

Oracle® GoldenGate
NonStop SQL/MX Installation and Setup
Guide
11g Release 1 (11.1.1)
E17800-01

September 2010

ORACLE®

Copyright © 1995, 2010 Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this software or related documentation is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle USA, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

This software is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications which may create a risk of personal injury. If you use this software in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure the safe use of this software. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software in dangerous applications.

Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.

This software and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

Contents



- Chapter 1 System requirements and preinstallation instructions** 3
 - Overview of Oracle GoldenGate for NonStop SQL/MX 3
 - Supported platforms..... 3
 - Operating system requirements..... 3
 - Database requirements 5
 - Supported data types..... 6
 - Supported objects and operations 7
 - Non-supported objects and operations..... 7
 - Supported and non-supported object names and case 7
 - Object names and owners 7
 - Case sensitivity 7
 - Supported characters 8
 - Non-supported characters..... 9

- Chapter 2 Installing Oracle GoldenGate**..... 10
 - Installation overview 10
 - Upgrades 10
 - New installations 10
 - Downloading Oracle GoldenGate 10
 - Installing Oracle GoldenGate on a NonStop system 11
 - Installing the Oracle GoldenGate files 11
 - Configuring Manager and other processes..... 12
 - Uninstalling Oracle GoldenGate 12

- Chapter 3 Preparing the system for Oracle GoldenGate processing** 13
 - Preparing tables for processing 13
 - Disabling triggers and cascade constraints 13
 - Assigning row identifiers..... 13
 - Linking catalog names to an Extract group 14
 - Defining the ODBC data source 14
 - Configuring ODBC to prevent timeouts..... 16



Specifying Replicat connection authentication.....	17
Definitions file.....	17
Appendix 1 Oracle GoldenGate installed components	18
Oracle GoldenGate Programs and Utilities	18
Oracle GoldenGate subdirectories	20
Other Oracle GoldenGate files.....	22
Oracle GoldenGate checkpoint table.....	25
Index	26

CHAPTER 1

System requirements and preinstallation instructions

.....

Overview of Oracle GoldenGate for NonStop SQL/MX

Oracle GoldenGate supports log-based extraction and replication from a source NonStop SQL/MX database to:

- other supported databases using standard connection methods for those databases.
- a target NonStop SQL/MX database through an HP NonStop OSS ODBC driver. Replicat is installed on the target NonStop SQL/MX database system. Replicat reads data sent from the source to a trail on the target and applies the data to the database through ODBC.

Oracle GoldenGate for NonStop SQL/MX supports data filtering, mapping, and transformation unless noted otherwise in this documentation.

Supported platforms

SQL/MX source and target databases running on NonStop Server H06 and J06.

Operating system requirements

System configuration - source and target

- Install the Open System Services (OSS) environment.
- Download the HP ODBC/MX Client from the NonStop eServices Portal, and follow the vendor's instructions to install and configure it. This includes creating a data source on both systems for GGSCI to make database logins and also on the target for Replicat to make database connections.

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:

- 50-150 MB, depending on the database and platform. This includes space for the compressed download file and space for the uncompressed files. You can delete the download file after the installation is complete.

.....

- 40 MB for the working directories and binaries for each instance of Oracle GoldenGate that you are installing on the system. For example, to install two builds of Oracle GoldenGate into two separate directories, allocate 80 MB of space.
- To install Oracle GoldenGate into a cluster environment, install the Oracle GoldenGate binaries and files on a shared file system that is available to all cluster nodes.
- Additional disk space on any system that hosts Oracle GoldenGate trails, which are files that contain the working data. The space that is consumed by the trails varies, depending on the volume of data that will be processed. A good starting point is 1 GB. See the following guidelines.

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 is 10 megabytes, but can be changed during the configuration process. Trail files accumulate but can be purged according to rules set with the PURGEOLDEXTRACTS parameter.

Trail files can reside on drives that are local to the Oracle GoldenGate installation, or they can reside on NAS or SAN devices. You will specify the location of the trails when you configure Oracle GoldenGate.

For trails that are stored at the source location, there should be enough space to handle data accumulation should the network connection fail. In a typical configuration, a secondary Extract process (known as a data pump) sends data from a local trail over the network, and will fail when the network does. However, the primary Extract that reads the transaction logs and writes to the local trail will continue to do so. This Extract should not be stopped during a failure; otherwise, transaction data might be missed if the transaction logs recycle or get off-loaded before the data is completely captured. There must be enough disk space to hold the data accumulation.

For trails at the target location, provide enough disk space to handle data accumulation according to the purge rules set with PURGEOLDEXTRACTS. Even with PURGEOLDEXTRACTS in use, data will always accumulate on the target because it is transferred across the network faster than it can be applied to the target database.

To estimate required trail space

1. Estimate the longest time that the network could be unavailable. Plan to store enough data to withstand the longest possible outage, because otherwise you will need to resynchronize the source and target data if the outage outlasts disk capacity.
2. Estimate how much transaction log volume your business applications generate in one hour.
3. Use the following formula to calculate the required disk space.

$$\text{[log volume in one hour]} \times \text{[number of hours downtime]} \times .4 = \text{trail disk space}$$

This equation uses a multiplier of 40 percent because only about 40 percent of the data in a transaction log is needed by Oracle GoldenGate.

NOTE This formula is a conservative estimate, and you should run tests once you have configured Oracle GoldenGate to determine exactly how much space you need.

TCP/IP

- Configure the system to use TCP/IP services, including DNS.
- 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 the following unreserved and unrestricted TCP/IP ports:
 - One port for communication between the Manager process and other Oracle GoldenGate processes.
 - A range of ports for local Oracle GoldenGate communications: can be the default range starting at port 7840 or a customized range of up to 256 other ports.
- Keep a record of the ports 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.

Third-party programs

- Oracle GoldenGate fully supports virtual machine environments created with any virtualization software on any platform. When installing Oracle GoldenGate into a virtual machine environment, select a build that matches the database and the operating system of the virtual machine, not the host system.

Database requirements**Database configuration**

The Extract process uses a program named VAMSERV to capture transaction data from the audit trails. This program is extracted into the installation subvolume when you install Oracle GoldenGate for NonStop SQL/MX and may need to be installed on other nodes if they contain table partitions. You will be prompted to install VAMSERV in the installation instructions in this guide.

Database user

- 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 database)
 - Replicat (target database)
 - DEFGEN (source or target database)
- To preserve the security of your data, and to monitor Oracle GoldenGate processing accurately, do not permit other users, applications, or processes to log on as, or operate as, the Oracle GoldenGate database user.
- To log on to a source NonStop SQL/MX database, the Extract process uses the native NonStop SQL/MX API with embedded SQL. This API does not log on to the database, so no connection authentication is required. The API passes the catalog and schema names through the Oracle GoldenGate API in the format of <catalog>@<schema>. You specify the connection information in the Extract parameter file. It can also be used in Oracle GoldenGate user exits if needed.

- To connect to a target NonStop SQL/MX database, the Replicat process uses an ODBC connection. You specify the connection information in the Replicat parameter file.

SQL/MX Access Privileges

- The NSK user (groupID.userID) or OSS alias userID that will be dedicated to Oracle GoldenGate requires specific access privileges at the SQL/MX data level: table, view, or 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.

Table 1 Database user privileges

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

Supported data types

- 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.

Supported objects and operations

- 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 of columns per table that is supported by the database. Oracle GoldenGate supports the maximum column size that is supported by the database.

Non-supported objects and operations

- Extraction or replication of DDL (data definition language) operations
- Oracle GoldenGate SQLEXEC functionality
- Oracle GoldenGate BATCHSQL functionality
- NonStop SQL/MX distributed transactions
- PURGEDATA operations
- Updates to primary keys. (NonStop SQL/MX does not allow updates to primary keys.)

Supported and non-supported object names and case

The following will help you verify whether the name of a supported object type qualifies or disqualifies it for inclusion in an Oracle GoldenGate configuration.

Object names and owners

Source and target object names must be fully qualified in Oracle GoldenGate parameter files, as in `fin.emp`. Oracle GoldenGate supports character case as follows.

Case sensitivity

The following are general guidelines for the case-sensitivity of object names as it relates to Oracle GoldenGate. These guidelines may or may not apply to your databases, depending on whether the database or the underlying operating system supports case-sensitivity. Keep in mind that case-sensitivity (or lack thereof) may apply to the source database but not the target, or to the target but not the source.

- If the system or database is case-sensitive, Oracle GoldenGate supports the case sensitivity of database names, owner and schema names, object names, column names, and user names.
- If the system or database is case-insensitive (or is configured for case-insensitivity), Oracle GoldenGate converts all names to upper case.

To preserve case-sensitivity in an Oracle GoldenGate configuration

In Oracle GoldenGate parameter files, specify case-sensitive names exactly as they appear in the database. In `TABLE` and `MAP` parameters, enclose case-sensitive names in double quotes if the other database (the source or target of the case-sensitive objects) is not case-sensitive.

If replicating from a case-insensitive source to a case-sensitive target, enter the source names in upper case in the Replicat MAP statements, to reflect the fact that Extract writes them to the trail as uppercase.

For example:

```
MAP SALES.CUSTOMER, TARGET "Sales.Account";
```

Supported characters

Oracle GoldenGate supports alphanumeric characters in object names and in the names of key columns and non-key columns. Oracle GoldenGate also supports the following non-alphanumeric characters in columns that are not being used by Oracle GoldenGate as a key.

Table 2 Supported non-alphanumeric characters in object names and non-key column names¹

Character	Description
~	Tilde
<>	Greater-than and less-than symbols
/	Forward slash
\	Backward slash
!	Exclamation point
@	At symbol
#	Pound symbol
\$	Dollar symbol
%	Percent symbol
^	Caret symbol
()	Open and close parentheses
_	Underscore
-	Dash
+	Plus sign
=	Equal symbol
	Pipe

Table 2 Supported non-alphanumeric characters in object names and non-key column names¹

Character	Description
[]	Begin and end brackets
{}	Begin and end curly brackets (braces)

¹ The type of key that is being used by Oracle GoldenGate depends on the definition of a given table and whether there are any overrides by means of a KEYCOLS clause. Oracle GoldenGate will use a primary key, if available, or a unique key/index (selection is dependent on the database). In the absence of those definitions, all columns of the table are used, but a KEYCOLS clause overrides all existing key types. For columns that are being used by Oracle GoldenGate as a key, the characters in the names must be valid for inclusion in a WHERE clause. This list is all-inclusive; a given database platform may or may not support all listed characters.

Non-supported characters

Oracle GoldenGate does not support the following characters in object or column names.

Table 3 Non-supported characters in object and column names¹

Character	Description
&	Ampersand
*	Asterisk
?	Question mark
:	Colon
;	Semi-colon
,	Comma
'	Single quotes
“ ”	Double quotes
ˆ	Accent mark (Diacritical mark)
.	Period
	Space

¹ This list is all-inclusive; a given database platform may or may not support all listed characters.

CHAPTER 2

Installing Oracle GoldenGate



Installation overview

These instructions are for installing Oracle GoldenGate for the first time. Installing Oracle GoldenGate installs all of the components required to run and manage the processing (exclusive of 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.

Upgrades

To upgrade Oracle GoldenGate from one version to another, follow the instructions on <http://www.oracle.com/technology/software/products/goldengate/index.html>.

New installations

To install Oracle GoldenGate for the first time, the following steps are required:

- Downloading Oracle GoldenGate
- Installing the Oracle GoldenGate software

NOTE Before proceeding, make certain that you have reviewed the System Requirements.

Downloading Oracle GoldenGate

1. Navigate to <http://edelivery.oracle.com>.
2. On the **Welcome** page:
 - Select your language.
 - Click **Continue**.
3. On the **Export Validation** page:
 - Enter your identification information.
 - Accept the **Trial License Agreement** (even if you have a permanent license).
 - Accept the **Export Restrictions**.
 - Click **Continue**.



4. On the **Media Pack Search** page:
 - Select the **Oracle Fusion Middleware** Product Pack.
 - Select the platform on which you will be installing the software.
 - Click **Go**.
5. In the **Results List**:
 - Select the Oracle GoldenGate Media Pack that you want.
 - Click **Continue**.
6. On the **Download** page:
 - Click **Download** for each component that you want. Follow the automatic download process to transfer the mediapack.zip file to your system.

NOTE Before installing the software, review the release notes for any new features, new requirements, or bug fixes that affect your current configuration.

Installing Oracle GoldenGate on a NonStop system

Installing the Oracle GoldenGate files

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. Run `gzip` with the following command.

```
gzip -d <filename>
```

The file is now decompressed and has a `.tar` extension.

3. Run `tar` with the following command.

```
tar -xvof <filename>
```

All Oracle GoldenGate files are placed in the current directory.

4. From the Oracle GoldenGate subvolume, run the GGSCI program.

```
GGSCI
```

5. In GGSCI, issue the following command.

```
CREATE SUBDIRS
```

6. Issue the following command to exit GGSCI.

```
EXIT
```

7. If this is a **source** NonStop system, perform step 8 and step 9.

8. 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.

9. 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 used for the Oracle GoldenGate for NonStop product used with SQL/MP and Enscribe databases.

Configuring Manager and other processes

- To use Oracle GoldenGate, you must configure the Manager process. You must specify a TCP/IP port for Manager to use, and you can specify optional parameters that control dynamic port assignments, trail file maintenance, and other properties.
- To configure other required processes, Oracle GoldenGate security, and other features that enable you to customize Oracle GoldenGate, see the *Oracle GoldenGate Windows and UNIX Administrator's Guide*.

Uninstalling 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 from a NonStop system

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 to 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. Exit GGSCI.
8. Remove the Oracle GoldenGate files by removing the installation directory.
9. Drop any Oracle GoldenGate-related objects from the database as needed.

CHAPTER 3

Preparing the system for Oracle GoldenGate processing

.....

Preparing tables for processing

The following table attributes must be addressed in an Oracle GoldenGate environment.

Disabling triggers and cascade constraints

Disable triggers, cascade delete constraints, and cascade update constraints on the target 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.

Assigning row identifiers

Oracle GoldenGate requires some form of unique row identifier on the source and target tables to locate the correct target rows for replicated updates and deletes.

How Oracle GoldenGate determines the kind of row identifier to use

Unless a KEYCOLS clause is used in the TABLE or MAP statement, Oracle GoldenGate selects a row identifier to use in the following order of priority:

1. Primary key

2. First unique key alphanumerically that does not contain a timestamp or non-materialized computed column
3. If none of the preceding key types exist (even though there might be other types of keys defined on the table) Oracle GoldenGate constructs a pseudo key of all columns that the database allows to be used in a unique key, excluding those that are not supported by Oracle GoldenGate in a key or those that are excluded from the Oracle GoldenGate configuration.

NOTE If there are other, non-usable keys on a table or if there are no keys at all on the table, Oracle GoldenGate logs an appropriate message to the report file. Constructing a key from all of the columns impedes the performance of Oracle GoldenGate on the source system. On the target, this key causes Replicat to use a larger, less efficient WHERE clause.

How to specify your own key for Oracle GoldenGate to use

If a table does not have one of the preceding types of row identifiers, or if you prefer those identifiers not to be used, you can define a substitute key if the table has columns that always contain unique values. You define this substitute key by including a KEYCOLS clause within the Extract TABLE parameter and the Replicat MAP parameter. The specified key will override any existing primary or unique key that Oracle GoldenGate finds.

Linking catalog names to an Extract group

Oracle GoldenGate supports two-part table names (schema.table) in table mappings and commands, but NonStop SQL/MX names require support for three parts, including a catalog (catalog.schema.table). To map the catalog portion of a table name, you must link it to an Extract group. Only one catalog can be linked to an Extract group. To use more than one catalog in the Oracle GoldenGate configuration, you must create an Extract group for each one.

To link a catalog to an Extract group

In the Extract parameter file, use the SOURCEDB and USERID parameters as one entry.

- Supply the catalog name with SOURCEDB.
- Supply the default schema with USERID.

```
SOURCEDB <catalog> USERID <schema>
```

NOTE The API that is used by Extract does not log in to the database, so no authentication password is required.

Defining the ODBC data source

If replicating data from a Windows or UNIX-based system to a NonStop system, edit the \$SYSTEM.SYSTEM.ODBCDSN ODBC configuration file on the NonStop target to define a data source (DSN) to which Oracle GoldenGate will connect. A default data source named TDM_Default_DataSource, with default connection settings, is included in this file by default.

To edit \$SYSTEM.SYSTEM.ODBCDSN

1. Log into the NonStop system and select a TACL prompt.
 2. Edit or Tedit the file.
 3. Add your DSN name to the [ODBC Data Sources] list, as shown in bold in the list in Figure 1.
 4. Add a section similar to the one shown in bold in Figure 1 to define your data source connection with the following items:
 - [**dsn**]: Replace <dsn> in the heading with your data source name.
 - **Description**: Add a text string description, if needed.
 - **Catalog**: Add the target catalog.
 - **Schema**: Add the target 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 Figure 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 data source name in the ODBCDSN file must exactly match the data source name defined in the ODBC/MX service (names are case-sensitive).
5. Save the file and then exit from the edit session.

Figure 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 the HP NonStop Open System Services ODBC/MX Client Driver documentation.

Configuring ODBC to prevent timeouts

Change the ODBC connection timeout from the SYSTEM_DEFAULT of ten minutes to NO_TIMEOUT by following this procedure.

To change timeouts

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;

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.

Specifying Replicat connection authentication

Provide connection authentication for Replicat to use on the target database.

To specify Replicat authentication

In the Replicat parameter file, use the TARGETDB and USERID parameters as one entry.

- Supply the data source name with TARGETDB.
- Supply the user name and password with USERID.

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

Definitions file

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.

To supply data definitions

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.

APPENDIX 1

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. Additional files not listed here might be installed on certain platforms. Files listed here might not be installed on every platform.

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 4 Programs and utilities

Program	Description
cobgen	Generates source definitions based on COBOL layouts. Used for Oracle GoldenGate for Datawise on Stratus.
convchk	Converts checkpoint files to a newer version.
ddlcob	Generates target DDL table creation statements based on COBOL layouts. Used for Oracle GoldenGate for Datawise on Stratus.
defgen	Generates data definitions and is referenced by Oracle GoldenGate processes when source and target tables have dissimilar definitions.
emslnt	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.
ggmxinstall	Oracle GoldenGate installation script for the SQL/MX database.



Table 4 Programs and utilities (continued)

Program	Description
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.
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.

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 5 Subdirectories

Directory	Description
dirchk	<p>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.</p> <p>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.</p> <p>Do not edit these files.</p> <p>Examples: ext1.cpe rep1.cpr</p>
dirdat	<p>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.</p> <p>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).</p> <p>Do not edit these files.</p> <p>Examples: rt000001 finance</p>
dirdef	<p>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.</p> <p>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.</p> <p>Example: defs.dat</p>
dirout	<p>This directory is not used any more.</p>

Table 5 Subdirectories (continued)

Directory	Description
dirpcs	<p>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).</p> <p>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.</p> <p>Do not edit these files.</p> <p>Examples: mgr.pcm ext.pce</p>
dirprm	<p>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.</p> <p>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.</p> <p>Examples: defgen.prm finance.prm</p>
dirrec	<p>Not used by Oracle GoldenGate.</p>
dirrpt	<p>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.</p> <p>File name format is <group name><sequence number>.rpt where <sequence number> is a sequential number appended to aged files.</p> <p>Do not edit these files.</p> <p>Examples: fin2.rpt mgr4.rpt</p>
dirtmp	<p>The default location for storing large transactions when the size exceeds the allocated memory size. Do not edit these files.</p>
dirver	<p>An Oracle GoldenGate Veridata directory. Not used unless this software is installed in the Oracle GoldenGate location.</p>

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 6 Other files

Component	Description
bcpfmt.tpl	Template for use with Replicat when creating a run file for the Microsoft BCP/DTS bulk-load utility.
blowfish.txt	Blowfish encryption software license agreement.
category.dll	Windows dynamic link library used by the INSTALL program.
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_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_ora9.sql	A script that gets tablespace information from an Oracle 9 database.
ddl_ora10.sql	A script that disables the Oracle recyclebin and gets tablespace information from an Oracle 10 database.
ddl_pin.sql	Script that pins DDL tracing, the DDL package, and the DDL trigger for performance improvements. (Oracle installations)
ddl_remove.sql	Script that removes the DDL extraction trigger and package. (Oracle installations)
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)

Table 6 Other files (continued)

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>_create.sql	Script that creates demonstration tables in the database associated with the Oracle GoldenGate installation.
demo_<db>_insert.sql	Script that inserts initial test data into the demonstration tables.
demo_<db>_misc.sql	Script that simulates transaction activity on the demonstration tables.
ENCKEYS	User-created file that stores encryption keys. Written in external ASCII format.
exitdemo.c	User exit example.
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.
LGPL.txt	Lesser General Public License statement. Applies to free libraries from the Free Software Foundation.
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 6 Other files (continued)

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)
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.
role_setup.sql	Script that creates the database role necessary for Oracle GoldenGate DDL support. (Oracle installations)
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 parmlib 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.
zlib.txt	License agreement for zlib compression library.

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 the type of database.

Do not change the names or attributes of the columns in this table. You can change table storage attributes as needed.

Table 7 Checkpoint table definitions

Column	Description
GROUP_NAME (primary key)	The name of a Replicat group using this table for checkpoints. There can be multiple Replicat groups using the same table.
GROUP_KEY (primary key)	A unique identifier that, together with GROUPNAME, uniquely identifies a checkpoint regardless of how many Replicat groups are writing to the same table.
SEQNO	The sequence number of the checkpoint file.
RBA	The relative byte address of the checkpoint in the file.
AUDIT_TS	The timestamp of the checkpoint position in the checkpoint file.
CREATE_TS	The date and time when the checkpoint table was created.
LAST_UPDATE_TS	The date and time when the checkpoint table was last updated.
CURRENT_DIR	The current Oracle GoldenGate home directory or folder.

Index

B

BATCHSQL 7

C

cascade deletes, disabling 13

cascade updates, disabling 13

case, supported 7

catalog, linking to Extract group 14

CHAR data type 6

characters

supported in object names 8

cluster, installing on 4

columns

data types supported 6

number and size supported 7

components, Oracle GoldenGate 18

connections, to database 5

constraints, integrity 13

CREATE SUBDIRS command 11

D

data definitions, on target 17

data types supported 6

database

configuration tasks 13

requirements 5

DATE data type 6

DDL 7

DECIMAL data type 6

DEFGEN utility 17

definitions file 17

deletes, cascaded 13

disk requirements 3

distributed transactions 7

DOUBLE data type 6

F

files, installed by Oracle GoldenGate 18

firewall, configuring 5

FLOAT data type 6

G

ggmessage.dat file 23

ggmxininstall script 12

I

installing Oracle GoldenGate 10

K

key

assigning 13

name, supported characters 8

updates to 7

KEYCOLS option, TABLE or MAP 14

L

LARGEINT data type 6

N

name

non-supported characters in 9

supported characters in 8

names, supported 7

NUMERIC data type 6

O

objects, supported 7

ODBC

configuring 16

Open System Services (OSS) 3

operating system requirements 3

operations, supported 7

Oracle GoldenGate

installed programs and files 18

installing 10

uninstalling 12

P

permissions, database 5

PIC data type 6

ports, required by Oracle GoldenGate 5

privileges, database 5

PURGEDATA operations 7

R

REAL data type 6

rows, size supported 7

S

SMALLINT data type 6

SOURCEDB parameter 14

SOURCEDEFS parameter 17

spaces

in object and column names 9

SQLEXEC 7

subdirectories, creating 11

SYSKEY data type 6

T

tables

name mapping 14

preparing for processing 13

size supported 7

TARGETDB parameter 17

TCP/IP, configuring 5

TIME data type 6

timeouts, ODBC 16

TIMESTAMP data type 6

triggers, disabling on target 13

U

uninstalling Oracle GoldenGate 12

user, Oracle GoldenGate 5

USERID parameter 14, 17

V

VAMSERV program 19

VARCHAR data type 6

VARCHAR(1)-(4040) data type 6

virtual machine, support for 5