



Installation Guide

Replication Agent™ for DB2 UDB

15.0

[z/OS]

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About This Book

Replication Agent™ for DB2 UDB for z/OS (Replication Agent) allows the replication of transaction operations from IBM DB2 UDB on z/OS to replicate databases using Sybase Replication Server®.

Audience

Use this document if you:

- Administer Replication Server systems
- Administer an MVS (z/OS) system
- Administer a DB2 database
- Are responsible for installing Replication Agent

How to use this book

Related documents

- Replication Agent for DB2 UDB *Release Bulletin* for z/OS
- Replication Agent for DB2 UDB *User's and Troubleshooting Guide* for z/OS
- Replication Server documentation
- Adaptive Server Enterprise™ documentation
- IBM DB2 documentation about messages and codes, commands and utilities, SQL, administration, and application programming
- TCP/IP connectivity protocol documentation

Other sources of information

Use the Sybase Getting Started CD, the SyBooks CD, and the Sybase Product Manuals Web site to learn more about your product:

- The Getting Started CD contains release bulletins and installation guides in PDF format, and may also contain other documents or updated information not included on the SyBooks CD. It is included with your software. To read or print documents on the Getting Started CD, you need Adobe Acrobat Reader, which you can download at no charge from the Adobe Web site using a link provided on the CD.
- The SyBooks CD contains product manuals and is included with your software. The Eclipse-based SyBooks browser allows you to access the manuals in an easy-to-use, HTML-based format.

Some documentation may be provided in PDF format, which you can access through the PDF directory on the SyBooks CD. To read or print the PDF files, you need Adobe Acrobat Reader.

Refer to the *SyBooks Installation Guide* on the Getting Started CD, or the *README.txt* file on the SyBooks CD for instructions on installing and starting SyBooks.

- The Sybase Product Manuals Web site is an online version of the SyBooks CD that you can access using a standard Web browser. In addition to product manuals, you will find links to EBFs/Maintenance, Technical Documents, Case Management, Solved Cases, newsgroups, and the Sybase Developer Network.

To access the Sybase Product Manuals Web site, go to Product Manuals at <http://www.sybase.com/support/manuals/>.

Sybase certifications on the Web

Technical documentation at the Sybase Web site is updated frequently.

❖ Finding the latest information on product certifications

- 1 Point your Web browser to Technical Documents at <http://www.sybase.com/support/techdocs/>.
- 2 Click Certification Report.
- 3 In the Certification Report filter select a product, platform, and timeframe and then click Go.
- 4 Click a Certification Report title to display the report.

❖ Finding the latest information on component certifications

- 1 Point your Web browser to Availability and Certification Reports at <http://certification.sybase.com/>.
- 2 Either select the product family and product under Search by Base Product; or select the platform and product under Search by Platform.
- 3 Select Search to display the availability and certification report for the selection.

❖ Creating a personalized view of the Sybase Web site (including support pages)

Set up a MySybase profile. MySybase is a free service that allows you to create a personalized view of Sybase Web pages.

- 1 Point your Web browser to Technical Documents at <http://www.sybase.com/support/techdocs/>.

- 2 Click MySybase and create a MySybase profile.

Sybase EBFs and software maintenance

❖ Finding the latest information on EBFs and software maintenance

- 1 Point your Web browser to the Sybase Support Page at <http://www.sybase.com/support>.
- 2 Select EBFs/Maintenance. If prompted, enter your MySybase user name and password.
- 3 Select a product.
- 4 Specify a time frame and click Go. A list of EBF/Maintenance releases is displayed.

Padlock icons indicate that you do not have download authorization for certain EBF/Maintenance releases because you are not registered as a Technical Support Contact. If you have not registered, but have valid information provided by your Sybase representative or through your support contract, click Edit Roles to add the “Technical Support Contact” role to your MySybase profile.

- 5 Click the Info icon to display the EBF/Maintenance report, or click the product description to download the software.

Conventions

Table 1 shows some of the style conventions used in the documentation for this product.

Table 1: Style conventions

Text	Explanation	Example
Command	- Programs - Utilities - Procedures - Commands	create connection
<i>Italics</i>	- File names - Directory names - Properties	<i>configuration file</i>
Code	- Code examples - Screen text	Replication Agent for DB2/12.6
Bold code	- User input - Command line input	/F [job_name],C, trace=1,11

Text	Explanation	Example
<i>Italics</i>	Variables (replace these with the appropriate values for your site)	<i>host_name</i>
<i>Code italics</i>	Variables in code you type (replace these with the appropriate values for your site)	<i>maintenance_user_ID</i>

Syntax conventions

The following example illustrates some of the syntax conventions used in this guide:

```
COMMAND [object_name, [ {TRUE | FALSE} ] ]
```

Table 2 explains the syntax conventions used in this guide.

Table 2: Syntax conventions

Symbol	Explanation	Example
()	Include parentheses as part of the command.	START DATABASE (database_name)
	A vertical bar indicates that you can select only one of the options shown. Do not type the bar in your command.	{red yellow blue}
,	A comma indicates that you can choose one or more of the options shown. Separate each choice by using a comma as part of the command.	{rice,potatoes,beans}
{ }	Braces indicate that you must choose at least one of the enclosed options. Do not type the braces when you enter the option.	Select only one: {red yellow blue} Select at least one: {rice,potatoes,beans}
[]	Brackets indicate that you can choose one or more of the enclosed options, or none. Do not type the brackets when you enter the options.	[anchovies]
...	An ellipsis indicates that you can repeat the previous item as many times as necessary.	{rice,potatoes}...

Accessibility features

This document is available in an HTML version that is specialized for accessibility. You can navigate the HTML with an adaptive technology such as a screen reader, or view it with a screen enlarger.

Replication Agent for DB2 and the HTML documentation have been tested for compliance with U.S. government Section 508 Accessibility requirements. Documents that comply with Section 508 generally also meet non-U.S. accessibility guidelines, such as the World Wide Web Consortium (W3C) guidelines for Web sites.

The online help for this product is also provided in HTML, which you can navigate using a screen reader.

Note You might need to configure your accessibility tool for optimal use. Some screen readers pronounce text based on its case; for example, they pronounce ALL UPPERCASE TEXT as initials, and MixedCase Text as words. You might find it helpful to configure your tool to announce syntax conventions. Consult the documentation for your tool.

For information about how Sybase supports accessibility, see Sybase Accessibility at <http://www.sybase.com/accessibility>. The Sybase Accessibility site includes links to information on Section 508 and W3C standards.

If you need help

Each Sybase installation that has purchased a support contract has one or more designated people who are authorized to contact Sybase Technical Support. If you cannot resolve a problem using the manuals or online help, please have the designated person contact Sybase Technical Support or the Sybase subsidiary in your area.

Preparing for Installation

Before you install Replication Agent, ensure that your site meets the requirements listed in this chapter. This chapter includes the following information:

Topic	Page
Understanding software requirements	1
Understanding Sybase server operational considerations	2
Understanding DB2 database considerations	3
Understanding Replication Agent architecture changes	5
Understanding permissions requirements	5

Understanding software requirements

This section describes the software requirements for Replication Agent, including:

- Mainframe software requirements
- LAN software requirements

Mainframe software requirements

Table 1-1 describes the mainframe software requirements for Replication Agent.

Check each item when it is verified by the appropriate team member. Your Replication Agent installation can fail if you do not meet the prerequisites described in this section.

Table 1-1: Replication Agent mainframe software requirements

Mainframe Software	Supported Versions
MVS	z/OS version 1.5 or later, TCP/IP connectivity.
DB2 database	6.1, 7.1, 8.1
	Note Replication Agent for DB2 UDB for z/OS 15.0 supports DB2 7.1 and DB2 8.1. Please check the Sybase web site for certification information on subsequent releases.

LAN software requirements

This section lists the requirements and restrictions for running Replication Server on the LAN with Replication Agent.

Understanding Sybase server operational considerations

This section contains information about the following Sybase server considerations:

- Heterogeneous datatype support (HDS)
- Replication Server-to-DB2 connectivity

Heterogeneous datatype support (HDS)

For more information on setting up Replication Server and the HDS feature, see the *Replication Server Configuration Guide* and the *Replication Server Heterogeneous Replication Guide*.

Replication Server-to-DB2 connectivity

Connectivity from Replication Server to DB2 replicate databases can be accomplished using a variety of gateways. However, this connectivity is required only under the following conditions:

- You are replicating data into your DB2 database.
- You are using automatic materialization to populate your replicate database.

The gateway connectivity that allows Replication Server to issue select, insert, update, or delete statements against the tables stored in DB2 can be configured in many ways. For details on the range of available connectivity options between Replication Server and DB2, see the Replication Server *Heterogeneous Replication Guide*.

If you set up connectivity at your site, be sure that the Replication Agent-to-Replication Server communication at your site functions correctly, and ensure that your site is prepared for the possibility of additional work involved in maintaining a Replication Server-to-DB2 communications path. Sites without connectivity between Replication Server and DB2 require bulk materialization.

See also

- <http://www.sybase.com/Partners/certification/index.html> on the World Wide Web for information about replication into DB2
- “Preparing for Replication” in the Replication Agent for DB2 UDB *User’s and Troubleshooting Guide* for z/OS for detailed information about bulk materialization

Understanding DB2 database considerations

This section details the following DB2 database restrictions you must consider when using Replication Agent:

- Support for DB2 features
- DB2 log capacity
- DB2 table size limit in Replication Server
- DB2 utilities

See also

- “Replicating Source Tables” in *Replication Agent for DB2 UDB User’s and Troubleshooting Guide* for z/OS for information about considerations when using Replication Agent and DB2

Support for DB2 features

Replication Agent for DB2 UDB for z/OS 15.0 supports DB2 7.1 and 8.1.

Although Replication Extract for Replication Agent 15.0 reads logs created by DB2 version 9, Replication Agent 15.0 is not certified with DB2 9.1 at the time of this publication.

DB2 log capacity

Replication Agent increases the amount of information stored in DB2 logs. The amount depends on the size of tables being replicated and on the nature of transactions being performed on the primary database.

For optimal recovery, your DB2 active logs need the capacity for at least the number of records accumulated in a 12-hour period.

See also

- *IBM DB2 Administration Guide* for information on allocating and managing DB2 data sets

DB2 table size limit in Replication Server

Replication Server version 12.1 and earlier has a 16KB stable queue buffer limit; therefore, a single transaction operation (insert, update, or delete) cannot be replicated if it exceeds 16KB.

Replication Server 12.5 and later does not have this limitation.

DB2 utilities

Using some DB2 utilities on primary tables can jeopardize replicate databases, which may necessitate rematerializing your data.

UNLOAD

You may now use DB2 UNLOAD files to assist in replicate materialization.

See also

- “Replication Server Setup” in the *Replication Agent for DB2 UDB User’s and Troubleshooting Guide* for z/OS.

LOAD

You may now use the DB2 LOAD LOG=YES utility to assist in replicate materialization.

See also

- “Restrictions on DB2 Utilities” in the *Replication Agent for DB2 UDB User’s and Troubleshooting Guide* for z/OS.

Understanding Replication Agent architecture changes

Previous versions of Replication Agent for DB2 used a proprietary interface to access the DB2 logs. Replication Server 12.6 uses an IBM DB2 API to read the DB2 log. The parameters that were previously defined in *hlq.PDR PARMLIB* are now defined in the LTM configuration file.

Understanding permissions requirements

DB2 and Replication Server both have permission requirements to access their data and system tables.

- Replication Agent requires permission to read DB2 logs.
- Replication Agent requires permission to log in to Replication Server as a Log Transfer Manager.

The LTMADMIN user ID creates Replication Agent system tables on DB2, and requires the permissions to:

- Alter tables, for all primary DB2 tables marked for replication
- Bind and add the log extract plan, for Replication Extract operation

Specifying DB2 system libraries for multi-member datasharing

❖ **Recording Replication Extract installation panel information:**

- 1 Record the DB2 subsystem ID in section 4a, “DB2 subsystem ID (*db2ssid*),” on the Replication Agent Installation Worksheet.

If you are running DB2 in nondata-sharing mode, the DB2 subsystem ID should identify the subsystem ID of the member from which you are replicating transaction information.

If you are running DB2 in data-sharing mode, the DB2 subsystem ID should identify the name of the data-sharing group.

- 2 Record the log extract plan name in section 4b, “Log extract plan name,” on the Replication Agent Installation Worksheet. The default value is **RAPLAN**.

If you are upgrading from an earlier version of Replication Agent that you are installing on the same DB2 subsystem as an older version, select a different plan name to prevent overlaying the old plan.

Note If you change the name of the log extract plan, you must also change the plan value for parameter *LTMP*lan in the LTM configuration and the *LTMBIND* member of the JCL library.

- 3 Obtain the DB2 *SDSNEXIT* library name from your systems programmer. Record this name in section 4c of the Replication Agent Installation Worksheet.
- 4 Obtain the DB2 *SDSNLOAD* library name from your systems programmer. Record this name in section 4d of the Replication Agent Installation Worksheet.
- 5 Record the version of DB2 UDB you are using with Replication Agent in section 4g of the Replication Agent Installation Worksheet.

Installing and Configuring Replication Agent

This chapter describes how to install all Replication Agent options from the InstallShield wizard, and how to complete the installation for the Replication Agent for DB2-UDB.

Note Skip the installation steps that do not pertain to the option, or options, you have chosen to install.

Topic	Page
Installing from InstallShield	8
Completing the installation	11

Product licensing

This product requires a permanent authorization key. However, a temporary key that is valid for 30 days has been included within the order at installation time. To avoid interruption of operations, within those 30 days, call Customer Service at 1-800-8Sybase, (1-800-879-2273) select Option 3, and select Option 3 again to request a permanent key. Be prepared to provide this information:

- Product name
- Order number
- Your machine type
- CPU Serial number of the machine
- Model number
- Valid e-mail address

Within seven business days, Sybase will send a permanent key to you by e-mail.

Installing from InstallShield

Follow the steps in this section to install Replication Agent for DB2-UDB using InstallShield.

Note The InstallShield wizard runs only on Windows.

- 1 Execute *setupwin.exe* from the root directory to start the InstallShield wizard from the CD.

Multiple dialog boxes display; they contain fields that you can modify. The values in these fields are used to modify the JCL and data templates used to create the installation jobs. Click Next to move forward in the Wizard; click Back to go to the previous screen. Click Cancel to cancel the installation.
- 2 Click Next. To accept the terms of the user license agreement, select your country from the drop-down list. Then select the option that indicates your agreement with the terms.
- 3 Click Next.

Table 2-1: JCL and system information

Field name	Description
JCL Line 1-3	Enter a valid jobcard. The jobcard is used to run the final installation jobs.
High Level Qualifier	Used for all data sets generated during installation.
Volume	Indicates where generated data sets are cataloged.
Unit	Device type for cataloged datasets.
Work Unit	Device type for temporary datasets.
TCP Address Space Name	The name of the TCP instance that will handle communications from Replication Agent to the Replication Server.

- 4 Provide information about the DB2 subsystem to be used for replication, as shown in Table 2-2.

Table 2-2: DB2 subsystem information

Field name	Description
DB2 DSN Name	Enter the DSN of the DB2 subsystem.
DB2 Version	Enter the version of DB2 running; that is, 7 or 8.
DB2 Plan Name	Enter the name of the DB2 Plan to be used to bind the log extract.
DB2 System Loadlib	Enter the system loadlib for your installation of DB2; that is, DSN810.SDSNLOAD.
Use exitlib?	Select if you want to include a DB2 exitlib in the Replication Agent JCL. Specify the exitlib dataset name on the next line. Note The EXIT library must be APF authorized.
Datasharing?	Select datasharing type used between DB2 regions, or “None.” Specify the DSN of the datasharing group on the next line.

Click Next.

- 5 Provide information about Replication Agent parameters, as shown in Table 2-3.

Table 2-3: Replication Agent parameters

Field name	Description
RepServer Name	Enter the name of the Replication Server to which the Replication Agent will connect.
RepServer Hostname	Enter the DNS name of the server hosting Replication Server.
RepServer Port	Enter the TCP port used by the Replication Server.
RepServer Userid	Enter the Replication Server administrative userid.
RepServer Password	Enter the Replication Server administrative userid's password.
LTAdmin Userid	Enter the DB2 userid to be used by the log extract.
RS Source Data Server	Enter the identifier, within Replication Server, of the source DB2 data subsystem.
RS Source Database	Enter the identifier, within Replication Server, of the source DB2 database name.
RSSD Server Name	Enter the name of the Adaptive Server Enterprise hosting the Replication Server RSSD.
RSSD Server Host	Enter the DNS name of the server hosting the Adaptive Server Enterprise instance of the RSSD.
RSSD Server Port	Enter the TCP port used by the ASE instance of the RSSD.
RSSD Userid	Enter the administrative userid of the Adaptive Server hosting the RSSD.
RSSD Password	Enter the administrative userid's password.
RSSD Database	Enter the ASE database name of the RSSD.

Click Next.

- 6 Click Next until the wizard displays the information you entered in steps 3 - 5. Review the information. If necessary, click Back to return to a screen and make corrections.
- 7 Click Next until the wizard displays a dialog box for FTP information. Provide the information in Table 2-4 to establish an FTP session to the mainframe.

Table 2-4: FTP session parameters

Field name	Description
Userid	Enter the mainframe userid for the FTP session.
Password	Enter the password for the FTP session.
Mainframe Host Name	Enter the mainframe DNS name.
FTP Port	Enter the control port used by the mainframe FTP server; usually 21.
VOL/UNIT Assignment	Specify either a volume serial number and unit assignment for FTP, or allow FTP to use default values. Note If you specify a volume serial number that does not exist, FTP hangs until the mainframe responds to a message requesting that the volume be mounted.
Log FTP Commands	Specify where FTP log information is to be written. The log information may be useful in troubleshooting FTP problems.

Click Next to create JCL and upload the selected components to the mainframe.

- 8 Close the InstallShield wizard.

Completing the installation

Follow the steps in this section to complete the installation.

- 1 Locate the installation JCL for Replication agent in *hlq.RA150.JCL*, where *hlq* is the high-level qualifier you specified in step 3 in the last section.
- 2 Run the jobs described below in the order shown:
 - RECEIVE: This job runs IKJEFT01 to use the TSO RECEIVE command to build and populate the product libraries.
 - ALLOC: This job creates the trunc-point dataset and generation data group used for the log dataset.

- LTMBIND: This job binds the DB2 log extract plan. Remember to grant permissions to this plan as shown in the GRANT member.
- 3 APF Authorize *hlq.RA150.LINKLIB*, where *hlq* is the high-level qualifier you specified in step 3, in “Installing from InstallShield.”

Replication Agent Installation Worksheet

Use this worksheet to record the information required to install Replication Agent.

Photocopy or print this worksheet and complete it before you begin the installation described in Chapter 2, “Installing and Configuring Replication Agent.” Keep the completed worksheet. You will need the information from the worksheet when you install and use Replication Agent and when you call Sybase Technical Support.

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User IDs

Use this section to record the User IDs required for installation.

LTMADMIN User ID

Sybase recommends that you create a TSO user named LTMADMIN. This user installs, starts, and stops Replication Agent, manages the DB2 system tables, and binds the log extract plan.

MVS restrictions apply to this user ID. This value must exactly match the value of the LTM for MVS Creator configuration parameter. See “Creator.”

LTMADMIN User ID: _____

LTM for MVS start-up procedure name

Replication Server maintenance user ID	This is the Replication Server user ID specified in the create connection command used when creating a connection to Replication Server.
	Note If you plan to replicate into DB2, ensure that the maintenance user ID is not identical to the RS user to prevent cyclic replication.
	<i>Replication Server maintenance user ID:</i> _____

RS user	This is a Replication Server user ID used by LTM for MVS to log in to the primary Replication Server.
	<i>RS user:</i> _____

RSSD user	This is the identifier that Replication Agent uses to log on to the Adaptive Server that contains the primary Replication Server RSSD.
	<i>RSSD user:</i> _____

LTM for MVS start-up procedure name

LTM for MVS start-up PROC name	Use this section to record the LTM for MVS start-up procedure name.
	The LTM for MVS PROC name becomes the LTM for MVS started task name when you start Replication Agent. Sybase recommends that you name this procedure with the prefix LTM plus a suffix of 5 characters maximum.
	<i>PROC name:</i> LTM __ _ _ _ _

Additional PROC names	If you are going to run more than one Replication Agent, provide a unique LTM PROC name for each one.
	<i>PROC name:</i> LTM __ _ _ _ _
	<i>PROC name:</i> LTM __ _ _ _ _

PROC name: LTM __ _ _ _ _

PROC name: LTM __ _ _ _ _

PROC name: LTM __ _ _ _ _

Replication Agent panel installation

Use this section to record information you will need to complete the Replication Agent installation panel.

Job card information

Supply valid job card information for your site. See your systems programmer if you need assistance.

Job card information: _____

High-level qualifier (hlq)

Identifies the data sets created during installation. This replaces the *hlq* variable in the JCL and library names throughout this documentation.

Example value: DWM.RA.TEST

High-level qualifier: _____

Disk volume (VOL=SER)

Obtain this value from the software distribution label.

Example value: RAD150

Disk volume: _____

Unit specification for temporary data sets

Use the name assigned by your systems programmer. There is an 8-character maximum.

Example value: SYSDA

Unit specification for temporary data sets: _____

Unit specification for
catalog data sets

Example value: 3390

Unit specification for catalog data sets: _____

Replication Extract installation panel information

Use this section to record information you will need to complete the Replication Extract installation panel.

DB2 subsystem ID

Identifies the DB2 subsystem ID from which transaction information will be replicated. If you run DB2 in data-sharing mode, Sybase recommends that you specify the subsystem ID for member 0 of the data-sharing group.

Example value: DMW5

DB2 subsystem ID: _____

Log extract plan name

Default value: RAD150

Log extract plan name: _____

DB2 SDSNLOAD
library name

Obtain this library name from your systems programmer.

DB2 SDSNLOAD library name: _____

DB2 DBRMLIB library
name

Obtain the DBRMLIB library name from your systems programmer. This is the DB2 utility DBRMLIB library.

DBRMLIB library name: _____

DB2 version

This is the version of DB2 you are using with Replication Agent.

DB2 version: _____

TCP/IP information for Replication Server

If you have more than one Replication Server in your replication system, make a copy of this page for each Replication Server. Then complete the information in this section for each Replication Server.

Replication Server
name
(SERVERNAME)

Identifies the name of the primary Replication Server to which Replication Agent connects. Restricted to 30 characters.

This value must match the value of the RS configuration parameter. See “RS.”

Replication Server name: _____

IP address (IPADDR)

This is the IP address of the machine on which Replication Server runs.

IP address: _____

Listen port
(LSTNPORT)

This identifies the listen port of the machine on which Replication Server runs.

Listen port: _____

TCP address space

(IBMTCPADDRSPACE) Supply the IBM TCP/IP address as this parameter value *only* if you use IBM TCP/IP. All characters must be uppercase.

TCP address space: _____

TCP/IP information for Adaptive Server

If you have more than one Adaptive Server containing a primary Replication Server RSSD in your replication system, make a copy of this page for each Adaptive Server. Then complete the information in this section for each Adaptive Server.

Adaptive Server name
(SERVERNAME)

Identifies the name of the Adaptive Server that contains the Replication Server System Database (RSSD). Can contain a maximum of 30 characters.

This value must match the value of the RSSD_server parameter. See “RSSD_server.”

Adaptive Server name: _____

Adaptive Server IP
address (IPADDR)

This is the IP address of the machine on which the RSSD Adaptive Server runs.

Adaptive Server IP address: _____

Adaptive Server listen
port (LSTNPORT)

This is the listen port of the machine on which the RSSD Adaptive Server runs.

Adaptive Server listen port: _____

RSSD_server

The RSSD_server value must match the name of the Adaptive Server containing the primary Replication Server RSSD. Use the value you recorded in “Adaptive Server name (SERVERNAME).”

Adaptive Server
database

This is the Adaptive Server that contains the primary Replication Server RSSD.

Adaptive Server database: _____

Adaptive Server User ID

This is the identifier that the Replication Agent uses to log on to the Adaptive Server that contains the primary Replication Server RSSD.

Adaptive Server User ID: _____

Adaptive Server password

This is the password that Replication Agent uses to log on to the Adaptive Server that contains the primary Replication Server RSSD.

Adaptive Server password: _____

LTM for MVS configuration information

Use this section to record required configuration information.

Configuration file name (LTMCNFG)

Configuration file name: _____

RS

This value must match the value of the *SERVERNAME* variable in “Replication Server name (SERVERNAME).”

RS: _____

RS_user

Identifies the user name that Replication Agent uses to log on to the primary Replication Server. Maximum 30 characters.

The value of RS_user should *not* be identical to the user identified by the LTMADMIN user ID.

RS_user: _____

RS_pw

This is the password for the User ID specified as RS_user. Maximum of 30 characters.

RS_pw: _____

RS_source_ds Must match the data server name in the Replication Server create connection command that Replication Agent issues to connect to Replication Server.
RS_source_ds: _____

RS_source_db Must match the database name in the Replication Server create connection command that Replication Agent issues to connect to Replication Server.
RS_source_db: _____

Creator Identifies the creator of the DB2 system table (LTMOBJECTS). The value you specify for Creator must match the user ID you entered for “LTADMIN User ID” on page 13.
Creator: _____

Log_identifier Identifies the DB2 subsystem ID from which transaction information is replicated, or, if DB2 runs in data-sharing mode, the DB2 group attach name.
Log_identifier: _____

LTM for MVS Configuration Parameters

This chapter contains information about the LTM for MVS configuration file and the parameters that control the behavior of the LTM for MVS component of Replication Agent.

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Understanding the LTM for MVS configuration file

When LTM for MVS starts, it reads the LTM for MVS configuration file, which contains parameters that control the behavior of the LTM for MVS component of Replication Agent.

The configuration file contains parameters and their associated values. Each line containing a configuration parameter is followed by the = (equals) character, followed by the value. LTM for MVS ignores blank lines and lines beginning with the # or * character.

Sample LTM for MVS configuration file

The following example shows the contents of the sample configuration file, located in the *LTMCNFG* member in the *hlq.JCL* dataset.

Example

```
#-----
*-----RS configs-----
*Parameter names are not case sensitive.
```

```

*-----
LTL_test_only=N                Y or N to turn off connection to RS
RS=DevUTF8_RS                  Rep Server (RS) to connect to
RS_user=sa                     RS User used for RS connection
RS_pw=                          RS password for RS User
RS_source_ds=tinker            What the RS calls the DB2 server and
RS_source_db=db4x              the database; that is, bc6, dbc7, db1x
RS_ccsid=819                   The RS Codeset default is 819
RSCsetname=iso_1               Charset to log in to Rep Server
RSHost=Perro                   The name that is looked up with DNS
RSIPAddress=usehost            The IP nn.nn.nn.nn for the RS or usehost
TCPName=TCPIP                  Name of the TCPIP address space
RSPort=6001                    and port; for example, 6030
Communications Protocol-IBMTCP Currently the only supported protocol
*-----
*
*-----RSSD configs if using REPDEFS-----
RSSD_server=RSSD_DevUTF8       The ASE Server
RSSD_user=sa                   The ASE user
RSSD_pw=                       and password
Use_repdef=Y                   Y or N to turn on/off use of repdefs
RSSDCsetname=iso_1             Charset to log in to RSSD Server
RSSD_database=DevUTF8_RS_RSSD The ASE database for Repdefs
RSSDHost=Perro                 The name of the ASE host
RSSDIPAddress=usehost          The IP for the ASE or usehost
RSSDPort=5010                  and port; for example, 6030
*-----
#
#-----
#
#Log Extract Configuration Parameters
#
#-----
DataSharingoption=Multi
BSDS=DB1X,DSNDB0X.DB1X.BSDS01
BSDS=DB2X,DSNDB0X.DB2X.BSDS01
BSDS=DB3X,DSNDB0X.DB3X.BSDS01
DetectDataCapture=Yes
Log_extractor=LTMEXT
Log_identifier=DBC7
LogTrace=N
GenID=1
CIMax=20
LogExtractError=Term
Buffers=25
PollInterval=0.0.20.0

```

```
LTMPlan=LEDB2REL
SetTruncPoint=47000
Creator=DSMITH
retry=10

#-----
#
# LTM Configuration Parameters
#
#-----
LTM_admin_user=noneyet
LTM_admin_pw=noneyet
Codepage=500,force,utf8
API_QID_request_interval=1000
max_messages=200
batch_ltl_cmds=on
Minimal_cols=Y
Use_repdef=Y
Stop_on_error=Y
Suppress_col_names=Y
Support_DB2_comp_rec=N
API_com_test=N
LTL_test_only=N
replace_null_in_char=_
Packet_size=32k
Maximum_connect_retries=10
Minimum_year=1998
Long_varchar=Y
Low_activity_latency=10
Ltl_table_col_case=lower
DateTime_conv_err=Default
Date_conv_default=1998-12-25
Time_conv_default=11:22:33
#User_exit=HOMEDPX

*-----
* Trace Configuration Parameters
*-----
*trace=Calls
*trace=General
*trace=RSCcommand
*trace=QIDs,25          (operator QIDs or QIDs,nn); for example, QID,25
*trace=TruncPoint
*trace=Connections
*trace=LTLbcdic
*trace=LTLascii
```

What you need to know

Case sensitivity	The keywords in the LTM for MVS configuration file are not case sensitive. You can verify whether LTM for MVS accepted the correct values from the configuration file by examining the <i>LTMLOG</i> file. After you restart Replication Agent, <i>LTMLOG</i> displays the configuration parameters and values, and configuration errors, if applicable.
One line per configuration parameter	Each configuration parameter entry must be on its own line; therefore, the LTM for MVS configuration file has no line continuation character.
Duplicate parameter entries	LTM for MVS processes duplicate entries for a single parameter in the configuration file inconsistently. In most cases, the second entry overrides the first entry. Sybase recommends that you avoid using multiple entries for single parameters in the configuration file.
Optional parameters	For optional configuration parameters you do not want to use, comment out the line in the LTM for MVS configuration file by inserting the “#” (pound) symbol in the first column of the line. Several changes were made to the syntax of the LTMCFG dataset: • Comments are now permitted after the configuration value. • Entire lines can be commented out by inserting “*” or “#.” • Configuration parameter names are not case sensitive. • Most configuration values are not case sensitive. Note A comment cannot follow a “blank” parameter. For example, <code>ASEPort= comment</code> is not valid.

Required parameters	Do not delete or comment out any required configuration parameters. LTM for MVS supplies default values for most configuration parameters. Change the values for these parameters for your site as needed.
Configuration errors	After modifying configuration parameters and before starting LTM for MVS, check this list for potential errors: • A line beginning with a blank is treated as a comment. • Provide valid values for all optional configuration parameters that are not commented out of the configuration file. Leaving a parameter name in an active state without an appropriate value causes syntax errors. • If a parameter is set to insert a null in a replicate column, make sure that column allows nulls. • Do not delete lines containing unused parameters. Your site may need those parameters in the future.
Adaptive Server LTM configuration parameters	LTM for MVS configuration parameters differ from Adaptive Server LTM configuration parameters.

Understanding the LTM for MVS configuration parameters

This section lists the LTM for MVS configuration parameters in alphabetical order with their valid values. Parameter descriptions include information about performance and tuning considerations where appropriate.

Note Be sure to read the information in this section before you change configuration parameter values so that you understand the consequences of the changes.

The default values for most of the parameters in the LTM for MVS configuration file enable the operation of most replication systems.

You can change parameter values to accommodate unusual environments or situations. For example, you can adjust parameter values if an error message indicates that your system has run out of configurable resource.

Table A-1 lists the configuration parameters described in this section according to their function.

Table A-1: LTM for MVS configuration parameters

Configuration parameter type	Parameter name and location
<i>Required parameters</i>	“Log_extractor” on page 45
	“RS” on page 59
	“RS_source_db” on page 62
	“RS_source_ds” on page 63
	“RS_user” on page 64
	“RS_pw” on page 64
	“LTM_admin_pw” on page 50
	“LTM_admin_user” on page 51
	“Communications_Protocol” on page 36
	“LTMPan” on page 52
<i>Performance parameters</i>	“Low_activity_latency” on page 48
	“RSSD_database” on page 67
	“RSSD_pw” on page 68
	“RSSD_server” on page 68
	“RSSD_user” on page 69
	“Minimal_cols” on page 53
	“Suppress_col_names” on page 75
	“Use_repdef” on page 81
	“Support_DB2_comp_rec” on page 74
	“API_QID_request_interval” on page 31
	“Packet_size” on page 55
	“trace=LTLaSCII” on page 80
	“RS_ccsid” on page 59
	“batch_ltl_cmds” on page 32
	“RSCsetname” on page 62
	“RSSDCsetname” on page 67
<i>Numeric and data conversion parameters</i>	“replace_null_in_char” on page 57
	“Codepage” on page 34

Configuration parameter type	Parameter name and location
<i>Date and time conversion parameters</i>	“GraphicType” on page 44
	“Date_in_char” on page 40
	“Time_in_char” on page 77
	“Timestamp_in_char” on page 78
	“DateTime_conv_err” on page 41
	“Date_conv_default” on page 40
	“Long_varchar” on page 47
	“Time_conv_default” on page 76
<i>Processing parameters</i>	“Minimum_year” on page 54
	“Stop_on_error” on page 72
	“User_exit” on page 83
<i>Log extract parameters</i>	“LTL_table_col_case” on page 48
	“Creator” on page 37
	“Log_identifier” on page 46
	“DataHandler” on page 37
	“GenID” on page 44
<i>Communication parameters</i>	“TableHandler” on page 73
	“LTM_process_maint_uid_trans” on page 51
	“retry” on page 58
	“Maximum_connect_retries” on page 52
	“RSIPAddress” on page 65
	“TCPName” on page 74
	“RSPort” on page 66
	“RSSDIPAddress” on page 70
	“RSSDPort” on page 70
	“RSHost” on page 65
	“RSSDHost” on page 68

Configuration parameter type	Parameter name and location
<i>Testing and debugging parameters</i>	“API_com_test” on page 29
	“LTL_test_only” on page 49
	“LogTrace” on page 47
	“trace=Calls” on page 79
	“trace=LTLebcdic” on page 79
	“trace=QID,n” on page 81
<i>Log extract parameters</i>	“BSDS” on page 33
	“Buffers” on page 33
	“DataSharingMember” on page 38
	“DataSharingOption” on page 38
	“DetectDataCapture” on page 43
	“LogExtractError” on page 45
	“LTMPlan” on page 52
	“PollInterval” on page 56
	“SetTruncPoint” on page 71

API_com_test

Assists with debugging log extract or user exit applications you create. The API_com_test parameter is *optional*.

Example syntax

```
API_com_test=N
```

Default value

- N

Valid values

- N

- Allows LTM for MVS to connect to Replication Server
- Does *not* create *APICOM* nor *UELECMD* files
- Y
 - Allows LTM for MVS to connect to Replication Server
 - Sends Replication API call structures to *APICOM* file
 - If a user exit is loaded, sends Replication API call structures to *UELECMD* file after the user exit is invoked
- O
 - Sends Replication API call structures to *APICOM* file
 - If a user exit is loaded, sends Replication API call structures to *UELECMD* file
 - Reads *LTMTRUNC* file for the LTM Locator value
 - Sets the maintenance user ID `FREDDY##` (where the # sign represents a space)
 - Prevents LTM for MVS from creating LTL
 - Prevents LTM for MVS from connecting to Replication Server

Comments

Use the output in the *APICOM* file to monitor Replication Extract's calls to the Replication API in the following cases:

- When a user exit is not installed
- When a user exit is installed, but before it is invoked

Use the *UELECMD* file to examine the manner in which the user exit altered the LE Command structure.

Set the value of `API_com_test` to Y or O, depending on whether you want to process transaction operations while debugging. Use the output in the *APICOM* file to monitor Replication Extract's calls to the Replication API without a user exit installed or before it is invoked, if a user exit is installed. Use the *UELECMD* file to examine Replication Extract's calls to the Replication API after the user exit is invoked.

When you set the value of the `API_com_test` to N, Replication Agent does not write output to the *APICOM* or *UELECMD* files, but it allows Replication Agent to connect to Replication Server.

When the `API_com_test` parameter is set to Y, memory allocations and file input and output result. Sybase recommends that you set the `API_com_test` parameter to N for normal operation. The correct space allocation depends on the amount of data involved.

If you set the value of `API_com_test` to Y or O, uncomment the `APICOM` DD statement in the JCL that starts the LTM for MVS started task on MVS:

```
//APICOM DD DSN=hlq.APICOM,DISP=(,CATLG),  
// UNIT=SYSDA,DCB=(LRECL=4096,RECFM=VB),  
// SPACE=(CYL,(1,1))
```

Uncomment the `UELECMD` DD statement *only* if you installed a user exit in the JCL that starts the LTM for MVS task on MVS:

```
//UELECMD DD DSN=hlq.UELECMD,DISP=(,CATLG),  
// UNIT=SYSDA,DCB=(LRECL=4092,RECFM=VB),  
// SPACE=(CYL,(1,1))
```

See “Creating User Exits” in the Replication Agent for DB2 UBD *User’s and Troubleshooting Guide* for z/OS for information about using a user exit to replace binary zeros.

See Appendix B, “Creating User Exits” in the Replication Agent for DB2 UBD *Installation Guide*

API_QID_request_interval

Controls the number of messages Replication API sends to the LTI before requesting a new LTM Locator from Replication Server.

The `API_QID_request_interval` parameter is *optional*.

Example syntax

```
API_QID_request_interval=1000
```

Default value

- 1000

Valid values

- Any integer from 1 to 10000

Note In Replication Agent for DB2 UDB for OS/390 version 12.6, the default value of the `API_QID_request_interval` parameter changes from 200 to 1000. The maximum value is currently 10000; formerly it was 1000.

Comments

The `API_QID_request_interval` configuration parameter controls the number of messages LTM for MVS sends to Replication Server before issuing a get truncation command to request a new LTM Locator value from Replication Server.

Issuing a get truncation command forces Replication Server to update `rs_locator` with the current LTM Locator for the primary database. This prevents Replication Extract from unnecessarily reprocessing transactions upon restart.

See the Replication Server *Reference Manual* for information about the `rs_locator` Replication Server system table.

batch_ltl_cmds

Controls whether LTM for MVS collects transactions (including inserts, updates, and deletes) in a 16K buffer and either ships them to Replication Server when the buffer is full, or sends the transactions one at a time.

The `batch_ltl_cmds` parameter is *required*.

Example syntax

```
batch_ltl_cmds=on
```

Default value

- on

Valid values

- on

Batches transactions in a 16K buffer and ships to Replication Server when buffer is full.

- off

Places a single transaction in each 16K buffer it sends to Replication Server.

Performance and tuning considerations

Set the value of `batch_ltl_cmds` to on to reduce network traffic and increase throughput.

BSDS

If you want the BSDS data listed in the operator commands, the BSDS parameter must be added for each member of a data-sharing group.

Example syntax

```
BSDS=member,dsn
```

Example

```
BSDS=DB1X,DSNDB0X.DB1X.BSDS01  
BSDS=DB2X,DSNDB0X.DB2X.BSDS01  
BSDS=DB3X,DSNDB0X.DB3X.BSDS01
```

where DB1X, DB2X, and DB3X belong to data-sharing group DB0X.

Buffers

The Buffers parameter determines how many buffers the Log Extract uses to retrieve data from the log.

The Buffers parameter is not required.

Example syntax

```
Buffers=nn
```

Default value

25

Valid values

1-50

Codepage

Identifies the name of the code page that DB2 is currently using. To identify the code page DB2 is using, check the value of the CCSID initialization parameter in DB2.

The Codepage parameter is *optional*.

Warning! If you change the DB2 CCSID setting in the DSNTIPF panel, you must also do the following to ensure LTM resumes processing at the end of the DB2 log using the proper CCSID value:

- 1 Change the values for the Replication Agent Codepage and RS_ccsid parameters in the *LTMCNFG* member of the *hlq.JCL* dataset to reflect the new CCSID value.
- 2 Reset the truncation point and rs_locator values to zero. See “Basic Replication Agent troubleshooting tips” on page 81 for instructions.

Options

- The force option for the Codepage configuration parameter forces Replication Agent to use the code page value provided in the Codepage configuration parameter instead of the CCSID value provided from DB2.

Note Replication Agent now supports all valid DB2 CCSIDs, including ASCII and double-byte CCSIDs, in addition to single-byte character sets.

- The utf8 option for the Codepage configuration parameter enables replication from DB2 using a Unicode character set.

Example syntax

Codepage=CP500,force,utf8

Default value

CP500

Valid values

To determine the appropriate value for the Codepage parameter, refer to the table provided in the *CODEPAGE* member of the *hlq.DOCS* library.

Here is an excerpt of the *CODEPAGE* member:

This table lists the values to use for the Rep Agent Codepage= and RS_ccsid= parameters. The 'DB2 CCSID' column lists the settings used on the DB2 installation panel 'DSNTIPF'. This is usually the same as the CCSID for the user database in which the primary table was created. The Rep Server/ASE column lists character set values. The RS_ccsid value should reflect the setting of Replication Server's RS_charset configuration parameter.			

DB2 CCSID	Rep Server/ASE ----- character set	Rep Agent Codepage=	Rep Agent RS_ccsid=

37	cp437	37	437

...	...	...	...

500	cp437	500	437

500	iso_1	500	819

500	cp850	500	850

500	iso15(8859-15)	500	923

...	...	...	...

5348	cp1252	5348	1252

This table matches DB2 CCSIDs with their appropriate Replication Agent Codepage and RS_ccsid configuration parameter values.

Comments

- You can verify the CCSID setting for a database by executing the following query:

```
SELECT * FROM SYSIBM.SYSDATABASE
WHERE NAME = 'database_name'
```

where *database_name* is the name of the database for which you are verifying the CCSID setting.

You can also verify the CCSID settings for translation tables used by the LTM in character data conversions by executing the following query:

```
SELECT * FROM SYSIBM.SYSSTRINGS
WHERE INCCSID = inccsid AND OUTCCSID = outccsid
```

Character translation errors can occur when the value of the Codepage parameter value does not match the code page that DB2 is currently using.

See the *IBM Character Data Representation Architecture Reference and Registry*, document #SC09-2190-00, for the Character Data Representation Architecture conversion tables.

- To support replication with a Unicode character set, you must:
 - Specify the utf8 option in the LTM for MVS Codepage parameter:
`Codepage=CP500, , utf8`
 - Specify a Unicode datatype (unichar or univarchar) in the replication definition for the column in the DB2 database

Warning! If Codepage is specified as CP500,force,utf8, then unprintable EBCDIC characters may not be replicated to char or varchar datatypes. This is not a problem when replicating to the unichar datatype.

Check for the latest EBF to address this issue (QTS #303468).

Communications_Protocol

Tells Replication Agent which protocol option your system is using:

- IBM TCP/IP

The Communications_Protocol parameter is *required*.

Example syntax

```
Communications_Protocol=IBMTCP
```

Valid values

- IBMTCP

Creator

Identifies the creator name for the LTMOBJECTS table, which is created on DB2 by the *LTADMIN* user ID during installation.

The Creator parameter is *required*.

Example syntax

```
Creator=LTADMIN
```

Default value

- LTADMIN

Valid values

- Maximum of eight characters

Note Obtain your site's value for the Creator parameter from the Replication Agent Installation Worksheet. This value should have been recorded on the worksheet during installation.

DataHandler

Specifies the program that will process the log records to be replicated. By default, this program is LTMIFI. This configuration is sent to LTMMAT when DB2 unload data is used to materialize a remote table. In a replication Toolkit implementation of the Replication Agent, you can substitute another program that reads and builds log records from a data source other than DB2.

Example syntax

```
LTMIFI
```

Default value

- LTMEXT

DataSharingMember

Specifies the DB2 subsystem that returns log records when the DataSharingOption is specified as “single” and Log_Identifier specifies a DB2 data sharing group name.

Example syntax

```
DataSharingMember=DB1X
```

where DB1X belongs to data-sharing group DB0X and DataSharingOption is “single.” If DataSharingOption is not “single,” this value is ignored.

Default value

- DataSharingMember=

Valid values

Any valid DB2 member name (maximum of eight characters).

DataSharingOption

Specifies the type of data-sharing environment in use in the DB2 subsystem.

If data sharing is not used with DB2, you must use this setting in the configuration file:

```
DataSharingOption=None
```

When data sharing is used, two configuration settings can be used:

```
DataSharingOption=Multi  
DataSharingOption=Single
```

If the DataSharingOption is Single, you must provide the name of the Data Sharing Member to be used with the DataSharingMember configuration parameter. For example:

DataSharingMember=DB2X

Note This requirement does not apply to the Multi and None options.

Log identifiers

The Log Identifier (SSID) must be entered for all configurations. If the log identifier is set incorrectly, rollback records may not correspond to the correct LRSN/RBAs when Support_DB2_comp_rec=Y is used.

Log identifier
examples

Log_identifier=DB0M

a group that has DB1M, DB2M, and DB3M as members

Log_identifier=DB2N

a specific SSID for the DB2, or an SSID within the data-sharing group

If DataSharingOption=Single or DataSharingOption=None, the Log_identifier can be the SSID of the member or the data-sharing group.

Example syntax 1

```
Log_identifier=DB0X
DataSharingOption=Multi
BSDS=DB1X,DSNDB0X.DB1X.BSDS01
BSDS=DB2X,DSNDB0X.DB2X.BSDS01
BSDS=DB3X,DSNDB0X.DB3X.BSDS01
```

Example syntax 2

```
Log_identifier=DB1X
DataSharingOption=Single
DataSharingMember=DB1X
```

Default value

- DataSharingOption=None

Valid values

DataSharingOption=None

DataSharingOption=Multi
DataSharingOption=Single

Date_conv_default

Can perform three functions:

- If the value of the DateTime_conv_err parameter is set to Default, this parameter supplies the value that LTM for MVS inserts in columns that encounter date conversion errors.
- Supplies date values during conversion of LTM for MVS date data to Adaptive Server datetime format.
- If your data contains year values less than the value of the Minimum_year parameter, then LTM for MVS inserts the value of the Date_conv_default parameter in the data you are replicating.

The Date_conv_default parameter is *optional*.

Example syntax

Date_conv_default=2000-12-31

Default value

- 1900-01-01

Valid values

- Any valid ISO date format value (YYYY-MM-DD, where YYYY=year, MM=month, and DD=day of the month)

See Chapter 6, “Working with datatype conversions” in the *Replication Agent for DB2 UDB User’s and Troubleshooting Guide for z/OS* for examples of valid date, time, and timestamp formats.

Date_in_char

Controls whether LTM for MVS sends date columns as char(10) fields or converts them to Adaptive Server datetime format.

The Date_in_char parameter is *optional*.

Example syntax

Date_in_char=N

Default value

- N

Valid values

- N

LTM for MVS converts LTM for MVS date datatype columns to Adaptive Server datetime.

- Y

When you set Date_in_char to Y, LTM for MVS converts dates that are out of range for the replicate table to a char(10) column.

LTM for MVS sends LTM for MVS date datatype columns as char(10) fields (ISO format: *CCYY-MM-DD*) instead of converting them to Adaptive Server datetime format.

See Chapter 6, “Working with datatype conversions” in the Replication Agent for DB2 UDB *User’s and Troubleshooting Guide* for z/OS for examples of valid date, time, and timestamp formats.

DateTime_conv_err

Controls the action LTM for MVS takes when it encounters conversion errors during conversion of LTM for MVS date, time, or timestamp data to Adaptive Server datetime.

The DateTime_conv_err parameter is *optional*.

Example syntax

DateTime_conv_err=Default

Default value

- Default

Valid values

- Default
If the error is a date error, LTM for MVS places the value stored in the Date_conv_default parameter in the column encountering the error.
- Null
LTM for MVS places a null in the column encountering the error.
- Datetime
If the error is a date error, LTM for MVS places the value stored in the Date_conv_default and Time_conv_default parameters in the column encountering the error.

Note If you set the value of DateTime_conv_err to null, be sure the affected replicate columns allow nulls.

See Chapter 6, “Working with datatype conversions” in the Replication Agent for DB2 UDB *User’s and Troubleshooting Guide* for z/OS for examples of valid date, time, and timestamp formats.

DateTime_conv_err

Controls the action LTM for MVS takes when it encounters conversion errors during conversion of LTM for MVS date, time, or timestamp data to Adaptive Server datetime.

The DateTime_conv_err parameter is *optional*.

Example syntax

```
DateTime_conv_err=Default
```

Default value

- Default

Valid values

- Default
If the error is a date error, LTM for MVS places the value stored in the Date_conv_default parameter in the column encountering the error.
- Null
LTM for MVS places a null in the column encountering the error.
- Datetime
If the error is a date error, LTM for MVS places the value stored in the Date_conv_default and Time_conv_default parameters in the column encountering the error.

Note If you set the value of DateTime_conv_err to null, be sure the affected replicate columns allow nulls.

See Chapter 6, “Working with datatype conversions” in the Replication Agent for DB2 UDB *User’s and Troubleshooting Guide* for z/OS for examples of valid date, time, and timestamp formats.

DetectDataCapture

Use the DetectDataCapture parameter to display a message when datacapture changes | none is toggled for a replicating table. Two examples of messages that could be generated are:

```
User USERID altered table TABLENAME to DATA CAPTURE  
NONE.
```

```
User USERID altered table TABLENAME to DATA CAPTURE  
CHANGES
```

Example syntax

```
DetectDataCapture=No
```

Default value

N

Valid values

- Y
- N

GenID

Used to increment the QID sent to a Replication Server. When a zOS Replication Sysem is first implemented, GenID is usually set to 1. The first two bytes (a short integer) of the QID value are set to this value. At restart, you may want to increment GenID by one so that Replication Server does not view the QID as lower than any QID received in the past.

Example syntax

Genid=1001

Valid values

- 1 to 32767

GraphicType

Determines whether a graphic type column in a DB2 row is replicated as a char value or as a hex string.

Example syntax

GraphicType=char

Valid values

- char
- bin

Log_extractor

Provides LTM for MVS with the name of the Replication Extract load module to be attached at start-up.

The Log_extractor parameter is *required*.

Warning! Do not change the default value of the Log_extractor parameter; doing so causes program failure.

Example syntax

```
Log_extractor=LTMEXT
```

Default value

- LTMEXT

Valid value

- LTMEXT

LogExtractError

The LogExtractError parameter determines whether the Log Extract terminates or returns a message when a log record error is encountered. When a message is specified, the Log Extract continues to execute after sending the message.

The LogExtractError parameter is not required.

Example syntax

```
LogExtractError=terminate
```

Default value

Terminates.

Valid values

- Terminate
- Message

Log_identifier

Provides LTM for MVS with the identifier of the subsystem containing the primary tables on DB2. This is also the subsystem on which the Replication Extract component of Replication Agent is running.

The Log_identifier parameter is *required*.

Example syntax

```
Log_identifier=DSNA
```

Default value

- none

Valid values

- A DB2 subsystem ID or group attach name (see “The Log_identifier parameter and data sharing” on page 47 for additional details)
- Maximum of four characters

Note Obtain your site’s value for the Log_identifier parameter from the Replication Agent Installation Worksheet. This value should have been recorded on the worksheet during installation.

Comments

When changing the value of the Log_identifier parameter, Replication Agent should have processed all records up to the end of the DB2 log. Changing the value causes Replication Extract to process transactions on a different DB2 subsystem. When Replication Extract stops processing the log for the subsystem you originally specified, open transactions on that subsystem may never reach the replicate database.

The Log_identifier parameter and data sharing

Replication Extract uses the value of the Log_identifier parameter to connect to DB2. The Log_identifier value identifies either the DB2 group attach name or a single DB2 subsystem (Sybase recommends using the group attach name as data sources for replication).

In DB2, the group attach name functions as an alias for a group of transaction identifiers. Replication Agent can use the group attach name to replicate transactions from multiple members of a data-sharing group.

LogTrace

When the LogTrace parameter is set to Y, the Log Extract produces a trace in the LOGTRACE file.

The LogTrace parameter is not required.

Example syntax

```
LogTrace=N
```

Default value

N Defaults to N meaning no trace will be put in the *LOGTRACE* file.

Valid values

- Y - a trace in the *LOGTRACE* file is produced.
- N - no trace is put in the *LOGTRACE* file.

Long_varchar

Specifies size limits for char and varchar datatypes.

The Long_varchar parameter is *required*.

Example syntax

```
Long_varchar=Y
```

Default value

- N

Valid values

- Y
Replication Agent limits char field lengths at 254 bytes and varchar fields at 32,704 bytes.
- N
Replication Agent uses old char and varchar field limits.

Low_activity_latency

Controls the length of time Replication Agent is quiescent during a low-activity period. This parameter can be used to conserve resources when the demand on Replication Agent is low.

The Low_activity_latency parameter is *optional*.

Example syntax

```
Low_activity_latency=5
```

Default value

- 10

Valid values

- Any integer from 1 to 99.

LTL_table_col_case

Specifies the case of replicate table and column names.

The LTL_table_col_case parameter is *optional*.

Example syntax

LTL_table_col_case=asis

Default value

- asis

Valid values

Values for this parameter must be entered in lowercase.

- asis

The replicate table name is the same as the primary table name.

- upper

The replicate table name is uppercase.

- lower

The replicate table name is lowercase.

Note The table names produced as a result of this parameter setting must match the table names in the replication definition and in the target database. Table and column names must be of the same case if this parameter is used.

LTL_test_only

Controls whether LTM for MVS connects to Replication Server and sends transaction operations for replication.

The LTL_test_only parameter is *optional*.

Example syntax

LTL_test_only=N

Default value

- N

Valid values

- N
In normal production mode, allows LTM for MVS to connect to Replication Server and send transaction operations for replication.
- Y
Setting the value of `LTL_test_only` to Y results in the following actions:
 - Prevents LTM for MVS from connecting to Replication Server
 - Sends LTL to the *LTLOUT* file (in EBCDIC format)
 - Obtains the LTM Locator value from *LTMTRUNC* file
 - Sets the maintenance user ID to `FREDDY##` (the # symbol represents a space)
- A
Causes Replication Agent to write data to the *LTLOUT* file in ASCII format instead of in EBCDIC format. This value is otherwise the same as a value of Y.

Comments

Set the value of `LTL_test_only` to Y only when debugging Replication Agent.

LTM_admin_pw

The `LTM_admin_pw` parameter is *required* but not used in this software release.

Although this parameter is not used, you must provide a value. Do not comment out or delete.

Example syntax

```
LTM_admin_pw=noneyet
```

Valid value

- Any value

LTM_admin_user

The LTM_admin_user parameter is *required* but not used in this software release.

Although this parameter is not used, you must provide a value. Do not comment out or delete.

Example syntax

```
LTM_admin_user=noneyet
```

Valid value

- Any value

LTM_process_maint_uid_trans

Controls whether LTM for MVS forwards transactions performed by the Replication Server maintenance user to Replication Server.

The LTM_process_maint_uid_trans parameter is *optional*.

Example syntax

```
LTM_process_maint_uid_trans=N
```

Default value

- N

Valid values

- N
Transactions performed by the Replication Server maintenance user are *not* sent to Replication Server.
- Y
Transactions performed by the maintenance user are sent to Replication Server for replication.

Comments

Most replication installations do not need to replicate transactions performed by the Replication Server maintenance user.

Set the value of this parameter to Y only if you are certain you need to replicate maintenance user transactions.

LTMPan

The LTMPan parameter is used by the Log Extract when it connects to the DB2 subsystem.

The LTMPan parameter is required.

Example syntax

```
LTMPan=LEDB2REL
```

Default value

LEDB2REL

Valid values

The 1 to 8 character plan name that was bound for the Log Extract.

Maximum_connect_retries

Controls the number of times LTM for MVS attempts to restore a failed connection to Replication Server.

The Maximum_connect_retries parameter is *optional*.

Example syntax

```
Maximum_connect_retries=10
```

Default value

- 10

Valid values

- Integers from 0 (none) to 9999 (infinite). A blank value will be accepted and set to 0.

Comments

- If the LTM for MVS message queue does not contain messages to send, LTM for MVS does not attempt to restore the connection to Replication Server.

Minimal_cols

Controls whether transaction operation records for updates include the entire before image of a row and only those columns in the after image that change as a result of the update.

The Minimal_cols parameter is *optional*.

Example syntax

Minimal_cols=Y

Default value

- Y

Valid values

- Y

Causes transaction operation records for updates to include the entire before image of a row but only those columns in the after image that change as a result of the update.

- N

Allows transaction operation records for updates to include the entire before image of a row and the entire after image of the row.

Performance and tuning considerations

Setting the value of `Minimal_cols` to Y can reduce network traffic, especially at sites with tables containing a high volume of columns.

Note Replication Agent limits char and varchar field lengths to 255 bytes and long varchar field lengths to 32704 bytes when `Minimal_cols=N`. When `Minimal_cols=Y`, Replication Agent limits char and varchar fields to 255 bytes and long varchar fields to 32704 bytes. Replication Agent allows a maximum of 126 double-byte characters when `Minimal_cols=N` and 124 double-byte characters when `Minimal_cols=Y`.

Minimum_year

The value you supply is the minimum year value that Replication Agent can accept.

The `Minimum_year` parameter is *optional*.

Example syntax

```
Minimum_year=1753
```

Default value

- 0000

Valid values

- Any four-digit integer

Comments

If a date or timestamp in the source data marked for replication contains a year earlier than the value you specify in the `Minimum_year` configuration parameter, then LTM for MVS inserts the value of the `Date_conv_default` parameter in the data you are replicating.

Updated data can fail (and Adaptive Server can fail, depending on the settings of the Adaptive Server parameters that control error behavior) under the following conditions:

- The source data contains dates before 1753.
- You specify a Minimum_year value of less than 1753.

See “Date_conv_default” on page 40 for information on the Date_conv_default parameter.

Packet_size

Packet size determines how many bytes are sent in each Replication Server command buffer. See Table A-2 for packet size information.

Table A-2: Packet size information

Packet size	Description
Packet_size=512	Minimum size; typically only useful for test purposes.
Packet_size=32K	Packet sizes in increments of 1024 bytes are required when packet size is greater than 1024 bytes.
Packet_size=32000	Use either whole numbers or abbreviate, using the K (1000) symbol.
Packet_size=1024K	Maximum packet size.

Packet size is useful when tuning Replication Agent for efficient operation in a network environment. Packet size must be larger than the largest command sent to Replication Server. A DB2 row can be as large as 32K. Determining the best packet size depends on configurations that change the size of data in a command, such as minimal columns. Inserts and deletes have a maximum size of ~32K; however, the before and after columns of an update make the maximum data size ~64K.

A minimum size of 175 bytes is needed for a typical Replication Server command. You must also allow enough space for table names, column names, punctuation, and other information necessary for a Replication Server command.

Note If packet size is exceeded by a single command, the log extract terminates with a user abend of 1408.

Configuration packet size should be tested in a production-like environment. When testing, use the same version of Replication Server and a substantive amount of data. Changing the setting should not affect Replication Agent functionality, but it is important to notice how the entire replication environment is affected. Increasing packet size sends data over the network in larger packets, with fewer sends and receives. Latency, the frequency with which truncation points are requested, and other configuration issues should also be considered when modifying packet size.

Example syntax

```
Packet_size=32k
```

Default value

- 32K

Valid values

- Multiples of 512 from 512 to 1024000 bytes. A value in this range ending with the letter k or K is also valid.

PollInterval

The PollInterval parameter determines how often the Log Extract wakes up to check for more log records after it has reached the end of the log.

The PollInterval parameter is not required.

Example syntax

```
PollInterval=0.nn.nn.nnn
```

Default value

```
0.00.20.000
```

Valid values

Hours.Minutes.Seconds.Milleseconds or 0.00.20.0 to 0.60.60.999 (the hours value is ignored even if a non zero value is supplied).

replace_null_in_char

Specifies the value that replaces binary zero (x'00') characters in LTM for MVS char or varchar data columns, except when the value of `replace_null_in_char` is blank or the parameter is commented out of the configuration file.

The `replace_null_in_char` parameter is *optional*.

Note This parameter is commented out of your LTM for MVS configuration file. Leave it commented out unless you know you have binary zeros in LTM for MVS char or varchar columns.

Example syntax

```
replace_null_in_char= blank
```

Default value

- Null

Valid values

- Any value *except* x'00'
- To replace the null characters with blanks, set this parameter value as follows:

```
replace_null_in_char=#blank
```

where the # symbol represents a space.

Comments

To make this parameter active, uncomment the parameter in the LTM for MVS configuration file.

When uncommented, this parameter can impair performance. It forces LTM for MVS to scan each char or varchar field and replace each binary zero. You can use a user exit to perform this function more efficiently.

See Appendix D, “Creating user exits” in the *Replication Agent for DB2 UDB User’s and Troubleshooting Guide for z/OS* for information about using a user exit to replace binary zeros.

Appendix B, “Creating User Exits” in the *Replication Agent for DB2 UDB Installation Guide* for further information.

retry

Controls the number of seconds LTM for MVS waits before attempting to restore a failed connection to Replication Server.

The retry parameter is *optional*.

Example syntax

```
retry=10
```

Default value

- 10

Valid values

- Integers between 1 (one second) and 86400 (one day)

Comments

If the LTM for MVS message queue does not contain messages to send, LTM for MVS does not attempt to restore the connection to Replication Server.

Performance and tuning considerations

If the value of this parameter is too low, your CPU usage can be unnecessarily high during network outages. If this value is too high, delays in replication can occur following network outages.

RS

Name of the machine where the primary Replication Server resides.

The RS parameter is *required*. The maximum length for this parameter is 30 alphanumeric characters.

Example syntax

```
RS=LTMIDRS1
```

Valid values

The value of the RS parameter for your site must exactly match the value of the *SERVERNAME* parameter in the SYGWHOST macro entry for Replication Server.

The value of the RS parameter must contain a maximum of 30 alphanumeric characters.

Note Obtain your site's value for the RS parameter from the Replication Agent Installation Worksheet. This value should have been recorded on the worksheet during installation.

RS_ccsid

Indicates the Coded Character Set Identifier (CCSID) used by the Replication Server to which Replication Agent is connected.

The RS_ccsid parameter is *optional*.

Warning! If you change the DB2 CCSID setting, you must also do the following to ensure LTM resumes processing at the end of the DB2 log using the proper CCSID:

- 1 Change the values for the Replication Agent Codepage and RS_ccsid parameters in the *LTMCNFG* member of the *hlq.JCL* data set to reflect the new CCSID value.
 - 2 Reset the truncation point and rs_locator values to zero. See “Basic Replication Agent Troubleshooting Tips” in Chapter 7, “Basic Troubleshooting Procedures” of the Replication Agent for DB2 UDB *User’s and Troubleshooting Guide* for z/OS for instructions.
-

Example syntax

RS_ccsid=819

Default value

- 819

Valid values

- The range of valid values for the RS_ccsid parameter is between 0 and 64534 inclusive. A value in this range starting with the prefix cp or CP is also valid. For example, the user may enter 1258 or CP1258 to indicate the code page value for Vietnamese.

Note Replication Agent version 12.6 and later supports all valid DB2 CCSIDs, including ASCII and double-byte CCSIDs.

To determine the appropriate value for the RS_ccsid parameter, see the table provided in the *CODEPAGE* member of the *hlq.DOCS* library. Here is an excerpt of the *CODEPAGE* member:

```
|-----|
| This table lists the values to use for the Rep Agent |
| Codepage= and RS-ccsid= parameters. The 'DB2 CCSID' |
| column lists the settings used on the DB2 installation |
| panel 'DSNTIPF'. This is usually the same as the |
```

CCSID for the user database in which the primary table was created. The Rep Server/ASE column lists character set values. The RS_ccsid value should reflect the setting of Replication Server's RS_charset configuration parameter.			
DB2 CCSID	Rep Server/ASE ----- character set	Rep Agent Codepage=	Rep Agent RS_ccsid=
37	cp437	37	437
37	iso_1	37	819
...	...	...	...
5026	cp932	5026	932
5035	cp932	5035	932
5348	cp437	5348	437
5348	iso_1	5348	819
5348	cp1252	5348	1252

This table matches DB2 CCSIDs with their appropriate Replication Agent Codepage and RS_ccsid configuration parameter values.

Comments

You can verify the CCSID setting for a database by executing the following query:

```
SELECT * FROM SYSIBM.SYSDATABASE WHERE NAME = 'database_name'
```

where *database_name* is the name of the database for which you are verifying the CCSID setting. You can also verify the CCSID settings for translation tables used by the LTM in character data conversions by executing the following query:

```
SELECT * FROM SYSIBM.SYSSTRINGS WHERE INCCSID = inccsid AND  
OUTCCSID = outccsid
```

RSCsetname

The character set name used by the Replication Server to which Rep Agent connects.

Example syntax

```
RSCsetname=cp850
```

Default value

- iso_1

RS_source_db

The value of the RS_source_db parameter represents a logical database name for the tables being replicated. Sybase recommends using the DB2 subsystem or group name (for example, DSNA).

You must select a name to represent the DB2 database, and use it consistently to represent the DB2 database.

Make sure that the value you supply for the RS_source_db parameter matches the value you specify for the *database* variable in the create connection command used to connect Replication Agent to the primary Replication Server.

The RS_source_db parameter is *required*.

Example syntax

```
RS_source_db=DSNA
```

Valid values

- The value of the RS_source_db parameter must match the primary database name in the Replication Server create connection command that LTM for MVS issues to connect the primary database to Replication Server.

Note Obtain your site's value for the RS_source_db parameter from the Replication Agent Installation Worksheet. This value should have been recorded on the worksheet during installation.

See Chapter 3, "Replication Agent Installation Worksheet," for further details.

RS_source_ds

Identifies the MVS system that contains the DB2 source database. You can choose this parameter value arbitrarily, as long as you use it consistently to represent the DB2 data server.

Be sure that the value you supply for the RS_source_ds parameter matches the value you specify for the *data_server* variable in the create connection command used to connect Replication Agent to the primary Replication Server.

The RS_source_ds parameter is *required*.

Example syntax

```
RS_source_ds=MVSA
```

Valid value

- The value of the RS_source_ds parameter must match the name of the primary data server in the Replication Server create connection command that LTM for MVS issues to connect the database containing the primary data to Replication Server.
- Maximum length: 30 characters.

Note Obtain your site's value for the RS_source_ds parameter from the Replication Agent Installation Worksheet. This value was recorded on the worksheet during installation.

RS_pw

Provides the password for RS_user, which is the user ID that LTM for MVS uses to log into the primary Replication Server.

The RS_pw parameter is *required*.

Example syntax

```
RS_pw=ltmdevrs_pw
```

Valid values

- # (blank space)
Setting this value to a blank space inserts a null password.
- Change this value for your site.
- Maximum length: 30 characters.

Note Obtain your site's value for the RS_pw parameter from the Replication Agent Installation Worksheet in the Replication Agent for DB2 UDB *Installation Guide* for z/OS. This value should have been recorded on the worksheet during installation.

RS_user

Identifies the Replication Server user ID that LTM for MVS uses to log in to the primary Replication Server. This user must have connect source permission on Replication Server.

The RS_user parameter is *required*.

Example syntax

```
RS_user=ltmdevrs
```

Valid value

- A valid Replication Server user ID

- Maximum length: 30 characters

Note Obtain your site's value for the RS_user parameter from the Replication Agent Installation Worksheet in the Replication Agent for DB2 UDB *Installation Guide* for z/OS. This value should have been recorded on the worksheet during installation.

RSHost

The DNS name of the platform on which Replication Server resides. RSHost overrides the Replication Server hostname parameter in the SYGWXCPH module.

Example syntax

```
RSHost=perro
```

Valid values

- The name used must be a valid DNS name.

RSIPAddress

The RSIPAddress parameter overrides the Rep Server IP Address in the SYGWXCPH module.

In order to use this override parameter, the TCPName and RSPort parameters must also be specified.

The RSIPAddress parameter is not required.

The RSIPAddress and RSPort parameters must be commented out or deleted from the configuration file to use the entries in the SYGWXCPH module.

Example syntax

```
RSIPAddress=nnn.nnn.nnn.nnn
```

Default value

Defaults to the value of the IP Address specified for the RS machine name configuration value that has been encoded in the SYGWXCPH module.

Valid values

The series of 4 *nnn* strings must be replaced by values from 0 to 255, and the four numbers separated by periods must represent the IP Address of the machine specified in the RS configuration parameter. If

`RSIPAddress=usehost`, `RSHost` is used to access Replication Server.

RSPort

The `RSPort` parameter overrides the Rep Server port number in the SYGWXCPH module.

In order to use this override parameter, the `TCPName` and `RSIPAddress` parameters must also be specified.

The `RSPort` parameter is not required.

The `RSIPAddress` and `RSPort` parameters must be commented out or deleted from the configuration file to use the entries in the SYGWXCPH module.

Example syntax

```
RSPort=nnnnn
```

Default value

Defaults to the value of the Rep Server port number specified for the RS machine name configuration value that has been encoded in the SYGWXCPH module.

Valid values

The port number on which the Rep Server specified in the RS configuration parameter is listening must replace the *nnnnn* string.

RSSDCsetname

The character set name used by the Replication Server to which Replication Agent connects.

The default value is iso_1. Use RSSDCsetname if the charset of Replication Server is not iso_1.

Example syntax

```
RSSDCsetname=cp850
```

Default value

- iso_1

RSSD_database

Provides the name of the database within the Adaptive Server that contains the Replication Server System Database (RSSD) for the primary Replication Server.

The RSSD_database parameter is *required* if you set the value of the Use_repdef parameter to Y.

LTM for MVS *ignores* the value of the RSSD_database parameter if you set the value of the Use_repdef parameter to N.

Example syntax

```
RSSD_database=rssd_name
```

Valid values

- The name of the Adaptive Server that contains the primary Replication Server's RSSD.

Comments

You must set the value of the Use_repdef parameter to Y to use the RSSD_database parameter.

RSSDHost

The DNS name of the Adaptive Server that contains the primary Replication Server RSSD. This parameter overrides the RSSDServer hostname parameter in the SYGWXCPH module.

Example syntax

```
RSSDHost=perro
```

Valid values

- The name used must be a valid DNS name.

RSSD_pw

Provides the password for the Adaptive Server user ID specified in the RSSD_user parameter value.

The RSSD_pw parameter is *required* if you set the value of the Use_repdef parameter to Y.

LTM for MVS *ignores* the value of the RSSD_pw parameter if you set the value of the Use_repdef parameter to N.

Example syntax

```
RSSD_pw=password
```

Valid values

- Password of the Adaptive Server user ID specified in the RS_user parameter value
- # (blank space)

Setting this value to a blank space inserts a null password.

RSSD_server

Provides the name of the Adaptive Server that contains the primary Replication Server's RSSD.

The `RSSD_server` parameter is *required* if you set the value of the `Use_repdef` parameter to Y.

LTM for MVS *ignores* the value of the `RSSD_server` parameter if you set the value of the `Use_repdef` parameter to N.

Example syntax

```
RSSD_server=sql_server_name
```

Valid value

- The value of the `SERVERNAME` variable in the SYGWHOST macro entry for the Adaptive Server that contains the primary Replication Server's RSSD.

Comments

If the value of the `Use_repdef` parameter is set to Y, you must specify a value for the `RSSD_server` parameter.

Note Obtain your site's value for the `RSSD_server` parameter from the Replication Agent Installation Worksheet. This value should have been recorded on the worksheet during installation.

RSSD_user

Provides the identifier that Replication Agent uses to log on to the Adaptive Server that contains the primary Replication Server RSSD. This user must have permission to perform selects against the Adaptive Server.

The `RSSD_user` parameter is *required* if you set the value of the `Use_repdef` parameter to Y.

LTM for MVS *ignores* the value of the `RSSD_user` parameter if you set the value of the `Use_repdef` parameter to N.

Example syntax

```
RSSD_user=sql_server_user
```

Valid value

- The user ID of the Adaptive Server user who has permission to perform selects against the Adaptive Server RSSD.

RSSDIPAddress

The RSSDIPAddress parameter overrides the IP Address for ASE server that has the RSSD database in the SYGWXCPH module.

In order to use this override parameter, the TCPName and RSSDPort parameters must also be specified.

The RSSDIPAddress parameter is not required.

LTM for MVS *ignores* the value of the RSSDIPAddress parameter if you set the value of the Use_repdef parameter to N.

The RSSDIPAddress and RSSDPort parameters must be commented out or deleted from the configuration file to use the entries in the SYGWXCPH module.

Example syntax

```
RSSDIPAddress=nnn.nnn.nnn.nnn
```

Default value

Defaults to the value of the IP Address specified for the RSSD machine name configuration value that has been encoded in the SYGWXCPH module.

Valid values

The series of 4 *nnn* strings must be replaced by values from 0 to 255, and the four numbers separated by periods must represent the IP Address of the machine specified in the RS configuration parameter.

If RSSDIPAddress=usehost, RSSDHost is used to access Adaptive Server.

RSSDPort

The RSSDPort parameter overrides the port number for the ASE server that

has the RSSD database in the SYGWXCPH module.

In order to use this override parameter, the TCPName and RSSDIPAddress parameters must also be specified.

The RSSDIPAddress parameter is not required.

LTM for MVS *ignores* the value of the RSSDPort parameter if you set the value of the Use_repdef parameter to N.

The RSSDIPAddress and RSSDPort parameters must be commented out or deleted from the configuration file to use the entries in the SYGWXCPH module.

Example syntax

```
RSSDPort=nnnnn
```

Default value

Defaults to the value of the Rep Server port number specified for the RS machine name configuration value that has been encoded in the SYGWXCPH module.

Valid values

The port number on which the Rep Server specified in the RS configuration parameter is listening must replace the *nnnnn* string.

SetTruncPoint

The SetTruncPoint parameter determines how often the Log Extract requests a truncation point from the Rep Server.

The SetTruncPoint parameter is not required.

Example syntax

```
SetTruncPoint =99999
```

Default value

47000

Valid values

1 to 99999

Note A low SetTruncPoint value can cause extra CPU usage and network traffic.

Stop_on_error

Controls whether the detection of specific errors shuts down LTM for MVS.
The Stop_on_error parameter is *optional*.

Example syntax

Stop_on_error=N

Default value

- N

Valid values

- N
LTM for MVS continues processing despite detection of specific errors.
LTM for MVS logs errors in the *LTMLOG* file.
- Y
 - Shuts down LTM for MVS upon detection of specific errors.
 - LTL is sent to *LTLOUT* without passing data to Replication Server.

Comments

Use this parameter to troubleshoot specific errors, including invalid replication definitions. Set the value of this parameter to Y to assist in troubleshooting Replication Extract or a user exit application you created.

Table A-3 shows the behavior of LTM for MVS when it detects specific error conditions.

Table A-3: Error conditions that shut down LTM for MVS

Message number	Condition	How Stop_on_error value affects LTM for MVS
14021	Invalid login. Note This message appears only when using Replication Server 11.x.	LTM for MVS shuts down regardless of Stop_on_error value.
14025	LTM for RS_source_ds. RS_source_db is not configured to connect.	LTM for MVS shuts down regardless of Stop_on_error value.
14027	LTM for RS_source_ds. RS_source_db is already connected.	LTM for MVS shuts down regardless of Stop_on_error value. LTM for MVS retries the connection once.
14039	Log Transfer for LTM for RS_source_ds. RS_source_db is suspended. The connect source is refused because Log Transfer is suspended.	LTM for MVS shuts down regardless of Stop_on_error value.
20014	Invalid login.	LTM for MVS shuts down regardless of Stop_on_error value.
32020	Table <i>table_name</i> is not defined.	LTM for MVS does not shut down; retries connection regardless of Stop_on_error value.
32032	Replication definition does not exist for table <i>table_name</i> .	LTM for MVS shuts down only when Stop_on_error=Y.

Upon detecting other errors, LTM for MVS continuously attempts to retry the connection to Replication Server.

TableHandler

Specifies the program that processes the LTMOBJECTS table in DB2. By default, this program is LTMINFO. LTMINFO gets its information from the DB2 database. In a replication toolkit implementation of Replication Agent, you can substitute another program that builds the table from a data source other than DB2.

Example syntax

TableHandler=LTMINFO

Default value

- LTMINFO

TCPName

The TCPName parameter overrides the TCPName value in the *SYGWXCPH* module.

To use this override, the RSIPAddress and RSPort, or RSSDIPAddress and RSSDPort parameters must also be specified.

The TCPName parameter is not required.

Example syntax

TCPName=TCPIP

Default value

Defaults to the value of the TCPName specified for the RS machine name configuration value that has been encoded in the *SYGWXCPH* module.

Valid values

This name must represent the name of a TCPIP subsystem name that is currently active in the z/OS system when the Rep Agent is started.

Support_DB2_comp_rec

With the value of the Support_DB2_comp_rec parameter set to Y, Replication Agent suppresses DB2 delete compensation records from the transaction operation information sent to Replication Server.

Default value

- N

Valid values

- N
LTM for MVS passes DB2 delete compensation records to Replication Server.
- Y
LTM for MVS ignores DB2 delete compensation records. Delete compensation records are not passed to Replication Server.

Suppress_col_names

The Suppress_col_name parameter determines whether LTM for MVS suppresses column names from the LTL that is sent to Replication Server. You can use this parameter to reduce network traffic.

The Suppress_col_name parameter is *optional*.

Example syntax

Suppress_col_names=N

Default value

- N

Valid values

- N
Includes column names in the LTL that LTM for MVS sends to Replication Server.
- Y

Suppresses column names from the LTL that LTM for MVS sends to Replication Server.

Warning! If you set the value of Suppress_col_names to Y, be sure that the order of the columns in your replication definition exactly matches the order of your DB2 columns. Failure to do so can result in a mismatch between your source and replicate data.

Comments

If you set the value of Suppress_col_names to Y, you must set the values of the following parameters as follows:

- Minimal_cols=Y
- Use_repdef=Y

Performance and tuning considerations

Setting the value of Suppress_col_names to Y, with Minimal_cols set to Y and Use_repdef set to Y, can dramatically increase throughput.

Time_conv_default

Performs two functions:

- Controls the value DateTime_conv_err supplies in columns that encounter date conversion errors when the DateTime_conv_err parameter is set to Datetime.
- Supplies time values during conversion of LTM for MVS date to Adaptive Server datetime format.

The Time_conv_default parameter is *optional*.

Example syntax

```
Time_conv_default=00:00:00
```

Default value

- 00:00:00

Valid values

- Any valid ISO time format value (*HH:MM:SS*, where *HH*=hour, *MM*=minute, and *SS*=second)

See “Working with Datatype Conversions” in the Replication Agent for DB2 UDB *User’s and Troubleshooting Guide* for z/OS for examples of valid date, time, and timestamp formats.

Time_in_char

Controls whether LTM for MVS time columns are sent as char(8) fields or converted to Adaptive Server datetime format.

The Time_in_char parameter is *optional*.

Example syntax

```
Time_in_char=N
```

Default value

- N

Valid values

- N
Causes LTM for MVS to convert LTM for MVS time columns to Adaptive Server datetime format.
- Y
Causes LTM for MVS to send unmodified time columns as char(8) fields (format: *HH:MM:SS*) instead of converting them to Adaptive Server datetime format.

See Chapter 6, “Working with datatype conversions” in the Replication Agent for DB2 UDB *User’s and Troubleshooting Guide* for z/OS for examples of valid date, time, and timestamp formats.

Timestamp_in_char

Controls whether unmodified timestamp columns are sent as char(26) fields or converted to Adaptive Server datetime format.

The Timestamp_in_char parameter is *optional*.

Example syntax

```
Timestamp_in_char=N
```

Default value

- N

Valid values

- N
LTM for MVS converts LTM for MVS timestamp columns to Adaptive Server datetime format. The datetime format contains only milliseconds, whereas timestamp contains microseconds.
- Y
LTM for MVS sends timestamp columns as char(26) fields (example: 1994-01-01-10.02.30.006123) instead of being converted to Adaptive Server datetime format.

Comments

LTM for MVS timestamp data has six digits of precision. Set the value of Timestamp_in_char to Y to prevent precision loss during conversion of LTM for MVS timestamp data to Adaptive Server datetime format. Use when LTM for MVS timestamp data needs to be replicated and to remain unique.

See Chapter 6, “Working with datatype conversions” in the Replication Agent for DB2 UDB *User’s and Troubleshooting Guide* for z/OS for examples of valid date, time, and timestamp formats.

trace=Calls

Traces Replication Extract's calls to the Replication API and sends the output to the *SYSPRINT* file.

Warning! Run this trace only on the advice of Sybase Technical Support.

The trace=1,4 parameter is *optional*.

Example syntax

To enable this facility, insert the statement trace=Calls in the LTM for MVS configuration file.

Note Be sure to comment out trace statements in the configuration file after you obtain the desired information. Traces require significant MVS resources and can seriously impair LTM for MVS performance.

Comments

This trace can be dynamically enabled or disabled from the operator console, using these commands:

```
F REPJOB,C,TRACE=Calls
F REPJOB,C,TRACEOFF=Calls
```

where *REPJOB* is the jobname of the Replication Agent.

See also

- Chapter 2, “Managing Replication Agent”

trace=LTLebcdic

Writes Log Transfer Language (LTL) that is passed to Replication Server to the *LTLOUT* trace file.

The trace=1,11 parameter differs from the trace=1,31 parameter in that it translates the *LTLOUT* file data into EBCDIC, while trace=1,31 translates the *LTLOUT* file data into ASCII.

The trace=1,11 parameter is *optional*.

Example syntax

To enable this trace facility, insert the statement `trace=1,11` in the LTM for MVS configuration file.

Note Be sure to comment out trace statements in the configuration file after you obtain the desired information. Traces require significant MVS resources and can seriously impair LTM for MVS performance.

Comments

This trace can be dynamically enabled or disabled from the operator console, using these commands:

```
F REPJOB,C,TRACE=LTLbcdoc
F REPJOB,C,TRACEOFF=LTLbcdic
```

where `REPJOB` is the jobname of the Replication Agent.

See also

- Chapter 2, “Managing Replication Agent”

trace=LTLascii

Starts a trace that sends data passed to Replication Server to the *LTLOUT* file. The user can then determine whether LTM for MVS is functioning properly by examining the *LTLOUT* file.

The `trace=1,31` parameter differs from the `trace=1,11` parameter in that it translates the *LTLOUT* file data into ASCII, while `trace=1,11` translates the *LTLOUT* file data into EBCDIC.

The `trace=LTLascii` parameter is *optional*.

Example syntax

To enable this trace facility, insert the statement `trace=1,31` in the LTM for MVS configuration file.

Comments

This trace may be dynamically enabled or disabled from the operator console, using these commands:

```
F REPJOB,C,TRACE=LTLascii
F REPJOB,C,TRACEOFF=LTLascii
```

where `REPJOB` is the jobname of the Replication Agent.

trace=QID,*n*

Traces the next *n* QIDs processed by Replication Extract. The output is sent to the `SYSPRINT` file. `trace=QID` is optional.

Warning! Run this trace only on the advice of Sybase Technical Support.

Example syntax

```
trace=QID,25
```

traces the first 25 QIDs processed. To enable this facility, insert the statement `trace=QID` into the LTM for MVS file.

Note Be sure to comment out trace statements in the configuration file after you get the information you need. Traces require significant MVS resources and can seriously impair LTM for MVS performance.

Comments

This trace can also be turned on and off dynamically from the MVS console.

Use_repdef

With TCP/IP connectivity, allows LTM for MVS to send LTL to Replication Server that contains only the columns specified in the replication definition.

The `Use_repdef` parameter is *optional*.

Example syntax

Use_repdef=N

Default value

- N

Valid values

- N

LTM for MVS sends LTL to Replication Server that contains all DB2 columns defined in your primary table.

- Y

With TCP/IP connectivity, LTM for MVS logs in to the Adaptive Server that contains the RSSD for the primary Replication Server. LTM for MVS then obtains the replication definition and includes only the columns specified in the replication definition in the LTL it sends to Replication Server.

Note Because LTM for MVS logs in to the Adaptive Server that contains the RSSD for the primary Replication Server, the Adaptive Server user ID used by LTM for MVS must have permissions to perform selects against the Adaptive Server RSSD. This Adaptive Server user ID, specified by the value of the `RSSD_user` parameter, must have a minimum of `SELECT` privileges.

If you set the value of `Use_repdef` to Y and use TCP/IP, you *must* do the following:

- Set the value of `Minimal_cols` to Y.
- Add a `SYGWHOST` macro entry for the Adaptive Server that contains the RSSD for the primary Replication Server. The `SYGWHOST` macro entry must contain valid values for this Adaptive Server in the `SERVERNAME`, `IPADDR`, and `LSTNPORT` parameters.

Note As an alternative, these values can be specified in the `RSSDIPAddress` and `RSSDPort` parameters in the LTM configuration file.

- Provide valid values for each of the following configuration parameters:

RSSD_database

RSSD_pw

RSSD_server

RSSD_user

Performance and tuning considerations

If you specify only a subset of the tables in the replication definition, and the tables have long column names, setting the value of Use_repdef to Y can help reduce network traffic and can therefore improve performance when you use TCP/IP.

User_exit

Supplies the name of your user exit to Replication Agent upon start-up.

The User_exit parameter is *optional*.

Example syntax

```
User_exit=RADAEX1
```

Default value

- Null

Valid values

- The value of the User_exit parameter must be identical to the name of your user exit module and is restricted to the following:
 - Must be a maximum of eight characters, all uppercase

Note When processing the configuration file, Replication Agent automatically changes the case of the User_exit parameter value to uppercase.

- Must begin with an alphabetic character
- Must be a valid module name on MVS
- Must be the name of the user exit module located in your *LINKLIB*

Comments

If you have a user exit, you must specify the name in the User_exit configuration parameter; otherwise the system will not load it.

Replication Agent Datasets

Replication Agent for DB2 UDB for z/OS version 15.0, which includes the LTM for MVS and Replication Extract components, is supplied on the Replication Agent distribution CD. This appendix describes the characteristics and contents of the Replication Agent datasets that result on the mainframe after the installation process.

Replication Agent datasets

This section contains information about Replication Agent datasets and dataset members.

DBRMLIB contents

The *hlq.DBRMLIB* file contains Replication Extract database request modules necessary for the DB2 plan.

DOCS contents

The following table shows the contents of the *hlq.DOCS* dataset.

Table B-1: DOCS library contents

Member name	Contents
<i>AMBLIST</i>	Sample JCL for utility. Use as directed by Sybase Technical Support.
<i>CODEPAGE</i>	Table of values for Replication Agent. Codepage= and RS-ccsid= are the parameters.
<i>DSNJU004</i>	Job to print the contents of the bootstrap datasets.
<i>RADAEX1</i>	Example user exit.
<i>SETRPERR</i>	Sample SPUFI input for updating the ERROR_CODE column of the LTMOBJECTS Replication Agent system table with an error code of 20.

JCL contents

The following table shows the contents of the *hlq.JCL* dataset.

Table B-2: JCL library contents

Member name	Contents
<i>ALLOC</i>	Job to allocate permanent Replication Agent datasets and define generation data groups for Replication Agent logs.
<i>GRANT</i>	Grants BIND and EXECUTE permissions to LTMADMIN user ID for the log extract plan.
<i>LTMBIND</i>	Sample JCL for binding the log extract plan.
<i>LTMCNFG</i>	Sample LTM for MVS configuration file.
<i>LTMPROC</i>	Sample JCL procedure for running Replication Agent.
<i>PINGRS</i>	Sample JCL to run PINGRS to test connectivity between Replication Agent and Replication Server.
<i>RUNLTM</i>	Sample JCL to run <i>LTMPROC</i> .
<i>SQLINIT</i>	Sample SPUFI input to create and grant permissions to <i>LTMOBJECTS</i> .

MACLIB contents

The following table shows the contents of the *hlq.MACLIB* dataset.

Table B-3: MACLIB library contents

Member name	Contents
<i>APIXITCA</i>	API exit communications area for <i>RADAEX1</i> .
<i>LECMDEXT</i>	<i>LECMD</i> copybook for sample user exit (<i>RADAEX1</i>).
<i>SYGW1</i>	Data for compiling <i>SYGWXCPH</i> .
<i>SYGW2</i>	Data for compiling <i>SYGWXCPH</i> .
<i>SYGW3</i>	Data for compiling <i>SYGWXCPH</i> .
<i>SYCTCUST</i>	Macro for compiling <i>SYGWXCPH</i> .
<i>SYGWDRIV</i>	Macro for compiling <i>SYGWXCPH</i> .
<i>SYGWHOST</i>	Macro for compiling <i>SYGWXCPH</i> .
<i>SYGWMCXL</i>	Macro for compiling <i>SYGWXCPH</i> .

RA.LINKLIB contents

The *hlq.LINKLIB* contains all of the executable modules for Replication Agent for DB2 UDB for z/OS version 15.0.

LTMLOC

The *hlq.LTMLOC* file contains error messages in U.S. English that you can translate into the language used at the installation site.

Additional datasets

The following table shows additional datasets installed with Replication Agent.

Table B-4: Additional datasets

Dataset	Contents
<i>TRUNCPT</i>	Contains the origin queue ID of the last update successfully received by Replication Server.

Dataset	Contents
<i>LTMLOG</i>	Replication Agent messages and errors.

Upgrading Your Replication Agent Software

This appendix contains the following tasks and topics:

Topic	Page
Migrating to Replication Agent for DB2 UDB 15.0 software	90
Additional migration considerations	94
Understanding the LTM Locator format	95

For assistance with restoring earlier versions of Replication Agent software, contact Sybase Technical Support.

Before you begin

- Complete the tasks outlined in Chapter 1, “Preparing for Installation.”
- Have a Replication Agent Installation Worksheet at hand while you work through the steps in this Appendix.
- Ensure that only the LTMADMIN user ID performs the Replication Agent installation. The LTMADMIN user ID, which you record in section 1 of the Replication Agent Installation Worksheet, must keep the authorizations or permissions granted, without regard for personnel changes.
- If you are upgrading to Replication Agent for DB2 UDB 15.0, verify that STEPLIB for the LTMMGR program contains the DB2 installation library *DB2.SDSNLOAD*.

See also

- The Replication Agent for DB2 UDB *Release Bulletin* for z/OS.
- Chapter 3, “Replication Agent Installation Worksheet.”

Migrating to Replication Agent for DB2 UDB 15.0 software

Follow the procedures in this section only when upgrading to Replication Agent for DB2 UDB for z/OS version 15.0. Sybase recommends that you perform this procedure during a period of low activity.

If you have not installed and used earlier versions of Replication Agent software before, do *not* use this procedure.

Warning! You must perform the tasks contained in this section AFTER you complete your installation of Replication Agent for DB2 UDB for z/OS version 15.0 but BEFORE you start Replication Agent in your production environment.

❖ To upgrade Replication Agent software to version 15.0 from 12.6

- 1 To prevent updates to the DB2 primary tables, use the following syntax:

```
START DATABASE (database_name) SPACENAM (space_name) ACCESS (RO)
```

- 2 Stop the currently installed Replication Agent using the instructions in the Replication Agent for DB2 UDB *User's and Troubleshooting Guide* for z/OS.
- 3 Shut down Replication Server.
- 4 On the Adaptive Server containing the RSSD for the primary Replication Server, issue the `rs_zeroltm` stored procedure using the following syntax:

```
rs_zeroltm RS_source_ds,RS_source_db
```

where the values for `RS_source_ds` and `RS_source_db` match the values you recorded in sections 8e and 8f of the Installation Worksheet.

- 5 Use ISPF to edit the `hlq.TRUNCPT` data set. Edit columns 1 through 36 to contain only binary zeros.
- 6 Review the configuration parameter values from the version of Replication Agent that you used most recently.
 - a Change the values of the parameters in the Replication Agent for DB2 UDB for OS/390 version 15.0 configuration file, located in the `LTMCFG` member of the `hlq.JCL` library, to match the values you used in the most recent version of Replication Agent.

- b Increase the value of the GenID parameter by 1 in the LTM configuration file to prevent QID sequence errors.
- 7 Start Replication Server.
- 8 Start the 15.0 version of Replication Agent using the instructions in the *Replication Agent for DB2 UDB User's and Troubleshooting Guide for z/OS*.
- 9 Resume updates to the primary tables on DB2.

You can use the following example syntax:

```
START DATABASE (database_name) SPACENAM (space_name) ACCESS (RW)
```

This command restores read and write access to the DB2 database.

Replication Agent begins processing the log at the point where it stopped processing.

❖ **To upgrade Replication Agent software to version 15.0 from 12.0 or 12.5**

- 1 To prevent updates to the DB2 primary tables, use the following syntax:

```
START DATABASE (database_name) SPACENAM (space_name) ACCESS (RO)
```

- 2 Allow the currently installed Replication Agent to process to the end of the log.

To determine whether processing has reached the end of the log, issue the XSTATUS command from the MVS operator console. This command displays the *hlq.PDR.PARMLIB* parameter values for Replication Extract version 12.0 or 12.5.

Use the following information to evaluate the values of the following parameters:

- *HI extracted RBA*. The relative byte address (RBA) of the last DB2 log record processed by Replication Extract. It uniquely identifies the position at which Replication Extract is processing the DB2 log.
 - *DB2 HI written RBA*. The RBA of the last record that DB2 wrote to the log. Compare this value with the high-extracted RBA to determine where Replication Extract is in relationship to the end of the DB2 log.
- 3 Stop the currently installed Replication Agent using the instructions in the *Replication Agent for DB2 UDB User's and Troubleshooting Guide for z/OS*.
 - 4 Shut down Replication Server.

- 5 On the Adaptive Server containing the RSSD for the primary Replication Server, issue the `rs_zerolrm` stored procedure using the following syntax:

```
rs_zerolrm RS_source_ds,RS_source_db
```

where the values for `RS_source_ds` and `RS_source_db` match the values you recorded in sections 8e and 8f of the Replication Agent Installation Worksheet.

- 6 Use ISPF to edit the `hlq.TRUNCPT` data set. Edit columns 1 through 36 to contain only binary zeros.
- 7 Review the configuration parameter values from the version of Replication Agent that you used most recently.
 - a Change the values of the parameters in the Replication Agent for DB2 UDB for z/OS version 15.0 configuration file, located in the `LTMCFG` member of the `hlq.JCL` library, to match the values you used in the most recent version of Replication Agent.

Note Replication Agent 15.0 uses an IBM-supplied API to access the DB2 log. The values that previously were in `hlq.PDR.PARMLIB` are now parameters in the LTM configuration file.

- b Use the following chart to correlate the parameters from the most recent release of Replication Agent that you have used with the new parameter names. The new parameters use the same values as those prior to version 15.0, except where noted.

Parameters in <code>hlq.PDR.PARMLIB</code> , prior to version 15.0	Parameters in LTM configuration file, version 15.0
SETUP00	
SSID	Log_identifier
LOADLIBS	No equivalent parameter
PLANS00	
PDRPLANS	LTMPlan
PDR	
REPL_ERROR: TERM or MSG	LogExtractError: valid values are either terminate or message
POLL_INTVL	PollInterval
CI_COUNT	CIMax
ARCHIVE	Not used
BUFFERS	Buffers
LOGCOPY2	No equivalent parameter

Parameters in hlq.PDR.PARMLIB, prior to version 15.0	Parameters in LTM configuration file, version 15.0
TRACE	LogTrace
GENID	GenID
SET_TRUNC	SetTruncPoint
READER_TYPE (only applies if RA used in SMO)	SharingType (only applies to RA used in DB2 Data Sharing environments)
READER_NAME (only applies if READER_TYPE = SMO)	SharingName (only applies to RA used in DB2 Data Sharing environments)

The Adaptive Server Enterprise server IP address and port number can be specified in the LTM configuration file with parameters RSIPAddress and RSPort. If these values, along with the parameter TCPName are specified, they will override the entry in the SYGWXCPH for the server name set as RS= in the LTM configuration file.

The Replication Server IP address and port number can be specified in the LTM configuration file with parameters RSSDIPAddress and RSSDPort. If these values, along with the parameter TCPName are specified, they will override the entry in the SYGWXCPH for the servername set as RSSD_server= in the LTM configuration file. This is only valid if Use_repdef=Y.

If the specification for the IP address and port number are to be obtained from the SYGWXCPH file, RSIPAddress, RSPort, RSSDIPAddress, RSSDPort, and TCPName should not be included in the LTM configuration file.

Replication Agent for DB2 UDB for z/OS version 15.0 does not verify that the name specified in the RS= parameter and the RSSD_server= parameter match what the Replication Agent is actually connecting to.

- c Increase the value of the GenID parameter by 1 in the LTM configuration file to prevent QID sequence errors.
- 8 Start Replication Server.
- 9 Start the 15.0 version of Replication Agent using the instructions in the Replication Agent for DB2 UDB *User's and Troubleshooting Guide* for z/OS.
- 10 Resume updates to the primary tables on DB2.

You can use the following example syntax:

```
START DATABASE (database_name) SPACENAM (space_name) ACCESS (RW)
```

This command restores read and write access to the DB2 database.

Replication Agent begins processing the log at the point where it stopped processing.

See also

- Chapter 3, “Replication Agent Installation Worksheet”
- Appendix A, “LTM for MVS Configuration Parameters,” for information about editing the LTM configuration file
- Replication Server *Reference Manual* for information about the `rs_zeroltm` stored procedure

Additional migration considerations

This section addresses the new LTI version, which can affect migration from earlier versions of Replication Agent:

New LTI version

Replication Agent for DB2 UDB 15.0 for z/OS supports extensible limits through use of the new `Long_varchar` configuration parameter for replication to Replication Server 15.0. If you attempt to replicate to a Replication Server 12.6 or earlier using `Long_varchar=Y`, you might receive the following LTM for MVS error message:

```
01133: "Long_varchar forced to 'N' - Rep Server does not  
support Long_varchar."
```

If you encounter this error message for Replication Server 12.5 and later, use the following procedure.

❖ Executing the `rs_del_locator` stored procedure (12.5 and later)

- 1 On the Adaptive Server containing the primary Replication Server RSSD, execute the `rs_del_locator` stored procedure using the following example syntax:

```
rs_del_locator RS_source_ds, RS_source_db
```

where the values for `RS_source_ds` and `RS_source_db` match the values you recorded on the Replication Agent Installation Worksheet.

The `rs_del_locator` stored procedure deletes some rows from the `rs_locator` table for the specified database connection. For more information on this and other stored procedures, see the *Replication Server Reference Manual*.

- 2 Restart the Replication Server.

If you encounter this error message for Replication Server 12w.1 and earlier, use this procedure.

❖ **Executing the `rs_del_locator` stored procedure (12.1 and earlier)**

- 1 Use `isql` to access the Adaptive Server containing the primary Replication Server RSSD.

- 2 Obtain the `dbid` for the connection using the following command:

```
select dbid from rs_databases where dsname =  
"RS_source_ds" and dbname = "RS_source_db"
```

`RS_source_ds` and `RS_source_db` are from the LTM configuration file.

- 3 Using the `dbid` obtained in step 2, ensure there is an "upgrade" record for this connection:

```
select * from rs_locator where sender = dbid and type  
= "U"
```

- 4 If the record exists, delete it using the following:

```
delete from rs_locator where sender = dbid and type  
= "U"
```

- 5 Restart the Replication Server.

Understanding the LTM Locator format

The LTM Locator is the QID of the most recent transaction operation that Replication Server successfully saved in its inbound queue.

Replication Server provides the LTM Locator to Replication Agent when Replication Agent issues a get truncation command to Replication Server.

Replication Agent issues a get truncation command to update its LTM Locator value during the following events:

- Start-up
- Recovery processing

- When the number of messages sent to the Replication API for processing exceeds the number of messages specified in the value of the `API_QID_request_interval` configuration parameter
- When Replication Extract requests that LTM for MVS obtain a new LTM Locator value

Replication Agent maintains a copy of the LTM Locator in the data set pointed to by the *LTMTRUNC DD* name in the Replication Agent execution JCL.

Replication Agent LTM Locator formats

Use the tables in this section to verify that your LTM Locator format is correct after you upgrade to Replication Agent for DB2 UDB for z/OS version 15.0.

Following is an example of the QID received from Replication Server upon start-up:

```
0001B0C79D60B866000000001B0C79D60B2B30001000010C8AC0C00
```

Table C-1 shows the format of the LTM Locator in the current version of Replication Agent.

Table C-1: LTM Locator format in current version of Replication Agent

Length (bytes)	Field description
2	Database generation ID
6	• RBA or LRSN of the current non-utility transaction • RBA or LRSN of the beginning of the next transaction in a utility operation
2	• Counter in a data-sharing environment (used to avoid duplication in the sysplex) • Counter for utility transactions • Hexadecimal zeros (x'00') any other time
2	• Member identifier used in a data-sharing environment • Hexadecimal zeros (x'00') any other time
6	URID* of the oldest open operation
2	• Member identifier associated with the oldest open operation in a data-sharing environment • Hexadecimal zeros (x'00') any other time
6	URID* identifying the beginning of the current operation
1	Type of record: • (x'00') operation control record • (x'01') insert, update, or delete transaction • (x'02') set truncation point • (x'11') insert, update, or delete compensation transaction
9	Reserved for future use

*The URID is an RBA value. See the **Glossary** in the *Replication Agent for DB2 UDB User's and Troubleshooting Guide* for a definition.

See also

- Appendix A, “LTM for MVS Configuration Parameters,” for more information about the API_QID_request_interval parameter

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