Oracle® Fusion Middleware

Installing and Configuring Oracle GoldenGate for Teradata

12*c* (12.2.0.1)

E66647-01

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Contains system requirements, installation, and setup instructions for Oracle GoldenGate for the Teradata database.

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Oracle Fusion Middleware Installing and Configuring Oracle GoldenGate for Teradata, 12*c* (12.2.0.1)

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Contents

3 Preparing the System for Oracle GoldenGate

4 Configuring Oracle GoldenGate

5 Modifying Objects in the Oracle GoldenGate Configuration

6 Uninstalling Oracle GoldenGate

A Oracle GoldenGate Installed Components

Preface

This guide helps you get started with installing Oracle GoldenGate in a Teradata database environment and configuring the Teradata database to support Oracle GoldenGate delivery.

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.

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Related Documents

The Oracle GoldenGate documentation set includes the following components:

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 Informix*

- *Installing and Configuring Oracle GoldenGate for MySQL*

- *Installing and Configuring Oracle GoldenGate for NonStop SQL/MX*

- *Installing and Configuring Oracle GoldenGate for SQL Server*

- *Installing and Configuring Oracle GoldenGate for Oracle TimesTen*

- *Installing and Configuring Oracle GoldenGate for Oracle Database*

- *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*

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.
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*][*option1* | *option2*]. Multiple options within an optional element are separated by a pipe symbol, for example:

1

System Requirements and Preinstallation Instructions

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

1.1 Overview of Oracle GoldenGate for Teradata

Oracle GoldenGate release 12*c* (12.2.0.1) and later only for Teradata supports the delivery of data from other types of databases to a Teradata database.

High-speed Oracle GoldenGate replication can be used to refresh a Teradata cache environment with minimal latency. In addition, with its heterogeneous support, Oracle GoldenGate enables the Teradata data store to be used as a data integration point for other data sources.

Oracle GoldenGate for Teradata supports the filtering, mapping, and transformation of data unless noted otherwise in this documentation.

1.2 Verifying Certification and System Requirements

Make sure that you are installing your product on a supported hardware or software configuration. For more information, see the certification document for your release on the *Oracle Fusion Middleware Supported System Configurations* page.

Oracle has tested and verified the performance of your product on all certified systems and environments; whenever new certifications occur, they are added to the proper certification document right away. New certifications can occur at any time, and for this reason the certification documents are kept outside of the documentation libraries and are available on Oracle Technology Network.

1.3 Supported Platforms for a Replication Server

In a Teradata environment, you install Oracle GoldenGate on a server that is separate from the one where the Teradata target databases are installed. This machine will be the replication server and must be a platform that is supported by Oracle GoldenGate for the Teradata database. To find out which Oracle GoldenGate builds are available for a specific combination 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.

Some notes about choosing a replication server or servers:

- The replication server can exist in the same location as the source or target server, or it can be remote from one or both.

- If possible, install Oracle GoldenGate on a multi-node cluster server to minimize the impact of any Oracle GoldenGate outages that are caused by server failure.

For additional configuration considerations, consult the *Teradata Replication Services Using Oracle GoldenGate* documentation from Teradata Corporation before installing Oracle GoldenGate.

1.4 Operating System Requirements

This section outlines the operating system resources that are necessary to support Oracle GoldenGate. These resources may apply to the database servers, the replication server(s), or all servers.

1.4.1 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).

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.

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*.

1.4.2 Disk Requirements

The recommended hardware configuration for the Oracle GoldenGate replication server is:

- Four 300-GB disks

- 4 dual-core CPUs

- 8 GB of RAM

Assign the following free disk space:

- To determine the size of the Oracle GoldenGate download file, view the Size column before downloading your selected build from Oracle Software Delivery Cloud. The value shown is the size of the files in compressed form. The size of the expanded Oracle GoldenGate installation directory will be significantly larger on disk. For more information, see Section 2.2, "Understanding and Obtaining the Oracle GoldenGate Distribution."

- Allow at least an additional 1 GB of disk space on any system that hosts Oracle GoldenGate trails, which are files that contain the working data. 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*.

- 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.

1.4.3 Network

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

- Configure the systems that are involved with Oracle GoldenGate 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.

1.4.4 Operating System Privileges

The Manager process requires an operating system user that has privileges to control Oracle GoldenGate processes and to read, write, and purge files and subdirectories in the Oracle GoldenGate directory. The Replicat processes require privileges to access the database.

1.4.5 Console

The operating system and the command console must have the same character sets. Mismatches occur on Microsoft Windows systems, where the operating system is set to one character set, but the DOS command prompt uses a different, older DOS character set. Oracle GoldenGate uses the character set of the operating system to send information to GGSCI command output; therefore a non-matching console character set causes characters not to display correctly. You can set the character set of the console before opening a GGSCI session by using the following DOS command:

```
chcp OS character set
```

If the characters do not display correctly after setting the code page, try changing the console font to Lucida Console, which has an extended character set.

1.4.6 Other Programs

The following are additional considerations in support of Oracle GoldenGate.

- Before installing Oracle GoldenGate on a Windows system, install and configure the Microsoft Visual C ++ 2010 SP1 Redistributable Package. **Make certain it is the SP1 version of this package, and make certain to get the correct bit version for your server.** This package installs runtime components of Visual C++ Libraries. For more information, and to download this package, go to http://www.microsoft.com.

- 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.

1.5 Database Requirements

This section contains Oracle GoldenGate requirements that are specific to the Teradata database.

1.5.1 Database Configuration

Follow these requirements for database configuration:

- Install an appropriate ODBC (Open Database Connectivity) driver for the database version that you are using. Oracle GoldenGate supports database versions 13.10, 14.00, and 14.10.*x.x* through 14.10.00.06.

- Configure ODBC on each target system including the creation of a data source name (DSN). A DSN stores information about how to connect to the database. See the *ODBC Driver for Teradata User Guide* at http://www.info.teradata.com/ for instructions.

1.5.2 Database User for Oracle GoldenGate Processes

Follow these requirements for the 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:
  - Replicat (target database)
  - The DEFGEN utility (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.

■ For Oracle GoldenGate to replicate to a target Teradata database, grant SELECT, INSERT, UPDATE, and DELETE on all of the target tables to the Replicat database user.

1.6 Supported Teradata Data Types

Table 1–1 shows the Teradata data types that Oracle GoldenGate supports. Any limitations or conditions that apply follow this table.

Table 1–1   Supported Data Types by Oracle GoldenGate, Per Teradata Version

Data type	v12	v13	v13.1
BLOB	No	Yes	Yes
BYTEINT	Yes	Yes	Yes
VARBYTE	Yes	Yes	Yes
BIGINT	Yes	Yes	Yes
BYTEINT	Yes	Yes	Yes
DATE	Yes	Yes	Yes
DECIMAL - 18 and under	Yes	Yes	Yes
DECIMAL - 19 to 38	No	Yes	Yes
DOUBLE PRECISION	Yes	Yes	Yes
FLOAT	Yes	Yes	Yes
INTEGER	Yes	Yes	Yes
NUMERIC - 18 and under	Yes	Yes	Yes
NUMERIC - 19 to 38	No	Yes	Yes
REAL	Yes	Yes	Yes
SMALLIINT	Yes	Yes	Yes
TIME	Yes	Yes	Yes
TIMESTAMP	Yes	Yes	Yes
INTERVAL	Yes	Yes	Yes
INTERVAL DAY	Yes	Yes	Yes
INTERVAL DAY TO HOUR	Yes	Yes	Yes
INTERVAL DAY TO MINUTE	Yes	Yes	Yes
INTERVAL DAY TO SECOND	Yes	Yes	Yes
INTERVAL HOUR	Yes	Yes	Yes
INTERVAL HOUR TO MINUTE	Yes	Yes	Yes
INTERVAL HOUR TO SECOND	Yes	Yes	Yes

Table 1–1   (Cont.) Supported Data Types by Oracle GoldenGate, Per Teradata Version

Data type	v12	v13	v13.1
INTERVAL MINUTE	Yes	Yes	Yes
INTERVAL MINUTE TO SECOND	Yes	Yes	Yes
INTERVAL MONTH	Yes	Yes	Yes
INTERVAL SECOND	Yes	Yes	Yes
INTERVAL YEAR	Yes	Yes	Yes
INTERVAL YEAR TO MONTH	Yes	Yes	Yes
CHAR	Yes	Yes	Yes
CLOB	No	Yes	Yes
CHAR VARYING	Yes	Yes	Yes
LONG VARCHAR	Yes	Yes	Yes
VARCHAR	Yes	Yes	Yes
GRAPHIC	Yes	Yes	Yes
LONG VARGRAPHIC	Yes	Yes	Yes
VARGRAPHIC	Yes	Yes	Yes
PERIOD (DATE)	No	Yes	Yes
PERIOD (TIME)	No	Yes	Yes
PERIOD (TIMESTAMP)	No	Yes	Yes
UDT	No	Yes	Yes

1.6.1 Limitations of Support for Numeric Data Types

When replicating these data types from a different type of database to Teradata, truncation can occur if the source database supports a higher precision that Teradata does.

The support of range and precision for floating-point numbers depends on the host machine. In general, the precision is accurate to 16 significant digits, but you should review the database documentation to determine the expected approximations. Oracle GoldenGate rounds or truncates values that exceed the supported precision.

1.6.2 Limitations of Support for Single-byte Character Data Types

Single-byte character types are fully supported within a single-byte Latin character set between other databases and Teradata. A VARCHAR or CHAR column cannot have more than 32k-1 bytes. If using UTF-16, this is 16k-2 characters.

1.6.3 Conditions and Limitations of Support for Multi-byte Character Data

Conditions and limitations of support for multi-byte character data are as follows:

- Install Oracle GoldenGate on a Windows or Linux replication server.
- Use the Teradata ODBC driver version 12.0.0.x or later.
- Do not use filtering, mapping, and transformation for multi-byte data types.

- A `CHAR` or `VARCHAR` column cannot contain more than 32k-1 bytes. If using UTF-16, these columns cannot contain more than 16k-2 characters.

- Set the ODBC driver to the UTF-16 character set in the initialization file.

- When creating Replicat groups, use the `NODBCHECKPOINT` option with the `ADD REPLICAT` command. The Replicat database checkpointing feature does not support an ODBC driver that is set to the UTF-16 character set. Checkpoints will be maintained in the checkpoint file on disk.

1.6.4 Limitations of Support for Binary Data Types

No limitations. These data types are supported between other source databases and Teradata targets.

1.6.5 Limitations of Support for Large Object Data Types

The following are limitations of support for large object data types.

- To replicate large objects from other databases to Teradata, use Teradata ODBC driver version 12.0 or higher on the target system. The target must support large objects that are delivered by ODBC.

- Enable the `UseNativeLOBSupport` flag in the ODBC configuration file. See the Teradata ODBC documentation.

1.6.6 Limitations of Support for Date Data Types

The following are limitations of support for date data types:

- `DATE`, `TIME`, and `TIMESTAMP` are fully supported when replicated from a different type of source database to Teradata.

- `TIME with TIMEZONE`, `TIMESTAMP with TIMEZONE`, and `INTERVAL` are not supported from a different type of source database to Teradata.

- 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.

- Oracle GoldenGate does not support negative dates.

1.6.7 Limitations of Support for IDENTITY Data Types

`IDENTITY` must be configured as `GENERATED BY DEFAULT AS IDENTITY` on the target to enable the correct value to be inserted by Replicat.

1.7 Supported Objects and Operations for Teradata

This section lists the data operations and database objects that Oracle GoldenGate supports.

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

- Truncating operations are supported with the use of the `GETTRUNCATES` parameter.

- Limitations on Automatic Heartbeat Table support are as follows:

- Teradata does not have any internal event/job schedulers so automatic updating and inserting of records into Heartbeat tables *cannot* occur.

- The `ALTER HEARTBEATTABLE` command is not supported and if used is ignored.

- The `ADD HEARTBEATTABLE` command with the `FREQUENCY`, `PURGE_FREQUENCY`, or `RETENTION_TIME` option is not supported. When any of these options are specified with the `ADD HEARTBEATTABLE` command, a warning is displayed that the option is ignored.

- Since Teradata does not have any internal event/job schedulers, automatic purging of heartbeat history tables *cannot* occur. As such, you should explicitly drop or truncate the corresponding heartbeat objects to suit your environment.

1.8 Non-Supported Operations for Teradata

This section lists the data operations that Oracle GoldenGate does not support.

- Extract (capture)

- DDL

2

Installing Oracle GoldenGate

This chapter describes installing Oracle GoldenGate for the first time and contains the following sections:

- Section 2.1, "Installation Overview"
- Section 2.2, "Understanding and Obtaining the Oracle GoldenGate Distribution"
- Section 2.3, "Setting Library Paths for Dynamic Builds on UNIX"
- Section 2.4, "Preparing to Install Oracle GoldenGate within a Cluster"
- Section 2.5, "Installing Oracle GoldenGate on Linux and UNIX"
- Section 2.6, "Installing Oracle GoldenGate on Windows"
- Section 2.7, "Integrating Oracle GoldenGate into a Cluster"

2.1 Installation Overview

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://docs.oracle.com/goldengate/c1221/gg-winux/index.html

Oracle GoldenGate operates on a *replication server*, which is a Linux, UNIX, or Windows server that is separate from the servers that contain the Teradata databases. See Section 1.3, "Supported Platforms for a Replication Server" for additional information.

2.2 Understanding and Obtaining the Oracle GoldenGate Distribution

For complete information about how to obtain Oracle Fusion Middleware software, see "Understanding and Obtaining Product Distributions" in *Planning an Installation of Oracle Fusion Middleware*.

To download the Oracle WebLogic Server and Coherence software for development or evaluation, see the following location on the Oracle Technology Network (OTN):

http://www.oracle.com/technetwork/middleware/fusion-middleware/downloads/index.html

For more information about locating and downloading Oracle Fusion Middleware products, see the *Oracle Fusion Middleware Download, Installation, and Configuration Readme Files* on OTN.

To obtain Oracle GoldenGate follow these steps:

1. Go to Oracle Technology Network.

2. Find the Oracle GoldenGate 12*c* (12.2.0.1) release and download the ZIP file onto your system.

2.3 Setting Library Paths for Dynamic Builds on UNIX

Oracle GoldenGate uses shared libraries. When you install Oracle GoldenGate on a UNIX system, and you will be running the GGSCI program outside the Oracle GoldenGate installation directory, the following must be done *before* you run GGSCI or any other Oracle GoldenGate process:

- (Optional) Add the Oracle GoldenGate installation directory to the PATH environment variable.

- (Required) Add the Oracle GoldenGate installation directory to the shared-libraries environment variable.

For example, given an Oracle GoldenGate installation directory of /users/ogg, the second command in the following example requires these variables to be set:

Table 2–1   Command Requiring Library Variable

Command	Requires GG libraries in environment variable?
$ users/ogg > ./ggsci	No
$ users > ./ogg/ggsci	Yes

To set the variables in Korn shell:

```
PATH=installation_directory:$PATH
export PATH
shared_libraries_variable=absolute_path_of_installation_directory:$shared_
libraries_variable
export shared_libraries_variable
```

To set the variables in Bourne shell:

```
export PATH=installation_directory:$PATH
export shared_libraries_variable=absolute_path_of_installation_directory:$shared_
libraries_variable
```

To set the variables in C shell:

```
setenv PATH installation_directory:$PATH
setenv shared_libraries_variable absolute_path_of_installation_directory:$shared_
libraries_variable
```

Where: `shared libraries variable` is one of the variables shown in Table 2–2:

Table 2–2   UNIX/Linux Library Path Variables Per Platform

Platform[1]	Environment variable
IBM AIX	LIBPATH
IBM z/OS	

Table 2–2   (Cont.) UNIX/Linux Library Path Variables Per Platform

Platform[1]	Environment variable
HP-UX	SHLIB_PATH
Sun Solaris	LD_LIBRARY_PATH[2]
HP Tru64 (OSF/1)	
LINUX	

[1] A specific platform may or may not be supported by Oracle GoldenGate for your database.

[2] In 64-bit environments with 32-bit Oracle databases, Oracle GoldenGate requires the LD_LIBRARY_PATH to include the 32-bit Oracle libraries.

Example

```
export LD_LIBRARY_PATH=/ggs/10.0:$LD_LIBRARY_PATH
```

> **Note:**   To view the libraries that are required by an Oracle GoldenGate process, use the ldd *goldengate_process* shell command before starting the process. This command also shows an error message for any that are missing.

2.4 Preparing to Install Oracle GoldenGate within a Cluster

This topic covers the installation requirements that apply when Oracle GoldenGate will be installed in a cluster environment. Oracle GoldenGate can be used with any cluster-management solution that has the ability to automate failover.

2.4.1 Deciding Where to Install Oracle GoldenGate Binaries and Files in the Cluster

You will need to install at least some Oracle GoldenGate objects on shared storage. Select cluster-aware shared storage that is independent of, but available to, all nodes of the cluster. The best practice is the install Oracle GoldenGate entirely on shared storage. This allows you to start the Oracle GoldenGate processes from any of the nodes without having to make changes to the parameter files. If the active node fails, the processes can be started quickly on another node, using the processing checkpoints that are preserved in the installation directory.

If you decide to install the Oracle GoldenGate binaries and files on each node, rather than on shared storage, the following must be true:

- The Oracle GoldenGate installation must have the same location path on every node.

- At minimum, install the following directories on the shared storage to support Oracle GoldenGate recovery requirements. On UNIX or Linux, you can create symbolic links to them from the installation directory on each node.

  - dirchk

  - dirdat

These directories are among those created when you issue CREATE SUBDIRS during installation.

- The parameter files in the dirprm directory, if not placed on the shared drive, must be identical on all nodes. To resolve environment settings that must be different from one node to the other, you can set environment settings so they are inherited

from the local Manager process or reference a node-specific Oracle GoldenGate macro file. Because this scenario can be difficult to enforce, the inherent concerns can be avoided by storing the parameter files on the shared drive.

See also Section 2.7, "Integrating Oracle GoldenGate into a Cluster" after you install Oracle GoldenGate.

2.5 Installing Oracle GoldenGate on Linux and UNIX

Follow these steps to install Oracle GoldenGate for Oracle on a Linux or UNIX system or in the appropriate location in a cluster. See Section 2.4, "Preparing to Install Oracle GoldenGate within a Cluster" for more information.

1. Extract the Oracle GoldenGate installation file to the system and directory where you want Oracle GoldenGate to be installed.

2. Run the command shell.

3. Change directories to the new Oracle GoldenGate directory.

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

   ```
   GGSCI
   ```

5. In GGSCI, issue the following command to create the Oracle GoldenGate working directories.

   ```
   CREATE SUBDIRS
   ```

6. Issue the following command to exit GGSCI.

   ```
   EXIT
   ```

2.6 Installing Oracle GoldenGate on Windows

Follow these steps to install Oracle GoldenGate for Oracle on a Windows system or in the appropriate location in a cluster. See Section 2.4, "Preparing to Install Oracle GoldenGate within a Cluster" for more information.

Section 2.6.1, "Installing Oracle GoldenGate into a Windows Cluster"

Section 2.6.2, "Installing the Oracle GoldenGate Files"

Section 2.6.3, "Specifying a custom Manager name"

Section 2.6.4, "Installing Manager as a Windows Service"

2.6.1 Installing Oracle GoldenGate into a Windows Cluster

To install Oracle GoldenGate into a Windows cluster:

1. Log into one of the nodes in the Windows cluster.

2. Choose a drive for the Oracle GoldenGate installation location. This drive must be a resource within the same Windows cluster group that contains the database instance.

3. Ensure that this Windows cluster group is owned by the cluster node that you are logging into.

4. Install Oracle GoldenGate according to the following instructions.

2.6.2 Installing the Oracle GoldenGate Files

To install the Oracle GoldenGate files:

1. Unzip the downloaded file(s) by using `WinZip` or an equivalent compression product.

2. Move the files in binary mode to a folder on the drive where you want to install Oracle GoldenGate. *Do not* install Oracle GoldenGate into a folder that contains spaces in its name, even if the path is in quotes. For example:

   `C:\"Oracle GoldenGate "` is not valid.

   `C:\Oracle_GoldenGate` is valid.

3. From the Oracle GoldenGate folder, run the GGSCI program.

4. In GGSCI, issue the following command to create the Oracle GoldenGate working directories.

   `CREATE SUBDIRS`

5. Issue the following command to exit GGSCI.

   `EXIT`

6. Install the TAM library into the root Oracle GoldenGate directory on the replication server. The TAM communicates with an Oracle GoldenGate API that is known as a *Vendor Access Module*, or *VAM*. The VAM passes transactional data changes to the Replicat process. For instructions on pairing the correct TAM version with your Teradata version, and for configuring the TAM for use with the Teradata database and Oracle GoldenGate, see the *Teradata Replication Services Using Oracle GoldenGate* documentation at `http://www.info.teradata.com`. In general, the TAM version should match the database version.

2.6.3 Specifying a custom Manager name

You must specify a custom name for the Manager process if either of the following is true:

- You want to use a name for Manager other than the default of `GGSMGR`.

- There will be multiple Manager processes running as Windows services on this system. Each Manager on a system must have a unique name. Before proceeding further, note the names of any local Manager services.

To specify a custom Manager name:

1. From the directory that contains the Manager program, run GGSCI.

2. Issue the following command.

   `EDIT PARAMS ./GLOBALS`

   > **Note:** The `./` portion of this command must be used, because the GLOBALS file must reside at the root of the Oracle GoldenGate installation file.

3. In the file, add the following line, where *name* is a one-word name for the Manager service.

```
MGRSERVNAME name
```

4. Save the file. The file is saved automatically with the name GLOBALS, *without a file extension*. Do not move this file. It is used during installation of the Windows service and during data processing.

2.6.4 Installing Manager as a Windows Service

By default, Manager is not installed as a service and can be run by a local or domain account. However, when run this way, Manager will stop when the user logs out. When you install Manager as a service, you can operate it independently of user connections, and you can configure it to start manually or at system start-up.

Installing Manager as a service is required on a Windows Cluster, but optional otherwise.

To install Manager as a Windows service:

1. (Recommended) Log on as the system administrator.

2. Click **Start** then **Run** and type cmd in the Run dialog box.

3. From the directory that contains the Manager program that you are installing as a service, run the INSTALL utility with the following syntax:

    ```
    install option [...]
    ```

    Where: *option* is one of the following:

Table 2–3   INSTALL Utility Options

Option	Description
ADDEVENTS	Adds Oracle GoldenGate events to the Windows Event Manager.
ADDSERVICE	Adds Manager as a service with the name that is specified with the MGRSERVNAME parameter in the GLOBALS file, if one exists, or by the default of GGSMGR. ADDSERVICE configures the service to run as the Local System account, the standard for most Windows applications because the service can be run independently of user logins and password changes. To run Manager as a specific account, use the USER and PASSWORD options.[1]
	The service is installed to start at system boot time (see AUTOSTART). To start it after installation, either reboot the system or start the service manually from the Services applet of the Control Panel.
AUTOSTART	Sets the service that is created with ADDSERVICE to start at system boot time. This is the default unless MANUALSTART is used.
MANUALSTART	Sets the service that is created with ADDSERVICE to start manually through GGSCI, a script, or the Services applet of the Control Panel. The default is AUTOSTART .
USER name	Specifies a domain user account that executes Manager. For the *name*, include the domain name, a backward slash, and the user name, for example HEADQT\GGSMGR .
	By default, the Manager service is installed to use the Local System account.
PASSWORD password	Specifies the password for the user that is specified with USER .

[1] A user account can be changed by selecting the Properties action from the Services applet of the Windows Control Panel.

4. If Windows User Account Control (UAC) is enabled, you are prompted to allow or deny the program access to the computer. Select **Allow** to enable the INSTALL utility to run.

The INSTALL utility installs the Manager service with a local system account running with administrator privileges. No further UAC prompts will be encountered when running Manager if installed as a service.

> **Note:** If Manager is not installed as a service, Oracle GoldenGate users will receive a UAC prompt to confirm the elevation of privileges for Manager when it is started from the GGSCI command prompt. Running other Oracle GoldenGate programs also triggers a prompt.

2.7 Integrating Oracle GoldenGate into a Cluster

If you installed Oracle GoldenGate in a cluster, take the following steps to integrate Oracle GoldenGate within the cluster solution.

2.7.1 General Requirements in a Cluster

The general requirements for integrating Oracle GoldenGate into a cluster are:

1. Register the Oracle GoldenGate Manager process (and only Manager) as a cluster-managed resource as you would any other application. Manager must be the only Oracle GoldenGate process that the cluster-management software starts and stops, because it is the parent process that manages all other processes.

2. If the cluster uses a virtual IP address, you may need to obtain an available fixed IP address for the Manager process. The VIP must be an available IP address on the public subnet and cannot be determined through DHCP. Other Oracle GoldenGate products that access Manager also should use the VIP.

3. When you configure Manager, add the AUTOSTART and AUTORESTART parameters so that Manager starts the replication processes automatically. You can, when needed, control Replicat, and other Oracle GoldenGate processes from within the Oracle GoldenGate user interfaces. For more information about these parameters, see *Reference for Oracle GoldenGate for Windows and UNIX*.

4. Mount the shared drive on one node only. This prevents processes from being started on another node. Use the same mount point on all nodes.

5. Configure Oracle GoldenGate as directed in this documentation.

2.7.2 Adding Oracle GoldenGate as a Windows Cluster Resource

When installing Oracle GoldenGate in a Windows cluster, follow these instructions to establish Oracle GoldenGate as a cluster resource and configure the Manager service correctly on all nodes.

- In the cluster administrator, add the Manager process to the group that contains the database to which Oracle GoldenGate will connect.

- Make sure all nodes on which Oracle GoldenGate will run are selected as possible owners of the resource.

- Make certain the Manager Windows service has the following dependencies (configurable from the Services control panel):

  - The database resource

- The disk resource that contains the Oracle GoldenGate directory
- The disk resource that contains the database transaction log files
- The disk resource that contains the database transaction log backup files

3

Preparing the System for Oracle GoldenGate

This chapter contains guidelines for preparing the database and the system to support Oracle GoldenGate. This chapter contains the following sections:

- Section 3.1, "Preparing Tables for Processing"

3.1 Preparing Tables for Processing

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

Section 3.1.1, "Disabling Triggers and Cascade Constraints"

Section 3.1.2, "Assigning Row Identifiers"

3.1.1 Disabling Triggers and Cascade Constraints

Disable triggers, cascade delete constraints, and cascade update constraints on target Teradata tables. 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.

3.1.2 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.

3.1.2.1 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.

3.1.2.2 Using KEYCOLS to Specify a Custom Key

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 Replicat `MAP` parameter. The specified key will override any existing primary or unique key that Oracle GoldenGate finds. For more information, see *Reference for Oracle GoldenGate for Windows and UNIX*.

4

Configuring Oracle GoldenGate

This chapter describes how to configure Oracle GoldenGate Replicat. This chapter contains the following sections:

- Section 4.1, "Configuring Oracle GoldenGate Replicat"
- Section 4.2, "Additional Oracle GoldenGate Configuration Guidelines"

4.1 Configuring Oracle GoldenGate Replicat

This section highlights the basic Replicat parameters that are required for most target database types. Additional parameters may be required. See the Oracle GoldenGate installation and configuration documentation for your target database and the *Reference for Oracle GoldenGate for Windows and UNIX*.

Perform these steps on the target replication server or target database system.

1. Configure the Manager process according to the instructions in Administering Oracle GoldenGate for Windows and UNIX.

2. In the Manager parameter file, use the PURGEOLDEXTRACTS parameter to control the purging of files from the local trail.

3. Create a Replicat checkpoint table. There are multiple options for this purpose. For instructions, see *Administering Oracle GoldenGate for Windows and UNIX*.

4. Create a Replicat group. For documentation purposes, this group is called rep.

   ```
   ADD REPLICAT rep, EXTTRAIL remote_trail
   ```

   Use the EXTTRAIL argument to link the Replicat group to the remote trail that you specified for the data pump on the source server.

5. Use the EDIT PARAMS command to create a parameter file for the Replicat group. Include the parameters shown in Example 4–1 plus any others that apply to your database environment.

Example 4–1   Parameters for the Replicat Group

```
-- Identify the Replicat group:
REPLICAT rep
-- State whether or not source and target definitions are identical:
SOURCEDEFS {full_pathname | ASSUMETARGETDEFS}
-- Specify database login information as needed for the database:
[TARGETDB dsn2,] [USERID user id[, PASSWORD pw]]
-- Specify error handling rules (See the NOTE following parameter file):
REPERROR (error, response)
-- Specify tables for delivery:
```

```
MAP owner.table, TARGET owner.table[, DEF template name];
```

> **Note:** In a recovery situation, it is possible that Replicat could attempt to apply some updates twice. If a multiset table is affected, this could result in duplicate rows being created. Use the REPERROR parameter in the Replicat parameter file so that Replicat ignores duplicate rows.

4.2 Additional Oracle GoldenGate Configuration Guidelines

The following are additional considerations to make once you have installed and configured your Oracle GoldenGate environment.

4.2.1 Handling Massive Update and Delete Operations

Operations that update or delete a large number of rows will generate discrete updates and deletes for each row on the subscriber database. This could cause a lock manager overflow on the Teradata subscriber system, and thus terminate the Replicat process.

To avoid these errors, you can do either of the following:

- Temporarily suspend replication for these operations and then perform them manually on the source and target systems. To suspend replication, use the following command, which suspends replication for that session only. The operations of other sessions on that table are replicated normally.

```
set session override replication on;
commit;
```

4.2.2 Preventing Multiple Connections

By default, the Replicat processes create a new connection for catalog queries. You can prevent this extra connection by using the DBOPTIONS parameter with the NOCATALOGCONNECT option.

4.2.3 Performing Initial Synchronization

Perform an initial synchronization of the source and target data before using Oracle GoldenGate to transmit transactional changes for the first time to configure an initial load, see *Administering Oracle GoldenGate for Windows and UNIX*.

5

Modifying Objects in the Oracle GoldenGate Configuration

This chapter contains instructions for performing some common maintenance tasks when using the Oracle GoldenGate replication solution. This chapter contains the following sections:

- Section 5.1, "Modifying Columns of a Table"

5.1 Modifying Columns of a Table

To modify columns of a table:

1. Suspend activity on the source database for all tables that are linked to Oracle GoldenGate.

2. Start GGSCI.

3. In GGSCI, issue this command for the Replicat group:

   `INFO REPLICAT group`

4. On the `Checkpoint Lag` line, verify whether there is any Replicat lag. If needed, continue to issue `INFO REPLICAT` until lag is zero, which indicates that all of the data in the trail has been processed.

5. Stop the Replicat group.

   `STOP REPLICAT group`

6. Perform the table modifications on the target databases.

7. Start the Replicat process.

   `START REPLICAT group`

8. Allow user activity to resume on all of the source tables that are linked to Oracle GoldenGate.

6

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. This chapter contains the following sections:

- Section 6.1, "Uninstalling Oracle GoldenGate from Linux or UNIX"
- Section 6.3, "Uninstalling Oracle GoldenGate from Windows (Non-cluster)"
- Section 6.2, "Uninstalling Oracle GoldenGate from Windows Cluster"

6.1 Uninstalling Oracle GoldenGate from Linux or UNIX

To uninstall Oracle GoldenGate from Linux or UNIX:

1. Run the command shell.

2. 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. Run GGSCI.

4. Stop all Oracle GoldenGate processes.

5. Stop the Manager process (where ! in the following command can be used to bypass the interactive prompt).

   ```
   Stop Manager [!]
   ```

6. Exit GGSCI.

7. Log into the database with the DBLOGIN command, and then remove the Replicat checkpoint table using the DELETE CHECKPOINTTABLE command.

8. Make certain all processes are stopped (including GGSCI).

9. Remove the Oracle GoldenGate files by removing the installation directory.

6.2 Uninstalling Oracle GoldenGate from Windows Cluster

To uninstall Oracle GoldenGate from Windows cluster:

1. Log into the node in the cluster that owns the cluster group that contains the Manager resource. 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.

2. Run GGSCI.

3. Stop all Oracle GoldenGate processes.

4. Exit GGSCI.

5. Use the Cluster Administrator tool to take the Manager resource offline.

6. Right click the resource and select **Delete** to remove it.

7. Run the `INSTALL` utility using the following syntax.

   ```
   INSTALL DELETEEVENTS DELETESERVICE DELETEDRIVERS
   ```

   This command stops Oracle GoldenGate events from being reported to the Windows Event Manager and removes the Manager service.

8. Move the cluster group to the next node in the cluster, and repeat from step 5.

9. Follow the instructions in Section 6.3, "Uninstalling Oracle GoldenGate from Windows (Non-cluster)".

6.3 Uninstalling Oracle GoldenGate from Windows (Non-cluster)

To uninstall Oracle GoldenGate from Windows:

1. 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.

2. Stop all Oracle GoldenGate processes.

3. Stop the Manager process (where `!` in the following command can be used to bypass the interactive prompt).

   ```
   STOP MANAGER [!]
   ```

4. Click **Start** then **Run** and type `cmd` in the Run dialog box.

5. Change directories to the Oracle GoldenGate installation directory.

6. Run the `INSTALL` utility using the following syntax.

   ```
   INSTALL DELETEEVENTS DELETESERVICE DELETEDRIVERS
   ```

   This command stops Oracle GoldenGate events from being reported to the Windows Event Manager and removes the Manager service.

7. Log into the database with the `DBLOGIN` command, and then remove the Replicat checkpoint table using the `DELETE CHECKPOINTTABLE` command.

8. Make certain all processes are stopped (including GGSCI) and then remove the Oracle GoldenGate files by removing the installation directory.

9. Exit GGSCI.

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. 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
- Oracle GoldenGate Subdirectories
- Other Oracle GoldenGate Files
- Oracle GoldenGate Checkpoint Table

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 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.
ggmxinstall	Oracle GoldenGate installation script for the SQL/MX database.

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

Program	Description
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*.