Oracle® GoldenGate

Installing and Configuring Oracle GoldenGate for NonStop SQL/MX

12*c* (12.1.2)

E29230-01

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Contains instructions for installing and performing initial setup of Oracle GoldenGate for NonStop SQL/MX databases.

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Oracle GoldenGate Installing and Configuring Oracle GoldenGate for NonStop SQL/MX, 12*c* (12.1.2)

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Contents

Preface

With the Oracle GoldenGate for NonStop SQL/MX databases, you can replicate data to and from supported NonStop SQL/MX versions or between a NonStop SQL/MX database and a database of another type. Oracle GoldenGate for NonStop SQL/MX supports data filtering, mapping, and transformation unless noted otherwise in this documentation.

This guide helps you get started with installing Oracle GoldenGate on a NonStop SQL/MX database system and performing initial setup. Refer to the other Oracle GoldenGate documentation listed in this Preface for additional information to configure, run, and manage your Oracle GoldenGate environment.

Audience

This guide is intended for installers, database administrators, and system administrators who are installing, configuring and running Oracle GoldenGate.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Related Documents

The Oracle GoldenGate documentation set includes the following components:

HP NonStop Platform

- *Reference for Oracle GoldenGate for Mainframe for HP NonStop Guardian*
- *Administering Oracle GoldenGate for Mainframe for HP NonStop Guardian*

Windows, UNIX, and Linux Platforms

- *Installing and Configuring Oracle GoldenGate for DB2 for i*
- *Installing and Configuring Oracle GoldenGate for DB2 LUW*
- *Installing and Configuring Oracle GoldenGate for DB2 z/OS*
- *Installing and Configuring Oracle GoldenGate for SQL Server*
- *Installing and Configuring Oracle GoldenGate for MySQL*
- *Installing and Configuring Oracle GoldenGate for NonStop SQL/MX*
- *Installing and Configuring Oracle GoldenGate for Oracle TimesTen*
- *Installing and Configuring Oracle GoldenGate for Oracle Database*
- *Installing and Configuring Oracle GoldenGate for PostgreSQL*
- *Installing and Configuring Oracle GoldenGate for SQL Server*
- *Installing and Configuring Oracle GoldenGate for Sybase*
- *Installing and Configuring Oracle GoldenGate for Teradata*
- *Administering Oracle GoldenGate for Windows and UNIX*
- *Reference for Oracle GoldenGate for Windows and UNIX*
- *Logdump Reference for Oracle GoldenGate*
- *Upgrading Oracle GoldenGate for Windows and UNIX*
- *Error Messages Reference for Oracle GoldenGate for Windows and UNIX*

Other Oracle GoldenGate Products

- *Administering Oracle GoldenGate Adapters*
- *Administering Oracle GoldenGate Director*
- *Administering Oracle GoldenGate Monitor*
- *Administering Oracle GoldenGate Veridata*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, such as “From the File menu, select **Save**." Boldface also is used for terms defined in text or in the glossary.

Convention	Meaning
italic `italic`	Italic type indicates placeholder variables for which you supply particular values, such as in the parameter statement: `TABLE table_name`. Italic type also is used for book titles and emphasis.
`monospace` `MONOSPACE`	Monospace type indicates code components such as user exits and scripts; the names of files and database objects; URL paths; and input and output text that appears on the screen. Uppercase monospace type is generally used to represent the names of Oracle GoldenGate parameters, commands, and user-configurable functions, as well as SQL commands and keywords.
UPPERCASE	Uppercase in the regular text font indicates the name of a utility unless the name is intended to be a specific case.
{ }	Braces within syntax enclose a set of options that are separated by pipe symbols, one of which must be selected, for example: `{option1 | option2 | option3}`.
[ ]	Brackets within syntax indicate an optional element. For example in this syntax, the `SAVE` clause is optional: `CLEANUP REPLICAT group_name [, SAVE count]`. Multiple options within an optional element are separated by a pipe symbol, for example: `[option1 | option2]`.

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System Requirements and Preinstallation Instructions

This chapter contains the requirements for the system and database resources that support Oracle GoldenGate. This chapter contains these sections:

1.1 Supported Platforms

To find the most recent matrix of Oracle GoldenGate builds for specific combinations of database version and operating system, log onto `http://support.oracle.com` and select the **Certifications** tab. For assistance, click **Tips for Finding Certifications**. An e-mail and password are required to enter this site.

1.2 Operating System Requirements

This section outlines the operating system resources that are necessary to support Oracle GoldenGate.

1.2.1 System Configuration

Install the Open System Services (OSS) environment.

1.2.2 Disk Requirements

Oracle GoldenGate must be installed on a physical disk drive, not on virtual disks that are maintained by NonStop SMF (Storage Management Foundation).

Assign the following free disk space:

- Approximately 200 MB for the compressed download file.
- Approximately 966 MB for the installation directory after the download is expanded. This requirement is per installation. For example, to install two builds of Oracle GoldenGate into two separate directories, allocate 1932 MB of space.

1.2.2.1 Other Disk Space Considerations

In addition to the disk space required for the files and binaries that are installed by Oracle GoldenGate, allow an additional 1 GB of disk space on any system that hosts the Oracle GoldenGate trail (or trails). A trail is a set of self-aging files that contain the working data at rest and during processing. You may need more or less than this amount, because the space that is consumed by the trails depends on the volume of data that will be processed. See the guidelines for sizing trails in *Administering Oracle GoldenGate for Windows and UNIX*.

1.2.2.2 Temporary Disk Requirements

By default, Oracle GoldenGate maintains memory data that it saves to disk as part of the memory management function in the `dirtmp` sub-directory of the Oracle GoldenGate installation directory. This directory can fill up quickly if there is a large transaction volume with large transaction sizes. To prevent I/O contention and possible disk-related Extract failures, dedicate a disk to this directory.

1.2.3 Memory Requirements

The amount of memory that is required for Oracle GoldenGate depends on the amount of data being processed, the number of Oracle GoldenGate processes running, the amount of RAM available to Oracle GoldenGate, and the amount of disk space that is available to Oracle GoldenGate for storing pages of RAM temporarily on disk when the operating system needs to free up RAM (typically when a low watermark is reached). This temporary storage of RAM to disk is commonly known as *swapping* or *paging* (herein referred to as *swapping*). Depending on the platform, the term *swap space* can be a swap partition, a swap file, a page file (Windows) or a shared memory segment (IBM i platforms).

Modern servers have sufficient RAM combined with sufficient swap space and memory management systems to run Oracle GoldenGate. However, increasing the amount of RAM available to Oracle GoldenGate may significantly improve its performance, as well as that of the system in general.

Typical Oracle GoldenGate installations provide RAM in multiples of gigabytes to prevent excessive swapping of RAM pages to disk. The more contention there is for RAM the more swap space that is used.

Excessive swapping to disk causes performance issues for the Extract process in particular, because it must store data from each open transaction until a commit record is received. If Oracle GoldenGate runs on the same system as the database, the amount of RAM that is available becomes critical to the performance of both.

RAM and swap usage are controlled by the operating system, not the Oracle GoldenGate processes. The Oracle GoldenGate cache manager takes advantage of the memory management functions of the operating system to ensure that the Oracle GoldenGate processes work in a sustained and efficient manner. In most cases, users need not change the default Oracle GoldenGate memory management configuration.

For more information about evaluating Oracle GoldenGate memory requirements, see the `CACHEMGR` parameter in *Reference for Oracle GoldenGate for Windows and UNIX*.

1.2.4 Storage for Oracle GoldenGate Trails

To prevent trail activity from interfering with business applications, assign a separate disk or file system to contain the trail files. These files are created during processing to store all of the data that is captured by Oracle GoldenGate. The default size can be changed during the configuration process. Trail files accumulate but can be purged

according to rules set with the PURGEOLDEXTRACTS parameter. You will specify the location of the trails when you configure Oracle GoldenGate. For more information about configuring trail files, see *Administering Oracle GoldenGate for Windows and UNIX*.

1.2.5 Network

The following network resources must be available to support Oracle GoldenGate.

- For optimal performance and reliability, especially in maintaining low latency on the target, use the fastest network possible and install redundancies at all points of failure.
- Configure the system to use TCP/IP services, including DNS. Oracle GoldenGate supports IPv4 and IPv6 and can operate in a system that supports one or both of these protocols.
- Configure the network with the host names or IP addresses of all systems that will be hosting Oracle GoldenGate processes and to which Oracle GoldenGate will be connecting. Host names are easier to use.
- Oracle GoldenGate requires some unreserved and unrestricted TCP/IP ports, the number of which depends on the number and types of processes in your configuration. See *Administering Oracle GoldenGate for Windows and UNIX* for details on how to configure the Manager process to handle the required ports.
- Keep a record of the ports that you assigned to Oracle GoldenGate. You will specify them with parameters when configuring the Manager process.
- Configure your firewalls to accept connections through the Oracle GoldenGate ports.

1.3 Database Requirements

This section descibes the operating database requirements for running Oracle GoldenGate for NonStop SQL/MX.

Section 1.3.1, "Database Configuration"

Section 1.3.2, "Database User for Oracle GoldenGate Processes"

Section 1.3.3, "SQL/MX Access Privileges"

1.3.1 Database Configuration

- On a source SQL/MX system, the Extract process uses a program named VAMSERV to capture transaction data from the audit trails. This program is placed into the installation subvolume when you install Oracle GoldenGate for NonStop SQL/MX. You will be prompted to install VAMSERV in the installation instructions in this guide.
- Oracle GoldenGate uses ODBC/MX to connect to the SQL/MX database. You may need to FUP DUP the ODBC/MX driver DLL to a location where the operating system will find it. This step is required every time the operating system is compiled, in case the new operating system includes a new version of the ODBC/MX.

1.3.2 Database User for Oracle GoldenGate Processes

Create a database user that is dedicated to Oracle GoldenGate. It can be the same user for all of the Oracle GoldenGate processes that must connect to a database:

- Extract (source SQL/MX database)
- Replicat (target SQL/MX database)
- DEFGEN (source or target database)

Table 1–1 Database user for Oracle GoldenGate processes

Privilege	Extract user	Replicat user	DEFGEN user
SELECT	X	X	X
DELETE	X		
INSERT	X		
UPDATE	X		
REFERENCES	X		

1.3.3 SQL/MX Access Privileges

Dedicate an NSK user (groupID.userID) or OSS alias userID to Oracle GoldenGate. This user requires the following access privileges at the SQL/MX data level:

- table
- view
- stored procedure.

Access privileges are granted through the SQL/MX command interface with a *GRANT* statement. For more information on the GRANT command, see the SQL/MX documentation.

1.4 Supported SQL/MX Data Types

The SQL/MX data types supported by Oracle GoldenGate are:

- CHAR
- VARCHAR
- REAL
- DOUBLE
- NUMERIC
- SMALLINT
- LARGEINT
- DECIMAL
- VARCHAR(1)-(4040)
- FLOAT
- PIC
- DATE
- TIME

- TIMESTAMP
- SYSKEY

Limitations of support:

- The original SYSKEY values are not preserved on the target. The target database generates a new unique value.
- Oracle GoldenGate does not support negative dates.
- Oracle GoldenGate supports timestamp data from 0001/01/03:00:00:00 to 9999/12/31:23:59:59. If a timestamp is converted from GMT to local time, these limits also apply to the resulting timestamp. Depending on the timezone, conversion may add or subtract hours, which can cause the timestamp to exceed the lower or upper supported limit.

1.5 Supported Objects and Operations for SQL/MX

The objects and operations supported by Oracle GoldenGate for SQL/MX are:

- Oracle GoldenGate supports the extraction and replication of DML operations on tables that contain rows of up to 512 KB in length.
- Oracle GoldenGate supports the maximum number and size of columns per table that is supported by the database.
- Updates to primary keys are supported for SQL/MX version 3.2 and later.

1.6 Non-supported Objects and Operations for SQL/MX

The objects and operations that Oracle GoldenGate does not support for SQL/MX are:

- Extraction or replication of DDL (data definition language) operations
- Oracle GoldenGate SQLEXEC functionality
- Oracle GoldenGate parameters that involve fetching from the database, such as FETCHCOLS, FETCHCOLSEXCEPT, and FETCHBEFOREFILTER.
- NonStop SQL/MX distributed transactions
- PURGEDATA operations
- Views

2

Installing Oracle GoldenGate

This chapter contains instructions for installing Oracle GoldenGate for Non-Stop SQL/MX. Following these procedures installs all of the components that are required to run and manage the processing (excluding any components required from other vendors, such as drivers or libraries) and it installs the Oracle GoldenGate utilities. The installation process takes a short amount of time.

This chapter contains these sections:

Note: These instructions are for installing Oracle GoldenGate for the first time. Additionally, they are for downloading the base release of a new version of Oracle GoldenGate.

To download and install subsequent patches to the base release, go to the Patches and Updates tab of My Oracle Support at:

http://support.oracle.com

To upgrade Oracle GoldenGate from one version to another, follow the upgrade instructions at

`http://www.oracle.com/technology/software/products/goldengate/index.html`

2.1 Installation overview

To install Oracle GoldenGate, the following steps are required:

- Downloading Oracle GoldenGate
- Installing Oracle GoldenGate on a NonStop System
- Configuring Manager and other processes

Note: Before proceeding, make certain that you have reviewed the System Requirements in this guide.

2.2 Downloading Oracle GoldenGate

Download the appropriate Oracle GoldenGate build for the platform of each system that will be part of the Oracle GoldenGate configuration.

1. Navigate to http://edelivery.oracle.com.

   The Oracle Software Delivery Cloud page appears.

2. Click **Sign-in/Register**.

   Note: If you are not already logged in, the Single Sign-on page appears. Enter your Oracle ID and password and click **Sign In**.

   The Terms & Restrictions page appears

3. Accept the Oracle Software Delivery Cloud Trial License Agreement and the Export Restrictions and click **Continue**.

   The Media Pack Search page appears.

4. On the Media Pack Search page, do the following:

   a. Click the **Select Product Pack** drop-down control and, from the list, select Oracle Fusion Middleware.

   b. Click the **Platform** drop-down control and, from the list, select the platform on which you are installing Oracle GoldenGate.

   c. Click **Go**.

   The Results list expands to show all available media packs that include your search criteria.

5. In the Results list, select the media pack you want to download and click **Continue**.

   The media pack's download page appears. Multiple download selections may appear, such as separate builds for different databases or versions of a database. Note that this page contains the part number and size of each downloadable file.

6. To ensure that you download the files successfully, first review the *Media Pack Readme* for download instructions and product information by clicking **Readme**. The Readme contains release notes for any new features, new requirements, or bug fixes that affect your current configuration and other known issues.

7. To begin the download process, click **Download** next to the name of the Oracle GoldenGate build that you want to download.

   A File Download dialog box appears.

8. Select either **Open with** or **Save File**:

To...	Select...
Install media pack immediately	**Open**, select the desired file extraction utility, and extract the files to a designated location on your file system.
Save the file for later installation	**Save** and point to a designated location on your file system.

2.3 Installing Oracle GoldenGate on a NonStop System

To install Oracle GoldenGate on a NonStop System, do the following:

1. FTP the SQL/MX ODBC version of Oracle GoldenGate to the NonStop OSS environment in binary mode, and place it in the directory where you want Oracle GoldenGate to be installed.

   Note: Do not use the generic ODBC Oracle GoldenGate build. It must be the SQL/MX version.

2. Uncompress the file into the current directory.
3. From the Oracle GoldenGate subvolume, run the GGSCI program.

   ```
   GGSCI
   ```

4. In GGSCI, issue the following command.

   ```
   CREATE SUBDIRS
   ```

5. Issue the following command to exit GGSCI.

   ```
   EXIT
   ```

6. If this is a source NonStop system, continue with the next steps.
7. On a source NonStop system, run the `ggmxinstall` script to SQL compile the Extract program on the system and install the `VAMSERV` object module in the NSK space.

   ```
   ggmxinstall destination
   ```

   Where: *`destination`* is the destination NSK volume and subvolume in OSS format, preferably the Oracle GoldenGate installation location. The volume must be a real volume name, not an SMF logical volume name.

8. After `ggmxinstall` completes, log on to `TACL` as `SUPER.SUPER` and `FUP LICENSE` the newly installed `VAMSERV` object.

   Note: The `VAMSERV` process is similar to the existing `AUDSERV` process that is part of the Oracle GoldenGate for NonStop product that is used with SQL/MP and Enscribe databases.

2.4 Configuring Manager and other processes

To configure Oracle GoldenGate to support your business requirements, see *Administering Oracle GoldenGate for Windows and UNIX*. It contains instructions to:

- Configure the Manager process with a TCP/IP port and other optional parameters that control dynamic port assignments, trail file maintenance, automatic startup, and other properties.
- Configure Extract and Replicat processes to support reporting, high availability, disaster recovery, and other topologies.
- Configure security to control user access, file security, and data encryption.

- Configure integration, manipulation, and conversion features that enable you to customize Oracle GoldenGate and support the delivery of data across heterogeneous environments.
- Configure utilities and other tools that support Oracle GoldenGate.

3

Preparing the System for Oracle GoldenGate Processing

Certain database attributes must be addressed in an Oracle GoldenGate environment. Some steps are required on the source system, some on the target, and some on both. This chapter describes these steps. It contains the following sections:

3.1 Configuring Oracle GoldenGate to Support Tables with a SYSKEY or Clustered Key

If your Replicat configuration includes tables that have a `SYSKEY` or a clustered key, you must take steps to ensure that the correct row is changed during an `UPDATE` or `DELETE` operation. Replicat uses an ODBC driver to connect to a target SQL/MX database. This driver does not allow Replicat to get the values of the `SYSKEYs` in the target tables, so they cannot be used in the `WHERE` clause to locate rows for processing. You can handle this condition in either of the following ways:

3.1.1 Method One (handle through the Replicat configuration)

Note: This is the preferred method of handling tables with `SYSKEY` or clustered keys.

This method maps the source `SYSKEY` to an additional column in the target table. Replicat can then be configured to use the key value to locate a target row that has the same key value.

1. Add a column named GGS_SYSKEY to the target table.
2. In the MAP statement, map the source SYSKEY column to the GGS_SYSKEY column by means of a COLMAP clause.
3. Specify the GGS_SYSKEY column in a KEYCOLS clause in the same MAP statement. This ensures that the unique source SYSKEY value is used as the key for the target table.

The following is an example of this procedure:

Source table:

```
CREATE TABLE DEV.TSSCAT.ENTRY
  (
    COLA    INT DEFAULT NULL
  , COLB    CHAR(20)  DEFAULT DEFAULT NULL
  )
```

Target table:

If the target table has a clustered key rather than a SYSKEY, include the user-defined columns in the STORE BY clause.

```
CREATE TABLE DEV.TASCAT.ENTRY
  (
    GGS_SYSKEY  LARGEINT NO DEFAULT NOT NULL
  , COLA        INT DEFAULT NULL
  , COLB        CHAR(20) DEFAULT DEFAULT NULL
  )
  STORE BY (GGS_SYSKEY ASC);
```

MAP statement:

If the target table has a clustered key rather than a SYSKEY, include the user-defined columns in the STORE BY clause.

```
MAP TSSCAT.ENTRY, TARGET TASCAT.ENTRY,
   COLMAP (ggs_syskey = syskey, USEDEFAULTS),
   KEYCOLS (ggs_syskey);
```

3.1.2 Method Two (handle through the Extract configuration)

You can allow Replicat to use the full row image to locate a row in the target table, rather than rely on a key. Replicat defaults to using the full row image when a target key is not defined or when it is not available (as in this case, where ODBC does not supply it). This method requires that the combination of all of the column values of any given row makes that row unique among all other rows in the table. Otherwise, Replicat may change more than one row.

No changes to the target table definitions are required by this method, nor are there any special column mapping requirements in the Replicat configuration. You only need to turn off compression in the source table attributes and in the Extract configuration.

1. Create or alter the source tables to have the ATTRIBUTE NO AUDITCOMPRESS set. The following is an example:

```
CREATE TABLE DEV.TSSCAT.ENTRY
  (
    COLA    INT DEFAULT NULL
  , COLB    CHAR(20)  DEFAULT DEFAULT NULL
  )
```

```
ATTRIBUTE NO AUDITCOMPRESS;
```

2. Use the NOCOMPRESSDELETES and NOCOMPRESSUPDATES parameters in the Extract parameter file to configure Extract to write all of the columns of a table to the trail for UPDATE and DELETE operations. Replicat will use all column values as the row locator. (By default Extract only writes the key to the trail for DELETEs and only the key and the changed columns for UPDATEs.) For more information, see *Reference for Oracle GoldenGate for Windows and UNIX*.

3.2 Define an ODBC data source

Follow these steps to specify a data source name (DSN) to which the GGSCI command interface can connect on the source and to which the Replicat process can connect on the target.

1. Log into the NonStop system and select a TACL prompt.
2. Edit or Tedit the $SYSTEM.SYSTEM.ODBCDSN ODBC configuration file.
3. Add the DSN to the [ODBC Data Sources] list, as shown in Example 3–1. A DSN of TDM_Default_DataSource and default connection settings are included in this file by default.
4. Define your data source connection by adding the following lines, referring to Example 3–1 as needed:
   - [*dsn*] : Replace *dsn* in the heading with the actual DSN.
   - Description : Add a text string description, if needed.
   - Catalog : Add the database catalog.
   - Schema : Add the database schema.
   - Server : Add the NSK server. The server is where the ODBC/MX server is running and must be in the format of TCP:*IP_address_or_domain_name*/*IP_port* as shown in Example 3–1.
   - Add the other parameters only if you want them to be something other than the default settings specified under TDM_Default_DataSource .

   Note: The DSN in the ODBCDSN file must exactly match the DSN that is defined in the ODBC/MX service. Data source names are case-sensitive.
5. Save the file and then exit the edit session.

Example 3–1 Template for ODBC configuration file

```
TACL> Edit $SYSTEM.SYSTEM.ODBCDSN

[ODBC]
TraceFlags = 6
TraceStart = 0
TraceFile = trlog

[ODBC Data Sources]
TDM_Default_DataSource = NonStop ODBC/MX 2.3
<dsn> = NonStop ODBC/MX 2.3
```

```
DataSourceName = <Driver>

[TDM_Default_DataSource]
Description = Default Data Source
Catalog = CAT
Schema = SCH
DataLang = 0
FetchBufferSize = SYSTEM_DEFAULT
Server = TCP:xxx.xxx.xxx.xxx/xxxx
SQL_ATTR_CONNECTION_TIMEOUT = SYSTEM_DEFAULT
SQL_LOGIN_TIMEOUT = SYSTEM_DEFAULT
SQL_QUERY_TIMEOUT = NO_TIMEOUT

[<dsn>]
Description = <text string describing data source>
Catalog = <target catalog>
Schema = <target schema>
Server = TCP:<ip address or domain name>/<ip port>
```

For more information about the `$SYSTEM.SYSTEM.ODBCDSN` file and how to configure ODBC for SQL/MX, see *HP NonStop Open System Services ODBC/MX Client Driver* at.

http://h20000.www2.hp.com/bc/docs/support/SupportManual/c02132824/c02132824.pdf

3.3 Specifying object names in a SQL/MX configuration

Oracle GoldenGate supports both two-part (`schema.table`) and three-part (`catalog.schema.table`) table names in parameter files and commands. See *Administering Oracle GoldenGate for Windows and UNIX* for complete information about specifying object names.

3.3.1 Using two-part names

In a two-part name, you specify the schema and the object name. To map the catalog portion of the name, you must link it to an Extract or Replicat group. Only one catalog can be linked to an Extract or Replicat group. To capture from, or apply to, more than one catalog, you must create an Extract group for each one on the source and a Replicat group for each one on the target. To link a catalog to an Extract group, use the `SOURCEDB` parameter. To link a catalog to a Replicat group, use the `TARGETDB` parameter. The `USERID` portion of `SOURCEDB` and `TARGETDB` specifies the default schema.

```
SOURCEDB catalog USERID schema

TARGETDB catalog USERID schema
```

Note: The API that is used by Extract does not log in to the database, so an authentication password is not required.

3.3.2 Using three-part names

In a three-part name, you specify the catalog, schema, and object name as `catalog.schema.object`. You must explicitly enable support for three-part names by using the `ENABLECATALOGNAMES` parameter in the `GLOBALS` file. For more

information about the GLOBALS file, see *Administering Oracle GoldenGate for Windows and UNIX*.

3.4 Disable triggers and cascade constraints on a SQL/MX target

Disable triggers, cascade delete constraints, and cascade update constraints on target SQL/MX tables, or alter them to ignore changes made by the Oracle GoldenGate database user. Oracle GoldenGate replicates DML that results from a trigger or cascade constraint. If the same trigger or constraint gets activated on the target table, it becomes redundant because of the replicated version, and the database returns an error. Consider the following example, where the source tables are emp_src and salary_src and the target tables are emp_targ and salary_targ.

1. A delete is issued for emp_src.
2. It cascades a delete to salary_src .
3. Oracle GoldenGate sends both deletes to the target.
4. The parent delete arrives first and is applied to emp_targ .
5. The parent delete cascades a delete to salary_targ .
6. The cascaded delete from salary_src is applied to salary_targ.
7. The row cannot be located because it was already deleted in step 5.

3.5 Configure ODBC to prevent timeouts on a SQL/MX target

Follow this procedure to change the ODBC connection timeout on a NonStop target from the SYSTEM_DEFAULT of ten minutes to NO_TIMEOUT .

1. From OSH, run mxci and set the mode to mxcs .

```
/G/DEV01/SUPERDEV 1>mxci
>>mode mxcs;
```

2. Issue the following command to show current settings.

```
info ds *,detail;
```

The system responds:

Example 3–2

```
Name: \SYSA.$MX.TDM_Default_DataSource
CpuList: ALL
InitPri..........Same as Assoc Server
CurrentState.................STARTED
ConnectedServers...................0
AvailableServers...................4
LastStateChg.............Apr 12 15:36
LastUpdate...............Apr 12 14:56
IdleServer.........................4
IdleTimeout............SYSTEM_DEFAULT
MaxServer.........................100
ConnTimeout............SYSTEM_DEFAULT
InitServer.........................4
StartAutomatic.....................ON
Trace............................OFF
SQLPrepareStat...................OFF
ConnInfoStat.....................ON
```

```
SQLExecuteStat...................OFF
SessionInfoStat..................ON
SQLExecDirectStat................OFF
SQLStmtStat......................OFF
SQLFetchStat.....................OFF
```

3. Change the `IdleTimeout` and `ConnTimeout` to `NO_TIMEOUT` as follows:

```
CS>alter ds "TDM_Default_DataSource", IdleTimeout NO_TIMEOUT;
CS>>alter ds "TDM_Default_DataSource", ConnTimeout NO_TIMEOUT;
```

4. Restart the NonStop SQL/MX server.

3.6 Specify connection authentication on a SQL/MX target

Add the following parameters to the Replicat parameter file to specify ODBC connection authentication for Replicat to use on the target SQL/MX database.

```
TARGETDB DSN USERID user, PASSWORD password
```

- Use the `TARGETDB` and `USERID` parameters as one entry.
- Supply the ODBC data source name with `TARGETDB` .
- Supply the user name and password with `USERID` .

3.7 Supply a data-definitions file on a NonStop target

To replicate data between source and target NonStop SQL/MX databases, you must supply source data definitions to the Replicat process, even though the two databases might be identical in version and structure. There are slight differences in the way that metadata is returned to Oracle GoldenGate by the native API from the source database and by ODBC from the target database.

1. Create a data definitions file with the DEFGEN utility.
2. Transfer the definitions file to the target system.
3. Specify the fully qualified name of the definitions file with the `SOURCEDEFS` parameter in the Replicat parameter file.

For more information about data-definitions files, see *Administering Oracle GoldenGate for Windows and UNIX*.

4

Uninstalling Oracle GoldenGate

This chapter contains procedures for removing Oracle GoldenGate. This procedure assumes that you no longer need the data in the Oracle GoldenGate trails, and that you no longer need to preserve the current Oracle GoldenGate environment. To preserve your current environment and data, make a backup of the Oracle GoldenGate directory and all subdirectories before starting this procedure.

To uninstall Oracle GoldenGate, do the following:

1. Run the command shell.
2. (Suggested) Log on as the system administrator or as a user with permission to issue Oracle GoldenGate commands and delete files and directories from the operating system.
3. Change directories to the Oracle GoldenGate installation directory.
4. Run GGSCI.
5. Stop all Oracle GoldenGate processes.
6. Stop the Manager process.
7. **For systems using a Replicat checkpoint table, only**, log into the database with the `DBLOGIN` command, and then remove the Replicat checkpoint table by running the `DELETE CHECKPOINTTABLE` command.
8. Make certain all processes are stopped (including GGSCI).
9. Remove the Oracle GoldenGate files by removing the installation directory.

A

Oracle GoldenGate Installed Components

This appendix describes the programs, directories, and other components created or used by the Oracle GoldenGate software in the Oracle GoldenGate installation directory.

This appendix includes the following sections:

A.1 Oracle Goldengate Programs and Utilities

This section describes programs installed in the root Oracle Goldengate installation directory.

> **Note:** Some programs may not exist in all installations. For example, if only capture or delivery is supported by Oracle GoldenGate for your platform, the extract or replicat program will not be installed, respectively. Likewise, special files might be installed to support a specific database.

Table A–1 Oracle GoldenGate Installed Programs and Utilities

Program	Description
`convchk`	Converts checkpoint files to a newer version.
`convprm`	Converts parameter files that do not use SQL-92 rules for quoted names and literals to updated parameter files that use SQL-92 rules. SQL-92 format for quoted object names and literals was introduced as the default with version 12c of Oracle GoldenGate.
`defgen`	Generates data definitions and is referenced by Oracle GoldenGate processes when source and target tables have dissimilar definitions.
`emsclnt`	Sends event messages created by Collector and Replicat on Windows or UNIX systems to EMS on NonStop systems.
`extract`	Performs capture from database tables or transaction logs or receives transaction data from a vendor access module.

Table A–1 (Cont.) Oracle GoldenGate Installed Programs and Utilities

Program	Description
ggmxinstall	Oracle GoldenGate installation script for the SQL/MX database.
ggcmd	Associated program of ggsci. Launches and monitors external applications, such as the JAGENT of Oracle GoldenGate Monitor. Integrates those applications into the ggsci environment.
ggsci	User interface to Oracle GoldenGate for issuing commands and managing parameter files.
ggsmgr.jcl ggsmgr.proc ggsmgrst.jcl ggsmgrst.proc	Start the Oracle GoldenGate Manager process from a batch job or the operator console on a z/OS system. Installed to support DB2 z/OS databases.
install	Installs Oracle GoldenGate as a Windows service and provides other Windows-based service options.
keygen	Generates data-encryption keys.
logdump	A utility for viewing and saving information stored in extract trails or files.
mgr	(Manager) Control process for resource management, control and monitoring of Oracle GoldenGate processes, reporting, and routing of requests through the GGSCI interface.
oggerr	Manages Oracle GoldenGate error messages.
replicat	Applies data to target database tables.
reverse	A utility that reverses the order of transactional operations, so that Replicat can be used to back out changes from target tables, restoring them to a previous state.
server	The Collector process, an Extract TCP/IP server collector that writes data to remote trails.
vamserv	Started by Extract to read the TMF audit trails generated by TMF-enabled applications. Installed to support the NonStop SQL/MX database.

A.2 Oracle Goldengate Subdirectories

This Section describes the subdirectories of the Oracle Goldengate installation directory and their contents.

Note: Some directories may not exist in all installations.

Table A–2 Oracle GoldenGate Installed Subdirectories

Directory	Description
br	Contains the checkpoint files for the bounded recover feature.
cfg	Contains the property and XML files that are used to configure Oracle GoldenGate Monitor.
dirdb	Contains the datastore that is used to persist information that is gathered from an Oracle GoldenGate instance for use by the Oracle GoldenGate Monitor application or within Oracle Enterprise Manager.

Table A–2 (Cont.) Oracle GoldenGate Installed Subdirectories

Directory	Description

`dirchk`	Contains the checkpoint files created by Extract and Replicat processes, which store current read and write positions to support data accuracy and fault tolerance. Written in internal Oracle GoldenGate format.
	
	File name format is *`group_name+sequence_number.ext`* where *`sequence_number`* is a sequential number appended to aged files and *`ext`* is either `cpe` for Extract checkpoint files or `cpr` for Replicat checkpoint files.
	
	Do not edit these files.
	
	Examples:
	
	`ext1.cpe`
	
	`rep1.cpr`

`dircrd`	Contains credential store files.

`dirdat`	The default location for Oracle GoldenGate trail files and extract files that are created by Extract processes to store extracted data for further processing by the Replicat process or another application or utility. Written in internal Oracle GoldenGate format.
	
	File name format is a user-defined two-character prefix followed by either a six-digit sequence number (trail files) or the user-defined name of the associated Extract process group (extract files).
	
	Do not edit these files.
	
	Examples:
	
	`rt000001`
	
	`finance`

`dirdef`	The default location for data definitions files created by the DEFGEN utility to contain source or target data definitions used in a heterogeneous synchronization environment. Written in external ASCII. File name format is a user-defined name specified in the DEFGEN parameter file. These files may be edited to add definitions for newly created tables. If you are unsure of how to edit a definitions file, contact Oracle GoldenGate technical support. Example: `defs.dat`
`dirdmp`	Contains trace, or dump, files that support the internal activity logging mechanism.
`dirjar`	Contains the Java executable files that support Oracle GoldenGate Monitor.

Table A–2 (Cont.) Oracle GoldenGate Installed Subdirectories

Directory	Description
dirpcs	Default location for status files. File name format is *group.extension* where *group* is the name of the group and *extension* is either pce (Extract), pcr (Replicat), or pcm (Manager). These files are only created while a process is running. The file shows the program name, the process name, the port number, and the process ID. Do not edit these files. Examples: mgr.pcm ext.pce
dirprm	The default location for Oracle GoldenGate parameter files created by Oracle GoldenGate users to store run-time parameters for Oracle GoldenGate process groups or utilities. Written in external ASCII format. File name format is *group name/user-defined name.prm* or mgr.prm. These files may be edited to change Oracle GoldenGate parameter values after stopping the process. They can be edited directly from a text editor or by using the EDIT PARAMS command in GGSCI. Examples: defgen.prm finance.prm
dirrec	Not used by Oracle GoldenGate.
dirrpt	The default location for process report files created by Extract, Replicat, and Manager processes to report statistical information relating to a processing run. Written in external ASCII format. File name format is *group name+sequence number.rpt* where sequence number is a sequential number appended to aged files. Do not edit these files. Examples: fin2.rpt mgr4.rpt
dirsql	Used by the triggen utility to store SQL scripts before triggen was deprecated. Currently used to store training scripts and any user-created SQL scripts that support Oracle GoldenGate.
dirtmp	The default location for storing transaction data when the size exceeds the memory size that is allocated for the cache manager. Do not edit these files.
dirwlt	Contains Oracle GoldenGate wallet files.
UserExitExamples	Contains sample files to help with the creation of user exits.

A.3 Other Oracle GoldenGate Files

This section describes other files, templates, and objects created or installed in the root Oracle GoldenGate installation directory.

Note: Some files may not be installed in your environment, depending on the database and OS platform.

Table A–3 Other Oracle GoldenGate Installed Files

Component	Description
bcpfmt.tpl	Template for use with Replicat when creating a run file for the Microsoft BCP/DTS bulk-load utility.
bcrypt.txt	Blowfish encryption software license agreement.
cagent.dll	Contains the Windows dynamic link library for the Oracle GoldenGate Monitor C sub-agent.
category.dll	Windows dynamic link library used by the INSTALL utility.
chkpt_*db*_create.sql	Script that creates a checkpoint table in the local database. A different script is installed for each database type.
db2cntl.tpl	Template for use with Replicat when creating a control file for the IBM LOADUTIL bulk-load utility.
ddl_cleartrace.sql	Script that removes the DDL trace file. (Oracle installations)
ddl_ddl2file.sql	Script that saves DDL from the marker table to a file.
ddl_disable.sql	Script that disables the Oracle GoldenGate DDL trigger. (Oracle installations)
ddl_enable.sql	Script that enables the Oracle GoldenGate DDL trigger. (Oracle installations)
ddl_filter.sql	Script that supports filtering of DDL by Oracle GoldenGate. This script runs programmatically; do not run it manually.
ddl_ nopurgeRecyclebin.sql	Empty script file for use by Oracle GoldenGate support staff.
ddl_ora11.sql ddl_ora12.sql	Scripts that run programmatically as part of Oracle GoldenGate DDL support; do not run these scripts.
ddl_pin.sql	Script that pins DDL tracing, the DDL package, and the DDL trigger for performance improvements. (Oracle installations)
ddl_purgeRecyclebin.sql	Script that purges the Oracle recyclebin in support of the DDL replication feature.
ddl_remove.sql	Script that removes the DDL extraction trigger and package. (Oracle installations)
ddl_session.sql ddl_session1.sql	Supports the installation of the Oracle DDL objects. This script runs programmatically; do not run it manually.
ddl_setup.sql	Script that installs the Oracle GoldenGate DDL extraction and replication objects. (Oracle installations)
ddl_status.sql	Script that verifies whether or not each object created by the Oracle GoldenGate DDL support feature exists and is functioning properly. (Oracle installations)
ddl_staymetadata_off.sql ddl_staymetadata_on.sql	Scripts that control whether the Oracle DDL trigger collects metadata. This script runs programmatically; do not run it manually.
ddl_trace_off.sql ddl_trace_on.sql	Scripts that control whether DDL tracing is on or off.

Table A–3 (Cont.) Other Oracle GoldenGate Installed Files

Component	Description
ddl_tracelevel.sql	Script that sets the level of tracing for the DDL support feature. (Oracle installations)
debug files	Debug text files that may be present if tracing was turned on.
demo_*db_scriptname*.sql demo_*more_db_scriptname*.sql	Scripts that create and populate demonstration tables for use with tutorials and basic testing.
.dmp files	Dump files created by Oracle GoldenGate processes for tracing purposes.
ENCKEYS	User-created file that stores encryption keys. Written in external ASCII format.
exitdemo.c	User exit example.
exitdemo_utf16.c	User exit example that demonstrates how to use UTF16 encoded data in the callback structures for information exchanged between the user exit and the process.
freeBSD.txt	License agreement for FreeBSD.
ggmessage.dat	Data file that contains error, informational, and warning messages that are returned by the Oracle GoldenGate processes. The version of this file is checked upon process startup and must be identical to that of the process in order for the process to operate.
ggserr.log	File that logs processing events, messages, errors, and warnings generated by Oracle GoldenGate.
ggsmsg.dll	Windows dynamic link library used by the install program.
GLOBALS	User-created file that stores parameters applying to the Oracle GoldenGate instance as a whole.
help.txt	Help file for the GGSCI command interface.
icudtxx.dll icuinxx.dll icuucxx.dll	Windows shared libraries for International Components for Unicode, where xx is the currently used version.
jagent.bat	Windows batch file for the Java Agent for Oracle GoldenGate Monitor.
jagent.log jagentjni.log	Log files for the Oracle GoldenGate Monitor Agent.
jagent.sh	UNIX shell script for the Java Agent for Oracle GoldenGate Monitor
LGPL.txt	Lesser General Public License statement. Applies to free libraries from the Free Software Foundation.
libodbc.so	ODBC file for Ingres 2.6 on Unix.
libodbc.txt	License agreement for libodbc.so.
libxml2.dll	Windows dynamic link library containing the XML library for the Oracle GoldenGate XML procedures.
libxml2.txt	License agreement for libxml2.dll .
marker.hist	File created by Replicat if markers were passed from a NonStop source system.
marker_remove.sql	Script that removes the DDL marker table. (Oracle installations)

Table A–3 (Cont.) Other Oracle GoldenGate Installed Files

Component	Description
marker_setup.sql	Script that installs the Oracle GoldenGate DDL marker table. (Oracle installations)
marker_status.sql	Script that confirms successful installation of the DDL marker table. (Oracle installations)
notices.txt	Third-party software license file.
odbcinst.ini	Ingres 2.6 on Unix ODBC configuration file.
params.sql	Script that contains configurable parameters for DDL support. (Oracle installations)
pthread-win32.txt	License agreement for pthread-VC.dll .
pthread-VC.dll	POSIX threads library for Microsoft Windows.
prvtclkm.plb	Supports the replication of Oracle encrypted data.
pw_agent_util.bat pw_agent_util.sh	Script files that support the Oracle GoldenGate Monitor Agent.
role_setup.sql	Script that creates the database role necessary for Oracle GoldenGate DDL support. (Oracle installations)
sampleodbc.ini	Sample ODBC file for Ingres 2.6 on UNIX.
sqlldr.tpl	Template for use with Replicat when creating a control file for the Oracle SQL*Loader bulk-load utility.
start.prm stop.prm	z/OS paramlib members to start and stop the Manager process.
startmgr stopmgr	z/OS Unix System Services scripts to start the Manager process from GGSCI.
startmgrcom stopmgrcom	z/OS system input command for the Manager process.
tcperrs	File containing user-defined instructions for responding to TCP/IP errors.
usrdecs.h	Include file for user exit API.
xerces-c_2_8.dll	Apache XML parser library.
zlib.txt	License agreement for zlib compression library.

A.4 Oracle GoldenGate Checkpoint Table

When database checkpoints are being used, Oracle GoldenGate creates a checkpoint table with a user-defined name in the database upon execution of the ADD CHECKPOINTTABLE command, or a user can create the table by using the chkpt_*db*_create.sql script (where *db* is an abbreviation of the type of database that the script supports). For a description of this table, see *Administering Oracle GoldenGate for Windows and UNIX*.