

Oracle® Database

Installing Oracle GoldenGate Classic Architecture



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Preface

This preface includes the following topics:

- [Audience](#)
- [Conventions](#)
- [Documentation Accessibility](#)
- [Related Information](#)

Audience

This guide is intended for users responsible for installing and managing Oracle GoldenGate Classic Architecture for Oracle and various non-Oracle databases.

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.
<i>italic</i>	Italic type indicates placeholder variables for which you supply particular values, such as in the parameter statement: <code>TABLE <i>table_name</i></code> . 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 process or utility unless the name is intended to be a specific case. Keywords in upper case (ADD EXTRACT, ADD EXTTRAIL, FORMAT RELEASE).
LOWERCASE	Names of processes to be written in lower case. Examples: ADD EXTRACT exte, ADD EXTRAIL ea.
{ }	Braces within syntax enclose a set of options that are separated by pipe symbols, one of which must be selected, for example: { <i>option1</i> <i>option2</i> <i>option3</i> }.
[]	Brackets within syntax indicate an optional element. For example in this syntax, the SAVE clause is optional: CLEANUP REPLICAT <i>group_name</i> [, SAVE <i>count</i>]. Multiple options within an optional element are separated by a pipe symbol, for example: [<i>option1</i> <i>option2</i>].

Convention	Meaning
Sample Locations	Compass directions such as east, west, north, south to be used for demonstrating Extract and Replicat locations. Datacenters names to use the standard similar to dc1, dc2.
Group names	Prefixes for each process, as follows: • Extract: ext. Usage with location: extn, where n indicates 'north' compass direction. • Replicat: rep. Usage with location: repn, where n indicates 'north' compass direction. • Distribution Path: dp. Usage with location: dpn, where n indicates 'north' compass direction. • Checkpoint table: ggs_checkpointtable • Trail file names: e or d depending on whether the trail file is for the Extract of distribution path. Suffix derived in alphabetical order. Usage for an Extract trail file: ea, eb, ec. • Trail file subdirectory: The name will use compass directions to refer to the trail subdirectories. Example for trail subdirectory name would be /east, /west, /north, /south.

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Related Information

The Oracle GoldenGate Product Documentation Libraries are found at:

[Oracle GoldenGate Documentation](#)

Oracle GoldenGate for Big Data Documentation:

<https://docs.oracle.com/en/middleware/goldengate/big-data/index.html>

For additional information on Oracle GoldenGate, refer to:

<https://www.oracle.com/middleware/technologies/goldengate.html>

[Oracle Database High Availability](#)

1

Overview

Learn about the prerequisites for installing Oracle GoldenGate.

Topics:

- [Understanding and Obtaining the Oracle GoldenGate Distribution](#)
- [Verify Certification and System Requirements](#)
- [Operating System Requirements](#)
- [Database Requirements](#)

Understanding and Obtaining the Oracle GoldenGate Distribution

You can download Oracle GoldenGate from the Oracle GoldenGate Downloads page: <https://www.oracle.com/middleware/technologies/goldengate-downloads.html>.

Verify Certification and System Requirements

Ensure that you install your product on a supported hardware or software configuration. For more information, see the [certification matrix](#) for this release.

Oracle tests and verifies the performance of your product on all certified systems and environments. As new certifications occur, they are added to the proper certification document. 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.

Here are some additional details about the supported platforms:

- **Cross Endian Support:** Most Oracle GoldenGate products support cross endian replication, which means that the source and target database can be a different platform (or even endian) than the actual server where Oracle GoldenGate is installed.
- **Fully Certified Criteria:** Oracle GoldenGate certifications are often phased in, for a particular new release of the product, Oracle typically supports Oracle databases first and then the various non-Oracle and Big Data technologies. In some cases, Oracle GoldenGate may support the data store you are looking for, but you may need to check the certification matrix for a previous release. Platforms that are in the certification matrix are platforms where either full regression testing is done or where basic validation is performed for continuity purposes.
- **Fully Supported by Inference:** There are other technologies that are supported for Oracle GoldenGate that may not be explicitly listed in the certification matrix. For example, Oracle certify its technologies based on a combination of Chipset, Operating System, Data Store Type, and Data Store Version. As long as these four criteria are met, support is available.

- **Fully Supported through Open Source Compatibility:** There are a number of Open Source technologies that Oracle GoldenGate is certified with such as Big Data and non-Oracle databases. Sometimes, users may have open source environments and need Oracle GoldenGate to provide support with such unique infrastructures, such as Apache HBase on Azure Data Lake. In such cases, Oracle GoldenGate does support any unique open source environment if the Chipset, Operating System, Open Source Framework and Framework Version are certified by Oracle GoldenGate. For example, in case of Apache HBase, Oracle GoldenGate support needs to check the version of Apache HBase, for which Oracle GoldenGate is certified, and if that version happens to be running on some Cloud, then Oracle GoldenGate will be supported. In each of these Open Source examples (that are not explicitly certified), Oracle GoldenGate support is available using the base open source configurations, such as Apache on certified hardware. However, Oracle may not be obligated to support each possible infrastructure combination that users may select.
- **Java JDBC Support:** Many SQL, NoSQL and Big Data technologies support Java JDBC capabilities. Oracle GoldenGate for Big Data enables replication of transactions into any JDBC compliant drivers. Individual drivers may vary in terms of performance and metadata coverage, so there is no specific guarantee that Oracle GoldenGate JDBC support will work with every JDBC driver, but most common JDBC drivers and commercial implementations usually work with Oracle GoldenGate JDBC and these are supported. If you don't find your technology in the certification matrix, but you know that there is a JDBC driver available, then it could be that you may have both technical compatibility and a supported configuration.
- **Managed and Unmanaged Data Stores:** With the advent of managed Cloud services such as native cloud services, many data stores are now available with automated lifecycle, patching, and other conveniences. In many cases, managed data stores are fully compatible and consistent with Oracle GoldenGate certifications and support. However, in some cases, a cloud vendor may turn-off or restrict access to features that Oracle GoldenGate requires for full features compatibility, particularly with Oracle GoldenGate Extract capabilities. If you have a question about a third party cloud managed service for a data store that Oracle GoldenGate may usually support, but you do not see that managed service listed in the Oracle GoldenGate certification matrix, directly contact Oracle GoldenGate product management.

Operating System Requirements

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

Topics:

- [Memory Requirements](#)
- [Disk Requirements](#)
- [Network](#)
- [Operating System Privileges](#)
- [Other Operating System Requirements](#)
- [Operating System Requirements for NonStop SQL/MX](#)
- [Windows Console Character Sets](#)

Memory Requirements

All Platforms

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

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

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

Excessive swapping to disk causes performance issues for the Extract process in particular, because it must store data from each open transaction until a commit record is received. If Oracle GoldenGate runs on the same system as the database, then 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 the *Reference for Oracle GoldenGate*. Also, see *Tuning the Performance of Oracle GoldenGate* in *Administering Oracle GoldenGate*.

Windows Platforms

For Windows Server environments, the number of process groups that can be run are tightly coupled to the *non-interactive* Windows desktop heap memory settings. The default settings for Windows desktop heap may be enough to run very small numbers of process groups. As you approach larger amounts of process groups, more than 60 or so, you have two choices:

- Adjust the non-interactive value of the SharedSection field in the registry based on information from Microsoft (Windows desktop heap memory).
- Increase the number of Oracle GoldenGate homes and spread the total number of desired process groups across these homes.

For more information on modifying the Windows Desktop Heap memory, review the following Oracle Knowledge Base document (Doc ID 2056225.1).

Disk Requirements

Disk space requirements vary based on the platform, database, and Oracle GoldenGate architecture to be installed.

- [Disk Requirements for Oracle GoldenGate Installation Files](#)
- [Temporary Disk Requirements](#)
- [Other Disk Space Considerations](#)
- [Disk Requirements for NonStop SQL/MX](#)
- [Storage for Oracle GoldenGate Trails](#)

Disk Requirements for Oracle GoldenGate Installation Files

The disk space requirements for a Oracle GoldenGate installation vary based on your operating system and database. Ensure that you have adequate disk space for the downloaded file, expanded files, and installed files, which can be up to 2GB.

Temporary Disk Requirements

When total cached transaction data exceeds the `CACHESIZE` setting of the `CACHEMGR` parameter, Extract begins writing cache data to temporary files located in the Oracle GoldenGate installation directory. For Classic Architecture, this is in the installation's `dirtmp` folder, and for Microservices Architecture, it is the `/var/temp` folder for that deployment.

The cache manager assumes that all of the free space on the file system is available. These directories can fill up quickly if there are many transactions with large transaction sizes. To prevent I/O contention and possible disk-related Extract failures, dedicate a disk to this directory. You can assign a name to this directory with the `CACHEDIRECTORY` option of the `CACHEMGR` parameter.

Note:

`CACHEMGR` is an internally self-configuring and self-adjusting parameter. It is rare that this parameter requires modification. Doing so unnecessarily may result in performance degradation. It is best to acquire empirical evidence before opening an Oracle Service Request and consulting with Oracle Support.

It is typically more efficient for the operating system to swap to disk than it is for Extract to write temporary files. The default `CACHESIZE` setting assumes this. Thus, there should be sufficient disk space to account for this, because only after the value for `CACHESIZE` is exceeded will Extract write transaction cached data to temporary files in the file system name space. If multiple Extract processes are running on a system, the disk requirements can multiply. Oracle GoldenGate writes to disk when there is not enough memory to store an open transaction. Once the transaction has been committed or rolled back, committed data is written to trail files and the data are released from memory and Oracle GoldenGate no longer keeps track of that

transaction. There are no minimum disk requirements because when transactions are committed after every single operation these transactions are never written to disk.

**Note:**

Oracle recommends that you do not change the `CACHESIZE` because performance can be adversely effected depending on your environment.

Other Disk Space Considerations

In addition to the disk space required for the files and binaries that are installed by Oracle GoldenGate, allow additional disk space to hold the Oracle GoldenGate trails. Trails can be created up to 2GB in size, with a default of 500MB. The space required depends upon the selected size of the trails, the amount of data being captured for replication, and how long the consumed trails are kept on the disk. The recommended minimum disk allocated for Trails may be computed as:

$((\text{transaction log size} * 0.33) * \text{number of log switches per day}) * \text{number of days to retain trails}$

Based on this equation, if the transaction logs are 1GB in size and there is an average of 10 log switches per day, it means that Oracle GoldenGate will capture 3.3GB data per day. To be able to retain trails for 7 days, the minimum amount of disk space needed to hold the trails is 23GB.

A trail is a set of self-aging files that contain the working data at rest and during processing. You may need more or less than this amount, because the space that is consumed by the trails depends on the volume of data that will be processed.

Disk Requirements for NonStop SQL/MX

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

Assign the following free disk space:

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

Other Disk Space Considerations

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

Temporary Disk Requirements

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

Storage for Oracle GoldenGate Trails

To prevent trail activity from interfering with business applications, assign a separate disk or file system to contain the trail files. These files are created during processing to store all of the data that is captured by Oracle GoldenGate. The default size can be changed during the configuration process. Trail files accumulate but can be purged according to rules set with the `PURGEOLDEXTRACTS` parameter. You will specify the location of the trails when you configure Oracle GoldenGate. For more information about configuring trail files, see *Creating a Trail in Administering Oracle GoldenGate*.

Network

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

- Use the fastest network possible and install redundancies at all points of failure for optimal performance and reliability, especially in maintaining low latency on the target.
- You can configure Oracle GoldenGate Microservices to use a reverse proxy. Oracle GoldenGate Microservices includes a script called `ReverseProxySettings` that generates configuration file for only the NGINX reverse proxy server.
See *Reverse Proxy Support in Oracle GoldenGate Security Guide*.
- Configure the system to use both TCP and UDP 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.
- Oracle GoldenGate requires some unreserved and unrestricted TCP/IP network ports, the number of which depends on the number and types of processes in your configuration. See *Administering Oracle GoldenGate* 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 processes. You specify them with parameters when configuring deployments for the Microservices Architecture and for the Manager and pumps with the Classic Architecture.
- Configure your firewalls to accept connections through the Oracle GoldenGate ports.

Operating System Privileges

The following are the privileges in the operating system that are required to install Oracle GoldenGate and to run the processes:

- The person who installs Oracle GoldenGate must be granted read and write privileges on the Oracle GoldenGate software home directory.

- To install on Windows, the person who installs Oracle GoldenGate must log in as an Administrator.
- The Oracle GoldenGate Extract, Replicat, and Manager processes, and configuring deployments using the `oggca.sh` script must operate as an operating system user that has read, write, and delete privileges on files and subdirectories in the Oracle GoldenGate directory.
- For Extract processes that read from transaction logs and backups, it must operate as an operating system user that has read access to the logs and backup files.
- Oracle recommends that you dedicate the Extract and Replicat operating system users to Oracle GoldenGate. Sensitive information might be available to anyone who runs an Oracle GoldenGate process, depending on how database authentication is configured.
- [Manager Running on Windows](#)

Manager Running on Windows

The Manager process can run as a Windows service, or it can run interactively as the current user. The Manager process requires:

- Full control permissions over the files and folders within the Oracle GoldenGate directories.
- Full control permissions over the trail files, when they are stored in a location other than the Oracle GoldenGate directory.
- Membership in the server's local Administrators Group (on all nodes in a cluster).
- If you are running Manager as a Windows service with an Extract or Replicat that is connected to a database using Windows Authentication, then the process attempts to log in to the database with the account that the Manager is running under. Ensure that the Manager's service account has the correct access to the database.

The programs that capture and replicate data, Extract and Replicat, run under the Manager account and inherit the Manager's operating system level privileges.

Other Operating System Requirements

The following additional features of the operating system must be available to support Oracle GoldenGate.

- To use Oracle GoldenGate user exits, install the C/C++ Compiler, which creates the programs in the required shared object or DLL.
- Gzip to decompress the Oracle GoldenGate installation files. Otherwise, you must unzip the installation on a PC by using a Windows-based product, and then FTP it to the AIX, DB2 for i, or DB2 z/OS platforms.
- For best results on DB2 platforms, apply high impact (HIPER) maintenance on a regular basis staying within one year of the current maintenance release. The HIPER process identifies defects that could affect data availability or integrity. IBM provides Program Temporary Fixes (PTF) to correct defects found in DB2 for i and DB2 z/OS.
- For Oracle GoldenGate running on a Windows system, install the Microsoft Visual C++ Redistributable Package for Visual Studio 2015, 2017, and 2019. This package installs runtime components of Visual C++ Libraries that are required for Oracle GoldenGate processes.

Download and install the x64 version of Visual C++ 2015, 2017, and 2019 package:

<https://support.microsoft.com/en-us/help/2977003/the-latest-supported-visual-c-downloads>

- For Oracle GoldenGate for Oracle to be installed on a remote hub server, download and install the Oracle Database 21c client for the operating system platform where Oracle GoldenGate will be installed and ensure that you install the Administrator version of the client.

Operating System Requirements for NonStop SQL/MX

To support Oracle GoldenGate for SQL/MX, install the Open System Services (OSS) environment.

Windows Console Character Sets

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 codepagenumber
```

For example, `chcp 437`.

For a code page overview, see [https://msdn.microsoft.com/en-us/library/windows/desktop/dd317752\(v=vs.85\).aspx](https://msdn.microsoft.com/en-us/library/windows/desktop/dd317752(v=vs.85).aspx) and the list of code page identifiers [https://msdn.microsoft.com/en-us/library/windows/desktop/dd317756\(v=vs.85\).aspx](https://msdn.microsoft.com/en-us/library/windows/desktop/dd317756(v=vs.85).aspx).

Database Requirements

This section outlines the database requirements that are necessary to support Oracle GoldenGate for different databases.

Topics:

- [Requirements for Installing Oracle GoldenGate for DB2 LUW](#)
- [Requirements for Installing Oracle GoldenGate for DB2 for i](#)
- [Requirements for Installing Oracle GoldenGate for DB2 z/OS](#)
- [Requirements for Installing Oracle GoldenGate for MySQL](#)
- [Requirements for Installing Oracle GoldenGate for Oracle Database](#)
- [Requirements for Installing Oracle GoldenGate for PostgreSQL](#)
- [Requirements for Installing Oracle GoldenGate for NonStop SQL/MX](#)
- [Requirements for Installing Oracle GoldenGate for SQL Server](#)
- [Requirements for Installing Oracle GoldenGate for Teradata](#)
- [Requirements for Installing Oracle GoldenGate for TimesTen](#)

Requirements for Installing Oracle GoldenGate for DB2 LUW

Learn the prerequisites for installing Oracle GoldenGate for a DB2 LUW database.

Topics:

- [Choosing an Installation System for DB2 LUW](#)
- [Choosing and Configuring a System for Remote Capture or Delivery](#)

Choosing an Installation System for DB2 LUW

To install Oracle GoldenGate for DB2 LUW, you can use either of the following configurations:

- Install Oracle GoldenGate on the DB2 LUW database server.
- Install Oracle GoldenGate on another server, and configure Oracle GoldenGate to connect remotely to the database server through DB2 Connect. All of the Oracle GoldenGate functionality that is supported for DB2 LUW is supported in this configuration. To use this option, proceed to [Choosing and Configuring a System for Remote Capture or Delivery](#).

To Use Remote Delivery to the DB2 LUW System Using DB2 Connect

1. For the intermediary system, select any supported for the DB2 for LUW database to be the system that Oracle GoldenGate is installed on.
2. Install and run DB2 for LUW on the selected remote system so that the Replicat process can use the supplied DB2 Connect driver.
3. Catalog the DB2 target node in the DB2 for LUW database on the remote system by using the following DB2 command:

```
catalog tcpip node db2_node_name remote DNS_nameserver DB2_port-number
```

4. Add the target DB2 database to the DB2 for LUW catalog on the intermediary system by using the following DB2 command:

```
catalog db database_name as database_alias at node db_node_name
```

Note:

Refer to the IBM DB2 LUW documentation for more information about these commands.

5. Install Oracle GoldenGate. For CA, see [Installing Oracle GoldenGate Classic Architecture for Non-Oracle Databases](#). For MA, see [Installing Microservices Architecture for Oracle GoldenGate](#).
6. Specify the DB2 target database name with the Replicat parameter.TARGETDB when you configure the Oracle GoldenGate processes.

Choosing and Configuring a System for Remote Capture or Delivery

In a remote installation, you install Oracle GoldenGate on a server that is remote from the source or target database server. This server can be any Linux, UNIX, or Windows platform that Oracle GoldenGate supports for the DB2 for LUW database. The Oracle GoldenGate build must match the version of DB2 LUW that is running on the installation server.

In this configuration, the location of the database is transparent to Extract and Replicat. Extract can read the DB2 logs on a source DB2 LUW database server, and Replicat can apply data to a target DB2 LUW server.

To Configure Remote Capture or Delivery:

1. Install and run DB2 for LUW on the remote server that has DB2 Connect.
2. Catalog the remote server in the DB2 source or target database by using the following DB2 command:

```
catalog tcpip node db2_node_name remote remote_DNS_name
```
3. Catalog the DB2 target node in the DB2 for LUW database on the remote server by using the following DB2 command:

```
catalog tcpip node db2_node_name remote remote_DNS_name server remote_port_number
```
4. Add the DB2 source or target database to the DB2 catalog on the remote server by using the following DB2 command:

```
catalog db database_name as database_alias at node db_node_name
```

 Note:

Refer to the IBM DB2 LUW documentation for more information about these commands.

5. Download and install the Oracle GoldenGate build that is appropriate for the DB2 LUW database on the remote server.

Requirements for Installing Oracle GoldenGate for DB2 for i

Learn the prerequisites for installing Oracle GoldenGate for a DB2 for i database.

Topics:

- [Memory Requirements](#)
- [Oracle GoldenGate Security Privileges](#)
- [General Requirements](#)
- [Choosing an Installation Operating System](#)
- [Supported ODBC Driver](#)
- [Installing Oracle GoldenGate Files for IBM DB2 for i](#)

Memory Requirements

Oracle GoldenGate requires the following memory resources on the remote system, and the database host system.

On the remote system:

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. Depending on the platform, the term swap space can be a swap partition, a swap file, or a shared memory segment (IBM i platforms). Modern servers have sufficient RAM combined with sufficient swap space and memory management systems to run Oracle GoldenGate. However, increasing the amount of RAM available to Oracle GoldenGate may significantly improve its performance, as well as that of the system in general.

Typical Oracle GoldenGate installations provide RAM in multiples of gigabytes to prevent excessive swapping of RAM pages to disk. The more contention there is for RAM, the more swap space is used. Excessive swapping to disk causes performance issues for the Extract process in particular, because it must store data from each open transaction until a commit record is received. If Oracle GoldenGate runs on the same system as the database, the amount of RAM that is available becomes critical to the performance of both.

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

For more information about evaluating Oracle GoldenGate memory requirements, see the CACHMGR parameter in the *Reference for Oracle GoldenGate*.

On the DB2 for i host system allocate approximately 10-50 MB of memory for each Oracle GoldenGate journal reader.

Oracle GoldenGate Security Privileges

This section outlines the security privileges that Oracle GoldenGate requires on a source DB2 for i system and on a Windows or Linux target system.

The person who installs Oracle GoldenGate must have read and write privileges on the Oracle GoldenGate installation directory, because steps will be performed to create some sub-folders and run some programs. On a Windows system, the person who installs Oracle GoldenGate must log in as Administrator.

Manager, Replicat, and Collector (program name is `server`) are active. Manager controls the other processes and interacts with Collector to receive incoming data, while Replicat applies data to the target DB2 for i database through ODBC.

Oracle GoldenGate processes must be assigned a user account that is dedicated to Oracle GoldenGate and cannot be used by any other program. One user account can be used by all of the Oracle GoldenGate processes. This account must have privileges to read, write, and delete files and directories within the Oracle GoldenGate installation directory.

If the Extract user profile does not have the required authority, Extract will log the following errors and stop.

```
[SC=-1224:SQL1224N A database agent could not be started to service a request, or was terminated as a result of a database system shutdown or a force command.SQL STATE 55032: The CONNECT statement is invalid, because the database manager was stopped after this application was started]
```

The user profile must be specified with the `USERID` parameter when you configure the parameter files and in the `DBLOGIN` command prior to issuing any GGSCI commands that interact with the database.

For more information on user profiles and security privileges, see [User Profiles and Security Privileges](#).

General Requirements

- Portable Application Solution Environment (PASE) must be installed on the system.
- Java 8 must be installed on the IBM i and the Linux host system where GoldenGate for IBM i will run.
- OpenSSH is recommended to be installed on the system. OpenSSH is part of the IBM Portable Utilities licensed program and allows SSH terminal access to the system in the same manner as other Linux system.
- A library/schema should be dedicated to each install for Oracle GoldenGate on the IBM i system.
- The IBM DB2 for i Program temporary fixes (PTFs) that are required by release for Oracle GoldenGate are detailed in the following tables:

IBM i7.3 Group PTF	Level	Name	Notes
SF99730	23103	Cumulative PTF	NA
SF99731	12	All PTF groups except cumulative PTF package	.

IBM i7.4 Group PTF	Level	Name	Notes
SF99740	23117	Cumulative PTF	NA
SF99741	8	All PTF groups except cumulative PTF package	NA

IBM i7.5 Group PTF	Level	Name	Notes
SF99750	23110	Cumulative PTF	NA

IBM i7.5 Group PTF	Level	Name	Notes
SF99751	4	All PTF groups except cumulative PTF package	NA

These required PTFs are the levels at which Oracle GoldenGate has been tested against for the 21c releases. To check the group PTF levels, you must use the `WRKPTFGRP` command from a 5250 terminal session and check for the specific PTFs with the commands shown in the preceding tables. The specific extra PTFs must be at least temporarily applied.

Choosing an Installation Operating System

Oracle GoldenGate for DB2 for i operates remotely on Intel Linux systems. A few components will be automatically copied to the IBM i systems.

Oracle GoldenGate for Db2 for i supports the IBM i Access ODBC Driver 64-bit. For more information, see [Supported ODBC Driver](#).

Consider the following:

- The best performance is seen with a system that has the lowest network latency to the IBM i system that you use. Although it is possible to run over a wide area network, the performance suffers due to the increased network latency.
- No special requirements beyond what capture already has for Oracle GoldenGate delivery. Because this Oracle GoldenGate release is a fully-remote distribution, the former Oracle GoldenGate DB2 for i remote product is no longer shipped separately. However, Windows is not supported in Oracle GoldenGate for DB2 for i in this release. If you still require delivery to DB2 for i from Windows, then Oracle GoldenGate DB2 for i remote 12.3 is still available.

Supported ODBC Driver

Starting from Oracle GoldenGate release 21.12, Oracle GoldenGate for Db2 for i supports the IBM i Access ODBC Driver 64-bit version 1.1.0.27 or higher.

See [Linux, macOS, and PASE Application Packages](#) for more information on IBM i Access ODBC Driver and follow the steps provided to install IBM i Access application package for the Linux operating system.

In addition, install unixODBC driver manager to be used with the Db2 ODBC driver on all supported Linux operating systems. For example, to install the unixODBC driver manager on the Red-Hat Linux operating system, use the `yum` command. See [Installing the unixODBC driver manager](#) for more information.

After the IBM i Access ODBC Driver and the unixODBC driver manager are installed successfully, add appropriate values in the `odbcinst.ini` and `odbc.ini` files to register the driver and the system.

You can test if the DSN and drivers are configured properly by testing the connection using the `isql` command. For example:

```
isql -v DSN user password
```

Installing Oracle GoldenGate Files for IBM DB2 for i

The installation of the Oracle GoldenGate requires that certain environment variables be set:

- The `JAVA_HOME` variable is set to the location of a Java 8 JRE.
- The `LD_LIBRARY_PATH` variable must include `$JAVA_HOME/lib:$JAVA_HOME/lib/amd64:$JAVA_HOME/lib/amd64/server`.

To install the Oracle GoldenGate files, do the following:

1. Unzip the downloaded files by using gunzip 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.
3. From the Oracle GoldenGate folder, run the GGSCI program.
4. Edit the `GLOBALS` file to set the location of the GoldenGate library (GGSCHEMA) that will be used on the IBM i system(s) that this installation will work with.
5. In GGSCI, issue the following command to create the Oracle GoldenGate working directories.

```
ggsci> CREATE SUBDIRS
```

6. Run the `DBLOGIN` command to all IBM i systems that this GoldenGate installation will work with using a user profile that has at least `*ALLOBJ` authority. This will allow the native objects to be correctly copied and setup on the IBM i system in the library specified by GGSCHEMA in `GLOBALS`. This level of authority is only required for Oracle GoldenGate setup, and not for any operation of the product.
7. Issue the following command to exit GGSCI.

```
ggsci>EXIT
```



Note:

On an upgrade installation process, the ownership of the objects on the IBM i system(s) is retained with the original owner of those objects. However, for an initial installation process, if the owner is to be a profile other than the install profile, then it would be required to log in to each IBM i system directly and change the ownership manually in the GGSCHEMA library to the user or group profile that is intended for that system.

Requirements for Installing Oracle GoldenGate for DB2 z/OS

Learn the prerequisites for installing Oracle GoldenGate for a DB2 z/OS database.

Topics:

- [System Services](#)
- [Memory Requirements](#)
- [Disk Requirements for DB2 z/OS](#)
- [Operating System Privileges for DB2 z/OS](#)

- [Choosing an Installation Operating System](#)
- [Installing Extract Components on Db2 z/OS](#)
- [Using Shared Memory Manager for Extract](#)

System Services

Activate UNIX System Services (USS) only if required to install the executables for the Extract support modules.

Oracle GoldenGate supports Sysplex data sharing.

Memory Requirements

Oracle GoldenGate requires the following memory resources on the Oracle GoldenGate remote system and the database host system.

On the remote system

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**. Depending on the platform, the term **swap space** can be a swap partition, a swap file, or a shared memory segment (IBM i platforms).

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

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

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

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

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

On the DB2 host system

Allocate approximately 10-50 MB of virtual memory for each Oracle GoldenGate log reader, `oggreadb`, that is invoked depending on the size of the log buffer. There is one invocation per Extract process on the remote system. To adjust the maximum log buffer size, use the `TRANLOGOPTIONS BUF SIZE` parameter in the Extract parameter file.

When setting up the Workload Manager (WLM) environment for the Extract log read components, it is recommended to set `NUMTCB` in the range of 10-40 depending on your environment. This is based on the IBM general guidelines available here:

https://www.ibm.com/support/knowledgecenter/en/SSEPEK_11.0.0/perf/src/tpc/db2z_assignprocfunc2wlmappenv.html

Disk Requirements for DB2 z/OS

On the DB2 host system

(Only applicable if you are installing stored procedures.) Assign a zFS (zSeries file systems) or hierarchical file system volume. To determine the size of the Oracle GoldenGate download file, examine the size of `zOSPrograms.zip` on the remote DB2 system after extracting the installation image.

Operating System Privileges for DB2 z/OS

The remote host requires privileges to use the `chmod +rw` command on the sub-directories in the Oracle GoldenGate product directory.

Table 1-1 shows the other required operating system privileges for Oracle GoldenGate:

Table 1-1 Operating System Privileges

DB2 z/OS User Privilege	Extract	Stored Procedures	Replicat
CONNECT to the remote DB2 subsystem.	X	X	X

Choosing an Installation Operating System

Oracle GoldenGate for DB2 for z/OS operates remotely on zLinux, AIX or Intel Linux systems. To capture data, a small component must be installed on the DB2 z/OS system that contains the DB2 instance that will allow Oracle GoldenGate to read the DB2 log data.

To install Oracle GoldenGate on a remote zLinux, AIX or Linux system, you have the following options for connecting to DB2 on the z/OS system:

- DB2 Connect v10.5 or greater
- IBM Data Server Driver for ODBC and CLI v10.5 or greater
- IBM Data Server Client v10.5 or greater
- IBM Data Server Runtime Client v10.5 or greater

Consider the following:

- Extract uses Open Database Connectivity (ODBC) to connect to the DB2 subsystem on the z/OS system. If one of the other drivers is not already installed, the IBM Data Server Driver for ODBC and CLI is the most lightweight driver and is recommended for most configurations, although the other drivers are suitable also.
- To capture DB2 log data, the log reader component must be installed in a Library (PDSE) on the z/OS system. Load Libraries (PDS) are not supported. The library must be authorized program facility (APF) helps your installation protect the system. APF-authorized programs can access system facility (APF) authorized. The log read component is called through SQL from the remote system and since it is APF authorized, an authorized Workload Manager (WLM) environment must

also be used to run these programs since the default DB2 supplied WLM environment is not able to run authorized workload.

- No special requirements beyond what capture already has for Oracle GoldenGate delivery. Because this Oracle GoldenGate release is a fully-remote distribution, the former Oracle GoldenGate DB2 Remote product is no longer shipped separately. However, Windows is not supported in Oracle GoldenGate for DB2 z/OS in this release. If you still require delivery to z/OS from Windows, then Oracle GoldenGate DB2 Remote 12.2 is still available.
- UNIX System Services (USS) is no longer required (as in prior releases) except for a few installation procedures.
- Windows only: To apply data to a DB2 target from Windows, Oracle GoldenGate DB2 Remote v12.2 must be used. Capture is not support in this scenario.
- Install Oracle GoldenGate DB2 Remote on a remote system for remote delivery to the DB2 target system. In this configuration, Replicat connects to the target DB2 database by using the ODBC API that is supplied in DB2 Connect . This configuration requires DB2 LUW to be installed on the remote system.

 Note:

All of the Oracle GoldenGate functionality that is supported for DB2 for z/OS is supported by DB2Connect. In addition, ASCII character data is converted to EBCDIC automatically by DB2 Connect.

- Although it is possible to install Oracle GoldenGate on zLinux, AIX, and Intel based Linux, the best performance is seen with a system that has the lowest network latency to the z/OS system that you use. Although it is possible to run over a wide area network, the performance suffers due to the increased network latency. Oracle recommends using a zLinux partition on the same physical hardware as the z/OS system that is running DB2 using Hipersockets or a VLAN between the partitions. Otherwise, systems connected with OSA adapters in the same machine room, would be the next best choice. Alternatively, the fastest Ethernet connection between the systems that is available would be acceptable.

Using the Remote Delivery to the DB2 z/OS using DB2Connect

1. For the intermediary system, select any platform that Oracle GoldenGate supports for the DB2 for LUW database. This is the system on which Oracle GoldenGate is installed.
2. Install and run DB2 for LUW on the selected remote system so that the Replicat process can use the supplied DB2 Connect driver.
3. Catalog the DB2 target node in the DB2 for LUW database on the remote system by using the following DB2 command:

```
catalog tcpip node db2_node_name remote DNS_name server DB2_port-number
```

4. Add the target DB2 database to the DB2 for LUW catalog on the intermediary system by using the following DB2 command:

```
catalog db database_name as database_alias at node db_node_name
```

See the IBM DB2 LUW documentation for more information about these commands.

Installing Extract Components on Db2 z/OS

The Oracle GoldenGate Db2 z/OS Extract uses SQL objects to access and read the Db2 log. These Oracle GoldenGate Db2 z/OS objects require a minimum hardware platform of z10, a minimum operating system release of 1.13, and a minimum Db2 release of 11. The components consist of executable load modules, SQL stored procedures and functions, and external programs called via the stored procedures. these components are:

1. External programs (authorized) includes the following programs:
 - a. oggib001 – Initialization and utility program
 - b. oggrb001 – Log read program functionality
 - c. oggmt001 – Stand-alone program that monitors ECSA and 64-bit memory
 - d. oggjt001 – Setup program for the oggmt001 startup JCL run from oggib001 program
 - e. oggfr001 – Utility for use by a DBA under guidance from Oracle Support
2. SQL stored procedure and function includes `demo_db2_setupb_os390.sql` with the `OGGINITB` and `OGGREADB SQL`.
3. JCL procedure, `oggtask.jcl`

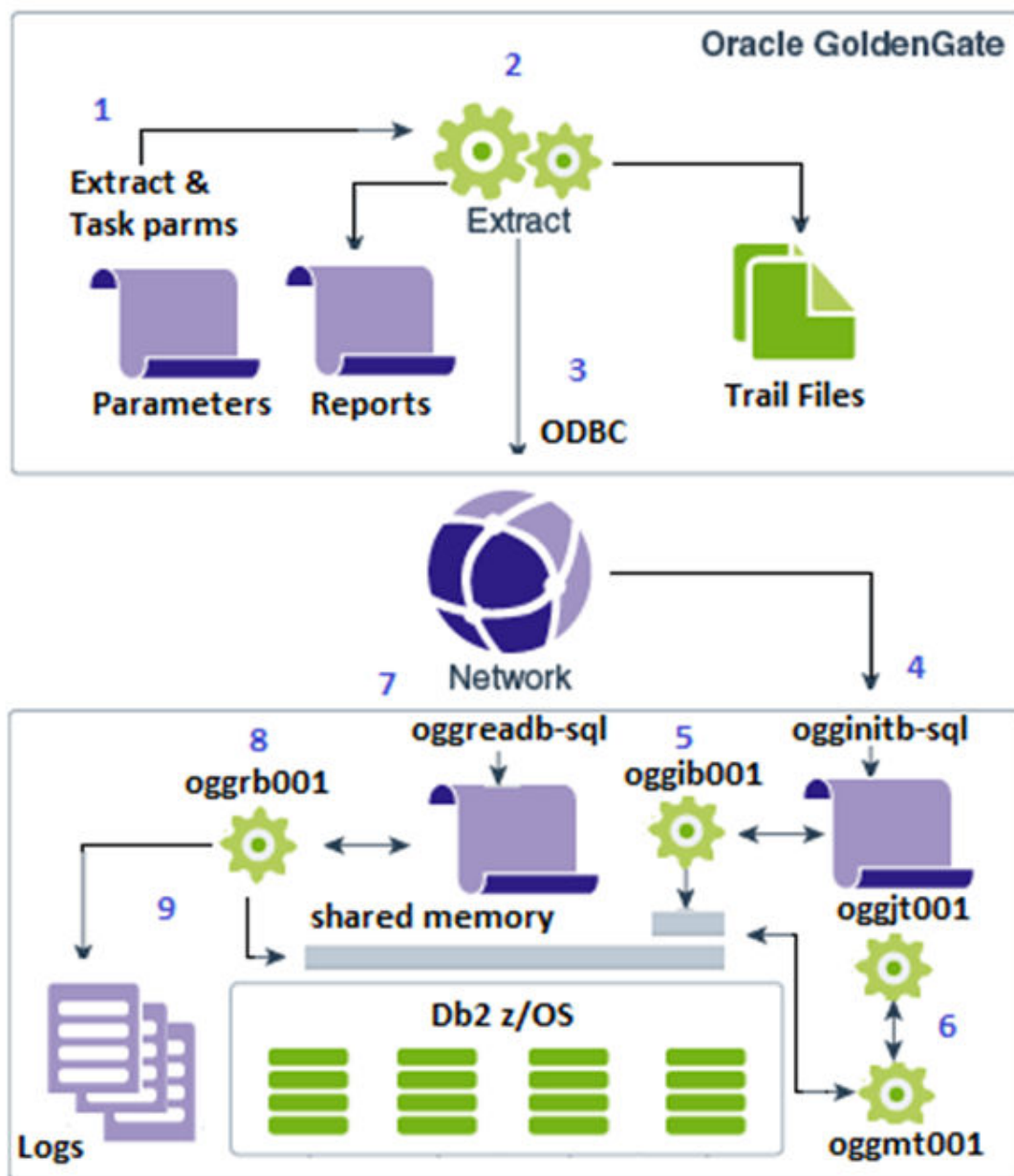


Note:

These external names, SQL and JCL names are the default names, which you can edit and update. This process is discussed in the subsequent sections.

The Replication Process for Db2 z/OS Extract figure illustrates the replication process for the Db2 z/OS Extract and its mainframe components.

Figure 1-1 Replication Process for Db2 z/OS Extract



The process starts and runs as shown using the numbers 1 through 9 in the figure, which is given below:

1. Extract reads the parameters, including the JCL parameters, from the parameter file created during installation.
2. Extract reports the startup information and prepares to write the trail files.
3. ODBC is used to gather information from the Db2 database and start replication.
4. The `OGGINITB` SQL stored procedure starts to prepare shared memory and to gather other data needed for replication.

5. The OGGIB001 external program called by the SQL stored procedure starts the memory monitor task using the OGGJT001 job setup program.
6. The OGGMT001 memory monitor task starts monitoring the ECSA and 64-bit shared memory.
7. The OGGREADB SQL Function calls the external program OGGRB001.
8. The OGGRB001 external program repeatedly calls the Db2 log read program to create a result set that returns 1 to many log record buffers to the Extract.
9. When a log record result set is complete, OGGRB001 ends after sending the result set to the Extract.

Extract repeats steps 7 to 9 until shut down or abnormal termination. If the memory task fails to start, OGGI001 program returns a flag indicating there was a JCL error or setup issue and Extract manages its own memory. If the memory task starts properly, the memory task tests constantly changing fields in the 48-byte ECSA shared memory. These fields stop changing if the Extract terminates for any reason. At that point, the memory manager waits in case the Extract or network is slow and releases the memory before shutting down after a configured time limit.

To install the components needed for Oracle GoldenGate for Db2 z/OS for Extract:

1. Ensure that a library (PDSE) exists on the Db2 z/OS system and an entry for it is made in the authorized library list. This library is the location where the Oracle GoldenGate external program objects will reside.
2. Ensure that an APF-authorized WLM environment exists that references the PDSE from the preceding step. Oracle recommends that NUMTCB value for the WLM environment be 10-40 for stored procedures. The NUMTCB value depends on the maximum number of Extracts that are running concurrently against the database and on how much throughput each Extract requires. If you want flexibility in setting NUMTCB, you specify it in the startup JCL for the WLM, but not in the creation panel.
3. You can set up security for the WLM application environments and for creating stored procedures by completing the following:
 - a. (Optional) Specify which WLM-established address spaces can run stored procedures. If you do not complete this step, then any WLM-established address space can run stored procedures.
 - b. Grant access to users to create procedures in specific WLM address spaces.
 - c. Grant access to users to create procedures in specific schemas. Use the GRANT statement with the CREATEIN option for the appropriate schema.
 - d. Grant access to users to create packages for procedures in specific collections. Use the GRANT statement with the CREATE option for the appropriate collection.
 - e. Grant access to refresh the WLM environments to the appropriate people.
 - f. Add additional RACF authority to the appropriate people, allowing the WLM procedures to start the memory manager job.
4. Ensure the ID used to run the WLM startup JCL procedure has permission to use RRSAP. Each time one of the Db2 WLM address spaces is started, it uses RRSAP to attach to Db2. See the [Db2 11 for z/OS Installation and Migration Guide](#)
5. In the Linux or UNIX installation of Oracle GoldenGate for Db2 z/OS, there is a ZIP file called zOSPrograms.zip. Unzip zOSPrograms.zip to zOSPrograms.tar and

copy `zOSPrograms.tar` in binary mode to your Db2 z/OS system into an HFS directory.

6. On your Db2 z/OS system in USS or OMVS, change directories to the directory containing `zOSPrograms.tar`.
7. Restore the objects with the command: `tar -xovf zOSPrograms.tar`.

 Note:

In this command, the copy target is double-quote forward-slash single-quote authorized PDSE name single-quote double quote. The `-x` is an uppercase capital X *not* a lowercase x.

8. Copy the objects to the authorized PDSE. Use the `cp -X ogg[irmj][abt][0-9]* "/'authorized_PDSE_name' " where authorized_PDSE_name is the name of the APF authorized PDSE, which is intended for the Oracle GoldenGate objects. Using this command installs the objects with the default names.`
9. Installing the scripts with different names allows you to conform with system protocols, or it allows you to run multiple versions of Oracle GoldenGate. To install the scripts with different names, it is recommended to create a shell script that renames the programs before copying them to the PDSE. An example of the shell script is given in the following code snippet.

```
#!/bin/bash
# Copy new programs renaming them to version 21.12 names.
cp oggib001 oggi2112
cp oggrb001 oggr2112
cp oggmt001 oggm2112
cp oggjt001 oggj2112
cp -X oggi2112 "/'SYS4.WLMDSNA.AUTHLOAD' "
cp -X oggr2112 "/'SYS4.WLMDSNA.AUTHLOAD' "
cp -X oggm2112 "/'SYS4.WLMDSNA.AUTHLOAD' "
cp -X oggj2112 "/'SYS4.WLMDSNA.AUTHLOAD' "
```

You can run the script using `chmod +x` command. You can copy and reuse this script for new versions.

10. You must create the SQL procedures using your SQL tool of choice so that Oracle GoldenGate can call the Extract objects. The Oracle GoldenGate stored procedures should have permission granted to only those users that use them for replication.

An example SQL script in the Oracle GoldenGate install directory contains the SQL statements to set up the stored procedures on the Db2 z/OS instance. The `demo_db2_setupb_os390.sql` script is for Db2 v11.1 and higher and can run from any SQL tool on any platform that can connect to your Db2 z/OS instance. This script must run on the Db2 instance that you use with your Extract. The script provided in the remote installation directory is in ASCII format. The same script is restored through `zOSPrograms.tar` on the Db2 z/OS system in EBCDIC and is suitable for use through native Db2 z/OS tools such as `SPUFI`.

Edit the following line before running the scripts:

- Modify the `WLM ENVIRONMENT` line to use the correct name for the WLM environment that you will use for Oracle GoldenGate.

 Note:

The oggifi0001 schema name is configurable using the `TRANLOGOPTIONS REMOTESCHEMA schemaname` parameter. The procedure names are not configurable. Each of the external names in the script and the PDSE can be renamed as long as the script names and the PDSE object names match. Changing these names is part of the procedure that allows migration to new versions or if specific naming procedures must be adhered to on Db2 z/OS. The following table contains a check list of components that you may wish to edit and/or update:

Table 1-2 List of Editable Components

Component	From	Rename	Where
oggib001	tar file		authorized PDSE
oggrb001	tar file		authorized PDSE
oggmt001	tar file		authorized PDSE & proc library
oggjt001	tar file		authorized PDSE & Extract parm
oggpr001	tar file		procedure library & Extract parm
proclib	MVS		add Extract parm if needed
step libraries	MVS		WLM and oggpr001 procedure library
remoteschema			demo_db2_setupb_os390.sql and Extract parm
WLM name	MVS		demo_db2_setupb_os390.sql
external program			demo_db2_setupb_os390.sql

 Note:

Remember to perform all these steps after every new patch installation.

Using Shared Memory Manager for Extract

Oracle GoldenGate Extract starts a separate task, or job, from the WLM to monitor shared memory usage. This memory consists of a small 48 to 64 byte ECSA area, and a large 64-bit area based on the Extract buffer size.

Specific fields in shared memory get updated for every read performed by the Extract. These fields are updated whether or not the script returns any data. The monitor

checks those fields to ensure the Extract has not become inactive. If the Extract is inactive, the shared memory is released, and the monitor ends. You can control the Memory Manager using the `remote_memory_options` parameter in the Extract's parameter file.

You can specify multiple sub-parameters to configure the monitor task. You can configure the wait interval and inactive time the monitor uses by specifying sub-parameters of the remote memory options, as shown in the following example:

```
remote_memory_options wait_interval 2000 inactive_time 01:00
```

The wait interval is expressed in hundredths of seconds in the example and causes the monitor to wait 20 seconds between each memory check. If the monitor has checked for 1 hour (format HH:MM) and the Extract is still inactive, then the monitor will shut down after releasing the shared memory. If the Extract returns to an active state during that hour, the monitor will reset its state and continue monitoring.

The `wait_interval` can have values from 100 to 6000 and the default is 1000. The `inactive_time` can be from 00:10 to 12:00 and the default is 00:30. If the monitor does not start properly, the Extract displays a warning message in the Extract report and the Extract continues the processing. The Extract will attempt to release ECSA memory when it shuts down.

The remote memory parameter has three options to make this feature work. The syntax for these parameters is:

- `task_procedure proc name`
- `task_library proc library`
- `task_setup task setup program`

Example:

```
remote_memory_options task_procedure OGGPR001
remote_memory_options task_library TEST.PROCLIB
remote_memory_options task_setup OGGJT001
```

You may specify multiple options in a single command, as shown below:

```
remote_memory_options task_procedure OGGPR001 task_library TEST.PROCLIB
task_setup OGGJT001
```

**Note:**

The values for the remote memory parameter are case insensitive.

The default values are procedure name `OGGPR001` and the task setup program `OGGJT001`. There is no default for task library as the procedure might be installed in one of the MVS system default procedure libraries. The task library parameter is only needed if the procedure is not in a system default library.

The memory task will start with a simple JOB card and an `EXEC` procedure name with parameters passed from the Extract. Some z/OS systems may require various other

parameters on the job card. The JOB parameters can also be modified using the remote memory parameter, as shown in the example given below.

```
remote_memory_options task_jobname [valid MVS job name (see below)]
remote_memory_options task_acct_info [valid MVS acct value ( see
below)]
remote_memory_options task_programmer [valid MVS programmer name, Can
use single quotes]
remote_memory_options task_class [valid MVS job class A to Z or 0 to 9]
remote_memory_options task_msgclass [valid MVS msgclass A to Z or 0 to
9]
remote_memory_options task_msglevel [valid MVS message level n or (,n)
or (n,n) n=valid digit]
remote_memory_options task_priority [valid MVS priority 0-15]
```

You can specify the JOB name using two valid characters and an asterisk, such as AA*. The default JOB name is GG*. The asterisk is replaced by six random numbers when it is specified. Otherwise, if you specify a one to eight byte character name, it must be a valid MVS job name.

Specify account values in any of the following valid MVS formats:

- OTXI
- 'MY ACCT'
- (ACCT,1234,ABC)

For parameters, like `acct_info` and `programmer`, that allow special characters, you must enclose those in single quotes. In addition, the MVS rules about using double single quotes or ampersands within quotes continue to apply. The Extract does minimal validation for these parameters and leaves the complete validation to the MVS process. Extract will accept the first one if you specify duplicate parameters and ignore any duplicates.

A sample procedure JCL file will be included in the `zOSPrograms.zip` file. The JCL has the following format:

```
/*=====
/* EXAMPLE JCL FOR RUNNING THE COMMON MEMORY MONITOR PROCEDURE
/* ADDRESS SPACE NEEDING AN AUTHORIZED LOAD LIBRARY
/* NOTE: THE PROGRAM OGGMT001 CAN BE RENAMED IN THE LIBRARY BUT THE
/*      NEW NAME MUST MATCH THE PROGRAM NAME IN THIS JCL
/*=====
//OGGDSNNA PROC RGN=0K TR=,EX=,MEM=,LEN=,SEC=,DUR=,VER=
//OGGDSNNX EXEC PGM=OGGMT001,REGION=&RGN,TIME=NOLIMIT,
// PARM='&TR &EX &MEM &LEN &SEC &DUR &VER'
/*-----
/* REPLACE &PREFIX.**.AUTHLOAD LIBRARIES WITH SITE SPECIFIC FILE(S)
/* ALSO REPLACE THE CEE LIBRARY WITH SITE SPECIFIC FILE
/* DSNN COULD REPRESENT A DB2 SPECIFIC LOAD LIBRARY IF ONE EXISTS
/*-----
//STEPLIB DD DISP=SHR,DSN=&PREFIX..WLMSNN.USER.AUTHLOAD
//          DD DISP=SHR,DSN=CEE.SCEERUN
//SYSPRINT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
```

Modify the libraries marked with `PREFIX` so that they work in your system. If you renamed the program `OGGMT001` you copied from the `zOSPrograms.tar` file, you must

change it in the JCL. The null parameters on the `PROC` statement are there for information purposes. The job setup program supplies those values using information passed from the Extract. You may also specify as many step library dataset names as required. The JCL procedure supplied in the `zosPrograms.tar` file gives an example using more than one step library.

Requirements for Installing Oracle GoldenGate for MySQL

Learn the prerequisites for installing Oracle GoldenGate for a MySQL database.

Topics:

- [Supported Databases](#)
- [Database Storage Engine](#)
- [Database Character Set](#)
- [Other Programs and Settings for MySQL](#)

Supported Databases

Oracle GoldenGate for MySQL supports capture and delivery for MySQL, Oracle MySQL Database Service, Amazon Aurora MySQL, Amazon RDS for MariaDB, Amazon RDS for MySQL, Azure Database for MySQL, and MariaDB.

For supported database versions, review the [Certification Matrix](#).

- [Limitations of Support](#)

Limitations of Support

Following are the limitations of support for Oracle GoldenGate for MySQL:

- MySQL databases enabled with binary log transaction compression are not supported with Oracle GoldenGate Extract.
- MySQL databases enabled with binary log encryption are not supported with Oracle GoldenGate Extract.

Database Storage Engine

Requirements for the database storage engine are as follows:

- Oracle GoldenGate supports the InnoDB storage engine for a source MySQL database.
- All the components of Oracle GoldenGate for MySQL, including Extract, Replicat, and GGSCI connect to the database using the MySQL native API.
- Oracle GoldenGate supports capture and apply from and to the InnoDB engine. Apply to MyISAM engine works, but there might be data integrity issues as MyISAM engine is non-transactional.

Database Character Set

MySQL provides a facility that allows users to specify different character sets at different levels.

Level	Example
Database	<pre>create database test charset utf8;</pre>
Table	<pre>create table test(id int, name char(100)) charset utf8;</pre>
Column	<pre>create table test (id int, name1 char(100) charset gbk, name2 char(100) charset utf8));</pre>

Limitations of Support

- When you specify the character set of your database as utf8mb4/utf8, the default collation is utf8mb4_unicode_ci/utf8_general_ci. If you specify collation_server=utf8mb4_bin, the database interprets the data as binary. For example, specifying the CHAR column length as four means that the byte length returned is 16 (for utf8mb4) though when you try to insert data more than four bytes the target database warns that the data is too long. This is the limitation of database so Oracle GoldenGate does not support binary collation. To overcome this issue, specify collation_server=utf8mb4_bin when the character set is utf8mb4 and collation_server=utf8_bin for UTF-8.
- The following character sets are **not** supported:

```
armscii8  
keybcs2  
utf16le  
geostd8
```

Other Programs and Settings for MySQL

Oracle GoldenGate requires OpenSSL shared libraries to be installed. If you are using Oracle GoldenGate for MySQL 8.0 and Oracle GoldenGate is installed on the local database server, then add the MySQL installation path to the `PATH` variable as follows:

For Windows:

```
PATH=MYSQL_HOME\bin;%PATH%
```

For Linux:

```
export PATH=MYSQL_HOME/bin:$PATH
```

If you need to set up Oracle GoldenGate for MySQL 5.7 or earlier or are installing Oracle GoldenGate on a remote server, then you need to install OpenSSL and add its installation location to the `PATH` variable. This is required for both Linux and Windows.

Requirements for Installing Oracle GoldenGate for Oracle Database

Learn about the requirements for installing Oracle GoldenGate on Oracle database. These apply to both capture modes unless explicitly noted.

- Ensure that your database has minimal supplemental logging enabled.
- Database user privileges and configuration requirements are explained in Establishing Oracle GoldenGate Credentials in *Using Oracle GoldenGate for Oracle Database*.
- If the database is configured to use a bequeath connection, the `sqlnet.ora` file must contain the `bequeath_detach=true` setting.
- Oracle Databases must be in `ARCHIVELOG` mode so that Extract can process the log files.
- It is highly recommended to use the `FORCE LOGGING` mode on the database side, or on the specific tablespace of the replicated tables, to ensure that all transactional data is written to redo logs.

Topics:

- [Setting TNS_ADMIN](#)

Setting TNS_ADMIN

The `TNS_ADMIN` environment variable contains the path to the TNS files.

It is recommended (but not required) to set the environment variable `TNS_ADMIN`. If this environment variable is not set, then Oracle GoldenGate looks for the `$HOME/.tnsnames.ora` or `/etc/tnsnames.ora` file. In addition, the environment variable must be set before starting the Admin Client or GGSCI. Otherwise, this variable is not detected.

If you are not using `TNS_ADMIN`, then you can use connection qualifiers such as `(DESCRIPTION=(ADDRESS=(...)))`, with TNS aliases.

A preferred technique for configuring database connections is using the EZconnect syntax. You need the username, password, hostname, port number, and service name connection information to use the EZConnect syntax.

Syntax that you need to specify in the User ID field: `username@hostname:port/service_name`

Here's an example for setting the User ID with EZConnect:

```
c##ggadmin@dc.example.com:1521/dcl.example.com
```

Requirements for Installing Oracle GoldenGate for PostgreSQL

Learn the prerequisites for installing Oracle GoldenGate for a PostgreSQL database.

Also see the *post-installation* instructions for installing the DataDirect driver for PostgreSQL in Classic Architecture at [Post-installation Tasks](#). These instructions are required for installing the DataDirect driver for Linux operating system after completing the installation.

Topics:

- [Prerequisites for Installing Oracle GoldenGate for PostgreSQL](#)
- [Other Programs and Settings](#)

Prerequisites for Installing Oracle GoldenGate for PostgreSQL

PostgreSQL libpq Module

For Oracle GoldenGate installations beginning with release 21.6.0 and after, required PostgreSQL `libpq` libraries are now included in the Oracle GoldenGate installation package and do not need to be installed separately.

For Oracle GoldenGate installations prior to release 21.6.0, PostgreSQL `libpq` libraries need to be manually installed where Oracle GoldenGate is to be installed. The steps to install the correct `libpq` module when running Oracle GoldenGate versions prior to release 21.6.0 are:

**Note:**

It is highly recommended to patch Oracle GoldenGate to the most recent patch available on the support.oracle.com page. If you plan to install the base release 21.3 (GA release) immediately followed by the release 21.6 patch or later, then there is no need to install the PostgreSQL `libpq` module separately.

Installing the PostgreSQL `libpq` Module

The steps to install the PostgreSQL `libpq` module are:

1. Follow the steps to install the PostgreSQL package, available at: <https://www.postgresql.org/download/>
2. Select the **Linux** operating system family and **Red Hat/Rocky/CentOS Linux** distribution from the **Packages and Installers** drop-down list.
3. Select the highest PostgreSQL version that is supported with Oracle GoldenGate.
4. Select the platform on which Oracle GoldenGate is to be installed, such as **Red Hat Enterprise, Rocky, or Oracle version 8**.
5. Last, select the architecture as **x86_64** from the **Architecture** drop-down list.
This will provide the PostgreSQL setup scripts needed to install the required package(s).
6. Install the repository RPM and the `libs` module. The sample code is given below:

```
# Install the repository RPM: sudo dnf install -y
https://download.postgresql.org/pub/repos/yum/reporpms/EL-8-x86_64/
pgdg-redhat-repo-latest.noarch.rpm

# Disable the built-in PostgreSQL module:

sudo dnf -qy module disable postgresql

# Install PostgreSQL libs module:

sudo dnf install -y postgresql14-libs
```

Database Software for Capture

To capture from a PostgreSQL database, Oracle GoldenGate requires the `test_decoding` database plug-in be installed for the database. This plug-in might not have been installed by default when the database was installed.

Ensure that the `postgresqlversion#-contrib` package is installed on the database server, as shown in the example:

```
sudo yum install postgresql14-contrib
```

Other Programs and Settings

Additional requirements for PostgreSQL are listed in this topic.

Configure the `LD_LIBRARY_PATH` and `OGG_HOME` environment variables prior to installing Oracle GoldenGate.



Note:

It is highly recommended to patch Oracle GoldenGate to the most recent patch available on support.oracle.com/. If you plan to install the base release 21.3 (the GA release) immediately followed by a patched version, then perform the steps given below to set the environment variables based on the final patch version that you will install.

- For Oracle GoldenGate installations prior to release 21.6.0, set the following environment variables before installing Oracle GoldenGate:

1. `OGG_HOME` – The planned Oracle GoldenGate installation path.
2. `LD_LIBRARY_PATH` – Includes the `$OGG_HOME/lib` and PostgreSQL `libpq` directories.

Example:

```
export OGG_HOME=<GoldenGate_Installation_Path>
export LD_LIBRARY_PATH=$OGG_HOME/lib:/usr/pgsql-14/lib
```

- For Oracle GoldenGate installations of release 21.6.0 and after, set the following environment variables before installing Oracle GoldenGate:

1. `OGG_HOME` – The planned Oracle GoldenGate installation path.
2. `LD_LIBRARY_PATH` – Includes the `$OGG_HOME/lib` directory.

Example:

```
export OGG_HOME=<GoldenGate_Installation_Path>
export LD_LIBRARY_PATH=$OGG_HOME/lib
```

- When installing Oracle GoldenGate on a remote server (one different from where the database is running), set the remote server's time and time zone to that of the source database server so that Oracle GoldenGate Extract can correctly position by time when creating the Extract with the `BEGIN` option, otherwise, position by a valid `LSN` value.

Requirements for Installing Oracle GoldenGate for NonStop SQL/MX

The operating database requirements for running Oracle GoldenGate for NonStop SQL/MX are:

- On a source SQL/MX system, the Extract process uses a program named `VAMSERV` to capture transaction data from the audit trails. This program is placed into the installation subvolume when you install Oracle GoldenGate for NonStop SQL/MX. You will be prompted to install `VAMSERV` in the installation instructions in this guide.

- Oracle GoldenGate uses ODBC/MX to connect to the SQL/MX database. You may need to FUP DUP the ODBC/MX driver DLL to a location where the operating system will find it. This step is required every time the operating system is compiled, in case the new operating system includes a new version of the ODBC/MX.

Requirements for Installing Oracle GoldenGate for SQL Server

To operate with SQL Server databases, Oracle GoldenGate supports the following instance, database, and other configurations.

- [Prerequisites for Installing Oracle GoldenGate Microservice Architecture for SQL Server](#)
- [SQL Server Supported Versions](#)
- [Other Programs and Settings](#)
- [Where to Install Oracle GoldenGate](#)

Prerequisites for Installing Oracle GoldenGate Microservice Architecture for SQL Server

Open a terminal session and using Microsoft's RedHat Enterprise Server installation instructions for adding the ODBC Drivers for Linux, perform the following steps with default values. Respond with 'y' when prompted.

```
sudo su #RedHat Enterprise Server 7
curl https://packages.microsoft.com/config/rhel/7/prod.repo >
/etc/yum.repos.d/mssql-release.repo
exit

sudo yum remove unixODBC-utf16 unixODBC-utf16-devel #to avoid conflicts
sudo ACCEPT_EULA=Y yum install msodbcsql17
sudo ACCEPT_EULA=Y yum install mssql-tools
echo 'export PATH="$PATH:/opt/mssql-tools/bin"' >> ~/.bash_profile
echo 'export PATH="$PATH:/opt/mssql-tools/bin"' >> ~/.bashrc
source ~/.bashrc
```

SQL Server Supported Versions

Certified versions of SQL Server can be found on the published certification matrix available for each release of Oracle GoldenGate, which is available at the following link:

<https://www.oracle.com/middleware/technologies/fusion-certification.html>

Oracle GoldenGate Extract supports Enterprise Edition and some versions of SQL Server Standard Edition. Review the Exceptions and Additonal Information column of the certification matrix to see the details of which Standard Edition versions of SQL Server are supported for Extract.

Oracle GoldenGate Delivery supports both SQL Server Enterprise and Standard editions.

Oracle GoldenGate supports remote capture and delivery for Azure SQL Database Managed Instance and remote delivery for Azure SQL Database.

Oracle GoldenGate supports remote capture and delivery for Amazon RDS for SQL Server.

Other Programs and Settings

Observe the following program and settings information for Oracle GoldenGate for SQL Server:

- Install the Microsoft ODBC Driver 17 for the operating system where Oracle GoldenGate is to be installed:

<https://docs.microsoft.com/en-us/sql/connect/odbc/download-odbc-driver-for-sql-server?view=sql-server-2017>

 Note:

Do not install the Microsoft ODBC Driver 18 as it is not supported by Oracle GoldenGate.

When installing Oracle GoldenGate on Linux, follow the instructions for installing Microsoft ODBC Driver 17 for SQL Server on Linux and MAC OS, available at <https://docs.microsoft.com/en-us/sql/connect/odbc/linux-mac/installing-the-microsoft-odbc-driver-for-sql-server?view=sql-server-2017#17>, refer to the content listed under the RedHat Enterprise Server section.

- Installation of the Oracle GoldenGate CDC cleanup task for Classic Architecture installation requires the Microsoft `sqlcmd` Utility. Download instructions for Windows and Linux systems can be found at:
<https://docs.microsoft.com/en-us/sql/tools/sqlcmd-utility?view=sql-server-ver15>
- To install capture on a remote Linux or Windows server, set the remote server's time and time zone to that of the database server, or use LSN based positioning for the Extract.
- [Installing Microsoft ODBC Drivers for Linux](#)

Installing Microsoft ODBC Drivers for Linux

For Oracle GoldenGate installed on Linux, the Microsoft ODBC. The following tasks are required to install the Linux drivers.

1. (Oracle GoldenGate Marketplace only) Edit the file `/etc/passwd`, to grant temporary shell access to the root user.

```
$ sudo vi /etc/passwd
```

2. (Oracle GoldenGate Marketplace only) In the file `/etc/passwd`, change the value for the root user from `/usr/sbin/nologin` to `/bin/bash`. Save and close the file.

3. Using Microsoft's RedHat Enterprise Server installation instructions for adding the ODBC Drivers for Linux, perform the following steps with default values by answering 'y' when prompted.

```
$ sudo su

$ #RedHat Enterprise Server 7
$ curl https://packages.microsoft.com/config/rhel/7/prod.repo
> /etc/yum.repos.d/mssql-release.repo

$ exit
$ sudo yum remove unixODBC-utf16 unixODBC-utf16-devel #to avoid
conflicts
$ sudo ACCEPT_EULA=Y yum install msodbcsql17
$ sudo ACCEPT_EULA=Y yum install mssql-tools
$ echo 'export PATH="$PATH:/opt/mssql-tools/bin"' >> ~/.bash_profile
$ echo 'export PATH="$PATH:/opt/mssql-tools/bin"' >> ~/.bashrc
$ source ~/.bashrc
```

4. (Oracle GoldenGate Marketplace only) After installing the Linux drivers, you can reset the original shell access values for the root user.

```
$ sudo vi /etc/passwd
```

5. (Oracle GoldenGate Marketplace only) Change the value for the root user from /bin/bash to /usr/sbin/nologin. Save and close the file.

Where to Install Oracle GoldenGate

Oracle GoldenGate for SQL Server must be installed on a supported operating system as per the [Certification Matrix](#), and can be installed on the database server itself or on an application hub server, based on your preference.

Requirements for Installing Oracle GoldenGate for Teradata

Learn the prerequisites for installing Oracle GoldenGate for a Teradata database.

Topics:

- [Supported Platforms for a Replication Server](#)
- [Operating System Privileges for Teradata](#)
- [Installing ODBC Drivers for Teradata](#)

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.

Operating System Privileges for Teradata

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.

Installing ODBC Drivers for Teradata

Install a supported Teradata ODBC driver based on the database version and operating system where Oracle GoldenGate will be installed. Use the following link to find the available Teradata ODBC drivers:

<https://downloads.teradata.com/download/connectivity>

Review the README instructions provided by Teradata and complete the required driver installation steps.

Requirements for Installing Oracle GoldenGate for TimesTen

Learn the prerequisites for installing Oracle GoldenGate for a TimesTen database.

Topics:

- [System Requirements and Preinstallation Instructions](#)

System Requirements and Preinstallation Instructions

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

Topics:

- [Supported Database Architectures](#)
- [Supported Platforms and Database Versions](#)
- [Oracle TimesTen Software Installation](#)
- [Client-only Instance Creation](#)
- [Operating System Privileges](#)
- [Database Requirements](#)

Supported Database Architectures

Oracle GoldenGate for Oracle TimesTen supports the Classic and Scaleout architectures of the TimesTen database.

Supported Platforms and Database Versions

Oracle TimesTen supports installing Oracle GoldenGate on Linux.

For supported platform and database version information, review the certification matrix:

<https://www.oracle.com/technetwork/middleware/ias/downloads/fusion-certification-100350.html>.

Oracle TimesTen Software Installation

The Oracle TimesTen Client needs to be installed on the server where Oracle GoldenGate is going to be installed. If Oracle GoldenGate is installed on the Oracle TimesTen database server, then the required components are already available. However, if you are installing Oracle GoldenGate on a hub server, then you must separately install the Oracle TimesTen Client.

In both cases you will need to configure the ODBC connection information.

For Linux platforms there is only one TimesTen software distribution that provides both server and client components. To download the Oracle TimesTen Software, visit:

<https://www.oracle.com/database/technologies/timesten-downloads.html>

Before beginning to install Oracle GoldenGate with Oracle TimesTen, you must also set the `LD_LIBRARY_PATH` variable:

1. Download the *TimesTen Scaleout and TimesTen Classic/Cache 18.x for Linux x86 (64-bit)* build.
2. Extract the Oracle TimesTen installation files to the designated location, based on the instructions provided in *Oracle TimesTen In-Memory Database Installation Guide*.
3. Set the `LD_LIBRARY_PATH` system variable to include the TimesTen installation's `lib` directory. This system variable must be set to install and run Oracle GoldenGate. Example:

```
export LD_LIBRARY_PATH=/installpath/tt18.1.2.2.0/  
lib:$LD_LIBRARY_PATH
```

Client-only Instance Creation

For non-database server environments where you plan to install Oracle GoldenGate, after installing the Oracle TimesTen client libraries, follow the TimesTen document instructions to create a client-only instance of TimesTen.

1. Perform the following:

```
[oracle@tt_installation_dir]$ ./tt18.1.2.1.0/bin/ttInstanceCreate -  
clientonly
```

2. Follow the instance installation prompts, taking note of where the TimesTen instance is installed. This information will be required when setting up a Replicat's ODBC connection to TimesTen.
3. Set the `TIMESTEN_HOME` system variable to the TimesTen instance path.

Example:

```
export TIMESTEN_HOME=/instancepath/tt181
```

Operating System Privileges

The operating system privileges for using Oracle GoldenGate for Oracle TimesTen are:

- You need read and write privileges on the Oracle GoldenGate installation directory.
- Oracle GoldenGate Replicat and Manager processes must operate as an operating system user that has privileges to read, write, and delete files and subdirectories in the Oracle GoldenGate directory. In addition, the Manager process requires privileges to control all other Oracle GoldenGate processes.
- Dedicate the Replicat and Manager operating system users to Oracle GoldenGate to avoid access to sensitive information to other users who run Oracle GoldenGate processes.

Database Requirements

This section describes the database requirements for using Oracle GoldenGate for Oracle TimesTen.

- [Database User for Oracle GoldenGate Processes](#)

Database User for Oracle GoldenGate Processes

Follow these requirements for the database user for Oracle GoldenGate processes:



Note:

Times Ten is only supported as a target.

- 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)
 - DEFGEN (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 Oracle TimesTen database, grant `SELECT`, `INSERT`, `UPDATE`, and `DELETE` on all the target tables to the Replicat database user.
- For creating heartbeat and checkpoint tables, grant `CREATE TABLE` to the Replicat database user.

2

Installing Oracle GoldenGate Classic Architecture

This chapter explains how to install Oracle GoldenGate Classic Architecture with various supported databases.

For installation prerequisites specific to your database, see [Database Requirements](#).

Topics:

- [Installing Classic Oracle GoldenGate for Oracle Database](#)
- [Installing Oracle GoldenGate Classic Architecture for Non-Oracle Databases](#)
- [Integrating Oracle GoldenGate into a Cluster in Classic Architecture](#)

Installing Classic Oracle GoldenGate for Oracle Database

Learn how to install the Oracle GoldenGate Classic Architecture for Oracle Database for the first time.

Installing Oracle GoldenGate installs all of the components that are required to run and manage the processing (excluding any components required from other vendors, such as drivers or libraries) and it installs the Oracle GoldenGate utilities.

- [Performing an Interactive Installation with OUI](#)
- [Performing a Silent Installation with OUI](#)
- [Specifying a Custom Manager Name for Windows](#)
- [Installing Manager as a Windows Service](#)

Performing an Interactive Installation with OUI

The interactive installation provides a graphical user interface that prompts for the required installation information. These instructions apply to new installations as well as upgrades. However, to perform an upgrade to Oracle GoldenGate, follow the instructions in *Upgrading Oracle GoldenGate*, which includes a prompt to run OUI at the appropriate time.

1. Expand the installation file.
2. From the expanded directory, run the `runInstaller` program on UNIX or Linux, or run `setup.exe` on Windows.
3. On the **Select Installation Option** page, select the Oracle GoldenGate version to install, and then click **Next** to continue.
4. On the **Specify Installation Details** page, specify the following:
 - For **Software Location**, specify the Oracle GoldenGate installation directory. It can be a new or existing directory that is empty and has the amount of disk space shown on the screen or in the existing Oracle GoldenGate installation location (if you are

upgrading an existing Oracle GoldenGate installation). The default location is under the installing user's home directory, but Oracle recommends changing it to a local directory that is not mounted and has no quotas. The specified directory cannot be a registered home in the Oracle central inventory. If installing in a cluster, install Oracle GoldenGate on local storage on each node in the cluster to provide high availability options for upgrading and software patching.

 Note:

The software location path cannot contain any whitespace.

- (Optional) Select **Start Manager** to perform configuration functions, such as creating the Oracle GoldenGate subdirectories in the installation location, setting library paths, and starting Manager on the specified port number. To proceed, a database must exist on the system. When **Start Manager** is selected, the **Database Location and Manager Port** fields are displayed.
 - For **Database Location**, the database version in the specified location must be **Oracle Database 12c** if you are installing Oracle GoldenGate for Oracle Database 12c or **Oracle Database 11g** if you are installing Oracle GoldenGate for Oracle Database 11g. The database must have a registered home in the Oracle central inventory. The installer registers the Oracle GoldenGate home directory with the central inventory.
 - For **Manager Port**, accept the default port number or enter a different unreserved, unrestricted port number for the Manager process to use for interprocess communication. The default port is the first available one starting with 7809. If you are installing multiple instances of Oracle GoldenGate on the same system, each must use a different port number.
 - Click **Next** to continue. If this is an upgrade to an existing Oracle GoldenGate installation, OUI prompts that the selected software location has files or directories. Click **Yes**.
5. The **Create Inventory** page is displayed if this is the first Oracle product to be installed from OUI on a host that does not have a central inventory.
 - For **Inventory Directory**, specify a directory for the central inventory. It can be a new directory or an existing directory that is empty and has the amount of disk space shown on the screen. The directory cannot be on a shared drive.
 - Select an operating system group in which the members have write permission to the inventory directory. This group is used to add inventory information to the Oracle GoldenGate subfolder.
 6. On the **Summary** page, confirm that there is enough space for the installation and that the installation selections are correct. Optionally, click **Save Response File** to save the installation information to a response file. You can run the installer from the command line with this file as input to duplicate the results of a successful installation on other systems. You can edit this file or create a new one from a template. See [Performing a Silent Installation with OUI](#).
 7. Click **Install** to begin the installation or **Back** to go back and change any input specifications. When upgrading an existing Oracle GoldenGate installation, OUI notifies you that the software location has files or directories. Click **Yes** to continue. You are notified when the installation is finished.

8. If you created a central inventory directory, you are prompted to run the `INVENTORY_LOCATION/orainstRoot.sh` script. This script must be executed as the root operating system user. This script establishes the inventory data and creates subdirectories for Oracle GoldenGate.

Performing a Silent Installation with OUI

These instructions apply to new installations, as well as upgrades.

You can perform a silent installation from the command console if the system has no X-Windows interface or to perform an automated installation. Silent installations can ensure that multiple users in your organization use the same installation options when they install your Oracle products.

You perform a silent installation by running a response file. You can create a response file by selecting the **Save Response File** option during an interactive OUI session or by editing a template.

1. To run a response file, use the following command:

```
runInstaller -silent -nowait -responseFile absolute_path_to_response_file
```

The response files and the template are stored in the response subdirectory of the Oracle GoldenGate installation directory. The Oracle GoldenGate response file contains a standard set of Oracle configuration parameters in addition to parameters that are specific to Oracle GoldenGate. These parameters correspond to the fields in the interactive session.

Note:

If you are upgrading an existing Oracle GoldenGate installation with the silent option, then you might get the following warning:

```
WARNING:OUI-10030:You have specified a non-empty directory to install  
this product. It is recommended to specify either an empty or a non-  
existent directory.
```

You may, however, choose to ignore this message if the directory contains Operating System generated files or subdirectories like lost+found. Do you want to proceed with installation in this Oracle Home?

2. Press **ENTER** to continue.

Specifying a Custom Manager Name for Windows

If you plan to install the Manager process as a Windows service and either of the following is true, then you must specify a custom name for the Manager service:

- You are installing the Manager as a Windows service and want to use a service name other than the default, which is `GGSMGR`.
- You want to have multiple Manager processes running as Windows services on this system. Each Manager service on a system must have a unique name.

To specify a custom Manager service name:

1. From the Oracle GoldenGate installation directory, run `ggsci.exe` from the Oracle GoldenGate directory.
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 unique, one-word name for the Manager service.

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

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 startup.

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

To install Manager as a Windows service:

1. Click **Start**, then **Run**, and then type `cmd` in the Run dialog box.
2. Go to the directory that contains the Manager program that you are installing as a service, then run the `INSTALL` utility with the following syntax:

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

Where *option* is one of the following:

Table 2-1 `INSTALL` Utility Options

Option	Description
ADDEVENTS	Adds Oracle GoldenGate events to the Windows Event Manager.

Table 2-1 (Cont.) INSTALL Utility Options

Option	Description
ADDSERVICE	Adds Manager as a service with the name that is specified with the <code>MGRSERVNAME</code> parameter in the <code>GLOBALS</code> file, if one exists, or the <code>GGSMGR</code> default. The <code>ADDSERVICE</code> 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 <code>USER</code> and <code>PASSWORD</code> options.
	 Note: A user account can be changed by selecting the Properties action from the Services applet of the Windows Control Panel.
	The service is installed to start at system boot time (see <code>AUTOSTART</code>). To start it after installation, either reboot the system or start the service manually from the Services applet in the Control Panel.
AUTOSTART	Sets the service that is created with <code>ADDSERVICE</code> to start at system boot time. This is the default unless <code>MANUALSTART</code> is used.
MANUALSTART	Sets the service that is created with <code>ADDSERVICE</code> to start manually through <code>GGSCI</code> , a script, or the Services applet in the Control Panel. The default is <code>AUTOSTART</code> .
USER <i>name</i>	Specifies a domain user account that executes Manager. For the <i>name</i> , include the domain name, a backward slash, and the user name, for example <code>HEADQT\GGSMGR</code> . By default, the Manager service is installed to use the Local System account.
PASSWORD <i>password</i>	Specifies the password for the user that is specified with <code>USER</code> .

3. 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 returns a prompt.

Installing Oracle GoldenGate Classic Architecture for Non-Oracle Databases

Before beginning installation, see the [Database Requirements](#) relevant for your database.

1. Copy the Oracle GoldenGate installation file to the system and directory where you want to install Oracle GoldenGate, and then unzip it.

 Note:

The installation path *cannot* contain any spaces.

2. Create a GLOBALS file (all CAPS and no file extension) in the Oracle GoldenGate installation directory. Edit this file to include the GGSCHEMA parameter, providing a valid schema name that exists in the database. The GLOBALS file and GGSCHEMA parameter are used by most Oracle GoldenGate installations and is necessary when Oracle GoldenGate objects are created in the database. The value of GGSCHEMA should be a dedicated schema only used by Oracle GoldenGate processes.

Here's a sample of the GLOBALS file:

```
GGSCHEMA schema_name
```

3. From this directory, run GGSCI. For Linux and UNIX, open a command shell to run `ggsci.sh`.

For Windows, it may be necessary to run `ggsci.exe` as an Administrator based on the systems User Account Control settings. Right-click the executable file then select **Run as administrator**.

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

```
CREATE SUBDIRS
```

5. Create the Manager parameter file and provide at a minimum, an unused TCP/IP port for the Manager to run under. For example:

```
EDIT PARAMS MGR  
PORT 7809
```

6. Save and close the Manager parameter file.
7. For Manager running interactively as the current user on Linux, start the Manager process in GGSCI.

```
START MGR
```

 Note:

For Manager running on Windows, review the optional instructions for Specifying a Custom Manager Name for Windows and Installing Manager as a Windows Service.

8. Exit GGSCI.

```
EXIT
```

- [Specifying a Custom Manager Name for Windows](#)
- [Installing Manager as a Windows Service](#)
- [Installing Oracle GoldenGate on a NonStop System](#)

Specifying a Custom Manager Name for Windows

If you plan to install the Manager process as a Windows service and either of the following is true, then you must specify a custom name for the Manager service:

- You are installing the Manager as a Windows service and want to use a service name other than the default, which is `GGSMGR`.
- You want to have multiple Manager processes running as Windows services on this system. Each Manager service on a system must have a unique name.

To specify a custom Manager service name:

1. From the Oracle GoldenGate installation directory, run `ggsci.exe` from the Oracle GoldenGate directory.
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 unique, one-word name for the Manager service.

```
MGRSERVNAME name
```

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

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 startup.

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

To install Manager as a Windows service:

1. Click **Start**, then **Run**, and then type `cmd` in the Run dialog box.
2. Go to the directory that contains the Manager program that you are installing as a service, then run the `INSTALL` utility with the following syntax:

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

Where *option* is one of the following:

Table 2-2 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 <code>MGRSERVNAME</code> parameter in the <code>GLOBALS</code> file, if one exists, or the <code>GGSMGR</code> default. The <code>ADDSERVICE</code> 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 <code>USER</code> and <code>PASSWORD</code> options.
 Note: A user account can be changed by selecting the Properties action from the Services applet of the Windows Control Panel.	
The service is installed to start at system boot time (see <code>AUTOSTART</code>). To start it after installation, either reboot the system or start the service manually from the Services applet in the Control Panel.	
AUTOSTART	Sets the service that is created with <code>ADDSERVICE</code> to start at system boot time. This is the default unless <code>MANUALSTART</code> is used.
MANUALSTART	Sets the service that is created with <code>ADDSERVICE</code> to start manually through <code>GGSCI</code> , a script, or the Services applet in the Control Panel. The default is <code>AUTOSTART</code> .
USER <i>name</i>	Specifies a domain user account that executes Manager. For the <i>name</i> , include the domain name, a backward slash, and the user name, for example <code>HEADQT\GGSMGR</code> . By default, the Manager service is installed to use the Local System account.

Table 2-2 (Cont.) INSTALL Utility Options

Option	Description
PASSWORD <i>password</i>	Specifies the password for the user that is specified with USER.

3. 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 returns a prompt.

Installing Oracle GoldenGate on a NonStop System

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

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

**Note:**

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

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

```
GGSCI
```

4. In GGSCI, issue the following command.

```
CREATE SUBDIRS
```

5. Issue the following command to exit GGSCI.

```
EXIT
```

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

```
ggmxinstall destination
```

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

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

 Note:

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

Integrating Oracle GoldenGate into a Cluster in Classic Architecture

To learn about integrating Oracle GoldenGate with Oracle RAC, Oracle Clusterware, and Oracle Database File System (DBFS) or Oracle ASM Cluster File System (ACFS), see the white paper [Oracle GoldenGate Classic Architecture with Oracle Real Application Clusters Configuration Best Practices](#).

3

Post-installation Tasks

Learn about any post-installation tasks that may be required after installing Oracle GoldenGate Classic Architecture for your database.

Installing the DataDirect Driver for PostgreSQL in Classic Architecture

After installing Oracle GoldenGate for PostgreSQL, the Extract and Replicat processes use a DataDirect ODBC driver to connect to a PostgreSQL database.

This driver is packaged with Oracle GoldenGate and needs to be installed and configured separately.

Installing on Windows

After installing Oracle GoldenGate for PostgreSQL on Windows, do the following:

1. Open a command prompt with the **Run as administrator** option.
2. Change directories to the Oracle GoldenGate installation folder.
3. Install the driver by running the following command:

```
INSTALL ADDDRIVERS
```

Installing for Linux

After installing Oracle GoldenGate for PostgreSQL on Linux, the DataDirect driver is *automatically installed*, but an `ODBCINI` variable needs to be set.

In Classic Architecture, you need to create a new session variable called `ODBCINI` and assign it the path of the `odbc.ini` file, which defaults to `/etc/odbc.ini`.

```
export ODBCINI=/etc/odbc.ini
```

4

Patching Oracle GoldenGate Classic Architecture for Oracle Database

Patches for Oracle GoldenGate for Oracle Database can be found on My Oracle Support when available, and are located under the Patches and Updates section of MOS.

Cumulative and one-off patches for Oracle GoldenGate can be applied on top of a base release or previously patched release, or they may be a one-off patch that should be applied to a specific Oracle GoldenGate version. The instructions in the subsequent topic apply to both types of patches.

Learn to prepare and install patches using OPatch for Classic Architecture.

Topic:

- [Downloading Patches for Oracle GoldenGate](#)
- [Patching Oracle GoldenGate Classic Architecture Using OPatch](#)
- [Uninstalling the Patch for Oracle and Non-Oracle Databases Using OPatch](#)

Downloading Patches for Oracle GoldenGate

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

1. Using a browser, navigate to <http://support.oracle.com>.
2. Log in with your Oracle ID and password.
3. Select the **Patches and Upgrades** tab.
4. On the Search tab, click **Product or Family**.
5. In the **Product** field, type **Oracle GoldenGate**.
6. From the **Release** drop-down list, select the release version that you want to download.
7. Make certain that **Platform** is displayed as the default in the next field, and then select the platform from the drop-down list.
8. Leave the last field blank.
9. Click **Search**.
10. In the Patch Advanced Search Results list, select the patch that best meets your search criteria, making certain that the Oracle GoldenGate patch that you select corresponds to the database that will be used.

When you select the build, a dialog box pops up under the build description, and then you are advanced to the download page.

11. Click the Patch file name link for each patch that you want to download. The File Download dialog box appears.
12. Select either **Open with** or **Save File**:

To...	Select...
Extract the patch immediately	Open with , then select the desired file extraction utility and extract the files to a location on your file system.
Save the patch for later extraction	Select Save file , then save to a directory on your file system.



Note:

Before installing the software, see Oracle GoldenGate Release Notes for any new features, parameter changes, upgrade requirements, known issues, or bug fixes that affect your current configuration.

Patching Oracle GoldenGate Classic Architecture Using OPatch

Perform the following prerequisites before installing the patch:

1. Download and install the most recent release of OPatch, and keep a note of the installation directory where you installed the latest release of OPatch.
Details from where to download OPatch is available at: [How To Download And Install The Latest OPatch\(6880880\) Version \(Doc ID 274526.1\)](#)
2. Download the Oracle GoldenGate patch and maintain a location for storing the contents of the patch ZIP file. This location or the absolute path is referred to as *patch_top_dir* in the subsequent steps.
3. Navigate to the *patch_top_dir* directory and run the following command to extract the contents of the patch ZIP file to the location you created previously.

```
$ cd patch_top_dir
$ unzip patch_number_version_platform.zip
```

4. Navigate to the unzipped patch directory:

```
$ cd patch_top_dir/patch_number_dir
```
5. Set the `ORACLE_HOME` environment variable to the Oracle GoldenGate installation directory:

```
$ export ORACLE_HOME=GoldenGate_Installation_Path
```
6. Set the `PATH` environment variable to include the locations of the `$ORACLE_HOME` and OPatch directories.

```
$ export PATH=$PATH:$ORACLE_HOME:/OPatch
```

7. Run the following command to verify the Oracle inventory, which OPatch accesses to install the patches:

```
$ opatch lsinventory
```

If the command displays any errors, contact Oracle Support to resolve the issue.

8. Run the OPatch prerequisites check and verify that it passes.

```
$ opatch prereq CheckConflictAgainstOHWithDetail -ph ./
```

If any errors are displayed, identify the error type. OPatch categorizes conflicts in the following types:

- Conflicts with a patch already applied to the `ORACLE_HOME`: In this case, stop the patch installation and contact Oracle Support Services.
 - Conflicts with a patch already applied to the `ORACLE_HOME` that is a subset of the patch you are trying to apply: In this case, continue with the patch installation because the new patch contains all the fixes from the existing patch in the `ORACLE_HOME`. The subset patch will automatically be rolled back prior to the installation of the new patch.
9. Before patching Oracle GoldenGate, ensure that you shut down all processes such as Extracts and Replicats, and stop all other services such as the Oracle GoldenGate Monitor JAgent and Performance Metrics Service.
 - a. Use the Oracle GoldenGate Software Command Interface (`ggsci`) in the GoldenGate Software Home to stop all processes.

```
$ ./ggsci
```

- b. Stop the Extract and Replicat processes and the Distribution Paths.

```
GGSCI> STOP ER *
```

- c. If monitoring is enabled, stop the GoldenGate Monitor JAgent and Performance Metrics Service.

```
GGSCI> STOP PMSRVR  
GGSCI> STOP JAGENT
```

- d. Stop the Manager process.

```
GGSCI> STOP MGR!
```

- e. Re-check to verify that all processes have stopped.

```
GGSCI> INFO ALL
```

- f. Exit the Oracle GoldenGate Software Command Interface.

```
GGSCI> EXIT
```

Perform the following steps to install the patch:

10. Install the patch by running the following command:

```
$ opatch apply
```

When the `OPatch` command starts, it validates the patch and ensures that there are no conflicts with the software already installed in `ORACLE_HOME` of the Oracle GoldenGate release.

11. After the patch installation completes, run the following command to verify that the Oracle inventory contains the installed patch:

```
$ opatch lsinventory
```

12. Start the Manager, followed by the other services such as GoldenGate Monitor JAgent and Performance Metrics Service, and the Oracle GoldenGate processes.

- a. Use Oracle GoldenGate Software Command Interface (`ggsci`) in the GoldenGate Software Home to start all processes and services.

```
$ ./ggsci
```

- b. Start the Manager process.

```
GGSCI> START MGR
```

- c. If monitoring was enabled, start the GoldenGate Monitor JAgent and Performance Metrics Service.

```
GGSCI> START PMSRVR  
GGSCI> START JAGENT
```

- d. Start the Extracts and the Replicats.

```
GGSCI> START ER *
```

- e. Check the status and verify that all processes and services are running.

```
GGSCI> INFO ALL
```

Uninstalling the Patch for Oracle and Non-Oracle Databases Using OPatch

To uninstall the patch, follow these steps:

1. Install the latest OPatch version, set the required environment variables, and stop the Oracle GoldenGate processes and services. The patch installation steps are documented in the previous topic.
2. Navigate to the `patch_top_dir/patch_number` directory:

```
$ cd patch_top_dir/patch_number
```

3. Uninstall the patch by running the following command:

```
$ opatch rollback -id patch_number
```

4. Start the services and processes from the Oracle GoldenGate home.

5

Patching Oracle GoldenGate Classic Architecture for Non-Oracle Databases

For non-Oracle databases, Oracle GoldenGate Classic Architecture patches are complete installations and can be applied as a new installation or over an existing installation.

Before you start installing the patch, perform the following steps:

1. (Source and target systems) Back up the current Oracle GoldenGate installation directory on the source and target systems, and any working directories that you have installed on a shared drive in a cluster (if applicable).
2. (Source system) Stop user activity on objects in the Oracle GoldenGate configuration.
3. (Source system) In GGSCI on the source system, issue the `SEND EXTRACT` command with the `LOGEND` option until it shows there is no more data in transaction log to process.

```
GGSCI> SEND EXTRACT group LOGEND
```

4. (Source system) In GGSCI, stop Extract and data pumps:

```
GGSCI> STOP EXTRACT group
```

5. (Target systems) In GGSCI on each target system, issue the `SEND REPLICAT` command with the `STATUS` option until it shows a status of "At EOF" to indicate that it finished processing all of the data in the trail. This must be done on all target systems until all Replicat processes return At EOF.

```
GGSCI> SEND REPLICAT group STATUS
```

6. (Target systems) In GGSCI, stop all Replicat processes:

```
GGSCI> STOP REPLICAT group
```

7. (Source and target systems) In GGSCI, stop Manager on the source and target systems.

```
GGSCI> STOP MANAGER
```

8. (Source for MySQL with DDL replication enabled) Ensure that there are no new DDL operations during the patching process, then stop the metadata server by executing the following:

```
./ddl_install.sh stop user-id password port-number
```

For MySQL 5.7, see instructions for patching in [Patching Oracle GoldenGate MySQL 5.7 with DDL Replication Enabled](#).

To begin installing the patch for any non-Oracle databases released for Oracle GoldenGate, perform the following steps:

1. Copy the Oracle GoldenGate latest version ZIP file to the existing Oracle GoldenGate location. You can do so by removing or replacing the existing ZIP file.
2. Unzip and then untar the zip file. This will install Oracle GoldenGate patched version to the Oracle GoldenGate location, however all the subdirectories starting with `dir` (`dirdat` for trail file, `dirchk` for checkpoint table and so on) will not be overwritten.

The command to perform this task would be similar to the following:

```
tar -xvf ggs_Linux_x64_MySQL_64bit.zip
```

For Windows, unzip the patch file.

3.



Note:

(Only for the Oracle GoldenGate for SQL Server Extract) Before performing this step, review the steps for [Patching Oracle GoldenGate for SQL Server - Extract Requirements](#).



Note:

(Only for Oracle GoldenGate for PostgreSQL) For Oracle GoldenGate for PostgreSQL installations patched to release versions 21.8.0.0.2 and later, prior to restarting the Extracts and Replicats, update the DSN entries in the `odbc.ini` file to take advantage of the new driver version. For more information, see [Patching Oracle GoldenGate for PostgreSQL to Release Version 21.8.0.0.2 and Later](#).

In GGSCI, start the Oracle GoldenGate processes on the source and target systems in the following order:

```
GGSCI> START MANAGER
GGSCI> START EXTRACT group
GGSCI> START EXTRACT pump
GGSCI> START REPLICAT group
```

4. (Source for MySQL with DDL replication enabled) Restart the `metadata_server` by executing the following:

```
./ddl_install.sh start user-id password port-number
```

5. Verify that the Extract and Replicat processes are running.
 - [Patching Oracle GoldenGate for SQL Server - Extract Requirements](#)
 - [Patching Oracle GoldenGate MySQL 5.7 with DDL Replication Enabled](#)

Patching Oracle GoldenGate for SQL Server - Extract Requirements

You must follow the existing patching procedures in Patching Oracle GoldenGate for Heterogeneous Databases. In addition, you must re-run `ADD TRANDATA` for each table that is already enabled for `TRANDATA` using these steps:

1. Stop all Oracle GoldenGate processes.
2. Follow normal patch procedures for binary replacement but do not start any Oracle GoldenGate processes. See [Patching Oracle GoldenGate Classic Architecture Using OPatch](#) for details.
3. Manually stop the SQL Server CDC Capture job for the database. If the job is processing a large transaction, it may take some time before it actually stops.
4. Ensure that the Extract is stopped.
5. Using GGSCI, run `ADD TRANDATA` again for every table that you previously enabled it for, including the heartbeat tables and any Replicat checkpoint table used as a `FILTERTABLE` object for active/active configurations.

 Note:

Do not run the `DELETE TRANDATA` command.

6. Manually restart the SQL Server CDC Capture job.
7. Manually restart the Oracle GoldenGate processes such as Extract, Replicat, and Manager.

Patching Oracle GoldenGate MySQL 5.7 with DDL Replication Enabled

To patch Oracle GoldenGate MySQL 5.7 with DDL replication enabled:

1. Stop the metadata server using the following DDL install script `stop` option.
2. Replace the `metadata_server` executable in the installation directory.
3. Start the metadata server running currently using `ddl` install script `start` option:

```
./ddl_install.sh stop user-id password port-number
```

```
./ddl_install.sh start user-id password port-number
```



Note:

The DDL operations issued in between starting and stopping the `metadata_server` would be lost.

6

Uninstalling Oracle GoldenGate Classic Architecture for Oracle Database

Learn about uninstalling Oracle GoldenGate Classic Architecture processes and files from the host in Linux, UNIX, and Windows environments.

It is assumed 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.

Topics:

- [Stopping Processes](#)
- [Removing the DDL Environment](#)
- [Removing Database Objects](#)
- [Uninstalling Oracle GoldenGate Using Oracle Universal Installer](#)
- [Uninstalling Oracle GoldenGate Manually](#)

Stopping Processes

This procedure stops the Extract and Replication processes. Leave Manager running until directed to stop it.

On all Systems:

1. Run the command shell.
2. Log on as the system administrator or as a user with permission to issue Oracle GoldenGate commands and delete files and directories from the operating system.
3. Change directories to the Oracle GoldenGate installation directory.
4. Run `ggsci`.
5. Stop all Oracle GoldenGate processes.
`STOP ER *`
6. Stop the Manager process.

`STOP MANAGER`

Removing the DDL Environment

(Valid when the DDL trigger is being used to support DDL replication.) This procedure removes all of the Oracle GoldenGate DDL objects from the DDL schema on a source system.

1. Log on as the system administrator or as a user with permission to issue Oracle GoldenGate commands and delete files and directories from the operating system.
2. Run `ggsci` from your Oracle GoldenGate directory.
3. Stop all Oracle GoldenGate processes.

`STOP ER *`
4. Log in to SQL*Plus as a user that has `SYSDBA` privileges.
5. Disconnect all sessions that ever issued DDL, including those of Oracle GoldenGate processes, SQL*Plus, business applications, and any other software that uses Oracle. Otherwise the database might generate an ORA-04021 error.
6. Run the `ddl_disable` script to disable the DDL trigger.
7. Run the `ddl_remove` script to remove the Oracle GoldenGate DDL trigger, the DDL history and marker tables, and other associated objects. This script produces a `ddl_remove_spool.txt` file that logs the script output and a `ddl_remove_set.txt` file that logs environment settings in case they are needed for debugging.
8. Run the `marker_remove` script to remove the Oracle GoldenGate marker support system. This script produces a `marker_remove_spool.txt` file that logs the script output and a `marker_remove_set.txt` file that logs environment settings in case they are needed for debugging.

Removing Database Objects

Follow these instructions to remove supplemental logging and any Oracle GoldenGate CDC Cleanup objects (for SQL Server) from the source database in the Oracle GoldenGate Extract configuration, and to remove the checkpoint table in the Replicat configuration. Specific steps and commands may not apply to your configuration.

On a Source System:

1. Log on as the system administrator or as a user with permission to issue Oracle GoldenGate commands and delete files and directories from the operating system.
2. Run `ggsci` from your Oracle GoldenGate directory.
3. Stop all Oracle GoldenGate processes.

`STOP ER *`

4. Stop the Manager process.

`STOP MANAGER`

5. In GGSCI, log into the database with the `DBLOGIN` (or the `MININGDBLOGIN` command if you need to remove a database logmining server from a downstream mining database). `[MINING]DBLOGIN` requires privileges granted in the `dbms_goldengate_auth.grant_admin_privilege` procedure.

`[MINING]DBLOGIN USERIDALIAS alias`

6. In GGSCI, run any or all of the following commands, depending on your configuration.

- Disable schema-level supplemental logging (wildcards are not allowed):

```
DELETE SCHEMATRANDATA schema [NOSCHEDULINGCOLS | ALLCOLS]
```

- Disable table-level supplemental logging.

```
DELETE TRANDATA [container.]schema.table [NOSCHEDULINGCOLS | ALLCOLS]
```

- (Bidirectional configuration) Remove the Oracle trace table.

```
DELETE TRACETABLE [container.]schema.table
```

- (Classic capture configuration) Disable log retention. DBLOGIN requires privileges shown in Log Retention Options.

```
UNREGISTER EXTRACT group LOGRETENTION
```

- (Integrated capture configuration) Remove the database logmining server from an Oracle mining database.

```
DELETE EXTRACT group  
UNREGISTER EXTRACT group DATABASE
```

7. Run the following Oracle procedure to remove the privileges from the Oracle GoldenGate administration users for both classic and integrated processes.

```
dbms_goldengate_auth.revoke_admin_privilege('ggadm')
```

On a Target System:

1. Stop Replicat.

```
STOP REPLICAT group
```

2. Log into the database.

```
DBLOGIN USERIDALIAS alias
```

3. (Integrated Replicat) Delete the Replicat group, which also deletes the inbound server from the target database.

```
DELETE REPLICAT group
```

4. (Nonintegrated Replicat) Remove the Replicat checkpoint table by running the DELETE CHECKPOINTTABLE command.

```
DELETE CHECKPOINTTABLE [container.]schema.table
```

Uninstalling Oracle GoldenGate Using Oracle Universal Installer

Follow these instructions to uninstall Oracle GoldenGate through an interactive session of Oracle Universal Installer (OUI).

 WARNING:

Before removing Oracle GoldenGate through OUI, follow the instructions in [Removing the DDL Environment](#) (if using trigger-based DDL capture) and [Removing Database Objects](#). These procedures require the use of Oracle GoldenGate commands and scripts, which are removed by the OUI uninstaller.

The following items are removed in this process.

- The Oracle GoldenGate home directory in the Oracle central inventory.
- The Oracle GoldenGate installation directory.
- The Oracle GoldenGate Manager service, if installed on Windows.
- The Oracle GoldenGate Windows Registry entries

To remove Oracle GoldenGate from the system:

1. Log on as the system administrator or as a user with permission to issue Oracle GoldenGate commands and delete files and directories from the operating system.
2. Run `ggsci` from your Oracle GoldenGate directory.
3. Stop all Oracle GoldenGate processes.

```
STOP ER *
```

4. Stop the Manager process.

```
STOP MANAGER
```

5. Run the following script from the Oracle GoldenGate installation directory.

UNIX and Linux:

```
OGG_HOME/deinstall/deinstall.sh
```

Windows:

```
OGG_HOME/deinstall/deinstall.bat
```

Uninstalling Oracle GoldenGate Manually

Follow these instructions to remove the Oracle GoldenGate environment from the system manually through the operating system.

- [Manually Removing Oracle GoldenGate Windows Components](#)
- [Manually Removing the Oracle GoldenGate Files](#)

Manually Removing Oracle GoldenGate Windows Components

This procedure:

- Removes Oracle GoldenGate as a Windows cluster resource from a source or target Windows system
- Stops Oracle GoldenGate events from being reported to the Windows Event Manager
- Removes the Manager service

Perform these steps on source and target systems:

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. (Cluster) Working from the node in the cluster that owns the cluster group that contains the Manager resource, run `ggsci` and make certain that all Extract and Replicat processes are stopped. Stop any that are running.

```
STATUS ER *
```

```
STOP ER *
```

3. (Cluster) Use the Cluster Administrator tool to take the Manager resource offline.
4. (Cluster) Right click the resource and select **Delete** to remove it.
5. Click **Start** then **Run**, and then type `cmd` in the Run dialog box to open the command console.
6. Change directories to the Oracle GoldenGate installation directory.
7. Run the `INSTALL` utility with the following syntax.

```
INSTALL DELETEEVENTS DELETESERVICE
```

8. (Cluster) Move the cluster group to the next node in the cluster, and repeat from Step 5.

Manually Removing the Oracle GoldenGate Files

These steps apply when the Oracle GoldenGate installation isn't done using the Oracle GoldenGate installer.

Perform these steps on all systems to remove the Oracle GoldenGate installation directory:



Note:

If Oracle GoldenGate has been installed using the installer, then you must uninstall Oracle GoldenGate with the uninstall script as well. Otherwise, you will have orphaned fragments within `ora inventory`.

1. In GGSCI, verify that all processes are stopped. Stop any that are running.

```
STOP ER *
STATUS ER *
STOP MANAGER
STATUS MANAGER
```

2. Exit GGSCI.

EXIT

3. Remove the Oracle GoldenGate installation directory.

Uninstalling Oracle GoldenGate Classic Architecture for Non-Oracle Databases

Learn how to uninstall Oracle GoldenGate for non-Oracle databases.

Topics:

- [Removing Oracle GoldenGate Database Objects](#)
- [Uninstalling Oracle GoldenGate from a Source DB2 for i System](#)
- [Uninstalling Oracle GoldenGate from a Linux System](#)
- [Uninstalling Oracle GoldenGate from a Windows System](#)

Removing Oracle GoldenGate Database Objects

Use the following instructions to remove database objects and stopping processes for your configuration. Some steps and commands may not apply to your configuration, however other instructions are applicable to all databases (until specified).

For SQL Server, use these steps to remove supplemental logging and any Oracle GoldenGate CDC Cleanup objects from the source database in the Oracle GoldenGate capture configuration, and to remove the Replicat checkpoint table in the apply configuration.

On a Source System:

1. Log on as the system administrator or as a user with permission to issue Oracle GoldenGate commands and delete files and directories from the operating system.
2. Run `ggsci` from the Oracle GoldenGate directory.
3. Stop all Oracle GoldenGate processes if not already done.

```
STOP EXTRACT *
```

4. Stop the Manager process.

```
STOP MANAGER
```

5. Issue the following command to log into the source database, see SOURCEDB.

```
DBLOGIN SOURCEDB {data_source | database@host:port} USERIDALIAS alias
```

6. Remove any heartbeat table entries by running the `DELETE HEARTBEATTABLE` command.
7. For a SQL Server Extract configuration, remove the Oracle GoldenGate CDC cleanup job and objects if they were created.
 - a. Open a command prompt and change to the Oracle GoldenGate installation folder.

- b.** Run the `ogg_cdc_cleanup_setup.sh/bat` file as follows:

```
ogg_cdc_cleanup_setup.sh/bat dropJob userid password
database_name servername\instancename schema
```

The `userid password` must be a valid SQL Server login and password for a sysadmin user. `database_name servername\instancename` are the source database name and instance name. If only server name is listed, then the default instance will be used to connect to the database server. `schema` is the schema name listed in the `GLOBALS` file, with the `GGSCHEMA` parameter.

For example:

```
ogg_cdc_cleanup_setup.bat dropJob ggsuser ggspword db1
server1\inst1 ogg
```

- 8.** Remove supplemental logging from tables that were enabled with it. See `DELETE TRANDATA`. Remove supplemental logging for any filter tables used for bi-directional replication as well. You can use a wildcard to specify multiple table names.

```
DELETE TRANDATA owner.table
```

- 9.** For PostgreSQL, the registered replication slot must be deleted after removing the Extract, otherwise the database logs will continue to grow.

```
DELETE EXTRACT extname
UNREGISTER EXTRACT extname
```

On a Target System:

- 1.** Stop Replicat.

```
STOP REPLICAT group
```

- 2.** Issue the following command to log into the target database. See `SOURCEDB`.

```
DBLOGIN SOURCEDB {data_source | database@host:port} USERIDALIAS
alias
```

- 3.** Remove the Replicat checkpoint tables and heartbeat by running the `DELETE CHECKPOINTTABLE` and `DELETE HEARTBEATTABLE` commands.

```
DELETE CHECKPOINTTABLE schema.table
```

```
DELETE HEARTBEATTABLE
```

Uninstalling Oracle GoldenGate from a Source DB2 for i System

1. Ensure that all Oracle GoldenGate processes are stopped, and any database objects are removed, based on instructions provided in [Removing Database Objects](#).
2. Delete the Oracle GoldenGate library. Specify `1` (ignore) for any prompts about unsaved journal receivers.

```
clrlib library  
dltlib library
```

Uninstalling Oracle GoldenGate from a Linux System

Follow these instructions to remove Oracle GoldenGate from a Linux system.

1. Run the command shell of the operating system.
2. Ensure all Oracle GoldenGate processes are stopped, and any database objects have been removed, based on the instructions in [Removing Database Objects](#).
3. Remove the Oracle GoldenGate files by removing the installation directory.

Uninstalling Oracle GoldenGate from a Windows System

Follow these instructions to remove Oracle GoldenGate from a Windows system.

1. Log on to the operating system 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. Ensure all Oracle GoldenGate processes are stopped, and any database objects have been removed based on instructions in [Removing Database Objects](#).
3. (Windows Cluster) Use the Cluster Administrator tool to take the Manager resource offline.
4. (Windows Cluster) Right click the resource and select **Delete** to remove it.
5. Click **Start, Run**, and then type `cmd` in the **Run** dialog box to open the command console.
6. Change directories to the Oracle GoldenGate installation directory.
7. Remove the Manager service and events using the `INSTALL` utility with the following syntax:

```
INSTALL DELETEEVENTS DELETESERVICE
```

8. (Windows Cluster) Move the cluster group to the next node in the cluster and repeat the process from step 6.
9. Remove the Oracle GoldenGate files by removing the installation directory.

A

Understanding Classic Architecture Components

Topics:

- [Oracle GoldenGate Classic Architecture Programs and Utilities](#)
- [Oracle GoldenGate Subdirectories](#)
- [Other Oracle GoldenGate Files](#)

Oracle GoldenGate Classic Architecture Programs and Utilities

This section describes programs installed in the 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.

Table A-1 Oracle GoldenGate Installed Programs and Utilities

Program	Description
convchk	Converts checkpoint files to a newer release.
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 the 12c release of Oracle GoldenGate.
defgen	Generates data definitions and is referenced by Oracle GoldenGate processes when source and target tables have dissimilar definitions.
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.
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.
install	Installs Oracle GoldenGate as a Windows service and provides other Windows-based service options.
keygen	Generates data-encryption keys.

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

Program	Description
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.

Oracle GoldenGate Subdirectories

Learn about the subdirectories of the Oracle GoldenGate Classic Architecture installation directories; it does *not* apply to the Oracle GoldenGate Microservices.

Table A-2 Oracle GoldenGate Classic Architecture 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 data store 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.
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 <i>group_name+sequence_number.ext</i> where <i>sequence_number</i> is a sequential number appended to aged files and <i>ext</i> is either <i>cpe</i> for Extract checkpoint files or <i>cpr</i> for Replicat checkpoint files. Do not edit these files. Examples: ext1.cpe repl.cpr
dircrd	Contains credential store files.

Table A-2 (Cont.) Oracle GoldenGate Classic Architecture Installed Subdirectories

Directory	Description
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 9-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 <code>DEFGEN</code> 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 <code>DEFGEN</code> 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. This directory is only applicable to the Classic Architecture, see <i>What is the Oracle GoldenGate Classic Architecture</i>.
dirjar	Contains the Java executable files that support Oracle GoldenGate Monitor.
dirpcs	Default location for status files. File name format is <i>group.extension</i> where <i>group</i> is the name of the group and <i>extension</i> is either <i>pce</i> (Extract), <i>pcr</i> (Replicat), or <i>pcm</i> (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 <i>group name/user-defined name.prm</i> or <i>mgr.prm</i>. 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 <code>EDIT PARAMS</code> command in GGSCI. Examples: defgen.prm finance.prm
dirrec	Not used by Oracle GoldenGate.

Table A-2 (Cont.) Oracle GoldenGate Classic Architecture Installed Subdirectories

Directory	Description
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 <i>group name+sequence number.rpt</i> where <i>sequence number</i> is a sequential number appended to aged files. Do not edit these files. Examples: FIN2.rpt MGR4.rpt
dirsql	Contains 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.

Other Oracle GoldenGate Files

Learn about other files, templates, and objects created or installed in the `root` Oracle GoldenGate installation directory.

Table A-3 Other Oracle GoldenGate Installed Files

Name	Description
bcpfmt.tpl	Template for use with Replicat when creating a run file for the Microsoft BCP/DTS bulk-load utility.
bccrypt.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 <code>INSTALL</code> 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 <code>LOADUTIL</code> 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.
ddl_enable.sql	Script that enables the Oracle GoldenGate DDL trigger.
ddl_filter.sql	Script that supports filtering of DDL by Oracle GoldenGate. This script runs programmatically; do not run it manually.

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

Name	Description
ddl_nopurgeRecyclebin.sql	Empty script file for use by Oracle GoldenGate support staff.
ddl_oral1.sql ddl_oral2.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.
ddl_purgeRecyclebin.sql	Script that purges the Oracle recycle bin in support of the DDL replication feature.
ddl_remove.sql	Script that removes the DDL extraction trigger and package.
ddl_session.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.
ddl_sqlmx.tpl	Template used by the DDLGEN utility to convert Tandem Enscribe DDL to NonStop SQL/MX DDL.
ddl_status.sql	Script that verifies whether or not each object created by the Oracle GoldenGate DDL support feature exists and is functioning properly.
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.
ddl_tracelevel.sql	Script that sets the level of tracing for the DDL support feature.
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.

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

Name	Description
ggserr.log	File that logs processing events, messages, errors, and warnings generated by Oracle GoldenGate.
ggsmsg.dll	Windows dynamic link library used by the <code>install</code> 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 icuinx.dll icuucxx.dll	Windows shared libraries for International Components for Unicode, where <code>xx</code> is the currently used version.
jagent.bat	Windows batch file for the JAgent for Oracle GoldenGate Monitor.
jagent.log jagentjni.log	Log files for the Oracle GoldenGate Monitor Agent.
jagent.sh	UNIX shell script for the JAgent 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 <code>libodbc.so</code> .
libxml2.dll	Windows dynamic link library containing the XML library for the Oracle GoldenGate XML procedures.
libxml2.txt	License agreement for <code>libxml2.dll</code> .
marker_remove.sql	Script that removes the DDL marker table.
marker_setup.sql	Script that installs the Oracle GoldenGate DDL marker table.
marker_status.sql	Script that confirms successful installation of the DDL marker table.
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.
ogg_cdc_cleanup_setup.bat	Available for Oracle GoldenGate for SQL Server. Its used in creating the Oracle GoldenGate CDC Cleanup job for SQL Server.
ogg_create_cdc_cleanup_job.sql	Available for Oracle GoldenGate for SQL Server. Its used in creating the Oracle GoldenGate CDC Cleanup job for SQL Server.
pthread-win32.txt	License agreement for <code>pthread-VC.dll</code> .
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.

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

Name	Description
role_setup.sql	Script that creates the database role necessary for Oracle GoldenGate DDL support.
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.
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.