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure.
AQTSXCN1	XML code for the retrieval of accelerator status information. The XML code is used as the value of the COMMAND parameter of the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure.
AQTSXCN2	XML code for the configuration of accelerator tracing. The XML code is used as the value of the COMMAND parameter of the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure.
AQTSXCN3	XML code for the collection of trace data. The XML code is used as the value of the COMMAND parameter of the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure.
AQTSXCN4	XML code that lists the active tasks on the accelerator. The XML code is used as the value of the COMMAND parameter of the SYSPROC.ACCEL_CONTROL_ACCELERATOR stored procedure.
AQTSXIM0	XML code that returns just the version of an IBM Db2 Analytics Accelerator stored procedure without executing its actual function. The XML code is used as the value of the MESSAGE input parameter.
AQTSXQHI	XML definition that serves as an input value for the QUERY_SELECTION parameter of the SYSPROC.ACCEL_GET_QUERIES stored procedure.
AQTSXSD1	All XML schema definitions (xsd files) for the input and output parameters of the IBM Db2 Analytics Accelerator stored procedures.
AQTSXTCO	XML definition that serves as an input value for the DIAGNOSTIC_INPUT parameter of the SYSPROC.ACCEL_TEST_CONNECTION stored procedure.
AQTSXTS0	XML definition of a table set as input for various stored procedures.
AQTSXTSL	XML definition that serves as an input value for the TABLE_LOAD_SPECIFICATION parameter of the SYSPROC.ACCEL_LOAD_TABLES stored procedure.

Table 11. Members of the SAQTSAMP data set (continued)

Member name	Function
AQTSXTSU	XML definition for an update of selected table partitions. The definition serves as an input value for the TABLE_LOAD_SPECIFICATION parameter of the SYSPROC.ACCEL_LOAD_TABLES stored procedure.
AQTTIJSP	JCL for the installation of the IBM Db2 Analytics Accelerator stored procedures.

End of NOT Programming Interface information

Appendix D. Transcript of the SAQTSAMP(AQTSXSD1) data set member

Search this transcript for information about the structure of the XML input and output elements that are used by IBM Db2 Analytics Accelerator for z/OS stored procedures.

AQTSXSD1

```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:dwa="http://www.ibm.com/xmlns/prod/dwa/2011"
  targetNamespace="http://www.ibm.com/xmlns/prod/dwa/2011">
  <!--@copyright(disclaimer)
```

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@endCopyright

```
-->
  <xs:element name="acceleratorOptions">
    <xs:complexType>
      <xs:sequence>
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Global settings applied to an accelerator instance that is created
            when pairing
            an accelerator with a DB2 subsystem.
          </xs:documentation>
        </xs:annotation>
        <xs:element maxOccurs="unbounded" minOccurs="0"
          name="acceleratorSetting" type="dwa:acceleratorSettingType">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              Lists the specific settings applied when creating the
              accelerator.
            </xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
```

```

    </xs:element>
  </xs:sequence>
  <xs:attribute name="version" use="required">
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="1.0"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
</xs:complexType>
</xs:element>
<xs:element name="controlCommand">
  <xs:complexType>
    <xs:choice minOccurs="1" maxOccurs="1">
      <xs:element name="setTraceConfig" type="dwa:traceConfigUpdateType">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Add new trace profiles, remove trace profiles or set the active
            trace profile.
            Does not
            generate output.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="getTraceConfig">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Return the active trace configuration in the output parameter
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="clearTraceData">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Clear historic trace data on the accelerator. Does not generate
            output.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="getTraceData" type="dwa:getTraceDataType">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Collect trace data from the accelerator and return it in a file
            or a stored
            procedure
            result set.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="getAcceleratorInfo" type="dwa:getInfoTasksType">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Return accelerator status and active software
            levels in the output parameter.
            Optionally return information about encryption.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="getAcceleratorTasks">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Return currently executing tasks on the accelerator in the output
            parameter.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="cancelTasks" type="dwa:cancelTasksType">

```

```

<xs:annotation>
  <xs:documentation xml:lang="en">
    Requests cancellation of one or more currently executing tasks on
    the accelerator.
    Does not
    generate output.
  </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="startReplication">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Start data replication for all tables that are enabled for
      replication and loaded.
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="stopReplication" type="dwa:stopReplicationType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Stop data replication for all tables on the accelerator.
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="getReplicationEvents"
  type="dwa:getReplicationEventsType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Requests status messages for table replication.
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="waitForReplication"
  type="dwa:waitForReplicationType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Wait until all replicated tables have been synchronized to the
      current log position.
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="enableProcedurePackage"
  type="dwa:procedurePackageNameType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Enable a stored procedure package that was transferred and
      applied to the accelerator.
      Added with version 1.4.
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="disableProcedurePackage"
  type="dwa:procedurePackageNameType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Disable a stored procedure package for an accelerator.
      Added with version 1.4.
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="getActivationLog">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Return the latest installation log as UTF-8 in
      result set with cursor name
      ACCELERATOR_TRACE_CURSOR.
      Added with version 1.5
    </xs:documentation>
  </xs:annotation>
</xs:element>

```

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        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:choice>
<xs:attribute name="version" use="required">
    <xs:simpleType>
        <xs:restriction base="xs:string">
            <xs:enumeration value="1.0"/>
            <xs:enumeration value="1.1"/>
            <xs:enumeration value="1.2"/>
            <xs:enumeration value="1.3"/>
            <xs:enumeration value="1.4"/>
            <xs:enumeration value="1.5"/>
        </xs:restriction>
    </xs:simpleType>
</xs:attribute>
</xs:complexType>
</xs:element>
<xs:complexType name="traceConfigUpdateType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Requests updates of the accelerator tracing configuration.
        </xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="removeTraceProfile" type="dwa:traceProfileNameType"
            minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Remove the specified trace profiles from the accelerator. Note: it
                    is possible to first
                    remove
                    a trace profile and then add a new profile with the same name in
                    one configuration update.
                    If the profile does not exist, the remove command will be ignored
                    with a warning
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="addTraceProfile" type="dwa:traceProfileType"
            minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Add the specified trace profiles to the accelerator. A profile with
                    the given name must not
                    yet
                    exist on the accelerator.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="activateTraceProfile" type="dwa:traceProfileNameType"
            minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Activate the specified trace profile. Note: it is possible to first
                    add a profile and then
                    activate it in one configuration update.
                    Specify DEFAULT as profile name to reset trace settings to
                    defaults. Activating a trace profile
                    other than DEFAULT may compromise system performance.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:simpleType name="getTraceDataEnum">
    <xs:restriction base="xs:string"/>

```

```

</xs:simpleType>
<xs:complexType name="getTraceDataType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Requests the collection of trace data from the accelerator. The
      generated trace
      archive is a gzipped, structured tar archive, intended for problem
      analysis by IBM support.
    </xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="content" minOccurs="0" maxOccurs="unbounded">
      <xs:complexType>
        <xs:simpleContent>
          <xs:extension base="dwa:getTraceDataEnum">
            <xs:attribute name="component" type="xs:string" use="optional">
              <xs:annotation>
                <xs:documentation xml:lang="en">
                  IBM support use only. nzlogcollector -component options
                </xs:documentation>
              </xs:annotation>
            </xs:attribute>
            <xs:attribute name="spec" type="xs:string" use="optional">
              <xs:annotation>
                <xs:documentation xml:lang="en">
                  IBM support use only. nzlogcollector -component component
                  specification
                </xs:documentation>
              </xs:annotation>
            </xs:attribute>
            <xs:attribute name="symptom" type="xs:string" use="optional">
              <xs:annotation>
                <xs:documentation xml:lang="en">
                  IBM support use only. nzlogcollector -symptom specification
                </xs:documentation>
              </xs:annotation>
            </xs:attribute>
            <xs:attribute name="days" type="xs:integer" use="optional">
              <xs:annotation>
                <xs:documentation xml:lang="en">
                  IBM support use only. nzlogcollector -days specification
                </xs:documentation>
              </xs:annotation>
            </xs:attribute>
            <xs:attribute name="from" type="xs:dateTime" use="optional">
              <xs:annotation>
                <xs:documentation xml:lang="en">
                  IBM support use only. nzlogcollector -from specification
                </xs:documentation>
              </xs:annotation>
            </xs:attribute>
            <xs:attribute name="to" type="xs:dateTime" use="optional">
              <xs:annotation>
                <xs:documentation xml:lang="en">
                  IBM support use only. nzlogcollector -to specification
                </xs:documentation>
              </xs:annotation>
            </xs:attribute>
          </xs:extension>
        </xs:simpleContent>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="outputLocation" type="xs:string" use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Output location where the trace archive should be stored, as HSF file
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>

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```

        name. If not
        provided, the trace archive is returned in the stored procedure
        result set.
    </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="keepConfiguration" type="xs:boolean" default="true"
    use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            If false, reset the trace profile to DEFAULT after traces have been
            collected.
            If true, keep current trace profile.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="cancelTasksType">
    <xs:sequence>
        <xs:element name="task" type="dwa:taskIdentifierType" minOccurs="1"
            maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="getInfoTasksType">
    <xs:attribute default="false" name="includeEncryptionInfo"
        type="xs:boolean" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            If true, return information about encryption in the
            accelerator info.
            This includes certificates and active tunnels for encryption
            of data in motion (IPsec).
            If true, keep current trace profile.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:element name="controlResult">
    <xs:complexType>
        <xs:choice minOccurs="1" maxOccurs="1">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The result of an accelerator command depends on the command that
                    was specified
                    in the stored procedure input. See the controlCommand element.
                </xs:documentation>
            </xs:annotation>
            <xs:element name="acceleratorInfo" type="dwa:infoType">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Reports accelerator status information if a getAcceleratorInfo
                        command was specified.
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="traceConfig" type="dwa:traceConfigType">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Reports the accelerator trace configuration if a getTraceConfig
                        command was specified.
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="acceleratorTasks" type="dwa:acceleratorTasksType">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Reports currently running accelerator tasks if a

```



```

        getAcceleratorTasks command was specified.
    </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="replicationEvents"
    type="dwa:replicationStatusMessages">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Reports replication event messages of the accelerator tasks if a
            getReplicationEvents command was specified.
            Added with version 1.1 of this schema.
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:choice>
<xs:attribute name="version" use="required">
    <xs:simpleType>
        <xs:restriction base="xs:string">
            <xs:enumeration value="1.0"/>
            <xs:enumeration value="1.1"/>
            <xs:enumeration value="1.2"/>
            <xs:enumeration value="1.3"/>
            <xs:enumeration value="1.4"/>
            <xs:enumeration value="1.5"/>
            <xs:enumeration value="1.6"/>
        </xs:restriction>
    </xs:simpleType>
</xs:attribute>
</xs:complexType>
</xs:element>
<xs:complexType name="infoType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Information about the current state and configuration of the
            accelerator.
        </xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="versionInformation" type="dwa:versionInformationType"
            minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Lists the version information for components active in the
                    accelerator.
                    The following versions will always be present: Accelerator,
                    Netezza, HPF, FDT,
                    Access Server, Replication Engine, Netezza Log Collector, and Linux
                    Operating System.
                    Added with version 1.5 of this schema.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="acceleratorSetting" type="dwa:acceleratorSettingType"
            minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Lists the specific settings applied when querying data.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="replicationInfo" type="dwa:replicationInfoType"
            minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Information about replication on the accelerator. This element is
                    only present if replication
                    has been configured on the accelerator.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>

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        Added with version 1.1 of this schema.
    </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="procedurePackages" type="dwa:procedurePackagesType"
    minOccurs="0" maxOccurs="1">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Lists the procedure packages that exist in accelerator, together
            with an
            indicator if the package is enabled for the DB2 subsystem.
            Added with version 1.6 of this schema.
        </xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element maxOccurs="1" minOccurs="0" name="encryptionInformation"
    type="dwa:encryptionInformationType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Lists information about encryption active on the accelerator.
            Added with version 1.6 of this schema.
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="state" use="required">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The current status of the accelerator.
        </xs:documentation>
    </xs:annotation>
<xs:simpleType>
    <xs:restriction base="xs:string">
        <xs:enumeration value="UNKNOWN">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The server status can not be determined.
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="Initializing">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The server is currently starting up and is not ready to receive
                    work.
                    No query processing can occur.
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="Online">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The server is fully operational and can receive work.
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="Offline">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The accelerator server is online but the database is not
                    available.
                    No query processing can occur. XSD_DOCUMENT_VERSION14("")
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="Maintenance">

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<xs:annotation>
  <xs:documentation xml:lang="en">
    A maintenance operation (e.g. Software Update) is currently
    running.
    No query processing can occur
  </xs:documentation>
</xs:annotation>
</xs:enumeration>
<xs:enumeration value="Paused">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Deprecated. This value is used by accelerator versions prior to
      V4.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="Stopped">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Deprecated. This value is used by accelerator versions prior to
      V4.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="Down">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Deprecated. This value is used by accelerator versions prior to
      V4.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="Unknown">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Deprecated. This value is used by accelerator versions prior to
      V4.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="Initialized">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Deprecated. This value is used by accelerator versions prior to
      V4.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
</xs:restriction>
</xs:simpleType>
</xs:attribute>
<xs:attribute name="activeTraceProfile" type="xs:string" use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The currently active trace profile on the accelerator. More
      information about the trace
      configuration can be retrieved with the getTraceConfig command in the
      controlCommand element
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="activeVersion" type="xs:string" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The currently active version of the accelerator software.
      This XML attribute has been deprecated. Refer to version information
      for

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        component "Accelerator" in XML element 'versionInformation' instead.
    </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="activeNettezzaVersion" type="xs:string" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The currently active version of Nettezza database management system
            used by the accelerator.
            This XML attribute has been deprecated. Refer to version information
            for
            component "Nettezza" in XML element 'versionInformation' instead.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="activeFDTVersion" type="xs:string" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The currently active version of Nettezza firmware (FDT) used by the
            accelerator.
            This XML attribute has been deprecated. Refer to version information
            for
            component "FDT" in XML element 'versionInformation' instead.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="activeHPFVersion" type="xs:string" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The currently active version of Nettezza platform (HPF) used by the
            accelerator.
            This XML attribute has been deprecated. Refer to version information
            for
            component "HPF" in XML element 'versionInformation' instead.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="activeAccessServerVersion" type="xs:string"
    use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The currently active version of the Access Server used by the
            accelerator.
            This XML attribute has been deprecated. Refer to version information
            for
            component "Access Server" in XML element 'versionInformation'
            instead.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="activeReplicationEngineVersion" type="xs:string"
    use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The currently active version of the Replication Engine used by the
            accelerator.
            This XML attribute has been deprecated. Refer to version information
            for
            component "Replication Engine" in XML element 'versionInformation'
            instead.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="authenticationTokenTimestamp" type="xs:dateTime"
    use="required">
    <xs:annotation>
        <xs:documentation xml:lang="en">

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        The timestamp when the authentication token for this accelerator was
        last modified.
    </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="currentAcceleratorTimestamp" type="xs:dateTime"
    use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The current timestamp of the accelerator. Normally, accelerator time
            is synchronized with DB2 time;
            if multiple DB2 systems with differing times are paired with the same
            accelerator, the accelerator
            time may differ from DB2.
            Added with version 1.1 of this schema.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="serialNumber" type="xs:string" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The serial number of the accelerator.
            Added with version 1.5 of this schema.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="traceConfigType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Reports the active accelerator tracing configuration.
        </xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="traceProfile" type="dwa:traceProfileType" minOccurs="1"
            maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Lists the specifications of all available trace profiles.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="activeTraceProfile" type="dwa:traceProfileNameType">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Specifies the currently active trace profile.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="acceleratorTasksType">
    <xs:sequence>
        <xs:element name="task" type="dwa:taskType" minOccurs="0"
            maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="replicationInfoType">
    <xs:sequence>
        <xs:element name="sourceAgent" type="dwa:replicationAgentStatisticType"
            minOccurs="1" maxOccurs="1">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Replication statistics for the source agent that captures updates
                    on DB2.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>

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</xs:element>
<xs:element name="targetAgent"
  type="dwa:replicationAgentStatisticTypeExtended" minOccurs="1"
  maxOccurs="1">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Replication statistics for the target agent that applies updates on
      the accelerator.
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="state" use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Current status of replication for the accelerator.
    </xs:documentation>
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:string"/>
  </xs:simpleType>
</xs:attribute>
<xs:attribute name="lastChangeTimestamp" type="xs:dateTime" use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Last timestamp when replication was explicitly started or stopped.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="latencyInSeconds" type="xs:unsignedLong"
  use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Approximate time it takes for an update in the DB2 source table until
      it is replicated on the accelerator.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="activeAccessServerVersion" type="xs:string"
  use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Current software version of the Access Server replication component
      installed on the accelerator.
      This XML attribute has been deprecated. Refer to version information
      for
      component "Access Server" in XML element 'versionInformation'
      instead.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="activeReplicationEngineVersion" type="xs:string"
  use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Current software version of the Replication Engine replication
      component installed on the accelerator.
      This XML attribute has been deprecated. Refer to version information
      for
      component "Replication Engine" in XML element 'versionInformation'
      instead.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="encryptionInformationType">
  <xs:sequence>

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<xs:element maxOccurs="1" minOccurs="1" name="encryptionOfDataInMotion"
  type="dwa:encryptionOfDataInMotionType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Information about network encryption on this accelerator including
      certificates and active tunnels.
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="encryptionOfDataInMotionType">
  <xs:sequence>
    <xs:element maxOccurs="1" minOccurs="0" name="certificates"
      type="dwa:certificatesType">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Information about network encryption certificates configured on
          this accelerator.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element maxOccurs="1" minOccurs="0" name="peers"
      type="dwa:peersType">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Information about active network encryption tunnels on this
          accelerator.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="certificatesType">
  <xs:sequence>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="certificate"
      type="dwa:certificateType">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Information about network encryption certificates configured on
          this accelerator.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="certificateType">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="friendlyName" type="xs:string" use="required"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="peersType">
  <xs:sequence>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="peer"
      type="dwa:peerType">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Information about encrypted network connections configured on this
          accelerator
          including active tunnels.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>

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<xs:complexType name="peerType">
  <xs:sequence>
    <xs:element maxOccurs="unbounded" minOccurs="0" name="tunnel"
      type="dwa:tunnelType">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Information about a single encrypted network tunnel active on this
          accelerator.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="name" type="xs:string" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The user-defined name associated with the z/OS remote IP address, for
        example the
        LPAR name.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="remoteIP" type="xs:string" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The z/OS remote IP address, for which this peer is configured
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="cert" type="xs:string" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The certificate used to authenticate the accelerator in this
        connection.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="tunnelType">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="localIP" type="xs:string" use="required">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            The IP address used on the accelerator for this tunnel.
          </xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="since" type="xs:dateTime" use="required">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            The date/time when this tunnel was established.
          </xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="inBytes" type="xs:integer" use="required">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Number of bytes flowing through this tunnel since it was established.
          </xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="outBytes" type="xs:integer" use="required">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Number of bytes flowing through this tunnel since it was established.
          </xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

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        </xs:attribute>
    </xs:extension>
</xs:simpleContent>
</xs:complexType>
<xs:element name="diagnosticCommand">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="ping" type="dwa:testPingType" minOccurs="0"
                maxOccurs="1">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Perform a ping from the z/OS host to an accelerator IP address,
                        using the same TCP/IP
                        configuration like the stored procedure.
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="connect" type="dwa:testConnectType" minOccurs="0"
                maxOccurs="1">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Test the connection to the accelerator, using the same handshake
                        mechanism like any other
                        accelerator procedure. If this test succeeds all other procedures
                        are also capable to connect to the accelerator
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="mtupath" type="dwa:testMTUPathType" minOccurs="0"
                maxOccurs="1">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Test max segment size along the network path from the z/OS
                        machine to the accelertor.
                        All parts of the network should be configured to the same size
                        and use jumbo frames for max performance.
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="networkSpeed" type="dwa:testNetworkSpeedType"
                minOccurs="0" maxOccurs="1">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Test the speed of the network between the accelerator and the
                        z/OS host, using the same
                        TCP/IP configuration and code like the stored procedures. This
                        can be used to determine network bottlenecks.
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="version" type="dwa:testVersionType" minOccurs="0"
                maxOccurs="1">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Connect to the accelerator server without authenticating and just
                        return the
                        descriptive meta-information about the server and stored
                        procedure, for example version,
                        protocol version and capabilities.
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
        </xs:sequence>
        <xs:attribute name="version" use="required">
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:enumeration value="1.0"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:attribute>
    </xs:complexType>
</xs:element>

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        <xs:enumeration value="1.1"/>
    </xs:restriction>
</xs:simpleType>
</xs:attribute>
</xs:complexType>
</xs:element>
<xs:complexType name="testPingType">
    <xs:attribute name="ip" type="xs:string" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The IP address of the host to ping. This should be the IP of the
                accelerator.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
</xs:complexType>
<xs:complexType name="testConnectType">
    <xs:attribute name="accelerator" type="xs:string" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The name of the accelerator to test the connectivity. This is the
                same name like the input to
                many stored procedures.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
</xs:complexType>
<xs:complexType name="testMTUPathType">
    <xs:attribute name="ip" type="xs:string" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The IP address of the host to test the max segment size with. This
                should be the IP of the accelerator.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="port" type="xs:string" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The port of the host where the accelerator service is waiting for
                connections.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
</xs:complexType>
<xs:complexType name="testVersionType">
    <xs:attribute name="accelerator" type="xs:string" use="optional">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The name of the accelerator to test the connectivity. This is the
                same name like the input to
                many stored procedures. If the accelerator is not yet paired, use the
                ip and port attributes instead.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="ip" type="xs:string" use="optional">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The IP address of the hostname to be connected to. This should be the
                IP of the accelerator.
                The IP address/port pair can be used instead of the accelerator name,
                if the accelerator is
                not yet paired with this DB2 subsystem.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
</xs:complexType>

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<xs:attribute name="port" type="xs:string" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The port of the host where the accelerator service is waiting for
      connections.
      The IP address/port pair can be used instead of the accelerator name,
      if the accelerator is
      not yet paired with this DB2 subsystem.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="testNetworkSpeedType">
  <xs:attribute name="accelerator" type="xs:string" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The name of the accelerator to test the network speed against. This
        is the same name like the input to
        many stored procedures.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="seed" type="xs:unsignedInt" default="12345678"
    use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        A seed for the data generated randomly during the networks speed
        test. The seed allows to generated
        the same data for the tests.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="totalNumberBytes" type="xs:unsignedLong"
    use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The total amount of bytes transfered during the test per connection.
        The real amount of data transfered is multiplied with the number of
        parallelConnections.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="dataBatchSize" type="xs:unsignedInt" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The size of data chunks in bytes for the test. A good value is 320000
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="parallelConnections" type="xs:unsignedByte" default="1"
    use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The number of parallel connections (threads) used to transfer the
        data.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
<xs:element name="diagnosticOutput">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="diagnostics" type="dwa:diagnosticsElementType"
        minOccurs="0" maxOccurs="unbounded">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Contains diagnostic information in plain text for every

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        diagnostic action performed by
        the stored procedure.
        Since Version 1.1: In case of "version" action it contains nested
        elements
        describing the version of the accelerator.
    </xs:documentation>
</xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="version" use="required">
    <xs:simpleType>
        <xs:restriction base="xs:string">
            <xs:enumeration value="1.0"/>
            <xs:enumeration value="1.1"/>
        </xs:restriction>
    </xs:simpleType>
</xs:attribute>
</xs:complexType>
</xs:element>
<xs:complexType name="diagnosticsElementType" mixed="true">
    <xs:sequence>
        <xs:element name="accelerator" type="dwa:diagnosticsVersionType"
            minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Returns version information and capabilities of this accelerator.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="storedProcedure" type="dwa:diagnosticsVersionType"
            minOccurs="0" maxOccurs="1">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Returns version information and capabilities of the accelerator
                    administrative stored procedures ACCEL_...
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
<xs:attribute name="action" type="xs:string" use="required">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The name of the action that was performed by the stored
            procedure.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="success" type="xs:boolean" use="required">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Flag whether the diagnostic action succeeded or had an error.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="diagnosticsVersionType">
    <xs:sequence>
        <xs:element name="versionInformation" type="dwa:versionInformationType"
            minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Key value pairs name/version of version information for the different
                    components in the
                    accelerator server or stored procedures.
                </xs:documentation>
            </xs:annotation>
        </xs:element>

```

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<xs:element name="DRDAProTOCOLLevel" type="xs:string" minOccurs="0"
  maxOccurs="1"/>
<xs:element name="highestSupportedCompatibilityLevel" type="xs:string"
  minOccurs="0" maxOccurs="1"/>
<xs:element name="setting" type="dwa:acceleratorSettingType"
  minOccurs="0" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Lists the specific capabilities and settings for the accelerator
      server or
      stored procedures.
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:element name="federatedTableSetInput">
  <xs:complexType>
    <xs:sequence>
      <xs:annotation>
        <xs:documentation xml:lang="en">
          List of all DB2 tables that should be processed by the stored
          procedure with optional qualifiers
          such as if the table is valid in the DB2 subsystem and the AOT name
          of the table for a
          referencing DB2 subsystem.
        </xs:documentation>
      </xs:annotation>
      <xs:element name="table" type="dwa:federatedTableInputType"
        minOccurs="1" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="version" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="1.0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
<xs:element name="federatedTableSetOutput">
  <xs:complexType>
    <xs:sequence>
      <xs:annotation>
        <xs:documentation xml:lang="en"/>
      </xs:annotation>
      <xs:element name="table" type="dwa:federatedTableOutputType"
        minOccurs="1" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="version" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="1.0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
<xs:element name="messageControl">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="compatibilityLevel" type="xs:string" minOccurs="0"
        maxOccurs="1">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Requests that the stored procedure should maintain compatible
            behavior for a client that was

```

written against the specified interface level. In particular, XML output of the stored procedure will not include any tags or attributes that were introduced in a later stored procedure interface to avoid breaking clients that perform XML validation against a back-level XML schema.

```

</xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="language" type="xs:string" minOccurs="0"
  maxOccurs="1" default="en_US">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The language in which localized stored procedure output texts
      should be generated.
      Currently, only english is supported and this value is ignored.
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="traceConfig" type="dwa:spTraceConfigType"
  minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The trace configuration that should be used for this invocation
      of a stored procedure.
      Specific trace configurations will be provided by IBM support if
      necessary.
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="environment" type="dwa:spEnvironmentType"
  minOccurs="0" maxOccurs="1">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The environment variables that are defined for all IDAA
      procedures can be overwritten per call.
      Since the procedure already is active, resetting some environment
      variables may not have an effect.
      (e.g. variables for Language Environment). Intended usage is for
      overriding IDAA variables defined in AQTENV.
      Added with version 1.2 of messageControl.
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="versionOnly" type="xs:boolean" use="optional"
  default="false"/>
<xs:attribute name="version" use="required">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="1.0"/>
      <xs:enumeration value="1.1"/>
      <xs:enumeration value="1.2"/>
    </xs:restriction>
  </xs:simpleType>
</xs:attribute>
</xs:complexType>
</xs:element>
<xs:complexType name="spTraceConfigType">
  <xs:sequence>
    <xs:element name="component" type="dwa:spTraceComponentType"
      minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="traceFileSizeInMB" type="xs:unsignedInt" default="1"
    use="optional"/>
  <xs:attribute name="location" type="xs:string" use="optional"
    default="GENERATED"/>

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<xs:attribute name="keepTrace" type="dwa:spKeepTraceType" default="false"
  use="optional"/>
<xs:attribute name="forceFlush" type="xs:boolean" default="false"
  use="optional"/>
</xs:complexType>
<xs:complexType name="spTraceComponentType">
  <xs:attribute name="name" type="xs:string" use="required"/>
  <xs:attribute name="level" type="dwa:spTraceLevelType" use="required"/>
</xs:complexType>
<xs:simpleType name="spTraceLevelType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="OFF"/>
    <xs:enumeration value="ERROR"/>
    <xs:enumeration value="WARN"/>
    <xs:enumeration value="INFO"/>
    <xs:enumeration value="DEBUG"/>
    <xs:enumeration value="TRACE"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="spKeepTraceType">
  <xs:union memberTypes="xs:boolean">
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="onError"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:union>
</xs:simpleType>
<xs:complexType name="spEnvironmentType">
  <xs:sequence>
    <xs:element name="environmentVariable" type="dwa:spEnvVarType"
      minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="spEnvVarType">
  <xs:attribute name="name" type="xs:string" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Name of an environment variable.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="value" type="xs:string" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Value of the environment variable.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
<xs:element name="messageOutput">
  <xs:complexType>
    <xs:sequence>
      <xs:annotation>
        <xs:documentation xml:lang="en">
          List of all stored procedure output messages, warnings and errors
        </xs:documentation>
      </xs:annotation>
      <xs:element name="message" type="dwa:messageType" minOccurs="1"
        maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="version" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="1.0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>

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        </xs:attribute>
    </xs:complexType>
</xs:element>
<xs:complexType name="messageType">
    <xs:sequence>
        <xs:element name="text" type="xs:string" minOccurs="1" maxOccurs="1"/>
        <xs:element name="description" type="xs:string" minOccurs="0"
            maxOccurs="1"/>
        <xs:element name="action" type="xs:string" minOccurs="0" maxOccurs="1"/>
    </xs:sequence>
    <xs:attribute name="severity" use="required">
        <xs:simpleType>
            <xs:restriction base="xs:string">
                <xs:enumeration value="informational"/>
                <xs:enumeration value="warning"/>
                <xs:enumeration value="error"/>
                <xs:enumeration value="severe"/>
            </xs:restriction>
        </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="reason-code" type="xs:string" use="required"/>
</xs:complexType>
<xs:element name="queryList">
    <xs:complexType>
        <xs:sequence>
            <xs:element name="query" type="dwa:queryShortInformationType"
                minOccurs="0" maxOccurs="unbounded">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        List of queries executed on the accelerator with associated
                        information.
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
        </xs:sequence>
        <xs:attribute name="version" use="required">
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:enumeration value="1.0"/>
                    <xs:enumeration value="1.1"/>
                    <xs:enumeration value="1.2"/>
                    <xs:enumeration value="1.3"/>
                    <xs:enumeration value="1.4"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:attribute>
    </xs:complexType>
</xs:element>
<xs:complexType name="queryShortInformationType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Accelerator information for an offloaded query.
        </xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="clientInfo" type="dwa:queryClientInformationType"/>
        <xs:element name="execution" type="dwa:queryExecutionInformationType"/>
        <xs:element name="task" type="dwa:taskIdentifierType" minOccurs="0"
            maxOccurs="1">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The accelerator task that is executing the query.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="sql" type="xs:string">
            <xs:annotation>

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        <xs:documentation xml:lang="en">
            The first 128 bytes of the SQL text of the query. Longer queries
            are truncated at character boundaries.
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="user" type="xs:string" use="required">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The DB2 user ID that submitted the query
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="planID" type="xs:string" use="required">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The accelerator plan ID that can be used to retrieve the full SQL
            query text
            and detailed plan information.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="queryClientInformationType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Client info provided by the application and passed on by DB2. All
            attributes are optional and
            are only provided if set by the client application.
        </xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="accountingInformation"
            type="dwa:accountingInformationType" minOccurs="0"
            maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Generic list of account information available for the query.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
    <xs:attribute name="productID" type="xs:string" use="optional">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Identification of the product that routed the query, like a JDBC
                driver.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="user" type="xs:string" use="optional">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The client-side user ID that submitted the query.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="workstation" type="xs:string" use="optional"/>
    <xs:attribute name="application" type="xs:string" use="optional"/>
    <xs:attribute name="packageName" type="xs:string" use="optional"/>
    <xs:attribute name="collectionID" type="xs:string" use="optional"/>
    <xs:attribute name="networkID" type="xs:string" use="optional"/>
    <xs:attribute name="locationName" type="xs:string" use="optional"/>
    <xs:attribute name="luName" type="xs:string" use="optional"/>
    <xs:attribute name="connName" type="xs:string" use="optional"/>
    <xs:attribute name="connType" type="xs:string" use="optional"/>

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<xs:attribute name="corrID" type="xs:string" use="optional"/>
<xs:attribute name="authID" type="xs:string" use="optional"/>
<xs:attribute name="planName" type="xs:string" use="optional"/>
<xs:attribute name="accounting" type="xs:string" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Optional client specific accounting information that the client
      application provides.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="dataSharingGroupName" type="xs:string" use="optional"/>
<xs:attribute name="dataSharingMemberName" type="xs:string"
  use="optional"/>
<xs:attribute name="subSystemID" type="xs:string" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      SSID of the DB2 subsystem or member in the data sharing group. The
      value is derived from
      the client accounting information if available.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="queryExecutionInformationType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Information about execution of the query on the accelerator
    </xs:documentation>
  </xs:annotation>
  <xs:attribute name="state" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The execution state of the query.
      </xs:documentation>
    </xs:annotation>
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="UNKNOWN">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              This value is deprecated and will no longer be used.
            </xs:documentation>
          </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="PENDING">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              This value is deprecated and will no longer be used.
            </xs:documentation>
          </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="QUEUED">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              The query is waiting to be executed. The accelerator is busy
              processing other requests.
            </xs:documentation>
          </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="RUNNING">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              The query is currently being executed, but no result rows have
              been sent to DB2 yet.
            </xs:documentation>
          </xs:annotation>
        </xs:enumeration>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>

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</xs:enumeration>
<xs:enumeration value="FETCHING">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The query is currently being executed and result rows are being
      sent to DB2, or
      query execution has already finished and only remaining result
      rows are sent to DB2.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="DONE">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The query completed successfully and no error occurred.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="ABORTED">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The query terminated with a failure.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="CANCELED">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The query execution was canceled, either by canceling the
      accelerator's task or by
      prematurely closing the connection from DB2 to the accelerator.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
</xs:restriction>
</xs:simpleType>
</xs:attribute>
<xs:attribute name="submitTimestamp" type="xs:dateTime" use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The accelerator timestamp at which the query was submitted to the
      accelerator.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="elapsedTimeSec" type="xs:unsignedInt" use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The total processing time of the query on the accelerator (including
      wait time).
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="executionTimeSec" type="xs:unsignedInt" use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The actual execution time of the query in the Netezza backend
      database system of the accelerator.
      The value may include wait time if the query gets queued in Netezza.
      It does not include preprocessing
      time before the query is sent to Netezza, and it also does not
      include fetch time required after Netezza
      has finished its processing.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="waitTimeSec" type="xs:unsignedInt" use="optional">

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<xs:annotation>
  <xs:documentation xml:lang="en">
    The time required for preprocessing the query in the accelerator
    (before it can be sent to the Netezza
    backend database system) and any queue wait time from Netezza itself.
  </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="fetchTimeSec" type="xs:unsignedInt" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The time measured from receiving the first row from the Netezza
      backend database system until
      the last row was requested by DB2 and send to DB2. The fetch time
      usually overlaps with the
      execution time because the first row is received from Netezza before
      query execution in Netezza
      can terminate.
      The value is provided only if fetching result rows from the the
      Netezza backend database system "
      has already started.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="cpuTimeSec" type="xs:unsignedInt" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      CPU time required for executing the query in the Netezza backend
      database system and on the
      accelerator.
      The value is provided only if CPU time information was already
      collected in the accelerator and
      from the Netezza backend database system.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="priority" type="xs:string" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The priority of the query execution on the accelerator. The attribute
      is only set if an
      explicit priority was associated with the query received from DB2.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="resultRows" type="xs:unsignedLong" use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Number of rows returned by the query. This value is an estimate if
      the query is not completed.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="resultBytes" type="xs:unsignedLong" use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Number of bytes returned by the query. This value is an estimate if
      the query is not completed.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="progressPercent" type="xs:unsignedInt" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      This attribute is deprecated and it will no longer be populated by
      the accelerator.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>

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    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="sqlState" type="xs:string" use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        SQL state returned by the query. This attribute is only provided when
        the query state is ABORTED.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="sqlCode" type="xs:string" use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        SQL code returned by the query. This attribute is only provided after
        the query completed in the
        Netezza backend database system. Query result processing in the
        accelerator may still be ongoing.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="errorDescription" type="xs:string" use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Description of the SQL error in case the query did not complete
        successfully.
        If the query succeeded, the attribute is omitted.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="accountingInformationType">
  <xs:attribute name="name" type="xs:string" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Name identifying the parameter.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="value" type="xs:string" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Value applied for the parameter.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
<xs:element name="querySelection">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="filter" type="dwa:querySelectionFilterType"
        minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Optional list of selection conditions to filter queries
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="result" type="dwa:querySelectionResultType"
        minOccurs="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Optional sorting criteria and maximum size for the result list
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
  <xs:attribute name="version" use="required">

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        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:enumeration value="1.0"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:complexType>
  </xs:element>
  <xs:complexType name="querySelectionFilterType">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Defines selection conditions to filter queries. All conditions are
        optional,
        queries are returned only if they match all given filter conditions.
      </xs:documentation>
    </xs:annotation>
    <xs:attribute name="scope" default="all" use="optional">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Defines the scope of queries that are returned; allows to select only
          queries that are
          currently executing on the accelerator or queries that have completed
          execution.
        </xs:documentation>
      </xs:annotation>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="all"/>
          <xs:enumeration value="active"/>
          <xs:enumeration value="completed"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
    <xs:attribute name="fromTimestamp" type="xs:dateTime" use="optional">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Select only queries that have been submitted after the given
          timestamp
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="toTimestamp" type="xs:dateTime" use="optional">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Select only queries that have been submitted before the given
          timestamp
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="minElapsedTimeSec" type="xs:unsignedInt"
      use="optional">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Select only queries whose elapsed time is at least the given number
          of seconds
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="minExecutionTimeSec" type="xs:unsignedInt"
      use="optional">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Select only queries whose execution time is at least the given number
          of seconds
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
  </xs:complexType>

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<xs:attribute name="user" type="xs:string" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Select only queries that were submitted by the given DB2 user ID
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="querySelectionResultType">
  <xs:attribute name="order" default="submitTimestamp" use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Defines by which criterion the returned queries should be sorted and
        therefore
        which queries should be left out if the maxRows attribute is
        specified.
      </xs:documentation>
    </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="submitTimestamp">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Sort by descending submit timestamp (later queries first)
          </xs:documentation>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="elapsedTime">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Sort by descending elapsed time (longer running queries first)
          </xs:documentation>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="executionTime">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Sort by descending execution time (longer running queries
            first)
          </xs:documentation>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="queueTime">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Sort by descending queue time (difference between elapsed and
            execution time,
            longer queue time first)
          </xs:documentation>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="resultRows">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Sort by descending number of result rows
          </xs:documentation>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="resultBytes">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Sort by descending number of result bytes
          </xs:documentation>
        </xs:annotation>
      </xs:enumeration>
    </xs:restriction>
  </xs:simpleType>

```

```

</xs:attribute>
<xs:attribute name="maxRows" type="xs:unsignedInt" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Specifies the maximum number of queries to return
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:element name="softwareUpdate">
  <xs:complexType>
    <xs:choice minOccurs="1" maxOccurs="1">
      <xs:element name="deployPackage"
        type="dwa:SoftwareUpdateDeployPackageType">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Transfer a single package to the accelerator.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="listZPackageDirectory"
        type="dwa:SoftwareUpdateListZPackageDirectoryType">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            List packages in a USS file system directory on the z/OS host the
            SP is executed on.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="listDeployedPackages"
        type="dwa:SoftwareUpdateListDeployedPackagesType">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            List binary files (aka packages) deployed to an accelerator.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="removeDeployedPackages"
        type="dwa:SoftwareUpdateRemoveDeployedPackagesType">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Remove multiple packages (that were not installed yet) from the
            accelerator.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="activateDeployedPackage"
        type="dwa:SoftwareUpdateActivateDeployedPackageType">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Activate a single package that was not installed yet on the
            accelerator.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:choice>
    <xs:attribute name="version" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="1.0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
<xs:complexType name="SoftwareUpdateDeployPackageType">
  <xs:attribute name="source" type="dwa:PackageSourceType" use="required"/>

```



```

<xs:attributeGroup ref="dwa:PackageIdentifyingAttributes"/>
<xs:attribute name="fileSizeInBytes" type="xs:integer" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The file size of the binary package in bytes.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="hash" type="xs:string" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The hash for the package computed with the algorithm denoted by the
      algorithm attribute.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="algorithm" type="dwa:HashAlgorithmType" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The algorithm used to compute the hash of the package.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="SoftwareUpdateListZPackageDirectoryType"/>
<xs:complexType name="SoftwareUpdateListDeployedPackagesType"/>
<xs:complexType name="SoftwareUpdateRemoveDeployedPackagesType">
  <xs:sequence>
    <xs:element name="package"
      type="dwa:SoftwareUpdateRemoveSinglePackageType" minOccurs="0"
      maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The package file to be removed from the accelerator.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="SoftwareUpdateActivateDeployedPackageType">
  <xs:attributeGroup ref="dwa:PackageIdentifyingAttributes"/>
</xs:complexType>
<xs:complexType name="SoftwareUpdateRemoveSinglePackageType">
  <xs:attributeGroup ref="dwa:PackageIdentifyingAttributes"/>
</xs:complexType>
<xs:simpleType name="PackageSourceType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="GTT">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The binary file is transferred via a Global Temporary Table
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="FILE">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The binary file is transferred from a USS file system
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="HashAlgorithmType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="SHA256">
      <xs:annotation>

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        <xs:documentation xml:lang="en">
            The algorithm used to compute a hash is sha256.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="SHA1">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The algorithm used to compute a hash is sha1.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="MD5">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The algorithm used to compute a hash is md5.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
</xs:restriction>
</xs:simpleType>
<xs:attributeGroup name="PackageIdentifyingAttributes">
    <xs:attribute name="fileName" type="xs:string" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The file name defining the binary package.
                It must be the name under which it is downloadable from FixCentral
                servers
                and serves as an ID of the package.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
</xs:attributeGroup>
<xs:element name="softwareUpdateResult">
    <xs:complexType>
        <xs:choice minOccurs="1" maxOccurs="1">
            <xs:element name="ZPackageDirectoryListing"
                type="dwa:ZPackageDirectoryListingType">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Returned directory listing for deployable packages on a z/OS USS
                        file system
                        if the input command was listZPackageDirectory
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="deployedPackagesListing"
                type="dwa:DeployedPackagesListingType">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Returned listing for deployed packages on an accelerator
                        if the input command was listDeployedPackages
                    </xs:documentation>
                </xs:annotation>
            </xs:element>
        </xs:choice>
        <xs:attribute name="version" use="required">
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:enumeration value="1.0"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:attribute>
    </xs:complexType>
</xs:element>
<xs:complexType name="ZPackageDirectoryListingType">
    <xs:sequence>

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<xs:element name="deployablePackage"
  type="dwa:SoftwareUpdateDeployPackageType" minOccurs="0"
  maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The details for a package file residing in the z/OS USS file system
      directory.
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attribute name="directoryName" type="xs:string" use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The directory name with the binary packages.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="DeployedPackagesListingType">
  <xs:sequence>
    <xs:element name="deployedPackage"
      type="dwa:SoftwareUpdateDeployedPackageType" minOccurs="0"
      maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The details for a package file residing in the z/OS USS file system
          directory.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="SoftwareUpdateDeployedPackageType">
  <xs:sequence>
    <xs:element name="activationImpact"
      type="dwa:SoftwareUpdateActivationImpactType" minOccurs="0"
      maxOccurs="1">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The details describing the impact when activating the package.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="fileName" type="xs:string" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The file name defining the binary package.
        It must be the name under which it is downloadable from FixCentral
        servers
        and serves as an ID of the package
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="fileSizeInBytes" type="xs:integer" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The file size of the binary package in bytes.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="deploymentTimestamp" type="xs:dateTime" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The timestamp of the deployment (transfer) of the package to the
        accelerator.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>

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        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="requiresManualInstall" type="xs:boolean"
      use="required">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Indicator, if the installation of the package requires manual
          intervention (rather than just calling a stored procedure)
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
  </xs:complexType>
  <xs:complexType name="SoftwareUpdateActivationImpactType">
    <xs:sequence>
      <xs:element name="impactDescription" type="xs:string" minOccurs="0"
        maxOccurs="unbounded">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            formatted input (CDATA) with a detailed impact description.
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
    <xs:attribute name="estimatedTimeForActivationInMinutes" type="xs:integer"
      use="optional">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The estimated time needed for activation of the package
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
  </xs:complexType>
  <xs:element name="softwareMaintenanceCommand">
    <xs:complexType>
      <xs:choice minOccurs="1" maxOccurs="1">
        <xs:element name="listAvailablePackages"
          type="dwa:listAvailablePackagesType">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              List all accelerator-related packages that are available on the
              z/OS system and can be
              deployed to the accelerator with the deployPackages command. This
              includes software
              updates for the accelerator itself as well as software updates
              for the underlying Netezza system.
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="deployPackages" type="dwa:deployablePackageListType">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              Transfer one or more of the available packages to the
              accelerator.
            </xs:documentation>
          </xs:annotation>
        </xs:element>
        <xs:element name="getDeployedPackageInformation"
          type="dwa:getDeployedPackagesType">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              List the packages that have been deployed to the accelerator and
              to which the products
              can be upgraded or downgraded using the activateDeployedPackage
              command.
            </xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:choice>
    </xs:complexType>
  </xs:element>

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</xs:element>
<xs:element name="activateDeployedPackage"
  type="dwa:deployedPackageType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Activate a deployed package on the accelerator and upgrade or
      downgrade the product
      software level to the version of the selected package
    </xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="removeDeployedPackages"
  type="dwa:deployedPackageListType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Remove one or more deployed packages from the accelerator.
      Added with version 1.1 of this schema.
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:choice>
<xs:attribute name="version" use="required">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="1.0"/>
      <xs:enumeration value="1.1"/>
    </xs:restriction>
  </xs:simpleType>
</xs:attribute>
</xs:complexType>
</xs:element>
<xs:complexType name="deployedPackageType">
  <xs:attribute name="target" type="dwa:packageTargetType"
    default="ACCELERATOR">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The target that defines the type of the software product that should
      be activated or removed.
      Added with version 1.1 of this schema.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="version" type="xs:string" use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The software component version that should be activated
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="fileName" type="xs:string" use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The file name defines the name of a file.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="deployedPackageListType">
  <xs:sequence>
    <xs:element name="package" type="dwa:deployedPackageType" minOccurs="1"
      maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="listAvailablePackagesType">
  <xs:complexContent>
    <xs:extension base="dwa:packageTargetListType">
      <xs:attribute name="acceleratorInstallPrefix" type="xs:string"

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        use="optional">
<xs:annotation>
  <xs:documentation xml:lang="en">
    Deprecated.
  </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="hostPackageDirectory" type="xs:string"
  use="optional">
<xs:annotation>
  <xs:documentation xml:lang="en">
    Allows to specify a directory which should be searched for
    available packages.
    If the attribute is not set, the value of
    AQT_HOST_PACKAGE_DIRECTORY from the AQTENV data set is used.
  </xs:documentation>
</xs:annotation>
</xs:attribute>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType name="getDeployedPackagesType">
  <xs:complexContent>
    <xs:extension base="dwa:packageTargetListType">
      <xs:attribute name="scope" type="dwa:getDeployedPackagesScope"
        default="ACTIVATE">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Allows to specify the scope of packages that should be listed.
        </xs:documentation>
      </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:simpleType name="getDeployedPackagesScope">
  <xs:restriction base="xs:string">
    <xs:enumeration value="ACTIVATE">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Show the deployed packages that can be activated.
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="REMOVE">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Show the deployed packages that can be removed.
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="packageTargetListType">
  <xs:sequence>
    <xs:element name="target" type="dwa:packageTargetType" minOccurs="0"
      maxOccurs="unbounded">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Defines the target types for which available or deployed packages
          should be listed.
          If no element is present, all package types are listed.
          Added with version 1.1 of this schema.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>

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```

</xs:complexType>
<xs:element name="package">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="information" type="dwa:informationInternalType"/>
      <xs:element name="files" type="dwa:filesType" minOccurs="0"/>
      <xs:element name="migration" type="dwa:migrationType" minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="version" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="1.0"/>
          <xs:enumeration value="1.1"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
<xs:complexType name="informationInternalType">
  <xs:complexContent>
    <xs:extension base="dwa:informationType">
      <xs:sequence>
        <xs:element name="localizedDescription"
          type="dwa:localizedDescriptionType" minOccurs="0"
          maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="localizedDescriptionType">
  <xs:complexContent>
    <xs:extension base="dwa:descriptionType">
      <xs:attribute name="lang" type="xs:string" use="required"/>
      <xs:attribute name="simpleVersion" type="xs:string" use="optional"/>
      <xs:attribute name="buildLabel" type="xs:string" use="optional"/>
      <xs:attribute name="version" type="xs:string" use="optional"/>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="filesType">
  <xs:sequence maxOccurs="unbounded">
    <xs:element name="entry" type="dwa:entryType"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="entryType">
  <xs:attribute name="path" type="xs:string" use="required"/>
  <xs:attribute name="permission" type="xs:string" use="required"/>
</xs:complexType>
<xs:complexType name="migrationType">
  <xs:sequence minOccurs="0" maxOccurs="unbounded">
    <xs:element name="sourceProductVersion" type="dwa:sourceVersionType"/>
  </xs:sequence>
</xs:complexType>
<xs:element name="softwareMaintenanceResult">
  <xs:complexType>
    <xs:choice minOccurs="1" maxOccurs="1">
      <xs:element name="availablePackages"
        type="dwa:deployablePackageListType">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Returned list of deployable packages on z/OS HFS if the input
            command
            was listAvailablePackages
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:choice>
  </xs:complexType>
</xs:element>
</xs:sequence>

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<xs:annotation>
  <xs:documentation xml:lang="en">
    Returned list of deployed packages on the accelerator if the
    input command
    was getDeployedPackageInformation
    Changed with version 1.1 of this schema
  </xs:documentation>
</xs:annotation>
<xs:element name="sourceProductVersion" type="dwa:sourceVersionType"
  minOccurs="0" maxOccurs="unbounded">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Information about currently active and other deployed versions
      for each product
      installed on the accelerator.
    </xs:documentation>
  </xs:annotation>
</xs:element>
</xs:sequence>
</xs:choice>
<xs:attribute name="version" use="required">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="1.0"/>
      <xs:enumeration value="1.1"/>
    </xs:restriction>
  </xs:simpleType>
</xs:attribute>
</xs:complexType>
</xs:element>
<xs:element name="tableSetForArchiving">
  <xs:complexType>
    <xs:sequence>
      <xs:annotation>
        <xs:documentation xml:lang="en">
          list of all tables that should be archived.
        </xs:documentation>
      </xs:annotation>
      <xs:element name="table" type="dwa:tableArchiveSpecificationType"
        minOccurs="1" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="usePhysicalPartitionNumbers" type="xs:boolean"
      default="false">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Interprets all specified partition numbers as physical partition
          numbers.
          If the attribute is set to false or not used,
          the specified partition numbers are interpreted as logical
          partitions.
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="version" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="1.0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
<xs:complexType name="tableArchiveSpecificationType">
  <xs:complexContent>
    <xs:extension base="dwa:tableReferenceType">
      <xs:sequence minOccurs="0" maxOccurs="1">
        <xs:element name="partitions" type="dwa:partitionNumberListType">

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        <xs:annotation>
          <xs:documentation xml:lang="en">
            Optional list of partitions to be archived. Default is to
            archive all partitions
            Partitions that are already archived are ignored
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:element name="tableSetDetails">
  <xs:complexType>
    <xs:sequence>
      <xs:annotation>
        <xs:documentation xml:lang="en">
          List of accelerated tables with associated detail information.
        </xs:documentation>
      </xs:annotation>
      <xs:element name="table" type="dwa:tableDetailsType" minOccurs="1"
        maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="version" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="1.0"/>
          <xs:enumeration value="1.1"/>
          <xs:enumeration value="1.2"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
<xs:complexType name="tableDetailsType">
  <xs:complexContent>
    <xs:extension base="dwa:tableReferenceType">
      <xs:choice>
        <xs:sequence>
          <xs:element name="partInformation"
            type="dwa:partitionInformationType"/>
          <xs:element name="part" type="dwa:partitionWithDetailsType"
            minOccurs="1" maxOccurs="unbounded"/>
          <xs:element name="archivePartitionPredicate" type="xs:string"
            minOccurs="0" maxOccurs="1"/>
        </xs:sequence>
        <xs:element name="changeInformation"
          type="dwa:tableChangeInformationType">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              Information about changes in an unpartitioned table.
              For partitioned tables, changes are reported at the partition
              level
            </xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:choice>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="partitionWithDetailsType">
  <xs:sequence>
    <xs:element name="archiveInformation"
      type="dwa:tableArchiveInformationType" minOccurs="0" maxOccurs="1">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Detail information about archived partitions
      </xs:documentation>
    </xs:annotation>
  </xs:sequence>

```

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        This element is only provided if the partition has been archived
    </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="changeInformation"
    type="dwa:tableChangeInformationType" minOccurs="0" maxOccurs="1">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Information about changes in the partition
            This element may also be present if the partition has been
            archived; archived partitions
            should not be changed any more in DB2, therefore a change type
            other than NoChange
            indicates a potential consistency problem.
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
<xs:attributeGroup ref="dwa:sharedPartitionAttributes"/>
</xs:complexType>
<xs:complexType name="tableChangeInformationType">
    <xs:attributeGroup ref="dwa:sharedChangeInformationAttributes"/>
    <xs:attribute name="category" type="dwa:tableChangeCategoryType"
        use="required"/>
    <xs:attribute name="type" type="dwa:tableChangeType" use="required"/>
    <xs:attribute name="lastLoadTimestamp" type="xs:dateTime">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Timestamp when the partition was last loaded into the accelerator.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
</xs:complexType>
<xs:complexType name="tableArchiveInformationType">
    <xs:complexContent>
        <xs:extension base="dwa:backupImageList">
            <xs:attribute name="archiveTimestamp" type="xs:dateTime">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Timestamp when the partition was archived.
                    </xs:documentation>
                </xs:annotation>
            </xs:attribute>
            <xs:attribute name="dataSizeInMB" type="xs:unsignedLong">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Approximate size of archived data.
                    </xs:documentation>
                </xs:annotation>
            </xs:attribute>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
<xs:simpleType name="tableChangeCategoryType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The categories of changes that can be detected in a table or partition.
        </xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:enumeration value="NONE">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    No changes in the table or partition were detected.
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
    </xs:restriction>
</xs:simpleType>

```

```

<xs:enumeration value="RELOAD_REQUIRED">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Changes were detected that require a reload of the table or
      partition.
      This occurs if the partitioning of the table is not in synch with
      the current data loaded on the accelerator, e.g. if a partition was
      added.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="UNKNOWN">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Change information about a table or partitions cannot be
      determined:
      The available information is insufficient or inconsistent.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="RELOAD_RECOMMENDED">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Changes in table or partition data were detected but a reload is
      not
      required if the data differences are tolerable.
    </xs:documentation>
  </xs:annotation>
</xs:enumeration>
</xs:restriction>
</xs:simpleType>
<xs:simpleType name="tableChangeType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Type of change that was detected
    </xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="NoChange">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          real-time statistics were evaluated and show no change
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="DataChange">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          real-time statistics were evaluated and show
          changes that should be reloaded but may be deselected
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="LoadReplacePerformed">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The DB2 Load Utility was used to do a load replace on the table or
          partition and the
          load replace timestamp has changed
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="NoRealtimeStatsInDBMS">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Changes that should be reviewed but do not have to be reloaded
          (potential false positives):

```

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        no real-time statistics are available in DB2
    </xs:documentation>
</xs:annotation>
</xs:enumeration>
<xs:enumeration value="NoRealtimeStatsOnAccel">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Changes that should be reviewed but do not have to be reloaded
            (potential false positives):
            real-time statistics are available in DB2 but not the accelerator
            catalog;
            i.e. they were not available when the table or partition was loaded
            the last time.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="RealtimeStatsInconsistent">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Changes that should be reviewed but do not have to be reloaded
            (potential false positives):
            real-time statistics are available but are not consistent, e.g.
            update counters have decreased
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="ReorgWithNoSubsequentUpdate">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Changes that should be reviewed but do not have to be reloaded
            (potential false positives):
            reorg was detected but update counters are zero - unclear whether
            data was modified
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="TableLoadedWithOldVersion">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Table was non-partitioned when added to the accelerator and was
            changed to
            partition-by-growth since then. The accelerator does not have the
            necessary
            meta-data for change detection.
            To enable change detection, the table needs to be removed from the
            accelerator
            and added again.
            This value is deprecated and only used for backward compatibility.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="NonPartitionedTableChangedToByGrowth">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Table was non-partitioned when added to the accelerator and was
            changed to
            partition-by-growth since then. The accelerator does not have the
            necessary
            meta-data for change detection and the table needs to be fully
            reloaded.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="DataChangeInReplicatedTable">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Changes that should be reviewed but do not have to be reloaded

```

```

        (potential false positives):
        Real-time statistics were evaluated and show
        changes that should be reloaded but table is enabled for
        replication,
        so the changes may already have been propagated to the accelerator.
    </xs:documentation>
</xs:annotation>
</xs:enumeration>
<xs:enumeration value="TableNotLoaded">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            table is not currently loaded on accelerator
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="PartitioningNotSynchronized">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            the list of partitions or limit keys in the DB2 catalog and the
            accelerator catalog differ -
            e.g. after REORG REBALANCE
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="PartitionAddedOrRotated">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            partition does not exist on accelerator
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="TableDataExchanged">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            EXCHANGE TABLE DATA was performed (clone table)
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="PartitionedTableModifiedByReplication">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            This code is not used anymore by the current product version.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="TableCreatedWithOldVersion">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Table was non-partitioned when added to the accelerator and was
            changed to
            partition-by-growth since then. The accelerator does not have the
            necessary
            meta-data for change detection.
            To enable change detection, the table needs to be removed from the
            accelerator
            and added again.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="AcceleratorOnly">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            This is an accelerator-only table, for which no data changes in DB2
            can occur.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>

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```

    </xs:restriction>
  </xs:simpleType>
  <xs:element name="tableInformation">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="table" type="dwa:tableInformationType" minOccurs="1"
          maxOccurs="unbounded"/>
      </xs:sequence>
      <xs:attribute name="version" use="required">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:enumeration value="1.0"/>
            <xs:enumeration value="1.1"/>
            <xs:enumeration value="1.2"/>
            <xs:enumeration value="1.3"/>
            <xs:enumeration value="1.4"/>
            <xs:enumeration value="1.5"/>
            <xs:enumeration value="1.6"/>
            <xs:enumeration value="1.7"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:complexType>
  </xs:element>
  <xs:complexType name="tableInformationType">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Accelerator-specific information about a table.
      </xs:documentation>
    </xs:annotation>
    <xs:complexContent>
      <xs:extension base="dwa:tableReferenceType">
        <xs:sequence>
          <xs:element name="status" type="dwa:tableStatusType" minOccurs="1"
            maxOccurs="1"/>
          <xs:element name="statistics" type="dwa:tableStatisticsType"
            minOccurs="1" maxOccurs="1"/>
          <xs:element name="remote" type="dwa:remoteTableType" minOccurs="0"
            maxOccurs="1"/>
          <xs:element name="task" type="dwa:taskType" minOccurs="0"
            maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
  <xs:complexType name="tableStatusType">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        General status information about an accelerated table.
      </xs:documentation>
    </xs:annotation>
    <xs:attribute name="loadStatus" type="dwa:tableLoadStatusType"
      use="required">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The load status defines which operations are possible with a table.
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="type" type="dwa:tableTypeType" use="optional"
      default="Regular">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The table type defines if it is a regular accelerated table, an
          accelerator only table,
          or another (future) table type.
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
  </xs:complexType>

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    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="accelerationStatus" type="xs:boolean" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The acceleration status defines whether a table can be used for query
        offloading.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="integrityStatus" type="dwa:tableIntegrityType"
    use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The integrity status defines whether meta-data in DB2 and on the
        accelerator is consistent.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="replicationStatus" type="xs:boolean" use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The replication status defines whether the table is enabled to
        replicate data if it is
        loaded and if replication is started. Whether data replication
        currently takes place for
        a table can be determined by the 'replicationDetails' attribute.
        Added with version 1.1 of this schema.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="replicationDetails" type="dwa:replicationDetailsType"
    use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The replication details provide information about the status of the
        actual replication
        processing that takes place for the table. In partiucular, it
        indicates whether replication
        for the table is currently taking place or whether errors have
        occurred that caused replication
        of the table to stop
        Added with version 1.3 of this schema.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="archiveStatus" type="xs:boolean" use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The archive status defines whether the table has archived partitions
        that exist on the accelerator
        but do not exist or contain no data in DB2.
        Added with version 1.2 of this schema.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="archiveProblemDetected" type="xs:boolean"
    use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        This attribute indicates if archiving problems have been detected
        for the table, for example partitions that have been incompletely
        archived or restored. Detailed problem information about the problems
        can be obtained by calling the ACCEL_GET_TABLES_DETAILS procedure.
        Note that some problems can only be detected by calling the
        ACCEL_GET_TABLES_DETAILS procedure, so a value of false does not
        necessarily

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        mean that no problems exist, but only that no problems have been
        detected.
        Added with version 1.3 of this schema.
    </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="archiveSynchronizationStatus"
    type="dwa:archiveSynchronizationStatusType" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            This attribute indicates if the table is archived on this or another
            accelerator.
            Added with version 1.6 of this schema.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="tableStatisticsType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Statistics information about table data on the accelerator.
        </xs:documentation>
    </xs:annotation>
    <xs:attribute name="usedDiskSpaceInMB" type="xs:unsignedLong"
        use="optional">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Approximate disk space that is occupied by the table on the
                accelerator.
                The value is zero if the table is not loaded on the accelerator.
                The value does not include disk space for archived partitions.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="rowCount" type="xs:unsignedLong" use="optional">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Deprecated. We plan to remove this attribute in future versions.
                Approximate count of table rows currently loaded on the accelerator
                based
                on statistics taken as a snapshot in time.
                Note, that statistics only recognizes transactions which have a
                transaction ID (xid)
                that is less than the stable (last committed) transaction ID.
                For example, some of the
                rows may already be logically deleted in a later transaction so the
                rowCount value may be larger than
                the number of rows accessible by a query or with a select count(*).
                The value does not include rows in archived partitions.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="skew" type="xs:decimal" use="optional">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Measures whether the distribution of the table between accelerator
                nodes is balanced. A value of zero
                corresponds to a perfectly balanced distribution. A high skew value
                indicates that the distribution key""
                of the table may need to be adjusted.
                The value is zero if the table is not loaded on the accelerator.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="organizedPercent" type="xs:decimal" use="optional">
        <xs:annotation>
            <xs:documentation xml:lang="en">

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        Measures how well the table is organized according to the specified
        organization key. This value is only
        meaningful for large tables.
        The value is zero if the table is not loaded on the accelerator or if
        the table has no organizing key
        columns defined.
    </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="lastLoadTimestamp" type="xs:dateTime" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Timestamp when the table was last loaded or updated by a stored
            procedure.
            The value is only provided when the table is loaded on the
            accelerator.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="capturePointTimestamp" type="xs:dateTime"
    use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Timestamp from which logged changes in DB2 can be captured and
            replicated for a replicated table.
            The value is only provided when the table is loaded on the
            accelerator and enabled for replication.
            Added with version 1.1 of this schema.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="archiveDiskSpaceInMB" type="xs:unsignedLong"
    use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Approximate disk space that is occupied by archived table partitions
            on the accelerator.
            Added with version 1.2 of this schema.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="archiveRowCount" type="xs:unsignedLong" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Count of table rows in archived partitions on the accelerator.
            Added with version 1.2 of this schema.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="remoteTableType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Three part remote table name for federated tables on the accelerator.
            The attributes are populated when table information is retrieved from
            the referring subsystem.
        </xs:documentation>
    </xs:annotation>
    <xs:attribute name="location" type="xs:string" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The location name of the owning subsystem for federated tables.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="schema" type="xs:string" use="required">
        <xs:annotation>

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        <xs:documentation xml:lang="en">
            The schema of the table on the owning subsystem for federated tables.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="name" type="xs:string" use="required">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The table name on the owning subsystem for federated tables.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:simpleType name="tableLoadStatusType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="Creating"/>
        <xs:enumeration value="InitialLoadPending"/>
        <xs:enumeration value="InitialLoadInProgress"/>
        <xs:enumeration value="Loaded"/>
        <xs:enumeration value="LoadInProgress"/>
        <xs:enumeration value="ReplicationInProgress"/>
        <xs:enumeration value="SchemaModificationInProgress"/>
        <xs:enumeration value="ArchivingInProgress"/>
        <xs:enumeration value="Error"/>
        <xs:enumeration value="Operational"/>
        <xs:enumeration value="Dropping"/>
        <xs:enumeration value="FederatedTableOperational"/>
        <xs:enumeration value="SelectPermissionRevoked"/>
        <xs:enumeration value="Unknown"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="tableIntegrityType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="Unimpaired">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The table exists in DB2 and on the accelerator.
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="ViolatedOnAccelerator">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The table exists in DB2 but not on the accelerator.
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="ViolatedInDatabaseManagementSystem">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The table does not exist in DB2.
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="ChangedSchema">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The table schema was changed in DB2.
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="replicationDetailsType">
    <xs:restriction base="xs:string"/>
</xs:simpleType>
<xs:element name="tableSetForLoad">

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<xs:complexType>
  <xs:sequence>
    <xs:sequence>
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Specification for external tool exploiters that replace DB2
          UNLOAD.
        </xs:documentation>
      </xs:annotation>
      <xs:element name="externalTool"
        type="dwa:externalToolSpecificationType" minOccurs="0"
        maxOccurs="1"/>
    </xs:sequence>
    <xs:sequence>
      <xs:annotation>
        <xs:documentation xml:lang="en">
          list of all tables that should be loaded or reloaded.
        </xs:documentation>
      </xs:annotation>
      <xs:element name="table" type="dwa:tableLoadSpecificationType"
        minOccurs="1" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:sequence>
  <xs:attribute name="usePhysicalPartitionNumbers" type="xs:boolean"
    default="false">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Interprets all specified partition numbers as physical partition
        numbers.
        If the attribute is set to false or not used,
        the specified partition numbers are interpreted as logical
        partitions.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="version" use="required">
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="1.0"/>
        <xs:enumeration value="1.1"/>
        <xs:enumeration value="1.2"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
</xs:complexType>
</xs:element>
<xs:complexType name="tableLoadSpecificationType">
  <xs:complexContent>
    <xs:extension base="dwa:tableReferenceType">
      <xs:sequence minOccurs="0" maxOccurs="1">
        <xs:element name="partitions" type="dwa:partitionNumberListType">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              Optional list of partitions to be loaded. Default is to load
              all partitions
            </xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
      <xs:attribute name="forceFullReload" type="xs:boolean" default="false">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Enforces loading of all partitions for a range-partitioned table.
            If the
            attribute is set to false, the scope of the load is controlled by
            the
            detectChanges attribute.
          </xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

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        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="detectChanges">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Controls which changes in the table the stored procedure detects.
          If the value
          is not specified or PARTITIONS, only added partitions in
          partitioned tables are detected
          and loaded.
          Added with version 1.1 of this schema.
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="PARTITIONS"/>
        <xs:enumeration value="DATA"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:extension>
</xs:complexType>
<xs:element name="tableSetForRemove">
  <xs:complexType>
    <xs:sequence>
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Specification of all DB2 tables that should be removed from the
          accelerator
        </xs:documentation>
      </xs:annotation>
      <xs:element name="table" type="dwa:tableReferenceType" minOccurs="1"
        maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="force" type="xs:boolean" use="optional">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Force removing tables even if this may result irregular states like
          leftover
          restrictive table space states and unrecovered archive data."
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
    <xs:attribute name="version" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="1.0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
<xs:element name="tableSetForRestoreArchiving">
  <xs:complexType>
    <xs:sequence>
      <xs:annotation>
        <xs:documentation xml:lang="en">
          list of all tables that should be restored.
        </xs:documentation>
      </xs:annotation>
      <xs:element name="table" type="dwa:tableRestoreSpecificationType"
        minOccurs="1" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="usePhysicalPartitionNumbers" type="xs:boolean"
      default="false">

```

```

<xs:annotation>
  <xs:documentation xml:lang="en">
    Interprets all specified partition numbers as physical partition
    numbers.
    If the attribute is set to false or not used,
    the specified partition numbers are interpreted as logical
    partitions.
  </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="version" use="required">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="1.0"/>
    </xs:restriction>
  </xs:simpleType>
</xs:attribute>
</xs:complexType>
</xs:element>
<xs:complexType name="tableRestoreSpecificationType">
  <xs:complexContent>
    <xs:extension base="dwa:tableReferenceType">
      <xs:sequence minOccurs="0" maxOccurs="1">
        <xs:element name="partitions" type="dwa:partitionNumberListType">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              Optional list of partitions to be restore. Default is to
              restore all archived partitions
              Partitions that are not archived are ignored
            </xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:element name="tableSet">
  <xs:complexType>
    <xs:sequence>
      <xs:annotation>
        <xs:documentation xml:lang="en">
          List of all DB2 tables that should be processed by the stored
          procedure
        </xs:documentation>
      </xs:annotation>
      <xs:element name="table" type="dwa:tableReferenceType" minOccurs="1"
        maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="version" use="required">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="1.0"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:attribute>
  </xs:complexType>
</xs:element>
<xs:element name="tableSetForSetTablesReplication">
  <xs:complexType>
    <xs:sequence>
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Specification of all DB2 tables whose replication status is to be
          changed
        </xs:documentation>
      </xs:annotation>
      <xs:element name="table" type="dwa:tableReferenceType" minOccurs="1"

```

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        maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="overrideExistingKeys" type="xs:boolean"
        default="false" use="optional">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Allows for replacing existing keys by new ones optimized for
                performance of setTablesReplication.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="version" use="required">
        <xs:simpleType>
            <xs:restriction base="xs:string">
                <xs:enumeration value="1.0"/>
            </xs:restriction>
        </xs:simpleType>
    </xs:attribute>
</xs:complexType>
</xs:element>
<xs:element name="tableSpecifications">
    <xs:complexType>
        <xs:sequence>
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Specification of all DB2 tables that should be added to the
                    accelerator
                </xs:documentation>
            </xs:annotation>
            <xs:element name="table" type="dwa:tableSpecificationType"
                minOccurs="1" maxOccurs="unbounded"/>
        </xs:sequence>
        <xs:attribute name="version" use="required">
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:enumeration value="1.0"/>
                    <xs:enumeration value="1.1"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:attribute>
    </xs:complexType>
</xs:element>
<xs:complexType name="tableSpecificationType">
    <xs:complexContent>
        <xs:extension base="dwa:tableReferenceType">
            <xs:sequence>
                <xs:element name="distributionKey" type="dwa:columnReferenceList"
                    minOccurs="0" maxOccurs="1">
                    <xs:annotation>
                        <xs:documentation xml:lang="en">
                            The distribution key determines how rows of tables get assigned
                            to processing nodes of the accelerator.
                            Query performance for joins between two large tables can be
                            improved by selecting the same distribution
                            key for both tables. Inappropriate choice of the distribution
                            key can lead to unbalanced amounts of
                            table data on the compute nodes.
                            If no distribution key is specified, a random distribution is
                            chosen which is always balanced.
                        </xs:documentation>
                    </xs:annotation>
                </xs:element>
                <xs:element name="organizingKey" type="dwa:columnReferenceType"
                    minOccurs="0" maxOccurs="unbounded">
                    <xs:annotation>
                        <xs:documentation xml:lang="en">
                            An organizing key determines how rows of tables are clustered

```

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        together on the accelerator.
        A table can have multiple, independent organizing keys. Each
        key consists of a single column.
        Query performance for frequent filtering conditions can be
        improved by selecting the filtering columns
        as organizing keys.
    </xs:documentation>
</xs:annotation>
</xs:element>
<xs:element name="informationalUniqueKey"
    type="dwa:columnReferenceList" minOccurs="0" maxOccurs="1">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            An informational unique key is a specification of a column
            combination that guarantees uniqueness,
            though this is not enforced by Db2 on z/OS (e.g. by a unique
            index).
            WARNING: If this uniqueness proposition is violated, incorrect
            output of queries is possible.
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:element name="tableSetForSynchronizeSchema">
    <xs:complexType>
        <xs:sequence>
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Specification of all DB2 tables that should be synchronized with
                    the accelerator
                </xs:documentation>
            </xs:annotation>
            <xs:element name="table" type="dwa:synchronizeSchemaTable"
                minOccurs="1" maxOccurs="unbounded"/>
        </xs:sequence>
        <xs:attribute name="continueReplication" type="xs:boolean"
            default="false" use="optional">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Allows replication to continue for tables in table set.
                </xs:documentation>
            </xs:annotation>
        </xs:attribute>
        <xs:attribute name="version" use="required">
            <xs:simpleType>
                <xs:restriction base="xs:string">
                    <xs:enumeration value="1.0"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:attribute>
    </xs:complexType>
</xs:element>
<xs:complexType name="synchronizeSchemaTable">
    <xs:complexContent>
        <xs:extension base="dwa:tableReferenceType">
            <xs:attribute name="continueReplication" type="xs:boolean"
                default="false"/>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
<xs:complexType name="traceProfileNameType">
    <xs:attribute name="name" type="xs:string" use="required"/>
</xs:complexType>
<xs:complexType name="traceProfileType">

```

```

<xs:annotation>
  <xs:documentation xml:lang="en">
    Defines an accelerator trace profile.
    Trace profile specifications are provided by IBM support
    when necessary.
  </xs:documentation>
</xs:annotation>
<xs:complexContent>
  <xs:extension base="dwa:traceProfileNameType">
    <xs:sequence>
      <xs:element name="description" type="xs:string" minOccurs="1"
        maxOccurs="1"/>
      <xs:element name="component" minOccurs="0" maxOccurs="unbounded">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Defines trace levels for individual tracing components in the
            accelerator
            that deviate from
            the default trace level specified below.
          </xs:documentation>
        </xs:annotation>
        <xs:complexType>
          <xs:attribute name="name" type="xs:string" use="required"/>
          <xs:attribute name="level" type="dwa:traceLevelType"
            use="required"/>
        </xs:complexType>
      </xs:element>
      <xs:element name="nzdbgParameters" type="dwa:nzdbgParametersString"
        minOccurs="0" maxOccurs="unbounded">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Defines command line parameters for the nzdbg tool that
            controls debug
            tracing of the
            Netezza host processes. For each element, a call to nzdbg will
            be made
            with the specified
            parameters. If no nzdbg element is given,
            Netezza debug tracing is turned
            off for all
            host processes
            No special characters except for '-', '*' and space may occur
            in
            the command
            line parameters
          </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="backendDbsDiagnosticParameters" type="xs:string"
        minOccurs="0" maxOccurs="unbounded">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Defines parameters for diagnostic purposes in the backend DBS
          </xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
    <xs:attribute name="defaultLevel" type="dwa:traceLevelType"
      use="required">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Defines the default trace level for all accelerator components
          that are
          not explicitly
          listed as sub-elements.
        </xs:documentation>
      </xs:annotation>
    </xs:attribute>
  </xs:extension>

```



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</xs:attribute>
<xs:attribute name="traceFileSizeInMB" type="xs:unsignedInt"
  use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Defines the aggregate size of the output trace files that are
      generated.
      When the
      specified
      size is exceeded, tracing wraps around and overwrites old trace
      files.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attribute name="forceRecordFlush" type="xs:boolean" use="optional"
  default="false">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Defines whether trace records will be immediately flushed to
      disk. If
      set to true, this
      impacts performance but ensures that no trace records are lost in
      the
      case of system crashed.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:simpleType name="nzdbgParametersString">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Restricts parameters for nzdbg to the characters that may actually
      appear in
      valid arguments
      and
      forbids shell special character (* is implicitly escaped by the
      executing
      code)
    </xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:pattern value="[\-* 0-9a-zA-Z]*"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="traceLevelType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="OFF"/>
    <xs:enumeration value="FATAL"/>
    <xs:enumeration value="ERROR"/>
    <xs:enumeration value="WARN"/>
    <xs:enumeration value="INFO"/>
    <xs:enumeration value="DEBUG"/>
    <xs:enumeration value="DEBUG_EXTENDED"/>
    <xs:enumeration value="TRACE"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="replicationSeverityType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="ALL"/>
    <xs:enumeration value="INFORMATION"/>
    <xs:enumeration value="WARNING"/>
    <xs:enumeration value="ERROR"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="stopReplicationType">

```

```

<xs:attribute name="mode" use="optional" default="CONTROLLED">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Mode how replication is stoped.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:simpleType>
  <xs:restriction base="xs:string">
    <xs:enumeration value="CONTROLLED">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Completes in-progress work and ends replication. This may take
          some time
          if there are long
          transactions that must be completely applied
          on the accelerator.
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="IMMEDIATE">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Stops all in-progress work and ends replication. Starting
          replication
          after stopping
          with
          IMMEDIATE can take longer than if it would have been stopped
          using CONTROLLED.
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="ABORT">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Stops all in-progress work and aborts replication. This option
          is the
          fastest way
          to end
          replication, but starting replication again can take much
          longer
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
</xs:attribute>
</xs:complexType>
<xs:complexType name="getReplicationEventsType">
  <xs:attribute name="fromTimestamp" type="xs:dateTime" use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Select only replication messages that were generated after the given
        timestamp
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="toTimestamp" type="xs:dateTime" use="optional">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Select only replication messages that were generated before the given
        timestamp
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="minSeverity" type="dwa:replicationSeverityType"
    use="optional">
    <xs:annotation>

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        <xs:documentation xml:lang="en">
            The minimum severity the replication messages; only messages of
            specified or higher
            severity
            are returned.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:complexType name="replicationStatusMessages">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Messages generated by the replication subsystem on the accelerator.
        </xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="event" type="dwa:replicationEventType" minOccurs="0"
            maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="replicationEventType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Replication status message of the accelerator.
        </xs:documentation>
    </xs:annotation>
    <xs:attribute name="id" type="xs:unsignedLong" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Id of the event.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="message" type="xs:string" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Message for the event.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="originator" type="xs:string" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Name of the agent that originated the event.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="time" type="xs:dateTime" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Timestamp when the event occurred.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="severity" type="dwa:replicationSeverityType"
        use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Severity of the event.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
</xs:complexType>
<xs:complexType name="replicationAgentStatisticType">
    <xs:attribute name="insertCount" type="xs:long" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">

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        Number of inserts that have been captured or applied by the agent.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="updateCount" type="xs:long" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Number of updates that have been captured or applied by the agent.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="deleteCount" type="xs:long" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Number of deletes that have been captured or applied by the agent.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="replicationAgentStatisticTypeExtended">
  <xs:complexContent>
    <xs:extension base="dwa:replicationAgentStatisticType">
      <xs:attribute name="spilledRows" type="xs:long" use="optional">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Number of spilled rows.
          </xs:documentation>
        </xs:annotation>
      </xs:attribute>
      <xs:attribute name="spilledRowsApplied" type="xs:long" use="optional">
        <xs:annotation>
          <xs:documentation xml:lang="en">
            Number of spilled rows applied by the agent.
          </xs:documentation>
        </xs:annotation>
      </xs:attribute>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="tableReferenceType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Identifies a DB2 table by schema (creator) and table name
    </xs:documentation>
  </xs:annotation>
  <xs:attribute name="name" type="xs:string" use="required"/>
  <xs:attribute name="schema" type="xs:string" use="required"/>
</xs:complexType>
<xs:complexType name="federatedTableInputType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Identifies a Federated table by schema (owner) and DB2 table name
    </xs:documentation>
  </xs:annotation>
  <xs:attribute name="name" type="xs:string" use="required"/>
  <xs:attribute name="schema" type="xs:string" use="required"/>
  <xs:attribute name="valid" type="xs:boolean" use="optional"/>
  <xs:attribute name="returnCode" type="xs:string" use="optional"/>
  <xs:attribute name="userSpecifiedAotName" type="xs:string" use="optional"/>
  <xs:attribute name="userSpecifiedAotSchema" type="xs:string"
    use="optional"/>
  <xs:attribute name="userSpecifiedDatabase" type="xs:string"
    use="optional"/>
  <xs:attribute name="referenceSynonym" type="xs:string" use="optional"/>
</xs:complexType>
<xs:complexType name="federatedTableOutputType">
  <xs:annotation>

```

```

    <xs:documentation xml:lang="en">
        Identifies a Federated table by schema (owner) and DB2 table name
    </xs:documentation>
</xs:annotation>
<xs:attribute name="name" type="xs:string" use="required"/>
<xs:attribute name="schema" type="xs:string" use="required"/>
<xs:attribute name="valid" type="xs:boolean" use="optional"/>
<xs:attribute name="returnCode" type="xs:string" use="required"/>
<xs:attribute name="userSpecifiedAotName" type="xs:string" use="optional"/>
<xs:attribute name="userSpecifiedAotSchema" type="xs:string"
    use="optional"/>
<xs:attribute name="columnList" type="xs:string" use="optional"/>
<xs:attribute name="referenceSynonym" type="xs:string" use="optional"/>
</xs:complexType>
<xs:complexType name="columnReferenceList">
    <xs:sequence>
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Specifies a list of columns in a DB2 table.
            </xs:documentation>
        </xs:annotation>
        <xs:element name="column" type="dwa:columnReferenceType" minOccurs="1"
            maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="columnReferenceType">
    <xs:attribute name="name" type="xs:string" use="required"/>
</xs:complexType>
<xs:complexType name="taskIdentifierType">
    <xs:attribute name="id" type="xs:string" use="required"/>
</xs:complexType>
<xs:complexType name="taskType">
    <xs:complexContent>
        <xs:extension base="dwa:taskIdentifierType">
            <xs:attribute name="type" type="xs:string" use="required">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        The type of the task, like Load or Query
                    </xs:documentation>
                </xs:annotation>
            </xs:attribute>
            <xs:attribute name="ageInSeconds" type="xs:unsignedLong"
                use="required">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        The time span for which the task has already been executing
                    </xs:documentation>
                </xs:annotation>
            </xs:attribute>
            <xs:attribute name="progressMessage" type="xs:string" use="required">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        Task-specific information about what the task is currently doing,
                        if available
                    </xs:documentation>
                </xs:annotation>
            </xs:attribute>
            <xs:attribute name="progress" type="xs:decimal" use="optional">
                <xs:annotation>
                    <xs:documentation xml:lang="en">
                        The progress of the task in percent, if available
                    </xs:documentation>
                </xs:annotation>
            </xs:attribute>
            <xs:attribute name="user" type="xs:string" use="optional">
                <xs:annotation>
                    <xs:documentation xml:lang="en">

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        The DB2 user ID that originated the task. The attribute is not
        set
        for accelerator internal
        system tasks.
    </xs:documentation>
</xs:annotation>
</xs:attribute>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType name="sourceVersionType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Identifies a software product version which is currently active.
        </xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="description" type="dwa:descriptionType">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The description of the currently active version.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="targetProductVersion" type="dwa:targetVersionType"
            minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Identifies the product versions that are available on the
                    accelerator but
                    not active.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
    <xs:attribute name="target" type="dwa:packageTargetType"
        default="ACCELERATOR">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The target that defines the type of this software product.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="fileName" type="xs:string" use="optional">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The file name defines the name of a file.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attributeGroup ref="dwa:productVersionAttributes"/>
</xs:complexType>
<xs:complexType name="targetVersionType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Identifies the version where we can go jump to.
        </xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="description" type="dwa:descriptionType">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The description of the target version.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="impact" type="dwa:impactType"/>
    </xs:sequence>

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</xs:sequence>
<xs:attribute name="minimumRequiredVersion" type="xs:string"
  use="optional">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      For backward compatibility.
    </xs:documentation>
  </xs:annotation>
</xs:attribute>
<xs:attributeGroup ref="dwa:productVersionAttributes"/>
</xs:complexType>
<xs:complexType name="impactType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The impact(s) associated with a switch to the target version.
    </xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="text" type="xs:string">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          A description of all impacts.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="reboot" type="xs:boolean" fixed="false">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Retained for backward compatibility.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="descriptionType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      The description of THIS version.
    </xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="short" type="xs:string">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The short (1 line) description of THIS version.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="long" type="xs:string">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The detailed description of THIS version.
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="deployablePackageListType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Specifies a list of deployable packages that are available in z/OS HFS
    </xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="package" type="dwa:deployablePackageType" minOccurs="0"
      maxOccurs="unbounded"/>
  </xs:sequence>

```

```

</xs:complexType>
<xs:complexType name="deployablePackageType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Describes an update package that can be deployed on the accelerator or
      the
      Netezza host.
    </xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="information" type="dwa:informationType" minOccurs="0">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          Package information from the manifest. Only available if the
          package was
          an accelerator
          package
        </xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="location" type="xs:string" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The absolute HFS file name for the deployable package that can be
        transferred to the
        accelerator.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
  <xs:attribute name="target" type="dwa:packageTargetType" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The target for deploying the package.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="informationType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Describes an update package for an accelerator software product.
    </xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="description" type="dwa:descriptionType"/>
  </xs:sequence>
  <xs:attributeGroup ref="dwa:productVersionAttributes"/>
</xs:complexType>
<xs:simpleType name="packageTargetType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="ACCELERATOR">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The Accelerator server kit will be deployed on the accelerator and
          can then be activated
          with the
          activateDeployedPackage command for the stored procedure.
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="HOST">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          The file will be deployed on the Neteza host system and can then be
          processed manually.
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>

```



```

    </xs:annotation>
  </xs:enumeration>
  <xs:enumeration value="NETEZZA_NPS">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The Netezza Server (NPS) will be deployed on the Neteza host system
        and can then be
        processed manually.
      </xs:documentation>
    </xs:annotation>
  </xs:enumeration>
  <xs:enumeration value="NETEZZA_FDT">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The Netezza Firmware (FDT) will be deployed on the Neteza host
        system
        and can then be
        processed manually.
      </xs:documentation>
    </xs:annotation>
  </xs:enumeration>
  <xs:enumeration value="NETEZZA_HPF">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The Netezza platform (HPF) will be deployed on the Neteza host
        system
        and can then be
        processed manually.
      </xs:documentation>
    </xs:annotation>
  </xs:enumeration>
  <xs:enumeration value="ACCESS_SERVER">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The Incremental Update Access Server kit will be deployed on the
        accelerator and can then be
        activated with the
        activateDeployedPackage command for the stored procedure.
      </xs:documentation>
    </xs:annotation>
  </xs:enumeration>
  <xs:enumeration value="REPLICATION_ENGINE">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The Incremental Update Replication Engine kit will be deployed on
        the
        accelerator and can
        then be activated with the
        activateDeployedPackage command for the stored procedure.
      </xs:documentation>
    </xs:annotation>
  </xs:enumeration>
  <xs:enumeration value="RPM">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        RPM packages will be deployed on the accelerator and can
        then be activated with the
        activateDeployedPackage command for the stored procedure.
      </xs:documentation>
    </xs:annotation>
  </xs:enumeration>
</xs:restriction>
</xs:simpleType>
<xs:attributeGroup name="productVersionAttributes">
  <xs:attribute name="version" type="xs:string" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">

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```

        Version number that uniquely identifies a deployed or deployable
        version
        of the software
        product.
    </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="buildLabel" type="xs:string" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Optional build label for the product version.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="simpleVersion" type="xs:string" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The simple version referencing this version.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:attributeGroup>
<xs:complexType name="partitionInformationType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Describes partitioning information about a table.
            If this information is not present, the
            table is not partitioned.
        </xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Specifies a list of partitioning columns.
            </xs:documentation>
        </xs:annotation>
        <xs:element name="column" type="dwa:columnReferenceType" minOccurs="0"
            maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="type" type="dwa:partitioningType" use="required"/>
</xs:complexType>
<xs:simpleType name="partitioningType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="BY_RANGE"/>
        <xs:enumeration value="BY_GROWTH"/>
        <xs:enumeration value="NOT_PARTITIONED"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="partitionNumberListType">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            A comma-separated list of logical partition numbers. Partition number
            ranges can be
            specified
            by two numbers separated by a colon.
            Negative partition numbers count from the end, -1 specifies the last
            partition.
        </xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string"/>
</xs:simpleType>
<xs:complexType name="backupImageList">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Describes backup images for an archived table.
        </xs:documentation>
    </xs:annotation>

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```

<xs:sequence>
  <xs:element name="backupImage" type="xs:string" minOccurs="0"
    maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>
<xs:complexType name="waitForReplicationType">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Parameters defining how long the accelerator waits for the
      synchronization.
      of replicated
      tables.
    </xs:documentation>
  </xs:annotation>
  <xs:attribute name="timeoutInSeconds" type="xs:unsignedLong" default="0">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Maximum wait time. If the timeout is exceeded, the command completes
        with a warning even if
        not all changes have been replicated.
        If the value is zero or not specified, the accelerator may wait
        indefinitely.
      </xs:documentation>
    </xs:annotation>
  </xs:attribute>
</xs:complexType>
<xs:simpleType name="archiveErrorStatusType">
  <xs:restriction base="xs:string">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        The value 'Unimpaired' indicates that no problem was detected;
        other values indicate
        potential problems. The specific error conditions
        and corresponding values are subject to change.
      </xs:documentation>
    </xs:annotation>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="archiveSynchronizationStatusType">
  <xs:restriction base="xs:string">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Is at least on partition of the table archived on this or another
        accelerator
      </xs:documentation>
    </xs:annotation>
    <xs:enumeration value="NotArchived">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          No partition of this table is archived on any accelerator.
          In SYSACCEL.SYSACCELERATEDTABLES(ARCHIVE) = ' '.
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="ArchivedOnAnotherAccelerator">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          At least one partition is archived on another accelerator
          In SYSACCEL.SYSACCELERATEDTABLES(ARCHIVE) = 'C'.
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="PartiallyArchived">
      <xs:annotation>
        <xs:documentation xml:lang="en">
          On this accelerator some partitions are archived, but it exists
          another accelerator

```

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        with more archived partitions or re-archived partitions.
        In SYSACCEL.SYSACCELERATEDTABLES(ARCHIVE) = 'B'.
    </xs:documentation>
</xs:annotation>
</xs:enumeration>
<xs:enumeration value="Archived">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            This accelerator is up-to-date and is a reference accelerator.
            In SYSACCEL.SYSACCELERATEDTABLES(ARCHIVE) = 'A'.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="RestoredOnAnotherAccelerator">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Partitions were restored on another accelerator. This accelerator
            can not answer
            queries until it is being brought up in sync again.
            In SYSACCEL.SYSACCELERATEDTABLES(ARCHIVE) = 'X'.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="UnkownDueToBackLevelSPs">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The stored procedures are backlevel, therefore the value can not be
            determined.
        </xs:documentation>
    </xs:annotation>
</xs:enumeration>
</xs:restriction>
</xs:simpleType>
<xs:attributeGroup name="sharedChangeInformationAttibutes">
    <xs:attribute name="dataSizeInMB" type="xs:unsignedLong">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Approximate size of data that would be loaded
                when loading the table or partition
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="sharedTablespace" type="xs:boolean">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                True if the table resides in a shared table space. In this case,
                change
                information may be
                incorrect because the changes may refer to other
                tables
                in the tablespace
                This attribute can only be set for table change information,
                never for
                partition change information
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
</xs:attributeGroup>
<xs:attributeGroup name="sharedPartitionAttibutes">
    <xs:attribute name="dbmsPartNr" type="xs:unsignedInt" use="optional">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Physical partition number in DB2.
                The attribute is not present for archived partitions that
                have been
                rotated
                in DB2 after they were archived.
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
</xs:attributeGroup>

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        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="logicalPartNr" type="xs:unsignedInt" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Logical partition number in DB2 for a range-partitioned table.
            For a table that is
            partitioned by growth, this attribute is identical
            to the physical partition number.
            The attribute is not present for archived partitions
            that have been
            rotated
            in DB2 after they were archived.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="endingAt" type="xs:string" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Range partition specification for a range-partitioned table.
            For archived partitions, this
            represents the range partition
            specification
            at the time when the partition was archived.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="archiveErrorStatus" type="dwa:archiveErrorStatusType"
    use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Status string of archiving for specified partitions.
            For archived partitions, this represents
            the status of the
            archiving. If not specified, the partitions is not archived.
            Added with version 1.1 of tableSetDetails.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:attributeGroup>
<xs:complexType name="externalToolSpecificationType">
    <xs:attribute name="name" type="xs:string" use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                The name of an external load utility that provides the data source.
                If tools vendors
                intercept DB2 unload utilities to provide data from
                other sources
                they must provide their tool name/identifier
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>
    <xs:attribute name="enforceTableLoadSequence" type="xs:boolean"
        use="required">
        <xs:annotation>
            <xs:documentation xml:lang="en">
                Enforces the load the tables in the sequence given of the specified
                table
                elements.
                If set to
                FALSE the accelerator may reorder the load of individual
                tables
                to shorten the load time. By setting this attribute to TRUE, the
                accelerator will
                not do this and load the tables in the pre-defined sequence.
                This may decrease the performance of the load and also
            </xs:documentation>
        </xs:annotation>
    </xs:attribute>

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        prevent to
        accelerator from handling
        more load operations in parallel.
    </xs:documentation>
</xs:annotation>
</xs:attribute>
<xs:attribute name="loadAppend" type="xs:boolean" use="optional"
    default="false">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            Flag indicating if data to be loaded shall replace existing data or
            only be appended.
            If set
            to FALSE, existing data is removed and then the new data is
            loaded. If set to TRUE,
            all existing data is retained and the new data is
            added.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
<xs:attribute name="utilityNamePrefix" type="xs:string" use="optional">
    <xs:annotation>
        <xs:documentation xml:lang="en">
            The prefix for the utility name. Must not be longer than 3
            characters.
            If not set the default AQT will be used.
        </xs:documentation>
    </xs:annotation>
</xs:attribute>
</xs:complexType>
<xs:simpleType name="tableTypeType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="Regular"/>
        <xs:enumeration value="AcceleratorOnly"/>
        <xs:enumeration value="FederatedReference"/>
    </xs:restriction>
</xs:simpleType>
<xs:complexType name="versionInformationType">
    <xs:sequence>
        <xs:element name="component" type="dwa:componentVersionType"
            minOccurs="1" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    Version information for a single component identified by the name.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="componentVersionType">
    <xs:attribute name="name" type="xs:string" use="required"/>
    <xs:attribute name="version" type="xs:string" use="required"/>
</xs:complexType>
<xs:complexType name="procedurePackagesType">
    <xs:sequence>
        <xs:element name="package" type="dwa:procedurePackageType" minOccurs="1"
            maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    A singel procedure package.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="procedurePackageType">
    <xs:attribute name="name" type="xs:string" use="required"/>

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<xs:attribute name="enabled" type="xs:boolean" use="required"/>
<xs:attribute name="version" type="xs:string" use="optional"/>
</xs:complexType>
<xs:complexType name="acceleratorSettingType">
  <xs:attribute name="name" use="required">
    <xs:annotation>
      <xs:documentation xml:lang="en">
        Name identifying the parameter.
        name="FACTREL_SIZE_THRESHOLD"
        value=Defines the minimum number of rows for a table considered
        to be a
        fact table or large table that should not be re-distributed
        for a join.
        name="UNICODE_SORT_ORDER"
        value=Sort order for character columns with Unicode encoding.
        Possible values are:
        BinaryUTF8
        default setting - recommended for installations that store
        Unicode strings in MBCS CHAR columns
        BinaryUTF16
        deprecated (not supported - mapped to BinaryUTF8)
      </xs:documentation>
    </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:string"/>
  </xs:simpleType>
</xs:attribute>
<xs:attribute name="value" use="required">
  <xs:annotation>
    <xs:documentation xml:lang="en">
      Value applied for the parameter.
    </xs:documentation>
  </xs:annotation>
  <xs:simpleType>
    <xs:restriction base="xs:string"/>
  </xs:simpleType>
</xs:attribute>
</xs:complexType>
<xs:complexType name="procedurePackageNameType">
  <xs:attribute name="name" type="xs:string" use="required"/>
</xs:complexType>
</xs:schema>

```

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For PID(s): 5697-DA7, 5697-DA5, 5697-DAB

Notice: This document is intended to help you in your preparations for GDPR readiness. It provides information about features of IBM Db2 Analytics Accelerator for z/OS that you can configure, and aspects of the product's use, that you should consider to help your organization with GDPR readiness. This information is not an exhaustive list, due to the many ways that clients can choose and configure features, and the large variety of ways that the product can be used in itself and with third-party applications and systems.

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The products, services, and other capabilities described herein are not suitable for all client situations and may have restricted availability. IBM does not provide legal, accounting, or auditing advice or represent or warrant that its services or products will ensure that clients are in compliance with any law or regulation.

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GDPR

General Data Protection Regulation (GDPR) has been adopted by the European Union ("EU") and applies from May 25, 2018.

Why is GDPR important?

GDPR establishes a stronger data protection regulatory framework for processing of personal data of individuals. GDPR brings:

- New and enhanced rights for individuals
- Widened definition of personal data
- New obligations for processors
- Potential for significant financial penalties for non-compliance
- Compulsory data breach notification

Read more about GDPR

- EU GDPR Information Portal (<https://www.eugdpr.org/>)
- [ibm.com®/GDPR website \(http://ibm.com/GDPR\)](http://ibm.com/GDPR)

The EU General Data Protection Regulation (GDPR) regulates data privacy in the European Union (EU). For details, see: <https://www.eugdpr.org>

The regulations laid out in the GDPR apply if the data controller (an organization that collects data from EU residents), or the processor (an organization that processes data on behalf of a data controller, such as a cloud service provider), or the data subject (an individual) is based in the EU (source: Wikipedia. See: https://en.wikipedia.org/wiki/General_Data_Protection_Regulation). A violation of GDPR regulations might incur severe financial penalties (fines) and reputation damages. This documentation is intended for data controllers or processors who use Db2 for z/OS together with IBM Db2 Analytics Accelerator for z/OS with the aim of storing personal data of EU residents (individuals). As regards IBM Db2 Analytics Accelerator for z/OS, the IBM company is neither the data controller, nor the data processor. Nevertheless, the IBM company feels obliged to give such entities guidance on how to follow GDPR regulations.

Your responsibilities as a data controller or processor

If you act on behalf of a data controller or data processor, see the frequently asked questions (FAQ) on the official GDPR website to find out what your responsibilities are:

<https://www.eugdpr.org/gdpr-faqs.html>

Furthermore, refer to chapter 4 in the GDPR regulations:

<https://www.eugdpr.org/article-summaries.html>

Product Configuration for GDPR

The following sections provide considerations for configuring IBM Db2 Analytics Accelerator for z/OS to help your organization with GDPR readiness.

How to configure the offering so that it can be used in a GDPR environment

The following sections describe how personal data is stored and processed by IBM Db2 Analytics Accelerator for z/OS (called 'accelerator' in the text that follows).

If personal data is to be stored on an accelerator, the following configuration steps might help you meet your compliance objectives with regard to GDPR:

- Activate the encryption of data in motion (data that is transferred over a data network between Db2 for z/OS and the accelerator).
- Activate the encryption of data at rest (encryption of disks and other storage devices).
- Do not share passwords for the operation of the IBM Db2 Analytics Accelerator Console between multiple persons. Instead, create separate user IDs with different passwords for each console user.
- Give read access to personal data (the privilege to run queries) only to authorized Db2 for z/OS users. To this end, define appropriate Db2 authorizations (SELECT, and so on) in the Db2 for z/OS catalog.

- Restrict the right to unload data from and to create image copies in Db2 for z/OS. Give this right to authorized administrators only.
- Restrict access to the 'Save Trace' function in Db2 Analytics Accelerator for z/OS because the collected trace data might contain personal data. Access should be given to authorized administrators only.
- Restrict access to the table SYSIBM.USERNAMES in the catalog of the Db2 for z/OS communication database because this table contains authentication credentials. If these credentials are read or copied by unauthorized users, these users might obtain access to sensitive personal data.

Data Life Cycle

You can create copies of any Db2 for z/OS table on an accelerator (accelerator-shadow tables). As soon as you create a copy of a Db2 for z/OS table and load it with personal data, the GDPR regulations apply in the same way as they apply to personal data in the original Db2 for z/OS tables.

An accelerator also allows you to load and store external data outside of Db2 for z/OS, such as the data of VSAM files, in accelerator-shadow tables. Products like the Db2 Analytics Accelerator Loader can be used to this end. If the external data contains personal information, the GDPR regulations apply to the data that is transferred to the accelerator.

What types of data?

The administrative environment of an accelerator (client and configuration software) does not store personal data, except for the user IDs and authentication tokens of its administrators. However, the GDPR regulations apply to all personal data that you store in database tables on the accelerator.

Where in the process?

An accelerator is loaded with data in the course of individual load operations or by the incremental update function (automated load of table updates). Adding a table to an accelerator does not yet copy any data. It merely defines the table's structure (metadata) on the accelerator. However, if you load the table or enable it for incremental updates, the data of the source table - which might contain personal data - is copied to the accelerator.

For what purpose?

An accelerator, like Db2 for z/OS, is a general database management system for SQL queries. Such queries are run with the aim of retrieving stored information and gaining further insights (analytical queries that uncover the dependencies or connections between sets of values). An accelerator can return the results of SQL queries to authorized and authenticated users of the system. The results usually consist of subsets or aggregations of numerous data records. All these records might include personal data.

Personal data used for online contact with IBM

IBM Db2 Analytics Accelerator for z/OS clients can submit online comments/feedback/requests to contact IBM about accelerator subjects in a variety of ways, primarily:

- Public comments area on pages in the IBM Integration community on IBM developerWorks®

- Public comments area on pages of the IBM Db2 Analytics Accelerator for z/OS product documentation in the IBM Knowledge Center
- Feedback forms in the IBM Integration community

Typically, only the client name and email address are used, to enable personal replies for the subject of the contact, and the use of personal data conforms to the *IBM Online Privacy Statement* (<http://www.ibm.com/privacy/cc/>).

Data Collection

IBM Db2 Analytics Accelerator for z/OS can be used to collect personal data. When assessing your use of IBM Db2 Analytics Accelerator for z/OS and the requirements of GDPR, you should consider the types of personal data which in your circumstances are stored on an accelerator.

The use of an accelerator does not impose new requirements for the collection of personal data. It does not introduce new users or new privileges, but makes use of existing users and their privileges as defined in Db2 for z/OS. The use of an accelerator does not introduce additional obligations for the safekeeping or administration of data if you already observe the GDPR regulations for the storage of data in Db2 for z/OS.

Make sure that the process of collecting data and storing it in Db2 for z/OS is GDPR-compliant. The use of an accelerator will then be equally compliant.

Data Storage

The use of IBM Db2 Analytics Accelerator for z/OS involves the storage of data in a persistent manner.

An accelerator is a general-purpose data processing and retrieval engine. It is not aware of the meaning of data or any meaning that can be inferred from it. It is thus the responsibility of the data controller or processor to classify the data as personal data - for example account data - and make sure that the collection, access and processing of this data is in accordance with the GDPR regulations.

Storage in backups:

An accelerator has no backup function. However, image copies are created in Db2 for z/OS when the accelerator's archiving function is used (high performance storage saver). If these image copies contain personal data, the GDPR rules apply. This means, for example, that if individuals request their data to be deleted, it must also be deleted from all the image copies that may exist.

Storage in archives:

The high performance storage saver deletes table data from Db2 for z/OS and stores it exclusively on an accelerator. If this data contains personal information, the GDPR regulations might require that you delete the personal information from a number of records. The current version of the accelerator software does not allow DELETE operations on archived partitions. So in case you must delete records, first restore the archived partition to Db2 for z/OS, then delete then delete the personal data from Db2 for z/OS. Finally, archive the partition again (which now does not include the personal data anymore).

Data Access

Access to data on an accelerator requires a Db2 for z/OS user ID and a password. The accelerator recognizes the privileges defined in Db2 for z/OS and does not allow a user to run functions that she or he is not entitled to use.

As long as the Db2 for z/OS authorizations, such as SELECT, INSERT, UPDATE, or DELETE privileges, are defined in accordance with the GDPR regulations, access to data on the accelerator will likewise be in accordance with these regulations.

So it is crucial that the definition of roles and access rights in Db2 for z/OS effectuates an adequate separation of duties and responsibilities.

One accelerator-specific function might provide access to personal data on the accelerator: This is the "Save Trace" function, which collects diagnostic information for troubleshooting. The resulting trace files might contain personal data because they sometimes include the code of SQL queries to which personal information has been passed in the form of query literals. Trace files can also include memory dumps that contain personal data.

It is therefore important that access privileges to data, such as SELECT privileges or superuser privileges like SYSADM and DBADM, are granted with great care. The permission to use the "Save Trace" function should be given to selected administrators only.

The privilege to create image copies in Db2 for z/OS must also be handled with care. It is required, for example, if a user wants to archive table partitions on an accelerator.

Data Processing

Privileges defined in the Db2 for z/OS catalog control data processing on an accelerator.

In addition to that, the encryption features (encryption of data in motion and encryption of data at rest) should be activated. This prevents an unauthorized person without proper privileges from gaining direct access to personal data by interfering with the network communication or by obtaining physical access to the storage devices (hard disks or solid state disks).

Encryption features and safeguarding precautions:

Encryption of data in motion:

This feature encrypts the network traffic between an IBM Z[®] system and an accelerator.

Encryption of data at rest:

This feature encrypts the data on an accelerator's physical storage devices (hard disks and solid state disks). Depending on the model of the hardware, the feature might already be turned on by default.

Encryption key ownership:

Restrict access to the encryption keys because the keys enable a person to read or decrypt personal data on a network or storage device. Put the safekeeping and maintenance (rotation) of the encryption keys in the hands of a trusted administrator.

Data Deletion

When data is deleted from Db2 for z/OS, it might still exist in table copies on the accelerator. To delete the data on an accelerator, you have the following options:

The data in accelerator-shadow tables is deleted:

- If the data in the original Db2 for z/OS tables has been deleted, and if the affected accelerator-shadow tables have been reloaded (with the contents of the now empty Db2 tables).
- If the accelerator-shadow tables are removed from the accelerator.
- If the incremental update function is used and the function replicates empty table content to the accelerator because the original Db2 for z/OS table data has been deleted.

The data in an accelerator-only table (AOT) is deleted:

- If the AOT is removed from the accelerator.
- If an explicit DELETE statement is submitted on the Db2 for z/OS side, which references the AOT and contains a predicate that specifies the row to be deleted.

The data in partitions archived by the high-performance storage saver (HPSS) is deleted:

- If the table partitions are removed from the accelerator.
- If an archived partition is restored to Db2 for z/OS.
- If the data is deleted from Db2 for z/OS because this means that the archived partition is reloaded or that the partition is archived again after the deletion from Db2 for z/OS (empty table content will be reloaded or archived).

Data Monitoring

Db2 for z/OS provides powerful auditing and monitoring functions that allow you to track the processing of personal data. Because IBM Db2 Analytics Accelerator for z/OS is a logical component of Db2 for z/OS, and keeps only copies of Db2 for z/OS data, the monitoring functions for data processing in Db2 for z/OS are sufficient.

Responding to Data Subject Rights

To identify an individual's data that is stored on an accelerator, you can submit SQL queries from Db2 for z/OS. These queries ought to search for the name, the account number, or for other identifying information about the subject using SQL syntax. Since an accelerator works on copies of Db2 for z/OS data, the same queries can be run to retrieve the data either from Db2 for z/OS or from the accelerator. Specific advice or examples of such queries can not be provided here because the structure and the content of the database tables, as defined by the data controller or data processor, is not known.

Does the offering facilitate being able to meet data subject rights?

Right to Access

Can the client provide individuals access to their data?

Db2 for z/OS and accelerators can process SQL queries in which an individual's ID can be specified as a search criterion. This way, all data

stored about that individual can be retrieved. In Db2 for z/OS, a client's data access can be restricted, so that the client can only search and retrieve a subset of the available data records, that is, those records that belong to a specific group of individuals. To this end, a feature called label based access control (LBAC) can be employed. IBM Db2 Analytics Accelerator provides a similar functionality, which restricts access to a selected set of rows based on the CURRENT SQLID special register.

Can the client provide individuals information about what data the client has about the individual?

Yes. To identify an individual's data stored on an accelerator, the client can submit SQL queries from Db2 for z/OS. These queries ought to search for the name, the account number, or for other identifying information about the subject using SQL syntax.

Right to Modify

Can the client allow an individual to modify or correct their data?

Db2 for z/OS allows a client to update the data that is stored about an individual. Depending on the architecture of the application, it might even be possible to authorize the individuals, so that these can update their data by themselves. After an update in Db2 for z/OS, the modified data is copied to the accelerators attached to the database during the next reload operation, which can be started manually or automatically (by the incremental update function). During that process, incorrect data will be overwritten.

Can the client correct an individual's data for them?

Yes (see the previous question *Can the client allow an individual to modify or correct their data?*).

Right to Restrict Processing

Can the client stop processing an individual's data?

Yes. In Db2 for z/OS, a client can submit DELETE statements to remove data records of individuals. The removal will be reflected in the data that is stored on an attached accelerator when the next reload operation (manual or automatic) is taking place. During that process, records previously deleted from Db2 for z/OS will also be deleted from the accelerator. Furthermore, an individual's data can be excluded from SQL queries through the use of filters in query predicates. For example, a query that reads `SELECT CUSTOMER_DATA FROM CUSTOMER_TABLE where custid NOT IN (a,b,...c)` returns only data records that are not related to (do not belong to) the users in the specified group (a,b,...c).

Right to Object

Same as "Right to Restrict Processing."

Right to Be Forgotten

Can the client delete an individual's data?

Yes.

Right to Data Portability

Can the customer provide an individual with the information that they have about the individual in a user-friendly/machine readable format?

Yes.

Glossary

NOT Programming Interface information

This glossary includes terms and definitions for IBM Db2 Analytics Accelerator stored procedures.

The following cross-references are used in this glossary:

- *See* refers you from a term to a preferred synonym, or from an acronym or abbreviation to the defined full form.
- *See also* refers you to a related or contrasting term.

A

access plan graph

A visual representation of a query that shows the database objects that are accessed by the query and the order in which this is done.

C

coordinator node

The primary node of the accelerator. It distributes the workload among the other nodes.

D

data slice

A portion of an accelerator-shadow table that is processed by a worker node.

DDF See distributed data facility (DDF).

distributed data facility (DDF)

A set of Db2 for z/OS components by which Db2 for z/OS communicates with another relational database management system.

Dynamic Statement Cache

A pool in which Db2 saves prepared SQL statements that can be shared among different threads, plans, and packages. By sharing these statements, applications can avoid unnecessary preparation processes and thus improve performance.

G

global temporary table

See temporary table.

H

handshake

The exchange of predetermined signals when a connection is established between two data set devices.

I

IFI See instrumentation facility interface.

IFI call

An invocation of the instrumentation facility interface (IFI) by means of one of its defined functions.

inhouse processing

A query is processed by Db2 for z/OS and not routed to an accelerator.

instrumentation facility interface (IFI)

A programming interface that enables programs to obtain online trace data about Db2, to submit Db2 commands, and to pass data to Db2.

L

lock A means of preventing uncommitted changes made by one application process from being perceived by another application process and for preventing one application process from updating data that is being accessed by another process. A lock ensures the integrity of data by preventing concurrent users from accessing inconsistent data.

P

plan ID

The identifier of an execution plan (part of the file name).

S

skew An imbalanced distribution of table rows among the processing nodes of the accelerator.

T

table space

A logical unit of storage in a database. In Db2 for z/OS, a table space is a page set and can contain one or more tables.

temporary table

A table that holds temporary data. Temporary tables are useful for holding or sorting intermediate results from queries that contain many rows. The two kinds of temporary tables, which are created by different SQL statements, are the created temporary table and the declared temporary table.

throughput

A measure of the amount of information transmitted over a network in a given period of time. Throughput is generally measured in bits per second (bps), kilobits per second (Kbps), or megabits per second (Mbps).

End of NOT Programming Interface information

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Product Number: 5697-DA7

SH12-7084-05

