Oracle® GoldenGate

Administering Oracle GoldenGate Veridata

12*c* (12.2.1)

E60970-01

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This guide explains how to run and administer the Oracle GoldenGate Veridata data comparison solution.

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Oracle GoldenGate Administering Oracle GoldenGate Veridata, 12*c* (12.2.1)

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Preface

This document describes how to configure and administer Oracle GoldenGate Veridata.

Audience

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

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Related Documents

The complete Oracle GoldenGate documentation set includes the following components:

- *Release Notes for Oracle GoldenGate Veridata*
- *Installing and Configuring Oracle GoldenGate Veridata*
- *Upgrading Oracle GoldenGate Veridata*
- *User's Guide*

Conventions

The following text conventions are used in this document:

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

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

1

Introduction to Oracle GoldenGate Veridata

This chapter describes how to use Oracle GoldenGate Veridata. It provides an overview of roles and interactions of the components, how to configure components, and how Oracle GoldenGate Veridata compares tables and repairs out-of-sync tables.

This chapter includes the following sections:

- Oracle GoldenGate Veridata Architecture
- Configuring Single Sign-on for Oracle GoldenGate Veridata
- Comparing Data with Oracle GoldenGate Veridata
- Viewing Comparison Results

1.1 Oracle GoldenGate Veridata Architecture

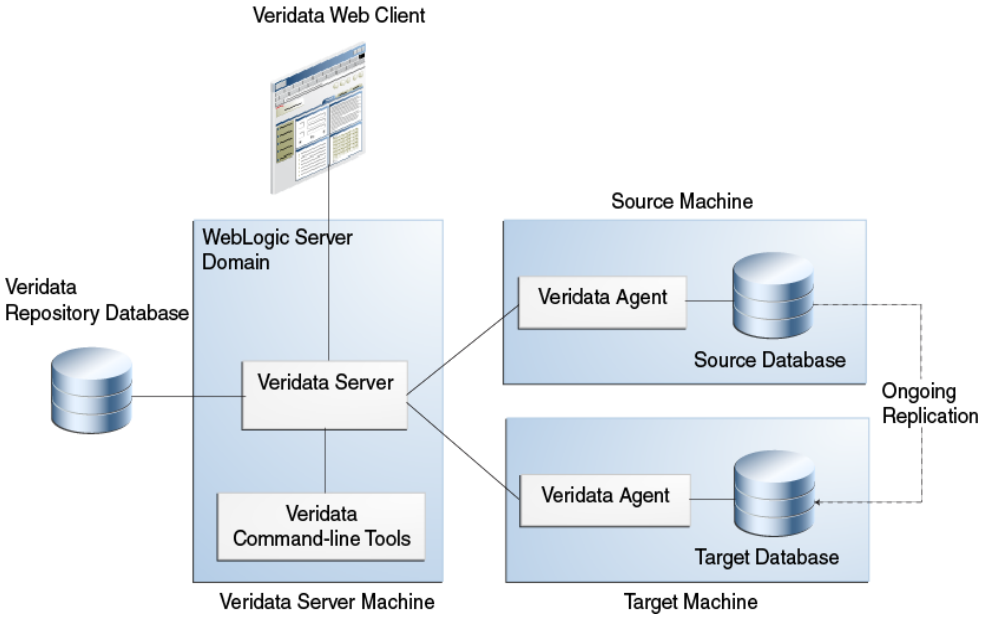
Oracle GoldenGate Veridata compares one set of data to another and identifies data that is out-of-sync, and allows you to repair any data that is found out-of-sync. Oracle GoldenGate Veridata supports high-volume, 24x7 heterogenous replication environments where downtime to compare data sets is not an option. By accounting for data that is being replicated while a comparison takes place, Oracle GoldenGate Veridata can run concurrently with data transactions and replication, while still producing an accurate comparison report.

Oracle GoldenGate Veridata will map column data types across different types of databases automatically, or you can map columns manually in cases where the automatic mapping is not sufficient to accommodate format differences in a heterogeneous environment. For detailed information about this feature in Veridata Web User Interface, see *Oracle GoldenGate Veridata Online Help*. Alternatively, you can map data by manually uploading an XML file using the `veridata_import` utility. For more information, see Chapter 5, "Using the Veridata Import and Export Utilities".

For the purposes of this documentation, the following terms are considered synonymous:

- tables and files
- columns and fields
- rows and records

Figure 1–1 Oracle GoldenGate Veridata Architecture



Oracle GoldenGate Veridata Server

The Oracle GoldenGate Veridata Server performs the following functions:

- Coordinate the execution of Oracle GoldenGate Veridata tasks
- Sort rows (optional)
- Compare data
- Confirm out-of-sync data
- Produce a report for review

Oracle GoldenGate Veridata Web User Interface

Oracle GoldenGate Veridata Web User Interface (UI) is a browser-based graphical user interface for these activities:

- Configure comparison objects and rules
- Initiate comparisons
- Review the status and output of comparisons
- Repair out-of-sync data
- Review out-of-sync data

Oracle GoldenGate Veridata Repository

The Oracle GoldenGate Veridata repository is a collection of database objects that persists configuration information to disk, saving it permanently as a user environment.

Note: Out-of-sync data is not stored in the Veridata repository. This data is stored in files on the file system of the Veridata Server.

Oracle GoldenGate Veridata Agent

The Oracle GoldenGate Veridata Agent executes the following database-related requests on behalf of the Oracle GoldenGate Veridata Server:

- Hash rows for initial comparison
- Fetch and update rows to repair out-of-sync data
- Return column-level detail for out-of-sync rows

Oracle GoldenGate Veridata Manager

The Manager process is part of the C-code based agent that is required for the NonStop platform. It controls the Oracle GoldenGate Veridata Agent process.

The Manager is not used in a Java agent, which is used for the other databases that are supported by Oracle GoldenGate Veridata.

Oracle GoldenGate Veridata Command Line Utilities

Oracle GoldenGate Veridata includes the following command-line utilities:

Table 1–1 Command-Line Utilities

Name	Description
`vericom`	Enables you to run comparisons by using automated programs. See Chapter 4, "Running Comparisons from the Command Line".
`veridata_import`	Maps comparison objects and rules in an XML file and imports it into the repository. See Chapter 5, "Using the Veridata Import and Export Utilities".
`veridata_export`	Maps comparison objects and rules in the repository and exports them to an XML file. See Chapter 5, "Using the Veridata Import and Export Utilities".
`veridata_param_process`	The Veridata GoldenGate Parameter Processing (VGPP) command line tool to use Oracle GoldenGate parameter files. See Chapter 1, "Introduction to Oracle GoldenGate Veridata".
`reportutil`	Supports viewing encrypted report files and out-of-sync data.

1.2 Configuring Single Sign-on for Oracle GoldenGate Veridata

Oracle GoldenGate Veridata 12*c* (12.2.1) supports Single Sign-on (SSO) mechanism for authentication. To configure SSO, you should set the SSO properties for Veridata Server and also configure the logout URL for the SSO session.

The web parameter `web.singleSignOutUrl` in the `DOMAIN_HOME/config/veridata/veridata.cfg` file is used to configure SSO for the Veridata Server. The parameter usage is explained in the `veridata.cfg` file:

```
# (web.singleSignOutUrl) as
# web.singleSignOutUrl - Specify the Single Sign Out URL here:
# Formats: /oamsso/logout.html?end_url=/veridata
# http://myoamserverhost:port/oam/server/logout?end_
url=http://my.veridata.site.com:veridata-port/veridata
# http://myoamserverhost:port/oamsso/logout.html?end_
url==http://my.veridata.site.com:veridata-port/veridata

# This URL must conform to the grammar in RFC 2396, except the few deviations
mentioned in the java documentation for construction of a URI by parsing the given
string.
```

```
web.singleSignOutUrl default
```

To configure SSO, set the `web.singleSignOutUrl` parameter and run the `configureVeridata` script as follows:

To Configure SSO Logout

```
DOMAIN_HOME/veridata/bin/configureVeridata.sh -pUweb.singleSignOutUrl=Single sign out URL
```

To Reset SSO Logout

If your domain is no longer using SSO, you can optionally remove the SSO logout configuration as follows:

```
DOMAIN_HOME/veridata/bin/configureVeridata.sh -pUweb.singleSignOutUrl=default
```

1.3 Comparing Data with Oracle GoldenGate Veridata

This section explains how to configure the objects that are to be compared and how Oracle GoldenGate Veridata processes comparisons.

1.3.1 Oracle GoldenGate Veridata Comparison Objects

To begin using Oracle GoldenGate Veridata, you need to create some objects that help you identify the data you want to compare and help you manage your work.

- Configure data source connections: Oracle GoldenGate Veridata Server connects to Oracle GoldenGate Veridata Agents that interact with the databases that contain the data that is to be compared. A connection is defined by a host, the port number of an Oracle GoldenGate Veridata Agent on that host, and the data source that is accessed by the agent.
- Configure groups: You need to configure at least one compare group that is linked to a set of source and target data source connections. A group is a logical container for organizing the objects to be compared.
- Configure compare pairs: You need to configure one or more compare pairs for each group that you create. A compare pair is a set of corresponding source and target tables or files. As part of configuring compare pairs, you map source and target columns to establish a structural relationship between the two objects.
- Configure profiles: A profile contains settings for run-time parameters and can be applied globally to a job, as well as to a specific compare pair as an override to the job profile. Profile parameters encompass considerations such as sorting method, thread and memory usage, reporting output, and so forth. Defining run profiles is optional, because Oracle GoldenGate Veridata includes a default profile that contains settings that apply to most usage scenarios. However, as you gain experience with Oracle GoldenGate Veridata, you may want to customize the default profile or create your own custom profiles.
- Configure jobs: A job is a logical container for one or more compare groups and is the unit of work by which comparison processing is executed. Within one or more jobs, you can manage and run large volumes of compare groups across numerous databases and systems, and you can control the timing of those comparisons.

For more information, see the *Oracle GoldenGate Veridata Online Help*.

1.3.2 Satisfying Uniqueness Requirements

Oracle GoldenGate Veridata relies on some form of unique identifier to order rows for comparison.

- **Primary Key:** By default, Oracle GoldenGate Veridata uses the primary key if one is available.
- **Unique Key:** If no primary key is defined, Oracle GoldenGate Veridata uses the smallest unique index
- **User-defined Key:** If a table or file has neither a primary nor unique key, you can define an existing index or set of columns for comparison purposes when defining a compare pair. However, although primary or unique keys can be mapped automatically, user-defined keys must be mapped manually. A user-defined key can also be used to override existing keys or indexes if you prefer a different ordering method.

For more information about choosing and mapping keys for comparison, see the Oracle GoldenGate Veridata online help.

1.3.3 How Oracle GoldenGate Veridata Compares Data

Comparison activities are divided into the following steps. You can change some of the aspects of these steps by making parameter changes in Oracle GoldenGate Veridata Web.

1.3.3.1 Initial Comparison Step

In the *initial comparison* (or *row hash*) step, rows are retrieved from the source and target tables with a query. If the source and target databases are of different types, the columns are converted to a standardized data type format for accurate comparison. By default, Oracle GoldenGate Veridata compares rows by comparing all columns of the primary key literally (value-for-value) and by using a hash value for all non-key columns. The unique digital signature that is used to calculate the hash value shrinks the data to be transferred over the network for the comparison, while still providing a highly reliable (but not absolute) and efficient mechanism for determining whether two rows contain the same or different column values.

For more assurance of discovering out-of-sync rows, you can configure Oracle GoldenGate Veridata to compare non-key rows column-for-column, instead of using a hash. Full-column comparisons reduce the processing performance in proportion to the number of columns, and they increase network usage.

For all supported databases, you can use the delta processing feature during the initial comparison step if you are using server-side sorting. Delta processing is a performance feature by which Oracle GoldenGate Veridata detects which data blocks in the database were modified since a previous comparison and only compares the rows in those blocks. Rows in unchanged blocks are skipped. The default is to compare all rows regardless of whether they changed or not.

There are two steps to delta processing:

- Collecting the base modification time of the previous run for subsequent delta comparisons. This step is always done when delta processing is enabled for a compare pair.
- Comparing data that has been modified since the base comparison, using the information that was collected in the first step. This step is enabled by clicking the **Enable Delta Processing** button on the Compare Pair Configuration page and the Run/Execute Job page of Oracle GoldenGate Veridata Web. The **Disable Delta**

Processing button allows you to disable the delta comparison step in case there were modifications, such as table reorganizations, that can invalidate the collected delta base information.

For more information about delta processing, see "Using Delta Processing" in *Oracle GoldenGate Veridata User's Guide* or the*Oracle GoldenGate Veridata Online Help*.

After the initial comparison, rows that appear to be out-of-sync are stored in a maybe out-of-sync (MOOS) queue in memory, because at this point the comparison is inconclusive. When replication is working concurrently with a comparison, especially if there is replication latency, rows can appear to be out-of-sync when, in fact, the current data is *in flight* (somewhere in the replication flow) and replication will soon synchronize them again.

1.3.3.2 Confirmation Step

The *confirmation*, or *confirm-out-of-sync (COOS)*, step ensures accurate results by confirming row status in a changing environment. This step involves predicated queries on source or target using the rows extracted from the MOOS queue, and the status is evaluated as one of the following:

- *in-flight*: the row was out-of-sync in the initial comparison step, but has since been updated. In this case, it is assumed that replication or another mechanism applied the change, but Oracle GoldenGate Veridata was unable to confirm that the rows were in-sync.
- *in-sync*: the source row values were applied to the target row by replication or another method. Even a status of in-sync does not guarantee that the rows are synchronized at any particular moment if the underlying tables are continuously changing, but it does indicate that replication is working.
- *persistently out-of-sync*: the row has not been updated since the initial comparison step took place, and therefore can be assumed to be out-of-sync.

By default, confirmation processing occurs in a thread that is parallel to the initial comparison step, but the confirmation of each row waits until after a specified replication latency threshold has expired. For example, if latency is 60 seconds, and the initial comparison step revealed an out-of-sync row at 9:30, then the confirmation step for that row is not performed until 9:31 to allow replication to apply any change that was in-flight. After latency is accounted for, rows can be confirmed as persistently out-of-sync and are stored in one or more out-of-sync reports.

1.4 Viewing Comparison Results

Upon completion of a job, you can view the comparison reports and the out-of-sync report by using Oracle GoldenGate Veridata Web User Interface or by viewing the files themselves.

If report encryption is enabled for the Veridata Server, you need to use the `reportutil` tool to view the report files. See Section 2.6, "Encrypting Report Files". The Veridata Web User Interface automatically decrypts the file before displaying them.

1.4.1 Out-of-Sync Report

You have the option to store an out-of-sync report in binary format, in XML format, or both (or none).

- **OOS file**: When stored in binary form, the OOS report contains out-of-sync comparison results that are used for viewing row differences using the Oracle GoldenGate Veridata Web Interface, and the report is also used to re-compare out-of-sync rows later. To re-compare rows, you select run options to execute another confirmation step, which compares the current state of just those rows and then reports which ones remain out-of-sync after replication or another restorative procedure has been applied.
- **OOSXML file**: When stored as XML, the OOS report is written to an `OOSXML` file and is stored in a structured way that conforms to an internal XML schema. XML has many advantages, the largest being that it can be manipulated easily by many tools. In its XML form, the file contains all of the information, including metadata, that is needed to select rows for re-synchronization by external programs.

1.4.2 Comparison Report

Each finished job, group, and compare pair generates a comparison report. The report file contains details about the comparisons that were performed, such as:

- Comparison parameters used
- The number of rows compared and out-of-sync
- The timing of the comparison
- Performance statistics
- Source and target data values

The files themselves are stored as follows:

By default, the OOS files are located in sub-directories of the Oracle GoldenGate Veridata Server installation directory:

- OOS files: *`VERIDATA_DOMAIN_HOME`*`/veridata/reports/oos`
- OOSXML files: *`VERIDATA_DOMAIN_HOME`*`/veridata/reports/oosxml`

You can change the default location by specifying another path for the server.veridata_data property in the `veridata.cfg` file.

These directories are further organized by run ID, job name, group name, and compare pair. In the `OOSXML` directory, the files with the `.oosxml` extension are the control files. The files with sequential file extensions are the `OOSXML` chunks. The XML data is spread into multiple files (called "chunks") for performance purposes.

You can choose to encrypt the comparison reports. For more information, see Section 2.6, "Encrypting Report Files".

2

Configuring Oracle GoldenGate Veridata Security

This chapter explains how to set security for Oracle GoldenGate Veridata.

This chapter includes the following sections:

2.1 Oracle GoldenGate Veridata Security Overview

When using Oracle GoldenGate Veridata, you will be selecting, viewing and storing data values from the tables or files of your business applications. Care must be taken to protect access to the following components:

- The files, programs, and directories in the Oracle GoldenGate Veridata installation directories
- Data files that contain the results of data comparisons
- The Oracle GoldenGate Veridata Web User Interface, where data values can be viewed

2.2 Configuring an SSL Connection between Veridata Server and Veridata Agents

Oracle GoldenGate Veridata supports both Secure Sockets Layer (SSL) and plain socket communication between the Veridata Server and multiple Veridata Agents that are connected over a network. This section describes how to configure SSL and secure communication between the Veridata Server and Veridata Agents.

Note: The Veridata Agent for NonStop platforms do not support SSL communication.

In an SSL scenario, the Veridata Server is considered as the SSL Client and the Veridata Agents as the SSL Servers. The Veridata Server and Agents authenticate each other's identity. The data exchanged between the server and agent is also encrypted.

2.2.1 One-Way and Two-Way SSL Connections

SSL can be configured one-way or two-way in Oracle GoldenGate Veridata.

In one-way SSL connection, the SSL Client (Veridata Server) should trust the SSL Server (Veridata Agent). In two-way SSL, mutual trust is required between the SSL Server and the SSL Client. You can either use self-signed certificates or CA signed certificates to enable SSL.

Using self-signed certificates

To establish one-way SSL using self-signed certificates:

- Create self-signed certificates for all Veridata Agents
- Upload all Veridata Agent certificates to the `VeridataWebTrustStore` of the Veridata Server. See Section 2.2.6, "Using OPSS Keystore Service to Manage Veridata Keystores".

To establish two-way SSL using self-signed certificates:

- Create self-signed certificates for all Veridata Agents.
- Upload all Veridata Agent certificates to the `VeridataWebTrustStore` of the Veridata Server. See Section 2.2.6, "Using OPSS Keystore Service to Manage Veridata Keystores".
- Create self-signed certificate for the identity store of the Veridata WebLogic Server.
- Upload the WebLogic Server identity certificate to all Veridata Agent truststores.

For more information about creating and importing certificates, see Section 2.2.5, "Creating Keystores and Self-Signed Certificates by using the Keytool Utility".

Using CA-signed certificates

To establish one-way SSL using CA signed certificates:

- Use certificates issued by the same Certificate Authority (CA) for all Veridata Agents.
- Trust the root CA certificate in the Veridata Weblogic Server.

To establish two-way SSL using CA signed certificates:

- Use certificates issued by the same Certificate Authority (CA) for all Veridata Agents.
- Trust the root CA certificate in the Veridata Weblogic Server.
- Use the certificate issued by a CA for identity store of Veridata Weblogic Server.
- Trust the root CA certificate used in the previous step in the Veridata agent truststore.

2.2.2 Enabling SSL: Main Steps

Oracle GoldenGate Veridata Server and Oracle GoldenGate Veridata Agents are not enabled for SSL by default. If you decide to use SSL, you must enable the properties for the server and the agents. See SSL Settings for Oracle GoldenGate Veridata Agent and SSL Settings for GoldenGate Veridata Server.

You must also create the identity and trust keystores. Create self-signed certificates if you are not using a Certificate Authority (CA) certificate. See Creating Keystores and Self-Signed Certificates by using the Keytool Utility.

To verify and establish an SSL connection between the Veridata Server and an Agent, follow these steps:

1. Configure SSL for the Veridata Web Server. See SSL Settings for GoldenGate Veridata Server.
2. Restart the Veridata Web Server.
3. Shutdown the Veridata Agent. Configure SSL for the Veridata Agent. See SSL Settings for Oracle GoldenGate Veridata Agent.
    a. Obtain the agent side keystores. See Using OPSS Keystore Service to Manage Veridata Keystores.
    b. Configure the agent-side keystores in the agent configuration properties file.
4. Run `configure_agent_ssl.sh` and supply the password to the keystores configured in the agent configuration file. See Modifying the Veridata Agent Wallet.
5. Start the agent.
6. If the trust is established properly between agent keystores and corresponding Veridata Server counterpart present in the OPSS Keystore Service, then SSL communication is established.

2.2.3 SSL Settings for Oracle GoldenGate Veridata Agent

By default, SSL is disabled for the Oracle GoldenGate Veridata Agent. To configure SSL, edit the following properties in the `agent.properties` file for your Veridata Agent.

Table 2–1 SSL Parameters in agent.properties file

Parameter	Description	Default Value
server.useSsl	Enables or disables SSL Communication between the Veridata Agent and Veridata Server. Possible values are: true: Enables SSL communication false: Disables SSL communication	false
server.use2WaySsl	Specifies whether the SSL communication is one-way or two-way. Options are: true: Uses two-way SSL communication false: Uses one-way SSL communication	false
server.identitystore.type	Specifies the type of keystore used for SSL configuration.	JKS
server.identitystore.path	Specifies the path for the server identity keystore.	./certs/serverIdentity.jks (Self Signed)
server.truststore.type	Specifies the type of truststore used for SSL configuration.	JKS
server.truststore.path	Specifies the path for the server truststore.	./certs/serverTrust.jks (Self Signed)

Table 2–1 (Cont.) SSL Parameters in agent.properties file

Parameter	Description	Default Value
server.identitystore.keyfactory.alg.name	Algorithm name of the keyfactory used for SSL server identity store.	SunX509
server.truststore.keyfactory.alg.nam	Algorithm name of the keyfactory used for SSL server trust store.	SunX509
server.ssl.algorithm.name	SSL algorithm name. **Note:** This value of this parameter must be same for the Veridata Agent and Veridata Server.	TLS

2.2.4 SSL Settings for GoldenGate Veridata Server

To enable SSL communication for all Veridata Server-Agent connections, you must set the SSL parameters in the `veridata.cfg` file located in the *`DOMAIN_HOME`*`/config/veridata` directory of your Veridata installation. Table 2–2 describes the various parameters that you must set in the `veridata.cfg` file for SSL communication.

You can also establish SSL communication only for certain connections. To do this, edit the connection properties in the Oracle GoldenGate Veridata web user interface. For more information, see the *Oracle GoldenGate Veridata Online Help*.

Note: In addition to these settings, configure Veridata Server Identity keystore and Trust keystore using the OPSS Keystore Service in the WebLogic domain. For more details, see Section 2.2.6, "Using OPSS Keystore Service to Manage Veridata Keystores".

Table 2–2 SSL Settings in veridata.cfg file

Parameter	Description	Default Value
server.useSsl	Enables or disables SSL Communication between the Veridata Agent and Veridata Server. Possible values are: true: Enables SSL communication false: Disables SSL communication	false
server.ssl.client.identitystore.keyfactory.alg.name	Algorithm name of the keyfactory used for SSL server identity store.	SunX509
server.ssl.client.truststore.keyfactory.alg.name	Algorithm name of the keyfactory used for SSL server trust store.	SunX509
server.ssl.algorithm.name	SSL algorithm name. **Note:** This value of this parameter must be same for the Veridata Agent and Veridata Server.	TLS

2.2.5 Creating Keystores and Self-Signed Certificates by using the Keytool Utility

For mutual authentication and to establish SSL communication, the Veridata Server and the Veridata Agents should mutually trust the add certificates in the respective truststores.

This section explains how to create keystores and self-signed certificates by using the `keytool` utility that is available as part of the Java Runtime Environment (JRE). For

more details about keytool, refer Java documentation at http://docs.oracle.com/javase/7/docs/technotes/tools/#security.

2.2.5.1 Creating an Identity Keystore with a Self-Signed Certificate

The following keytool command creates a keystore containing a self-signed certificate:

```
keytool -genkey -keystore certs -keyalg rsa -alias vdt_alias -storepass server_ks_
pwd -keypass server_pwd
```

The keytool utility prompts to enter details about the certificate. Provide answers on the command-line when prompted.

2.2.5.2 Building Veridata Server and Veridata Agent Keystores

To build the Veridata Agent keystore, run the following keytool command:

```
keytool -genkey -alias agent.server.keys -keyalg RSA -keystore
agent.server.keystore -storepass ks_password -keypass keypwd
```

To export the Veridata Agent certificate to a file, run the following keytool command:

```
keytool -export -alias agent.server.keys -keystore agent.server.keystore
-storepass ks_password -file agent.server.cer
```

To build the Veridata Web Server keystore, run the following keytool command:

```
keytool -genkey -alias vdt.web.client.keys -keyalg RSA -keystore
vdt.web.client.keystore -storepass ks_password -keypass keypwd
```

To export the Veridata Server certificate to a file, run the following keytool command:

```
keytool -export -alias vdt.web.client.keys -keystore vdt.web.client.keystore
-storepass ks_password -file vdt.web.client.cer
```

2.2.5.3 Importing Certificates to the Veridata Server and Agent Truststores

To import the Veridata Server certificate to the Agent truststore, run the following keytool command:

```
keytool -import -v -keystore agent.server.truststore -storepass ks_password -file
vdt.web.client.cer
```

To import the Veridata Agent certificate the Veridata Web Server truststore, run the following keytool command:

```
keytool -import -v -keystore vdt.web.client.truststore -storepass ks_password
-file agent.server.cer
```

2.2.5.4 Examples

Example 1 Create a Veridata Agent ID Keystore

keytool -genkey -alias vdt.agent.id -keyalg RSA -keystore vdtAgentID.jks -storepass changeit -keypass changeit -validity 365

```
C:\java\Java8\jdk1.8.0_40\bin>keytool -genkey -alias vdt.agent.id -keyalg RSA
-keystore vdtAgentID.jks -storepass changeit -keypass c
hangeit -validity 365
What is your first and last name?
  [Unknown]:  COMPANY A
What is the name of your organizational unit?
  [Unknown]:  NA
```

```
What is the name of your organization?
  [Unknown]:  COMPANY A
What is the name of your City or Locality?
  [Unknown]:  USA
What is the name of your State or Province?
  [Unknown]:  USA
What is the two-letter country code for this unit?
  [Unknown]:  US
Is CN=COMPANY A, OU=NA, O=COMPANY A, L=USA, ST=USA, C=US correct?
  [no]:  yes
```

keytool -export -alias vdt.agent.id -keystore vdtAgentID.jks -storepass changeit -file vdtAgentID.cer

C:\java\Java8\jdk1.8.0_40\bin>keytool -export -alias vdt.agent.id -keystore vdtAgentID.jks -storepass changeit -file *vdtAgentID.cer*

The certificate is stored in the *vdtAgentID.cer* file.

Example 2 Create a Veridata Server ID Keystore

keytool -genkey -alias vdt.server.id -keyalg RSA -keystore vdtServerID.jks -storepass changeit -keypass changeit -validity 365

```
C:\java\Java8\jdk1.8.0_40\bin>keytool -genkey -alias vdt.server.id -keyalg RSA
-keystore vdtServerID.jks -storepass changeit -keypass changeit -validity 365

What is your first and last name?
  [Unknown]:  VERIDATA WEBLOGIC SERVER
What is the name of your organizational unit?
  [Unknown]:  NA
What is the name of your organization?
  [Unknown]:  COMPANY A
What is the name of your City or Locality?
  [Unknown]:  USA
What is the name of your State or Province?
  [Unknown]:  USA
What is the two-letter country code for this unit?
  [Unknown]:  US
Is CN=COMPANY A, OU=NA, O=COMPANY A, L=USA, ST=USA, C=US correct?
[no]:  yes
```

keytool -export -alias vdt.server.id -keystore vdtServerID.jks -storepass changeit -file vdtServerID.cer

```
C:\java\Java8\jdk1.8.0_40\bin>keytool -export -alias vdt.server.id -keystore
vdtServerID.jks -storepass changeit -file vdtServerID.cer
```

The certificate is stored in the *vdtAgentID.cer* file.

Example 3 Create a Trust Stores for Veridata Agent and Server

keytool -import -v -keystore vdtAgentTrust.jks -storepass changeit -file vdtServerID.cer -alias vdt.server.id

```
C:\java\Java8\jdk1.8.0_40\bin>keytool -import -v -keystore vdtAgentTrust.jks
-storepass changeit -file vdtServerID.cer -alias vdt.ser
ver.id
Owner: CN=VERIDATA WEBLOGIC SERVER, OU=NA, O=COMPANY A, L=USA, ST=USA, C=US
Issuer: CN=VERIDATA WEBLOGIC SERVER, OU=NA, O=COMPANY A, L=USA, ST=USA, C=US
Serial number: 2aded02f
```

```
Valid from: Thu May 14 12:18:09 IST 2015 until: Fri May 13 12:18:09 IST 2016
Certificate fingerprints:
         MD5:  4E:7D:89:F7:C8:E8:64:37:E5:0C:D3:03:8F:3E:94:0A
         SHA1: 1B:00:9D:44:BD:73:6E:71:9D:44:56:4A:29:4E:F5:D7:1C:49:57:F3
         SHA256:
25:CB:77:3F:BC:5F:88:4B:09:D2:2D:C1:F8:E6:BA:70:DB:2B:55:53:48:7D:BA:F1:A3:01:18:A
B:AA:D1:56:6A
         Signature algorithm name: SHA256withRSA
         Version: 3

Extensions:

#1: ObjectId: 2.5.29.14 Criticality=false
SubjectKeyIdentifier [
KeyIdentifier [
0000: EF C3 25 BB 83 4E 2D 0D   15 3D EF 50 F7 F2 D0 A6  ..%..N-..=.P....
0010: 94 5F 87 F2                                        ._..
]
]

Trust this certificate? [no]:  yes
Certificate was added to keystore
[Storing vdtAgentTrust.jks]
```

keytool -import -v -keystore vdtServerTrust.jks -storepass changeit -file vdtAgentID.cer -alias vdt.agent.id

```
C:\java\Java8\jdk1.8.0_40\bin>keytool -import -v -keystore vdtServerTrust.jks
-storepass changeit -file vdtAgentID.cer -alias vdt.age
nt.id
Owner: CN=COMPANY A, OU=NA, O=COMPANY A, L=USA, ST=USA, C=US
Issuer: CN=COMPANY A, OU=NA, O=COMPANY A, L=USA, ST=USA, C=US
Serial number: 6b590df2
Valid from: Thu May 14 12:08:00 IST 2015 until: Fri May 13 12:08:00 IST 2016
Certificate fingerprints:
         MD5:  3E:75:A3:96:40:60:10:96:DD:10:7B:4D:E4:3F:4C:04
         SHA1: D1:CC:EB:67:A1:C6:CD:CA:62:27:EA:F8:82:BF:AB:E4:E7:2B:45:6D
         SHA256:
E7:20:CF:D4:48:E2:AE:1E:1C:C7:06:1A:B3:0A:17:1F:8F:02:88:B7:A6:A0:5D:F7:12:BC:26:6
8:5B:C3:C9:C8
         Signature algorithm name: SHA256withRSA
         Version: 3

Extensions:

#1: ObjectId: 2.5.29.14 Criticality=false
SubjectKeyIdentifier [
KeyIdentifier [
0000: C0 D5 02 D9 24 6F 58 F6   63 D7 34 D3 9D C4 9E 33  ....$oX.c.4....3
0010: FC 16 4E 5F                                        ..N_
]
]

Trust this certificate? [no]:  yes
Certificate was added to keystore
[Storing vdtServerTrust.jks]
```

2.2.6 Using OPSS Keystore Service to Manage Veridata Keystores

The Oracle Platform Security Services (OPSS) keystore services is used as a repository for storing identity and trust keystores for Veridata Server. The Veridata Agent keystores can also be managed using the OPSS keystore service. For more information, see "Managing Keys and Certificates with the Keystore Service" in *Securing Applications with Oracle Platform Security Services*.

Table 2–3 lists the default values for the OPSS settings.

Table 2–3 OPSS Settings

Setting	Value
Name of the Application Stripe created by WebLogic Server.	`VeridataSec`
Name of the identity keystore under the application stripe VeridataSec.	`VeridataWebIdentityStore`
Name of the trust keystore under the application stripe VeridataSec	`VeridataWebTrustStore`

To configure two-way SSL by using the OPSS keystore service:

1. For each Veridata Agent, create an identity and trust keystore.
2. Update the `VeridataWebIdentityStore` with the identity certificate of the Veridata Web Server.
3. Update the `VeridataWebTrustStore` with all Veridata Agent certificates.
4. Update each Veridata Agent truststore with the identity certificate of the Veridata Web Server.
5. Export the Agent keystore and truststore as JKS files and note the passwords.
6. Distribute the JKS files to corresponding Agent machines.
7. Run the `configure_agent_ssl` tool to update the Agent wallet with the keystore passwords.
8. For each Agent, configure the agent.properties file to enable SSL.

To configure one-way SSL by using the OPSS keystore service:

1. For each Veridata Agent, create an identity keystore.
2. Update the `VeridataWebIdentityStore` with the identity certificate of the Veridata Web Server.
3. Export the Agent keystore and truststore as JKS files and note the passwords.
4. Distribute the JKS files to corresponding Agent machines.
5. Run the `configure_agent_ssl` tool to update the Agent wallet with the keystore passwords.
6. For each Agent, configure the agent.properties file to enable SSL.

2.2.7 Modifying the Veridata Agent Wallet

Before you start the Veridata agent in SSL mode, you must update the Veridata Agent Wallet with the identity and trust keystore passwords. Otherwise, the Veridata Agent fails to start.

To update the wallet, run the `configure_agent_ssl` script that is available in the agent home:

AGENT_HOME`\configure_agent_ssl.sh` *AgentID*

where `AgentID` is the name of the agent properties file, without the `.properties` extension. The default value for `AgentID` is `agent`.

When prompted, enter the entry or unlock password for the identity and trust keystores for the agent.

2.3 Securing the Oracle GoldenGate Veridata Files

This section describes how to secure your business data and control access to the Oracle GoldenGate Veridata installation directories and user interface.

2.3.1 Controlling Access to the Installation Directories

Standard operating system permissions apply to the programs, files, and directories within the Oracle GoldenGate Veridata Server and Web User Interface, and Oracle GoldenGate Veridata Agent installation directories. You should adjust the permissions for these objects based on your business security rules.

2.3.2 Securing files that Contain Business Data

Oracle GoldenGate Veridata Server creates data files that will contain sensitive application data. By default, these files reside in the `DOMAIN_HOME/veridata/reports`. All of the sub-directories within that directory contain files that may reflect business data.

The types of files that contain sensitive data are:

- The comparison report (`rpt` sub-directory)
- The out-of-sync report (`oosxml` and `oos` sub-directories)

These files inherit the same file permissions as those of the user that runs the Oracle GoldenGate Veridata Server installation program. Do not change the permissions, or Oracle GoldenGate Veridata may be unable to maintain them. These files should be kept just as secure as you would keep your business data. Users of Oracle GoldenGate Veridata Web do not require access to these files because they see the same information through the client interface.

The contents of all report files can be optionally encrypted. For more information, see Section 2.6, "Encrypting Report Files".

2.4 Securing Access to Oracle GoldenGate Veridata by Defining User Roles

You can assign security roles to the users of Oracle GoldenGate Veridata to control their access to the functions that are performed by the software, some of which expose selected data values from the database. Table 2–4 describes the Veridata user roles.

Table 2–4 Veridata User Roles

Veridata	Type	Description
`veridataAdministrator`	Type-A	The administrator role is the highest-level security role in Oracle GoldenGate Veridata. This role can perform all of the functions that configure, execute, and monitor Oracle GoldenGate Veridata.
`veridataPowerUser`	Type-A	The power user role is the second-highest role in Oracle GoldenGate Veridata. This role can perform all of the functions that configure, execute, and monitor Oracle GoldenGate Veridata from the Oracle GoldenGate Veridata Web User Interface, but this role cannot perform any configuration functions for the Oracle GoldenGate Veridata Server.
`veridataReportViewer`	Type-B	The report viewer role cannot perform functions that configure Oracle GoldenGate Veridata or execute jobs. This role can only view configuration and job information, and view comparison reports.
`veridataDetailReportViewer`	Type-B	The detail report viewer role cannot perform any functions that configure Oracle GoldenGate Veridata or execute jobs. This role can only view configuration and job information, and view comparison reports and out-of-sync report information through the Oracle GoldenGate Veridata Web User Interface or at the file level.
`veridataRepairOperator`	Additional	The RepairOperator role can use the Repair feature in Veridata.
`veridataCommandLineUser`	Additional	The commandLineUser role provides access to the Veridata command line tools, `vericom` and the Veridata import and export utilities.

These roles are categorized into various types as follows:

- Type A and Type B: By default, Type A and Type B users are not given any privileges of the Additional user roles. Assign Additional roles to users of these types.
- Additional: WebLogic Administrators can assign these Additional roles to Type A users to perform the required Veridata functions.

Security is controlled through the Oracle WebLogic Server Administration Console. From this interface, a user with the administrator role can:

- Create a user and assign it a security role.
- Create user groups and assign them security roles. Users can be added to these groups without being given a security role. A user inherits the role of its group.
- Create a user and assign it a security role, and then add that user to a group. The user inherits the role of its group and keeps its individual role.

To open Oracle WebLogic Server Administration Console

1. Connect to the Oracle WebLogic Server Administration Console from a browser by typing the following address:

   `http://`*`weblogic_admin_server_hostname`*`:`*`admin_server_port`*`/console`

   Where:

weblogic_admin_server_hostname is the name or IP address of the system where the Oracle GoldenGate Veridata server and web components are hosted, and *admin_server_port* is the port number assigned to the server (default is 7001).

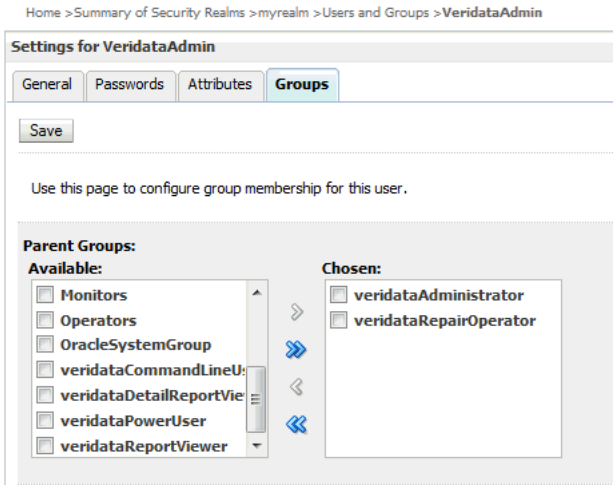
2. Log on to the Administration Console as an Oracle GoldenGate Veridata administrator user. A default administrator user was created during the creation of Oracle GoldenGate Veridata domain.

To create or edit a user

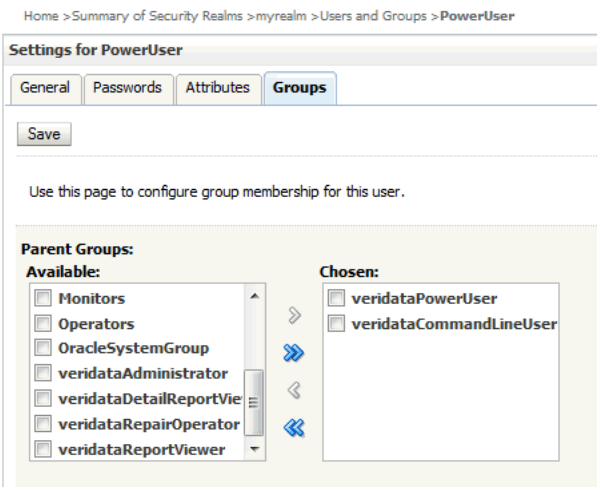
1. In the left pane of the Administration Console, select **Security Realms**.
2. On the Summary of Security Realms page select the name of the Veridata security realm.
3. On the Settings for Veridata Security realm page select **Users and Groups** > **Users**. The User table displays the names of all users defined in the Authentication provider. Click New to create a new user or select an existing user to edit settings. Enter the following properties for a new user:
   - **Name**: Specify a name for the user.
   - **Provider**: Select the Authentication provider for the user.
   - **Password**: Enter a password for the user.
   - **Description**: (Optional) Specify a description for this user.
4. To assign a role to the user, go to the Settings for *user_name* page and click Groups.

   Select appropriate roles for the user. All roles for a Veridata user are described in Table 2–4, " Veridata User Roles".

   For example, an administrator, **VeridataAdmin**, can be given privileges as shown in the figure below.



   For example, a Veridata power user, **PowerUser**, can be given privileges as shown in the figure below.



5. Click **Save** to save the user.

2.5 Changing Database Schema Passwords

You can change Veridata database schema passwords when a schema password expires, an account is locked, or a password change is necessary. This section applies to all database schemas that are prefixed with 'OGG'. For example, OGG_IAU, OGG_IAU_APPEND, or OGG_IAU_VIEWER.

Change a database schema password:

1. Stop your Veridata Server.

   DOMAIN_HOME/veridata/veridata/bin/veridataServer.sh stop

2. Stop your Oracle WebLogic Server.

   DOMAIN_HOME//veridata/bin/stopWebLogic.sh

3. Start the Oracle WebLogic Scripting Tool, wlst.sh. For example:

   /home/oracle/Oracle/Middleware/Oracle_Home/oracle_common/common/bin/wlst.sh

4. Modify the database schema password as in this example:

   ```
   modifyBootStrapCredential(jpsConfigFile='/home/oracle/wls_
   domains/veridata/config/fmwconfig/jps-config.xml',username='OGG_
   OPSS',password='welcome123')
   ```

   Where the username= is your database schema name and password= is the new password.

5. Exit the scripting tool using **exit()**.

6. Log into the metadata repository database and change the schema passwords and unlock the schema as in the following example that unlocks the OGG_OPSS schema:

   ```
   alter user OGG_OPSS identified by welcome123;
   alter user OGG_IAU identified by welcome123;
   alter user OGG_IAU_APPEND identified by welcome123;
   alter user OGG_IAU_VIEWER identified by welcome123;
   alter user OGG_STB identified by welcome123;
   alter user OGG_VERIDATA identified by welcome123;
   alter user OGG_OPSS account unlock;
   ```

7. Start the Oracle WebLogic Configuration Wizard, config.sh. For example:

   ```
   /home/oracle/Oracle/Middleware/Oracle_Home/oracle_common/common/bin/config.sh
   ```

8. Select **Update an Existing Domain** then click **Next**.
9. Select **JDBC Component Schema** then enter the new database schema passwords.
10. Click **Next** until you reach the **Configuration Summary** screen, and then click **Update**.
11. Click **Next** then **Finish** to save your schema password changes.
12. Start your Oracle WebLogic Server.

    ```
    DOMAIN_HOME//veridata/bin/startWebLogic.sh
    ```

13. Start your Veridata Server.

    ```
    DOMAIN_HOME/veridata/veridata/bin/veridataServer.sh start
    ```

2.6 Encrypting Report Files

Oracle GoldenGate Veridata provides you with an option to encrypt the comparison report files (`.rpt`, `.oos`, `.oosxml`). The following sections explain the report encryption in Veridata:

- Section 2.6.1, "Enabling Report Encryption"
- Section 2.6.2, "Using the reportutil Tool to view Reports"

2.6.1 Enabling Report Encryption

The encryption is controlled by the following parameters in the Veridata configuration file, `veridata.cfg`:

- `server.encryption`
- `server.encryption.bits`

To enable encryption of Veridata report files, set `server.encryption` to `true`.

Encryption of Veridata report files use AES encryption, and the default encryption strength is 128 bits. You can increase the encryption strength to 192 or 256 bits by editing the value of `server.encryption.bits` parameter in `veridata.cfg`. Note that any encryption strength greater than 128 requires you to use a JRE that has Unlimited Strength Cryptography Extension installed.

For more information about these parameters, see "Parameters for Report File Encryption".

Encrypted Veridata report files have the following extensions in the file names:

- `.xrpt` : Encrypted comparison or repair report file
- `.xoos`: Encrypted binary out-of-sync file
- `.xoosxml`: Encrypted out-of-sync XML file
- `.xNNN`: Encrypted out-of-sync XML chunk file (`NNN` is a decimal number)

2.6.2 Using the reportutil Tool to view Reports

When Veridata report encryption is enabled, all Veridata report files will be encrypted using an encryption key which is initially a large random value. The encryption key can be changed if required.

The encrypted files must be decrypted before you read it. The Veridata Web User Interface automatically decrypts files before displaying them. Alternatively, use the `reportutil.sh/.bat` utility to display the encrypted contents. This utility is located in the *`VERIDATA_DOMAIN_HOME`*`\veridata\bin` directory. Run the tool as follows:

```
reportutil   [-wlport port ] -wluser weblogic_user { options }
```

Where `wlport` is the WebLogic Server port number (the default port is 8830) and `wluser` represents the WebLogic Server user name.

The valid `options` are:

- `-version`, `-v`: displays the current version
- `-help`: displays the help message
- `-r`: rolls report encryption
- `-f` *`filename`* [`-d` *`directory`*]: decrypts and prints the report file to the specified file if a directory is specified by the `-d` option. Or else the command prints the decrypted file to the standard output.

Note that the Veridata user running the `reportutil` tool must be in the appropriate user group to perform the operations:

- `-r`, `-f`: Allowed only if the user is a member of `veridataCommandLineUser` group
- `-r`: Allowed if the user is a member of `veridataAdministrator` group
- `-f`: Allowed if the user is a member of `veridataAdministrator` group, or a member of `veridataPowerUser` group, or a member of `veridataDetailReportViewer`. group

For more information about the user roles, see Section 2.4, "Securing Access to Oracle GoldenGate Veridata by Defining User Roles".

3

Running the Oracle GoldenGate Veridata Programs

This chapter explains how to run the Oracle GoldenGate Veridata programs, such as the agents and Java components.

This chapter includes the following sections:

3.1 Starting and Stopping the C-agent and Manager

The C-agent starts automatically at the request of Oracle GoldenGate Veridata Server when initiating comparisons. However, for Oracle GoldenGate Veridata Agent to function correctly, the following must be running:

- The database to which the agent is linked.
- The Manager process for the C-agent.

Although the agent process itself is an automatic process, you can stop the Manager process that controls the agent. Stopping Manager prevents Oracle GoldenGate Veridata Server from being able to start a new agent process, but it does not stop agents that are already running.

To control the C-agent Manager on all platforms

1. From the Oracle GoldenGate Veridata Agent installation location, run GGSCI.
2. In GGSCI, issue the appropriate command as follows to stop or start the Manager.

```
START MANAGER
```

Or...

```
STOP MANAGER
```

3.2 Starting and Stopping the Java-Based Components

The Oracle GoldenGate Veridata Server and Oracle GoldenGate Veridata Web components are Java-based programs. The Oracle GoldenGate Veridata Agent component is also available as a Java program for all platforms except NonStop.

Note: Before starting the server and web processes, start the repository database.

3.2.1 Controlling the Java-Based Components from the Command Line

To control the agent component, change directories to its installation directory and issue the appropriate command as follows:

UNIX and Linux	Windows
`agent.sh {start | run}`	`agent.bat {start | run}`
Or...	Or...
`agent.sh stop`	`agent.bat stop`

Where:

- `run` starts the agent in the same command window from which it is launched.
- `start` starts the agent in a separate command window.

Note: The `run` option is useful for diagnosing errors that happen during the startup process before the agent error logging is configured. When the `run` option is used, messages written `stdout` and `stderr` appear in the command window. The agent normally logs its messages to the log file, so only operating system messages and logging system errors are written to `stderr`. When the start option is used, messages written to `stdout` and `stderr` are discarded.

Configure the host to start and stop the processes automatically. Contact your system administrator if you need assistance.

3.3 Reloading Log Information

You can reload logging information from the `AGENT_ORACLE_HOME/config/odl.xml` configuration file to a running agent by using the `reloadLog` option. The changes in the `odl.xml` file are put into effect on the agent. The agent must be running for this command to work.

Use the following command:

UNIX and Linux	Windows
`agent.sh reloadLog`	`agent.bat reloadLog`

3.4 Connecting to Oracle GoldenGate Veridata Web Interface

To connect to the Veridata Web User Interface, open a web browser and type the following address:

`http://`*`hostname`*`:`*`port`*`/veridata`

Where:

hostname is the name of the system where Oracle GoldenGate Veridata Server is installed and *port* is the port number where it is running (default is 8830). Use `localhost` as the host name if connecting on the system that is local to the server installation.

Examples:

```
http://localhost:8830/veridata
http://sysa:8830/veridata
```

The Oracle GoldenGate Veridata Web login page is displayed upon successful connection. Log in with your user name and password. For full instructions on using Oracle GoldenGate Veridata Web Interface, see the Online Help.

4

Running Comparisons from the Command Line

This chapter explains how to use the `vericom` command line interface to run comparisons.

This chapter includes the following sections:

4.1 Overview of the `vericom` Tool

You can use the `vericom` tool of Oracle GoldenGate Veridata to execute certain comparison tasks from the command shell of the operating system. The `vericom` tool runs the Oracle GoldenGate Veridata Command Line Interface and enables you to handle these activities with automated programs.

You can:

- Run an entire job or a specific compare pair of a job

> **Note:** You cannot run a group individually.

- Set tracing (only under guidance of an Oracle Support analyst)

For specific compare pairs, you can:

- Review previous out-of-sync results
- Generate out-of-sync XML from the previous run
- Override the same profile and row partition settings that are possible from the web interface

Comparisons also can be run from the Oracle GoldenGate Veridata Web interface. This interface provides greater control in configuring the objects to be compared and for controlling runtime parameter settings.

4.2 Running Vericom

The `vericom` program can be run by anyone who has the correct operating system permissions to run it.

1. On the system where the Oracle GoldenGate Veridata is installed, run the command shell of the operating system.
2. Navigate to the *VERIDATA_DOMAIN_HOME*`/veridata/bin` directory.
3. Use the following syntax to run the `vericom` program.

Syntax

```
vericom{.bat|.sh} required_parameter [optional_parameter]
```

Required Parameters

One of the following are required; otherwise an error is returned. Enter only one option.

```
[-wlport port ] |
-wluser user_name |
-help |
-helprun |
[-version | -v] |
[-job | -j] job |
```

The `-wluser` specifies the WebLogic Server user name to connect to the WebLogic Server. This WebLogic Server user should have the `veridataCommandLineUser` privilege to access and execute command-line operations. The user should also have the `veridataAdministrator` or `veridataPowerUser` privilege to successfully run jobs and to use the Veridata Import and Export utilities.

See Section 2.4, "Securing Access to Oracle GoldenGate Veridata by Defining User Roles".

If `-version`, `-v`, `-help`, or `-helprun` are specified, they take precedence over any other flag specified.

Optional Parameters

These are the optional parameters:

```
[ -g group -c compare_pair ]
[ -nw ]
[ -repair | -norepair]
[ -rP profile ]
[ -rR ]
| -rO ]
[ -rN threads ]
[ -rD seconds ]
[ -rC | +rC ]
[ -rOb | -rOx | -rO2 | -rO0 ]
[ -rOs records ]
[ -rTi ]
[ -rTc ]
[ -rTs trace_number ]
[ -pS source_partition_name |
    -pSq source_sql_predicate |
    -pSA1 source_ascii_start_key |
    -pSA2 source_ascii_end_key |
    -pSH1 source_hex_start_key |
```

```
    -pSH2 source_hex_end_key ]
[ -pT target_partition_name |
    -pTq target_sql_predicate |
    -pTA1 target_ascii_start_key |
    -pTA2 target_ascii_end_key |
    -pTH1 target_hex_start_key |
    -pTH2 target_hex_end_key ]
[ -pq sql_predicate ]
[ -rd0 | -rdN run_ID ]
[ -wp ]
```

Table 4–1 Vericom Runtime Arguments

Argument	Description
`-wluser`	Specifies the WebLogic Server user name that authenticates and connects to the server.
`-wlport`	Specifies the WebLogic Server port number.
`-help`	Displays the `vericom` syntax components and their descriptions.
`-helprun`	Displays run-related syntax components and their descriptions.
`{-version | -v}`	Displays the version of the Oracle GoldenGate Veridata command-line interface that is being used.
`{-job | -j}` *job*	Specifies the job to be run. For *job*, specify the name that was assigned when the job was created in Oracle GoldenGate Veridata Web.
`-g` *group* `-c` *compare_pair*	Specifies a group and compare pair. For *group* and *compare_pair*, specify the names that were assigned when these objects were created in Oracle GoldenGate Veridata Web. ■ If `-g` and `-c` are used, `-j` must also be used.
`-nw`	Directs `vericom` not to wait for the job to finish before returning the prompt. Instead, `vericom` returns immediately after starting a job.
`-repair | -norepair`	Specifies to whether or not to repair after a comparison completes and has confirmed out of sync data exists.
`-rP` *profile*	Overrides the profile that is defined for a job. For *profile*, specify the name that was assigned when the profile was created in Oracle GoldenGate Veridata Web. ■ If `-rP` is used, -j must be used.
`-rR`	A run override option. Compares only those rows that were out-of-sync in the previous run, based on the information that is stored in the out-of-sync file. The results identify which rows were brought back into synchronization by replication or another method. ■ Do not use `-rR` and `-r0` in the same run.
`-r0`	A run override option. Generates an `OOSXML` file based on the out-of-sync file from the previous run. It generates XML for every row that is in the file. You can use the XML to view the out-of-sync information in an XML editor or for other purposes. ■ `-r0` must be used with `-j`. ■ Do not use `-rR` and `-r0` in the same run.

Table 4–1 (Cont.) Vericom Runtime Arguments

Argument	Description
`-rN` *threads*	Specifies the number of concurrent comparison threads to use. You can use as many threads as there are processors on the server system. This option overrides the default job profile and has no effect if a job is not run with `-j` or if just one comparison is run `by` using `-j` with `-g` and `-c`.
`-rD` *seconds*	Delays the confirmation step by the specified number of seconds to account for replication lag. Delaying the confirmation step reduces the number of false out-of-sync results that occur because an updated source value was not replicated fast enough. This option overrides the default job profile and has no effect if the `-rR` option is used.
`-rC` | `+rC`	Controls whether or not the confirmation step (confirm OOS) is performed in the job. ■ `-rC` skips the confirmation step. You can skip the confirmation step if activity on the source tables is stopped or if replication is not continuously updating the target table(s). ■ `+rC` includes the confirmation step. These options override the default job profile and are mutually exclusive. They have no effect unless `-j` is used.
`-rOb` | `-rOx` | `-rO2` | `-rO0`	Controls the kind of file that is produced for the out-of-sync report. ■ `-rOb` generates binary format that is compatible with the Oracle GoldenGate Veridata Web browser. ■ `-rOx` generates output in XML. ■ `-rO2` generates both binary and XML output. ■ `-rO0` suppresses out-of-sync output. These options override the default job profile and are mutually exclusive. They have no effect if `-rR` is used.
`-rOs` *records*	Limits the number of out-of-sync rows that are written to a chunk of the `OOSXML` file. Writing the file in chunks prevents it from becoming too large for the system to manage and allows periodic archiving or purging. The current file is closed when the specified number of rows is written, and a new file is opened. This option overrides the default job profile and has no effect if `-rR` is used.
`-rTi`	Turns on tracing of Oracle GoldenGate Veridata Agent for the initial comparison step. Do not use without the guidance of an Oracle support analyst.
`-rTc`	Turns on tracing of Oracle GoldenGate Veridata Agent for the confirmation step. Do not use without the guidance of an Oracle support analyst.
`-rTs` *trace_number*	Turns on tracing for Oracle GoldenGate Veridata Server. *trace_number* is a bitmask of server execution trace flags. The higher the level, the more detailed the trace data. Do not use without the guidance of an Oracle support analyst.

Table 4–1 (Cont.) Vericom Runtime Arguments

Argument	Description
-pS *source_partition_name* | -pSq *source_sql_predicate* | -pSA1 *source_ascii_start_key* | -pSA2 *source_ascii_end_key* | -pSH1 *source_hex_start_key* | -pSH2 *source_hex_end_key*	Runs the comparison using an existing source row partition or using an override partition that is defined by partition criteria. These options are mutually exclusive. They are valid only if comparing one compare pair (-j with-g and -c) and are ignored otherwise. **-pS *source_partition_name*** Specifies an existing source partition that is already defined and stored in the repository. The partition name is not validated and is passed directly to Veridata Server. There will be an error if the specified partition does not exist. **-pSq *source_sql_predicate*** Specifies a SQL predicate that defines a partition to override an existing source partition for a SQL table. The predicate is the conditional statement that follows the WHERE keyword, for example: LAST_NAME BETWEEN "A" AND "M". Do not include the WHERE keyword. It will be added automatically at runtime. If the predicate contains multiple words, it must be enclosed within quotes to make it a single command argument. The type of quote is dependent on the command shell or interpreter that is being used. If the predicate contains special characters (such as $, *, < in sh/csh or %, < in Windows), they must be properly escaped for that shell or interpreter. **-pSA1 *source_ascii_start_key*** Specifies an ASCII key as the starting key value of a partition that overrides an existing source partition for an Enscribe file. **-pSA2 *source_ascii_end_key*** Specifies an ASCII key as the ending key value of a partition that overrides an existing source partition for an Enscribe file. **-pSH1 *source_hex_start_key*** Specifies a hexadecimal key as the starting key value of a partition that overrides an existing source partition for an Enscribe file. **-pSH2 *source_hex_end_key*** Specifies a hexadecimal key as the ending key value of a partition that overrides an existing source partition for an Enscribe file.
-pT *target_partition_name*| -pTq *target_sql_predicate* | -pTA1 *target_ascii_start_key* | -pTA2 *target_ascii_end_key* | -pTH1 *target_hex_start_key* | -pTH2 *target_hex_end_key*	These options specify target partitions and have the same rules as the corresponding options that specify source partitions.
-pq *sql_predicate*	Specifies a SQL predicate to be used for both the source and target SQL tables, as an override to existing partitions. This option has the same rules as -pSq *source_sql_predicate* and-pTq *target_sql_predicate*.

Table 4–1 (Cont.) Vericom Runtime Arguments

Argument	Description
`-rd0 | -rdN run_ID`	Controls delta processing for a compare pair. ■ `-rd0` disables delta processing for this run. All rows are compared. ■ `-rdN run_ID` enables delta processing using a previous job run as the basis for the delta. For `run_ID` use the number from the `Run ID` line at the beginning of the job comparison report. Vericom does not validate the run ID that is supplied. To use these options, you must specify a compare pair with: ■ `-j` ■ `-g` ■ `-c`
`-wp seconds`	Waits for a job to complete. The client also polls the status of job submitted to the server at the specified interval (in seconds). ■ `-wp` must be used with `-job | -j`.

4.3 Vericom exit statuses

Vericom exits with one of the following statuses. This examples shown are for a UNIX or Linux system.

Status	Description
0	The command executed successfully. If a job was run, it finished with all rows in-sync. If `-nw` was specified, the exit status is 0 if the job started successfully.
1	Invalid `vericom` syntax was used. For example, the following are invalid: `vericom.sh -helptun` (Typographical error.) `vericom.sh -j -g group1` (The name of the job is missing.)

3	Provides more granularity for input errors that involve flags that run comparisons. For example, the following mistakes will cause this error:
	`vericom.sh -j job1 -c address=address`
	In the preceding example, the `-g group` input is missing. It is required with `-j` if `-c` is used.
	`vericom.sh -j job1 -g group1 -rd0`
	In the preceding example, the `-rd0` flag requires `-c` because delta processing applies at the compare pair level.

4	The job ran successfully, but there were rows that had a comparison status of something other than in-sync.
5	There was a communication error with Oracle GoldenGate Veridata Server.

4.4 Vericom Output Examples

To view the results of a comparison that is run with `vericom`, you can use Oracle GoldenGate Veridata Web to view the comparison report (see Section 1.4, "Viewing Comparison Results"), and you can view the output that is returned by `vericom` to the terminal. If a run finishes successfully, statistics for the job are displayed.

Example 1

The following example shows a run on a Windows system of `TestJob` without specifying `-w`. The process exits with status 0, and finished job statistics are not displayed.

```
VERIDATA_DOMAIN_HOME\veridata\bin\vericom.bat -j TestJob
Connecting to: localhost:9177
Run ID: (2256, 0, 0)
C:\veridata\server\bin> if errorlevel 0 echo EXITED 0 STATUS
EXITED 0 STATUS
```

Example 2

The following example shows a run of `TestJob` with`-w` specified. The process exits with status 4 because one of the compare pairs had a validation error. Finished job statistics are displayed.

```
VERIDATA_DOMAIN_HOME\veridata\bin\vericom.bat -j TestJob -w
Connecting to: localhost:9177
Run ID: (2257, 0, 0)
Job Start Time: 2008-03-21 22:48:05
Job Stop Time: 2008-03-21 22:48:20
Job Report Filename: C:\testjunit\rpt\TestJob\00002257\TestJob.rpt
Number of Compare Pairs: 3
Number of Compare Pairs With Errors: 1
Number of Compare Pairs With OOS: 1
Number of Compare Pairs With No OOS: 1
Number of Compare Pairs Cancelled: 0
Job Completion Status: WITH ERRORS
C:\veridata\server\bin> if errorlevel 4 echo EXITED 4 STATUS
EXITED 4 STATUS
```

Example 3

The following example shows a run of compare pair `TABLE9=TABLE9` in job `TestJob` with `-w` specified. The process exits with status 0 because the tables are in-sync. Finished job statistics are displayed.

```
VERIDATA_DOMAIN_HOME\veridata\bin\vericom.bat -j TestJob -g TestGroup -c
TABLE9=TABLE9 -w
Connecting to: localhost:9177
Run ID: (2258, 0, 0)
Job Start Time: 2008-03-21 22:51:08
Job Stop Time: 2008-03-21 22:51:11
Job Report Filename: C:\veridata\data\rpt\TestJob\00002258\TestJob.rpt
Number of Compare Pairs: 1
Number of Compare Pairs With Errors: 0
Number of Compare Pairs With OOS: 0
Number of Compare Pairs With No OOS: 1
Number of Compare Pairs Cancelled: 0
Compare Pair Report Filename: C:\veridata\data\rpt\TestJob\00002258\TestGroup\CP_
TABLE9=TABLE9.rpt
Number of Rows Compared: 21
Number of Rows In Sync: 21
Number of Rows With Errors: 0
Number of Rows Out Of Sync: 0
Number of Inserts Out Of Sync: 0
Number of Deletes Out Of Sync: 0
Number of Updates Out Of Sync: 0
Compare Pair OOSXML Directory: C:\veridata\data\oosxml\TestJob\00002258\TestGroup
Compare Pair OOSXML Filename:
```

```
Job Completion Status: IN SYNC
C:\veridata\server\bin> if errorlevel 0 echo EXITED 0 STATUS
EXITED 0 STATUS
```

On UNIX systems, the exit status of the previously executed command is in the special variable `'$?'` if you are using `SH` or `KSH` shells. If you are using the `CSH` shell, the exit status of the previously executed command is in the special variable `'$status'`.

5

Using the Veridata Import and Export Utilities

This chapter describes how to use the Veridata Import and Export utilities. In addition to using the Oracle GoldenGate Veridata Web User Interface, you can use the import and export utilities provided with the Veridata installation to define portions of your configuration.

This chapter includes the following sections:

5.1 Introduction to the Import and Export Utilities

Using the import and export utilities, you can create XML documents that are used to configure Oracle GoldenGate Veridata. The DTD (Document Type Definition) that governs these XML documents is stored in the `ORACLE_HOME/veridata/clilib/lib/veridata-scripting.jar` file.

The import utility allows you to configure database connections, comparison groups including compare pairs, comparison jobs, and profiles. It takes an XML document as input then creates comparison objects in Veridata. Typically, the XML document matches the inputs on the configuration pages in the user interface.

The export utility helps you to either selectively or completely export the compare configuration data to an XML file. It can be used to export configurations from your current Veridata configuration or from other Veridata configurations using the `-repoUrl` option. Additionally, you can use it to export configurations between different Veridata repository types using the import functionality. For example, from a SQL Server configuration to an Oracle configuration.

You should have an understanding of basic XML and its rules.

These utilities provide the following advantages:

- It can reduce the time required to define repetitive tasks
- It allows you to create reusable configurations
- It can ensure that your test configuration mirrors the one you use for production

5.1.1 Supported Configurations

Oracle GoldenGate Veridata import and export utilities support configuring:

- Database connections

- Comparison groups (jobs, groups, and compare pairs)
- Profiles

5.2 Running the Import and Export Utilities

The import and export utilities run from the *DOMAIN_HOME*/veridata/bin directory of the Oracle GoldenGate Veridata installation location. The Windows programs are veridata_export.bat and veridata_import.bat; the UNIX and Linux scripts are veridata_export.sh and veridata_import.sh.

5.2.1 Using the Export Utility

The syntax for running the export utility is:

```
veridata_export[.sh | .bat] -export filePath -wluser commandlineUusername
[-wlport portNo] [-jobs jobName | - groups groupName | -connections connName |
-profiles profileName | -all | -exportPassword] [[-repoUrl jdbc_url] [-u
username>][-schema schema_name][-vdtPath VERIDATA_PRODUCT_HOME]]
```

- -wlport: Represents the port for Veridata web server. The default value is 8830.
- -wluser: Specifies a user *commandlineUsername* with Veridata configuration privileges and command-line privileges.
- One of these optional operations can be requested at run time:
  - -jobs: Export all jobs, by name, including the associated groups, connections and profiles. You can specify one or more jobs by separating the names with a space, such as job1 job2 job3. If no job name is specified, all jobs with associated objects are exported.
  - -groups: Export all groups in the repository or add group names separated by a space, such as group1 group2 group3.
  - -connections: Export all connections in the repository or add connections separated by a space, such as conn1 conn2 conn3.
  - -profiles: Export all profiles in the repository or add profiles separated by a space, such as profile1 profile2 profile3.
  - -all: Export objects that are not part of any job. Takes precedence over all optional operations. This is the default when no other options are specified.
  - -exportPassword: Export the passwords for connections. By default, passwords for connections are not exported.
  - -repoUrl: Set the remote Veridata repository database JDBC URL for the export to use. You must set the -u option when using -repoUrl.

    For Oracle Database:

    jdbc:oracle:thin:@*hostname*/*ip*:*port*:*SID*

    or

    jdbc:oracle:thin:@*hostname*/*ip*:*port*/*serviceName*

    For SQL Server:

    jdbc:weblogic:sqlserver://*hostname*/*ip*:*port*;*databaseName= databaseName*

    The repoUrl may require double quotes.

- `-u`: Set the remote Veridata database username from which the configuration export is requested. Use with the `-repoUrl` option.
- `-schema`: Set the remote Veridata schema name from which the configuration export is requested.
- `-vdtPath` *`veridataLocation`*: Set the Veridata domain location for the 12c release and later. For 11g release, it is the installation location.
- `-help`: Provides command line syntax.

I f you want to export data from a Veridata repository database that is not part of your existing installation, you must provide the URL, username, and schema name. You will be prompted to enter the external Veridata repository password during run time. The Connection passwords are not exported by default, use the `-exportPassword` option for exporting passwords.

5.2.2 Using the Import Utility

The syntax for running the import utility is:

```
veridata_import[.sh | .bat] [-wlport portNo] -wluser commandlineUusername [-create
| -update | -delete | -replace] configuration.xml
```

- `-wlport`: Represents the port for Veridata web server. The default value is 8830.
- `-wluser`: Specifies a user *`commandlineUsername`* with Veridata configuration privileges and command-line privileges.
- One of these optional operations can be requested at run time:
  - `-create:` All items listed in the configuration are new. If any item in the list exists in the repository, nothing is added.
  - `-update:` New items are added to the repository and existing items are modified. Items existing in the repository and not listed in the configuration are deleted.
  - `-delete:` All named items that exist for the configuration are removed from the repository.
  - `-replace:` All items listed to be replaced in the configuration are replaced as specified.
- *`configuration.xml:`* The name of the import XML configuration file that you created to describe the configuration. This is a required option.

5.2.3 Processing the Configuration

The import utility first parses the *`configuration.xml`* file attempting to complete the entire file before aborting due to the errors. Any errors it finds are logged in the *`DOMAIN_HOME`*`/veridata/logs/veridata_import.log`. If it does not abort because of errors, it makes a second parsing pass, this time processing the configuration.

Matching Object Names

Database object names, such as catalogs, schema, tables, indexes, and columns will be matched according to these rules:

- The matching is case insensitive
- The hyphen (-) is considered a match to the underscore (_) to support matching Enscribe DDL and SQL columns

- Wildcard expressions for table names and source column names match against the exact name and against the uppercase version of the name.
- Quoted names for schemas and wildcards match everything within the quotations must be matched exactly. A wildcard character within quotes is treated as an ordinary character. An example of a quoted name as it would appear in the XML is:

  ```
  source-table="&quot;CHAR_TYPES&quot;*"
  ```

  This would match `CHAR_TYPES`, `CHAR_TYPES2`, and `CHAR_TYPES_NOTNULL`.
- Filters can either include or exclude schemas and tables. If include filters are used, at least one filter must be matched before a table can be included in a compare pair. If exclude filters are used, a table is excluded if it matches any exclude filter. Include filters can include a `COLFILTER` element that contains a list of columns to include or exclude. When a table matches a include filter, the include filter's `COLFILTER` is used to specify the columns for the generated compare pair. The schema and table name can use wildcards.

  For NonStop Enscribe files, file pattern filters are used. The file pattern is any valid NonStop file name pattern.
- A compare pair may have a column specification with the Boolean attribute "optional". When this attribute is true, the column is only included in the compare pair if the source table includes the specified source column.

Determining Key Columns

The key columns are selected in the following order:

1. Explicit key column definitions if they are available. In this case if `source-pkey` and `target-pkey` `compare-pair` element attributes are set it will generate an error.
2. Columns in the index specified by `source-pkey` and `target-pkey` attributes of the `compare-pair` element. The number of columns and all data types must match and the data types must be compatible.
3. Columns in the system-selected primary key.

Generating Compare Pairs

Compare pair generation has the following characteristics:

- Generating from wild cards works the same as the user interface generation except that regular expressions can be used.
- Compare pairs are processed in the order specified in the *`configuration.xml`* file
- The compare pairs generated by a single compare pair element are generated in alphabetical order of the source table name.
- When compare pairs are generated by more than one compare pair element, the first one will be used.

As a general rule, the order of the compare pair elements should be:

1. Compare pairs with specialized configuration requirements, such as user-defined keys.
2. Compare pairs that match general patterns.
3. Exclusions of compare pairs that would otherwise match general patterns.

5.3 Configuration File Element Reference

The configuration is defined by the top level `configuration` element and several nested elements. Most of these elements have attributes that define their characteristics, such as the `operation` attribute for the `configuration` element or the `port` attribute for the `connection` element.

The following is the high-level element hierarchy in the configuration XML file. For more information about an element and its attributes, click the element name in the hierarchy.

```
configuration
    connection
       conn-properties
    group
       description
       filter
       sql-partition
       enscribe-key
       compare-pair
          enscribe-info
          enscribe-key
          sql-partition
          column
          excluded-column
          delta-config
    job
    profile
```

Appendix B provides a sample configuration file.

Appendix C provides a description of the profile parameters that you can use to configure your profiles.

configuration

The root element is `configuration`.

The following elements can be nested within the `configuration` element:

Table 5–1 configuration Elements

Elements	Description
`connection`	One or more Veridata database connection definitions.
`group`	One or more Veridata comparison group definitions.
`job`	One or more comparison job definitions.
`profile`	One or more profile definitions.

The following attributes describe the `configuration` element:

Table 5–2 configuration Attributes

Attribute	Description
`validation`	Specifies the type of validation that is used for the configuration. The options are: "`required`" - All compare pairs must be successfully validated before any pairs are added to the repository. This is the *default* value. "`omit-failures`" - Successfully validated compare pairs are added to the repository and compare pairs that cannot be validated are ignored. "`none`" - Compare pairs are added to the repository without any validation. If this option is selected, the Oracle GoldenGate Veridata Web User Interface should be used to review and fix validation problems.
`operation`	Specifies how data is applied to the repository. The options are: "`create`" - All items listed in the configuration are new. If any item in the list exists in the repository, nothing is added. This can be used to prevent unintended modification to existing repository items. This is the *default* value. "`update`" - New items are added to the repository and existing items modified. Items existing in the repository and not listed in the configuration are deleted. "`delete`" - All named items in the configuration are removed from the repository. You can use a command line flag to override the value entered for this attribute.
`wildcard`	Specifies the pattern matching method that is used. The options are: "`ggs`" - Use the typical Oracle GoldenGate pattern using an asterisk (*). See the Oracle GoldenGate Veridata Web User Interface help for details on this type of matching. This is the default value. "`regex`" - Use regular expressions for matching.

Example

The following example adds compare pairs that can be validated and ignores those that cannot; uses regular expressions for wild carding; and uses the `"create"` default to adds all items as new items, adding nothing if any item already exists.

```
<configuration validation="omit-failures" wildcard="regex">
.
.
.
</configuration>
```

column

The `column` element defines a set of columns to be included or excluded from the compare pair. The `column` element has no nested elements or text data.

The following attributes describe the `column` element:

Table 5–3 column attributes

Attribute	Description
`source-name`	A regular expression that defines a set of source column names. This value is required.
`target-name`	A regular expression that defines a set of target column names. It can include references to groups captured by the `source-name` expression.
`exclude`	Indicates whether or not the matched columns should be excluded from the compare pair. The options are: `"true"` - The matched columns should be excluded. `"false"` - The matched columns should be included. This is the default.
`type`	Indicates the type of the column. The options are: `"key"` - The column is used as a key. `"hash"` - The column is compared using a hash value. This is the default value. `"literal"`- The column is a literal value.
`format`	Specifies a format to override the comparison format that would normally be used.
`scale`	Specifies a scale to override the default scale for the comparison.
`precision`	Specifies a precision to override the default precision used for the comparison.
`timezone`	Specifies a time zone to override the default time zone of the comparison.
`optional`	Indicates whether the column mapping is optional. For example, mapping will not fail if the base tables do not have the column patterns specified. Default is `"false"`.

colfilter

The `colfilter` element defines a set of columns to be included or excluded. It is used to specify the names of the columns to use as filtering criteria.

The following element describes the `colfilter` element:

Table 5–4 colfilter Element

Attribute	Description
`colfiltercol`	Specifies a set of columns to be included or excluded.

The following attribute describes the `colfilter` element:

Table 5–5 colfilter Attribute

Attribute	Description
`type`	Specifies whether to include the columns or exclude them. The options are `include` or `exclude`; the default is `include`. This is a required attribute.

Example

This example excludes `COL3` and `COL5` for the table `TABLE_NAME` from the generated compare pair.

```
<filter type="include" table="TABLE_NAME">
    <colfilter type ="exclude">
        <colfiltercol name="COL3" />
        <colfiltercol name="COL5" />
    </colfilter>
</filter>
```

colfiltercol

The `colfiltercol` element defines a set of columns to be included or excluded. It is used to specify the names of the columns to use as filtering criteria.

The following attribute describes the `colfiltercol` element:

Table 5–6 colfiltercol Attribute

Attribute	Description
`name`	A regular expression that defines a set of source column names. This is a required attribute.

compare-pair

The `compare-pair` element specifies a set of compare pair items. As in the Oracle GoldenGate Veridata Web User Interface, the compare pairs default to system mapped keys and columns.

The following elements can be nested within the `compare-pair` element:

Table 5–7 compare-pair Elements

Element	Description
`enscribe-info`	One or more sets of information used when comparing NonStop Enscribe files.
`sql-partition`	One or more specifications of a subset of rows within the table.
`enscribe-key`	One or more specifications of a subset of records within an Enscribe file.
`key-column`	A set of columns to be used as the user-defined key for the comparison.
`column`	One or more definitions of a set of columns to be included.
`excluded-column`	Defines a set of columns to excluded from the a compare pair when the compare pair uses system mapped columns.
`delta-config`	Defines the delta processing configuration for the compare pair. The maximum is to add it once per compare pair.

The following attributes describe the `compare-pair` element:

Table 5–8 compare-pair Attributes

Attribute	Element
`name`	An expression defining the name of the compare pair. This expression can include groups captured with `source-table` expressions and target table group `$0`.
`source-table`	A regular expression that defines the table or tables to be compared. See "Regular Expression Grouping" later in this section for more detail. The default is to match all tables.
`target-table`	A regular expression that defines the target tables for the comparison. This may contain references to groups captured by the source table expression. The default is $0 for the full source table name.
`source-schema`	The name of the default schema for the source tables referenced for the compare pair. The default is the value specified for the `group`. For SQL/MP, this is the subvolume of the SQL catalog. This is not used with Enscribe files.
`target-schema`	The name of the default schema for the target tables referenced for the compare pair. The default is the value specified for the `group`. For SQL/MP, this is the subvolume of the SQL catalog. This is not used with Enscribe files.
`source-catalog`	The default catalog for the source tables referenced in this compare pair. For SQL/MP, this is the volume of the SQL catalog. This is not used for Oracle, DB2, Enscribe, or Teradata.
`target-catalog`	The default catalog for the source tables referenced in this compare pair. For SQL/MP, this is the volume of the SQL catalog. This is not used for Oracle, DB2, Enscribe, or Teradata.

Table 5–8 (Cont.) compare-pair Attributes

Attribute	Element
exclude	Indicates whether or not the compare pair should be included in the group element. This can be used to remove a compare pair generated by an earlier compare pair element. The options are: "true" - Exclude the compare pair. "false" - Include the compare pair. This is the default.
source-file-pattern	The default file pattern for the source if the data source is Enscribe or SQL/MP.
target-file-pattern	The default file pattern for the target if the data target is Enscribe or SQL/MP.
source-pkey	The name of the unique index to use as the source portion of the user-specified primary key. The default is no user-specified index name.
target-pkey	The name of the unique index to use as the target portion of the user-specified primary key. The default is the value of the source-pkey.
delta-processing	Indicates whether or not delta processing is enabled for this compare pair. The options are: "true" - delta processing is enabled. "false" - delta processing is not enabled. This is the default.
profile-name	The name of the profile to use when running the compare-pair comparison.
system-key	If the compare pair has no column elements and no specified source-pkey, Oracle GoldenGate Veridata will select the most appropriate primary key or unique index to use. The options are: "true" - Oracle GoldenGate Veridata selects the key if it is not defined. This is the default. "false" - Oracle GoldenGate Veridata does not select the key.
system-columns	Indicates that the compare pair contains column elements with the type attribute set to key, so the generated compare pair will have user-defined columns for the key. The options are: "true" - Compare pair has key column elements. This is the default. "false" - Compare pair does not have key column elements.
wildcard	Specifies the pattern matching method that is used. The options are: "ggs" - Use the typical Oracle GoldenGate pattern that matches an asterisk (*) to any number of characters. "regex" - Use regular expressions for matching. "default" - Use the setting for the configuration. This is the default.

Regular Expression Grouping

Regular expression grouping can be used to capture the parts of the source table names to be used for matching the target table name. You can do this by changing the wildcard attribute should be changed to regex. Groups to be matched are referenced as $1, $2, $3 and so on. Group $0 matches the entire source table name.

Examples of matching groups include:

- `P(.*)` - Matches table names that begin with `P`. It captures the variable portion in `$1`. This matches table `PROSPECTS`.
- `[^PV].*` - Matches table names that do *not* begin with `P` or `V`. This does not match the table `PROSPECTS`, but does match the table `REGIONS`.
- `([P-R])(.*)` - Matches table names starting with `P`, `Q`, or `R` and captures the initial letter in group `$1` and the rest of the name in group `$2`. Groups are defined by parenthesis pairs. Group numbers are defined by the count of left parenthesis. Group `$1` starts at the first left parenthesis and group `$2` starts at the second parenthesis.

Captured groups (`$n`) are then used in expressions for selecting the target tables.

Example

The following example describes the `key-only` compare-pair. It's source tables are defined in the `"test"` schema and target tables in the `"other"` schema. It creates a compare pair in which the source table name begins with `S` and target table name begins with `T`. For example, `S_TABLE` and `T_TABLE`, where `S_TABLE` is a table in schema "test" and `T_TABLE` is table in schema "other". It also excludes all non-key columns in the generated compare pairs.

```
<configuration>
    <connection name="source" host="somehost"
               .... use-ssl="true">
        <description>
             <![CDATA[
                Group SQL Scripting Source Connection
              ]]>
          </description>
     </connection>
...
...
</configuration>
```

connection

The `connection` element defines a connection to a source or target comparison database through an Oracle GoldenGate Veridata agent.

The following elements can be nested within the `connection` element:

Table 5–9 connection Elements

Element	Description
`description`	Provides a description of the connection.
`conn-properties`	Defines the connection properties for a connection.

The following attributes describe the `connection` element:

Table 5–10 connection Attributes

Attribute	Description
`name`	A name that identifies the connection. This is a required attribute.
`host`	The name of the system on which the Oracle GoldenGate Veridata agent is running.
`port`	The port number of the system on which the agent is running.
`user`	The user name the agent uses to connect to the database.
`password`	The password the agent uses to connect to the database.
`repairUser`	The database user with privileges to perform repair operations. See *Installing and Configuring Oracle GoldenGate Veridata*.
`repairPassword`	The password for the repairUser.
`agent-timeout`	The amount of time Oracle GoldenGate Veridata will wait before timing out when sending requests to the agent.
`truncate-spaces`	Either `"true"` or `"false"` to indicate whether or not spaces will be removed from the end of character columns. The default is `"true"` to truncate spaces.
`fetch-size`	(Oracle only) The number of rows fetched in each batch.
`use-ssl`	Defines using SSL communication between the Veridata Agent and the Server. The default is `"true"`.

Example

The following example identifies the connection named `source`.

```
<configuration>
   <connection name="source" host="somehost"
    port="7850" user="somename" password="somepw"repairUser="veridata1"
repairPassword="veridata1" agent-timeout="4000" truncate-spaces="false"
fetch-size="3" use-ssl="true">
      <description>
             <![CDATA[
                Group SQL Scripting Source Connection
            ]]>
...
...
      </description>
```

```
   </connection>
.
.
</configuration>
```

conn-properties

The `conn-properties` element provides additional connection to a source or target comparison database elements.

The following attributes can be nested within the `conn-properties` element:

Table 5–11 conn-properties

Element	Description
`datatype-name`	Specifies the data type for which properties have changed.
`format`	Specifies the Veridata comparison format to be used for comparison.
`precision`	Specifies the precision to be applied to the comparison.
`scale`	Specifies the scale to be applied to the comparison.
`timezone`	Timezone name is same as in the Veridata GUI.

delta-config

The `delta-config` element defines the delta processing configuration for the specified compare pair. It can be used once per compare pair. This element can appear once or not at all depending on the type of configuration you want. When the source or target configuration specified, the corresponding column-name attribute and query element are mandatory.

The following elements describe the `delta-config`:

Table 5–12 delta-config Elements

Attribute	Description
`source-config`	Provides source side configuration for delta processing.
`target-config`	Provides target side configuration for delta processing.
`query`	Specifies the query for delta processing.

Example

This example creates a compare pair with delta processing enabled. Delta processing is enabled on `COL1` of `SYSMAPPING1` table for both source and target side. The SQL query is defined within the "query" tag.

```
<configuration validation="required">
   .
   .
   <group name="testGroup" source-conn="sourceConn" target-conn="targetConn"
source-schema="sourceSchema" target-schema="targetSchema">
        <compare-pair source-table="SYSMAPPING1" target-table="SYSMAPPING1"
name="sameTables" delta-processing="true" >
                  <delta-config>
                        <source-config column-name="COL1">
                              <query><![CDATA[ SELECT MAX(COL1) from SYSMAPPING1
]]></query>
                        </source-config>
                        <target-config column-name="COL1">
                              <query><![CDATA[ SELECT MAX(COL1) from SYSMAPPING1
]]></query>
                        </target-config>
                  </delta-config>
            </compare-pair>
    </group>
      .
      .
</configuration>
```

description

The `description` element is free-form text that can be used to attach a description to the containing element. It has no associated attributes.

Example

The following example provides a description for the connection named `source`.

```
<configuration>
   <connection name="source" host="somehost"
    port="7850" user="somename" password="somepw"
      <description>
         <![CDATA[
           This connection is used when the Veridata agent connects
           to the source.
         ]]>
      </description>
   </connection>
.
.
.
</configuration>
```

enscribe-info

The `enscribe-info` element provides additional information used to compare NonStop Enscribe records at the field level.

The following elements can be nested within the `enscribe-info` element:

Table 5–13 enscribe-info Elements

Element	Description
`expandddl`	Describes the rules that are used when applying the DDL.

The following attributes describe the `enscribe-info` element:

Table 5–14 enscribe-info Attributes

Attribute	Description
`side`	Indicates whether the information applies to the source or the target table. The options are: `"source"` to specify the source table. This is the *default*. `"target"` to specify the target table.
`dictionary`	The volume and subvolume containing the data dictionary.
`record`	The name of the record in the data dictionary.

enscribe-key

The `enscribe-key` element defines the key that is to be used for Enscribe files. The `enscribe-key` element defines a delta processing that can used in a where clause on the initial comparison query.

The following attributes describe the `enscribe-key`:

Table 5–15 enscribe-key Attributes

Attribute	Description
`name`	A name that identifies the key. This is a required attribute.
`start-key`	The key that is to be used to begin reading the Enscribe file. This is a required entry.
`end-key`	The key of the last Enscribe record that should be read. This is a required entry.
`format`	Specifies the format of the Enscribe key. The options are: `"ascii"` - The format of the key is ASCII. This is the default. `"hexadecimal"` - The format of the key is hexadecimal.
`side`	Indicates whether the partition should be applied at the source database, the target database, or both databases.
`default`	Indicates whether this is the default partition. This is equivalent to the "use at run time" indicator on the UI. The default is `both`.

Examples

```
<enscribe-key name = "Part1" end-key ="1000" format ="hexadecimal" default
="false" side="source"/>
<enscribe-key name = "Part1" start-key ="001" format ="hexadecimal" default
="false" side="target"/>
<enscribe-key name = "Both" start-key ="001" end-key ="1000" default ="true"/>
```

excluded-column

The `excluded-column` element defines a set of columns to be excluded from a compare pair when the compare pair uses system mapped columns.

The following attribute describes the `excluded-column` element:

Table 5–16 excluded-column Attributes

Attribute	Description
`name`	A regular expression that defines a set of source column names. This is a required attribute.

expandddl

The `expandddl` element describes the rules used when applying the DDL.

The following attributes describe the `expandddl` element:

Table 5–17 expandddl Attributes

Attribute	Description
`expandGroupArrays`	Whether or not to expand group arrays. The options are: `"true"` to expand the array. This is the default. `"false"` not to expand the array.
`redefined-columns`	Whether or not to include redefined columns. The options are: `"include"` - Includes redefined columns `"omit"` - Leaves out redefined columns. This is the default.
`resolvedups`	Specifies how to resolve duplicates that result when the array is expanded. The options are: `"appendIndex"` - Adds a unique numeric index to the end of the duplicate. This is the default. `"appendAlphaIndex"` - Adds an alpha character index to the end of the duplicate. `"prependGroup"` - Prefixes the name of the array group to the duplicate.
`ddl-separator`	The character separator for defining array output into columns. An example is the dash used in FIELDX-3, which is the third occurrence of `FIELDX` in the array. The options are: `"none"` - There is no separator. This is the *default*. `"dash"` - Use a dash (-) as the separator. `"bracket"` - Use brackets [] as the separator. `"underscore"` - Use underscore (_) as the separator. `"double-underscore"` - Use double underscore (__) as the separator.
`zero-fill-length`	Prepends zeros to adjust the number of the occurrence. The value is the number of digits enclosed in quotation marks. "0" is the default.
`fix-long-names`	Whether to fix the names that result from resolving duplicates if they exceed the `max-col-name-length`. The options are: `"true"` - Fix the names that exceed the maximum. This is the default. `"false"` - Do not change the names that exceed the maximum.
`max-col-name-length`	The maximum length allowed for a column name. The entry is a number within quotation marks. The default is `"120"`.

filter

The `filter` element defines a set of schemas and tables to either be included or excluded.

When using include filters, at least one filter must be matched before a table can be included in a compare pair. When a table matches a include filter, the include filter's `colfilter` is used to specify the columns for the generated compare pair.

When using exclude filters, a table is excluded if it matches any exclude filter. Include filters can include a `colfilter` element, which contains a list of columns to include or exclude.

Instead of schema and table filters, NonStop platforms use file pattern filters. The file pattern is any valid NonStop platform file name pattern.

The schema and table name can use wildcards.

The following attribute describes the `filter` element:

Table 5–18 filter Attributes

Attribute	Description
`type`	Specifies either to include or exclude schemas and tables. Valid values are `include` or `exclude`.
`catalog`	Specifies the default catalog name.
`schema`	Specifies the schema name.
`table`	Specifies the table name.
`file-pattern`	For NonStop platforms only, specifies the file patter filter.

Example

When the source and target schemas have `CHAR_TYPES3`, `INT_TYPE1`, and `INT_TYPE2` tables, then the following filters only create compare pairs for tables `CHAR_TYPES1` and `CHAR_TYPES3`. The `CHAR_TYPES2` table is excluded because of exclude filter and `INT_TYPE1` and `INT_TYPE2` are excluded because they were not part of include filter.

```
<group
      ..
        <filter type="include" table="CHAR_TYPES*" />
        <filter type="exclude" table="CHAR_TYPES2" />
        <compare-pair source-table="*" target-table="*">
        </compare-pair>
      ..
</group>
```

group

The `group` element defines a set of compare pairs that all have the same source and target database connections. These compare pairs also have other properties in common.

The following elements can be nested within the `group` element.:

Table 5–19 Group Elements

Element	Description
`description`	Provides a description of the group.
`filter`	One or more filter specifications, which allows table name filtering at the group level.
`sql-partition`	One or more specifications of a subset of rows within the table.
`enscribe-key`	One or more specifications of a subset of records within an Enscribe file.
`compare-pair`	Defines one or more compare pairs. The `compare-pair` elements are added to the group in the order they are specified. If the same compare pair fits the criteria of another specification in the group, the first compare pair will be used.

The following attributes describe the `group` element:

Table 5–20 Group Attributes

Attribute	Description
`name`	A name that identifies the group. This value is required.
`source-conn`	The name of the connection to the source database. This can reference an existing connection in the Oracle GoldenGate Veridata repository or a connection previously defined in this configuration. This attribute is required if it references an existing connection in the repository.
`target-conn`	The name of the connection to the target database. This can reference an existing connection in the Oracle GoldenGate Veridata repository or a connection previously defined in this configuration. This attribute is required if it references an existing connection in the repository.
`source-schema`	The name of the default schema for the source tables referenced in the compare pairs that make up the group.
`target-schema`	The name of the default schema for the target tables referenced in the compare pairs that make up the group.
`source-catalog`	The default catalog for the source tables referenced in this group.
`target-catalog`	The default catalog for the target tables referenced in this group.

Table 5–20 (Cont.) Group Attributes

Attribute	Description
validation	Specifies the type of validation that will be used for the configurations. The options are: "required" - All compare pairs must be successfully validated before any pairs are added to the repository. "omit-failures" - Successfully validated compare pairs are added to the repository and compare pairs that cannot be validated are ignored. "none" - Compare pairs are added to the repository without any validation. If this option is selected the Oracle GoldenGate Veridata Web User Interface should be used to review and fix validation problems. "default" - Use the type of validation specified for a higher level, such as the configuration element. This is the default.
source-file-pattern	The default file pattern for the source if the data source is Enscribe or SQL/MP.
target-file-pattern	The default file pattern for the target if the data target is Enscribe or SQL/MP.

Example

```
<group name="weekly-tables" source-conn="source" target-conn"="target">
   <description>
   .
    .
    .
   </description>
   <sql-partition>
    .
    .
   </sql-partition>
   <compare-pair>
    .
    .
    .
</compare-pair>
</group>
```

job

The `job` element defines an Oracle GoldenGate Veridata comparison job.

The following elements can be nested within the `job` element:

Table 5–21 job Elements

Element	Description
`description`	Provides a description of the job.
`group`	The name of the group associated with the job. This can be a new group or a previously defined group.

The following attributes describe the `job` element:

Table 5–22 job Attributes

Attribute	Description
`name`	A name that identifies the job. This is a *required* attribute.
`source-conn`	The name of the connection to the source database. This can reference an existing connection in the Oracle GoldenGate Veridata repository or a connection previously defined in this configuration. This attribute is required if it references an existing connection in the repository. The job `source-conn` is used to override the source connection specified for the groups included in the job.
`target-conn`	The name of the connection to the target database. This can reference an existing connection in the Oracle GoldenGate Veridata repository or a connection previously defined in this configuration. This attribute is used to override the target connection for the groups included in the job.
`profile`	The default profile to use when running the job.

Example

```
<job name="all-groups" profile="server-sort">
    <group name="all-tables"/>
    <group name="selected-tables"/>
</job>
```

profile

The `profile` element defines the connection properties of a comparison job connection.

The following elements can be nested within the `profile` element:

Table 5–23 profile Elements

Element	Description
`description`	Provides a description of the profile.
`profile-general`	Defines the profile parameters that control the output options.
`sorting-method`	Defines the profile parameters that control the sorting method and memory management. The data is sorted to match keys (or a key specification) so that the correct source and target rows are compared.
`initial-compare`	Defines the profile parameters that control the parameters for the job that performs the initial compare step
`confirm-out-of-sync`	Specifies the profile parameters that control the parameters for the job that performs the confirmation step
`repair`	Specifies the profile parameters that control the parameters for the repair job.

The following attributes describe the `profile` element:

Table 5–24 profile Attributes

Attribute	Description
`name`	A name that identifies the profile. This is a required attribute.

Example

This example creates profile named "userDefinedProfile". The parameter names like "oos-format", "sort-method" are described in the table (link for table is in another pin)

```
<configuration validation="required">
   .
   .
<profile name="userDefinedProfile">
    <profile-general>
        <param name="oos-format" value="xml" />
        <param name="oos-xml-chunk-size" value="1000" />
    </profile-general>
    <sorting-method>
        <param name="sort-method" value="server" />
    </sorting-method>
</profile>
      .
      .
</configuration>
```

key-column

The `key-column` element defines a set of columns to be used as the user defined key for the comparison job.

The following attributes describe the `key-column` element:

Table 5–25 profile Attributes

Attribute	Description
`source-name`	A regular expression that defines a set of source column names. This value is required.
`target-name`	A regular expression that defines a set of target column names. It can include references to groups captured by the `source-name` expression.
`format`	Specifies a format to override the comparison format that would normally be used.
`scale`	Specifies a scale to override the default scale for the comparison.
`precision`	Specifies a precision to override the default precision used for the comparison.
`timezone`	Specifies a time zone to override the default time zone of the comparison.

profile-general

The `profile-general` element provides parameters to control the output options.

The data is sorted to match keys (or a key specification) so that the correct source and target rows are compared.

The following elements can be nested within the `profile-general` element:

Table 5–26 profile-general Element

Element	Description
`param`	Defines the parameter to change for the profile.

sorting-method

The `sorting-method` element provides parameters for sorting method and memory management. The data is sorted to match keys (or a key specification) so that the correct source and target rows are compared.

The following elements can be nested within the `sorting-method` element:

Table 5–27 sorting-method Element

Element	Description
`param`	Defines the parameter to change for the profile.

initial-compare

The `initial-compare` element provides parameters for the process that performs the initial compare step.

The following elements can be nested within the `initial-compare` element:

Table 5–28 initial-compare Element

Element	Description
`param`	Defines the parameter to change for the profile.

confirm-out-of-sync

The `confirm-out-of-sync` element provides parameters for the process that performs the confirmation step.

The following elements can be nested within the `confirm-out-of-sync` element:

Table 5–29 confirm-out-of-sync Element

Element	Description
`param`	Defines the parameter to change for the profile.

param

The `param` element defines the parameters that are used for configuring profile options.

The following attributes describe the `repair` element:

Table 5–30 param Attributes

Attribute	Description
`name`	The name of the parameter. This is a required attribute.
`value`	The value of the parameter

repair

The `repair` element provides parameters for the repair process.

The following elements can be nested within the `repair` element:

Table 5–31 repair Element

Element	Description
`param`	Defines the parameters that are used to configure the profile options.

sql-partition

The `sql-partition` element defines a boolean SQL expression that can be used in a `where` clause in the initial comparison query.

The following attributes describe the `sql-partition` element:

Table 5–32 sql-partition Attributes

Attribute	Description
`name`	A name that identifies the partition. This is a required attribute.
`side`	Indicates whether the partition should be applied at the source database, the target database, or both databases. The default is `"both"`.
`default`	Indicates whether this is the default partition. This is equivalent to the "use at run time" indicator on the UI. The default is `"false"`.

Example

```
<sql-partition name="replicate" default="true" side="source">
  <![CDATA[ replicated='false']]>
</sql-partition>
<sql-partition name="replicate" default="true" side="source">
  <![CDATA[ replicated='true']]>
</sql-partition>
```

6

Running Veridata GoldenGate Parameter Processing

This chapter explains how to use the Veridata GoldenGate Parameter Processing (VGPP) command line tool to use Oracle GoldenGate parameter files.

This chapter includes the following sections:

6.1 Overview of the Command Line Interface

An Oracle GoldenGate parameter file contains all of the information required to extract or apply replicated data. The data propagated through Oracle GoldenGate replication is controlled by settings in the Extract and/or Replicat parameter files. Typically, the Extract parameter file specifies the tables to be replicated and Replicat parameter file controls the mapping of columns, as well as further restricting the tables. The VGPP command line utility accepts one or two Oracle GoldenGate parameter files as input. One of these parameter files *must* be a Replicat parameter file while the other optional file must be an Extract parameter file.

Oracle GoldenGate replication can capture information about the transaction responsible for changing the data as well as the actual changed data. However, Oracle GoldenGate Veridata can only detect the current state of the source and target databases so it cannot support any Oracle GoldenGate parameters relating to transactional changes. For example, the `INSERTDELETES` parameter. VGPP uses the `MAP` statements from a GoldenGate `REPLICAT` file to generate Veridata compare pairs. Other information in the parameter file is used to determine the relevant `MAP` statements. Optionally, the `TABLE` statements from the `EXTRACT` parameter can be used to restrict the compare pairs that are generated.

Oracle GoldenGate Veridata only support single column mapping. Thus, the column mapping assumes a one to one mapping between source columns and target columns.

You can:

- Reuse parameter Oracle GoldenGate Replicat and Extract configurations in Oracle GoldenGate Veridata.
- Avoid creating separate Oracle GoldenGate Veridata Replicat and Extract parameter files.

6.2 Running VGPP

The VGPP program can be run by anyone who has the correct operating system permissions to run it.

1. Ensure that the parameter files you want to use are on the system where the Oracle GoldenGate Veridata is installed. If you need to copy the files from another system, these files should be copied as binary files so that the `CHARSET` parameter remains valid.
2. Run the command shell of the operating system.
3. Navigate to the *`VERIDATA_DOMAIN_HOME`*`/veridata/bin` directory.
4. Use the following syntax to run the VGPP program.

Syntax

```
veridata_param_process{.bat|.sh} required_parameter [optional_parameter]
```

Required Parameters

The following are required; otherwise an error is returned.

```
[-noscripting |
-create |
-replace|
-update ]
[-wlport port ] |
-wluser user_name |
[-p <propfile>]
[-o <outputFile>]
[replicat_param_filename]
```

The `-wluser` specifies the WebLogic Server user name to connect to the WebLogic Server. This WebLogic Server user should have the `veridataCommandLineUser` privilege to access and execute command-line operations. The user should also have the `veridataAdministrator` or `veridataPowerUser` privilege to successfully run jobs and to use the Veridata import and export utilities.

Optional Parameter

This is the optional parameter:

```
[extract_param_filename]
```

Table 6–1 VGPP Runtime Arguments

Argument	Description
`{ -noscripting | -create | -replace | -update}`	Specifies that `veridata_scripting` will not be run with the generated configuration file. The `-create`, `-replace`, and `-update` options indicate that `veridata_scripting` should be run with the generated configuration file. In either case, the generated scripting configuration file can be used as input to the `veridata_scripting`.
`-wluser`	Specifies the WebLogic Server user name that authenticates and connects to the server.
`-wlport`	Specifies the WebLogic Server port number. The default listening port is 8830.
`-p`	Specifies a properties file containing additional information required for the Veridata configuration.

Table 6–1 (Cont.) VGPP Runtime Arguments

Argument	Description
-o	Specifies the output file containing the generated Veridata scripting file. The default is *replicat_name*_scripting.xml; *replicat_name* is the value of the REPLCAT parameter. The optional *extract_param_filename* specifies an EXTRACT parameter file containing source information for the comparison. The *replicat_param_filename*is the REPLICAT parameter containing the target information.

6.2.1 Using a Property File

When the VGPP program is run, an optional property file can be specified. This file contains information that is not available in the Oracle GoldenGate parameter file and is required to generate a valid Veridata comparison configuration. The following are some of properties (information) that you can specify.

Table 6–2 Optional Parameters

Property Name	Comments
source.connection.name	The name of the Veridata agent/manager connection. This may be the name of an existing Veridata connection. The default is the Extract name. This is the only source connection property needed to reference an existing connection.
source.connection.port	The port for the source agent. This is required when the connection does not already exist.
source.connection.host	The host name where the source agent is running. This is required when the connection does not exist.
source.connection.user	This defaults to the user information in the extract parameter file. This is required when the connection does not exist.
source.connection.password	This defaults to the user information in the extract parameter file. This is required when the connection does not already exist. If property name is specified without a value, the scripting utility will prompt for the value when the scripting configuration is loaded into Veridata.
source.catalog	This is valid for Sybase, SQL Server, and Oracle consolidated databases. For Sybase and SQL Server, it is the database containing the source tables. For Oracle, it specifies the Oracle PDB to use when processing an Extract parameter. Statements not associated with this PDB are ignored. The default value is the first PDB reference in the file. The reference can be a SOURCECATALOG parameter or the first part of a three-part name in a TABLE statement.
extract.useansiquotes	Indicates whether or not the Extract parameter file follows the ANSI quotation specification. This is a Boolean value. The default value is true. This is the same as the GoldenGate core GLOBALS parameters USEANSISQLQUOTES | NOUSEANSISQLQUOTES.
extract.charset	The character set for the extract parameter file. This overrides any charset specified in the extract parameter file.

Table 6–2 (Cont.) Optional Parameters

Property Name	Comments
Extract.trail	The trail file name to use when more than one trail file is specified in an extract parameter file. The default is the first trail file specified in the extract parameter file. When an extract parameter file contains multiple rmttail entries with the same name, Veridata will use the first occurrence.
target.connection.name	The name of the Veridata agent/manager connection. This may be the name of an existing Veridata connection. The default is the Replicat name. This is the only target connection property required to reference an existing connection.
target.connection.port	The port for the target agent. This is required when the connection does not already exist.
target.connection.host	The host name where the target agent is running. This is required when the connection does not exist.
target.connection.user	This defaults to the user information in the parameter file
target.connection.password	This defaults to the user information in the extract parameter file. If property name is specified without a value, the scripting utility prompts for the value when the scripting configuration is loaded into Veridata.
Target.catalog	This is valid for Sybase and SQL Server. It is the database containing the target tables.
replicat.useansiquotes	Indicates whether or not the replicat parameter file follows the ANSI quotation specification. This is Boolean value. The default value is true. This is the same as the GoldenGate core GLOBALS parameters USEANSISQLQUOTES | NOUSEANSISQLQUOTES.
replicat.charset	The character set for the replicat parameter file. This overrides any CHARSET specification in the replicat parameter file.

6.3 Parameter Handling

This section describes the handling of all of the parameters allowed in an Oracle GoldenGate Extract or Replicat parameter file. Each keyword is either supported, unsupported, or ignored. A supported parameter is used to generate the Veridata configuration. An unsupported parameter is something that interferes with the Veridata configuration generation. When an unsupported parameter (INSERTDELETES) is specified, subsequent MAP parameters are ignored. An ignored parameter specifies a feature that is not applicable to Veridata configuration generation.

The following table contains the known parameters and the expected handling: if a parameter is not listed, it is ignored.

Table 6–3 Parameter Handling

GoldenGate Parameters	Veridata Support
CATALOGEXCLUDE	This parameter is ignored. Veridata only processes items from a single catalog.
CHARMAP	Unsupported.
CHARSET	Supported. This parameter is supported in parameter files and include/obey files. Veridata does not process GLOBALS files.
COLMATCH	Supported.

Table 6–3 (Cont.) Parameter Handling

GoldenGate Parameters	Veridata Support
COMMENT | --	Supported.
DICTIONARY	Supported for NSK extract and replicat.
EXPANDDDL	Supported for NSK extract and replicat.
EXCLUDEWILDCARDOBJECTSONLY	Supported.
EXTRACT	Supported.
EXTTRAIL	Supported.
FILE | TABLE	Supported for NSK extract.
INCLUDE	Supported. When the file is not found by the specified path, VGPP will look for the file name in the same directory as the parameter file.
INSERTALLRECORDS	Unsupported. Ignore all subsequent MAP statements.
INSERTDELETES | NOINSERTDELETES	Unsupported | Supported. Ignore all MAP statements following an INSERTDELETES command until a NOINSERTDELETES command is found.
INSERTUPDATES | NOINSERTUPDATES	Unsupported | Supported: Ignore all MAP statements between the INSERTUPDATES and the NOINSERTUPDATES.
MACRO	Supported.
MACROCHAR	Supported.
MAP	Supported.
MAPEXCLUDE	Supported.
OBEY	Supported. The same as INCLUDE.
REPLICAT	Supported.
RMTTRAIL	Supported.
SCHEMAEXCLUDE	Supported.
SOURCECATALOG	Supported for Oracle consolidated databases.
TABLE | MAP	Supported. The details are explained in section 3.4.4
TABLEEXCLUDE	Supported.
UPDATEDELETES | NOUPDATEDELETES	Unsupported | Supported.
UPDATEINSERTS | NOUPDATEINSERTS	Unsupported | Supported.
USEANSISQLQUOTES | NOUSEANSISQLQUOTES	Supported.

6.4 Map and Table Statement Handling

Veridata will generate a compare pair element in the scripting configuration file for each Map statement in the Replicat parameter file. The generated scripting file will list the specific table mappings first, followed by the wildcard mappings, and finally the excluded mappings. This matches the behavior of the Oracle GoldenGate Replicat where specific mappings take precedence over wildcard mappings.

When the same source and target table specification appears in multiple MAP statements, the first occurrence will be used for the compare pair specification. The multiple occurrences can occur when the MAP statements use thread specifications and range filters.

The following table lists all of the keywords for the MAP and TABLE statements and support level in VGPP. MAP statements containing unsupported keywords will not generate a Veridata comparison configuration. Items marked with maybe indicate that more information is needed in order to determine the value for Veridata.

Table 6–4 Map and Table Statement Handling

Keyword	Veridata Support
TARGET	Supported.
COLMAP	Supported. Only simple source column to target column mapping is supported. Target columns mapped to functions or literals is excluded from the comparison configuration. The USEDEFAULTS keyword is supported. The BINARYINPUT keyword is ignored.
COLS	Supported.Results in an explicit column list in the generated compare pair configuration.
COLSEXCEPT	Supported. If an explicit column mapping does not exist, this results in system mapped columns with a list of omitted columns.
COMPARECOLS	
COORDINATED	Ignored.
DICTIONARY	Supported for NSK.
TARGETDICT	Supported for NSK.
DEF	Supported for NSK.
TARGETDEF	Supported for NSK.
EVENTACTIONS	Ignored.
EXCEPTIONSONLY	Unsupported.
EXITPARAM	Ignored.
FETCHBEFOREFILTER	
FETCHCOLS|FETCHCOLSEXCEPT	
FETCHMODCOLS|FETCHMODCOLSEXCEPT	
FILTER	Ignored.
GETBEFORECOLS	Ignored.
HANDLECOLLISIONS | NOHANDLECOLLISIONS	
INSERTALLRECORDS	Unsupported.
INSERTAPPEND | NOINSERTAPPEND	
KEYCOLS	Supported.
MAPEXCEPTION	Ignored.

Table 6–4 (Cont.) Map and Table Statement Handling

Keyword	Veridata Support
REPERROR	
RESOLVECONFLICT	Ignored.
SQLEXEC	
SQLPREDICATE	
THREAD	Ignored.
THREADRANGE	Ignored.
TOKENS	Ignored.
TRIMSPACES | NOTRIMSPACES	Supported.
TRIMVARSPACES | NOTRIMVARSPACES	Supported.
WHERE	Ignored.

7

Oracle GoldenGate Veridata Server Configuration Parameters

This chapter describes parameters that adjust different aspects of the sort memory configuration when using server-side sorting.

This chapter includes the following sections:

7.1 Overview of the Server Memory

Oracle GoldenGate Veridata Server uses virtual memory in the following ways:

- **Server memory for basic operation**. This is the amount of virtual memory that the Veridata server and web components need to operate. It stores object pools, database access libraries, and other information. This is usually about 200 MB.
- **Sort memory**. This is the memory that is used when server-side sorting is used. The virtual memory for sorting is allocated for the entire comparison, not per thread. The rows are read from the agent and submitted to be sorted. The sorting occurs in a thread that is separate from the thread that reads from the agent, and the sort may use more threads to work in parallel. Once all the rows from the agent are submitted to the sort process, the server process retrieves the sorted rows from the sort for comparison.
- **Row hash queue memory**. This is the memory that buffers data between the agent processes, the sort process, and the server process. A comparison that uses database sorting requires a single queue each for the source and target. Each queue has a capacity of 20 MG. The memory usage by the queues is affected by the relative speed of the comparison and by the data coming from the agent. The relative speed between the two agents also affects the memory usage. A larger differential in speed increases the amount of memory that is used, because the queue needs to buffer the data.
- **MOOS queue memory.** This is the memory that holds potentially out-of-sync records between the initial comparison and confirmation steps of a comparison. The size of the MOOS queue is limited to 50K of records. Memory usage is also dependent on the width of each record.

- **IPC buffer memory**. This is the memory that is used to exchange messages between the server and the agent.
- **Scratch runtime transient memory**. This is virtual memory space.

The amount of memory that can be used by the sort process cannot be greater than the minimum of:

- System physical memory
- Available memory in swap
- Java boot option `-Xmx` maximum memory setting

7.2 Estimating Memory Usage

The maximum amount of memory available to Oracle GoldenGate Veridata is specified by the Java boot option `-Xmx`. When server-side sorting is used, a large portion of this memory is reserved for sorting during comparisons. This reserved amount is controlled by the `server.max_sort_memory` configuration parameter.

When a comparison is run, two buffers are allocated from the reserved sort memory. Each of these is equal to the size specified as **Maximum Memory Usage (MB)**. To access this setting click the **Edit** option from the Profile Configuration screen, then **Sorting Method** from the Profile settings categories.

To Estimate Memory based on the Number of Concurrent Comparisons

The maximum amount of memory that can be used for any comparison is set by the parameter `server.max_comparison_sort_memory`. The `-Xmx` Java boot option should be set large enough to allow the desired number of concurrent comparisons.

The maximum number of concurrent comparisons is defined by the `server.max.concurrent_comparison_threads` configuration parameter. Therefore the maximum amount of sort memory can be as large as:

`server.max_comparison_sort_memory` * `server_max_comparison_threads`

For example, if you set `server.max_concurrent_comparison_threads` to allow 10 concurrent comparisons and leave `server.max_comparison_sort_memory` set to the default value of 100 MB, you will need 1 GB of available memory.

To Estimate the Amount of Memory Used per Row

Refer the section "Disk and Memory Requirements for the Server Component" in *Installing and Configuring Oracle GoldenGate Veridata* for the calculation to estimate the amount of memory used per row.

7.3 How to Set a Parameter

To set a parameter, edit its entry in the `veridata.cfg` file. This file is stored in the `DOMAIN_HOME/config/veridata` directory within the Oracle GoldenGate Veridata Server installation directory.

Open an Oracle service request before changing these parameters. For more information, go to `http://support.oracle.com`.

7.4 Parameter Descriptions

This section describes the parameters that can be set in the `veridata.cfg` file. These parameters are grouped under the following categories:

Server Parameters

This section defines the following configurable parameters for your Veridata Server:

- server.veridata_data
- server.persistence_db_type
- server.meta_session_handle_timeout
- server.max_concurrent_jobs
- server.max_concurrent_comparison_threads
- server.max_sort_memory
- server.concurrent.writers
- server.concurrent.readers
- server.number_sort_threads

server.veridata_data

The directory that contains Oracle GoldenGate Veridata reports.

Syntax

```
server.veridata_data path
```

where *path* is a relative or absolute path for the directory where Veridata reports will be stored.

> **Note:** If you specify a relative path for the data directory, you need not start the path with a forward (/) or backward (\) slash. The path will be relative to the Veridata domain home directory.

Default Value

```
veridata/reports
```

That means the default data directory is *VERIDATA_DOMAIN_HOME*/veridata/reports.

server.persistence_db_type

This parameter defines the persistence database type.

Syntax

```
server.veridata_data database_type
```

where *database_type* is the persistence database type. The options are:

- ORACLE_OCI
- MS_SQL

Default Value

ORACLE_OCI

server.meta_session_handle_timeout

This parameter defines the meta-session handle timeout in seconds.

Syntax

```
server.meta_session_handle_timeout seconds
```

Example

```
server.meta_session_handle_timeout 600
```

Default Value

900

server.max_concurrent_jobs

This parameter specifies the maximum number of jobs that can be run simultaneously.

Syntax

```
server.max_concurrent_jobs number_of_jobs
```

Example

```
server.max_concurrent_jobs 200
```

Default Value

100

server.max_concurrent_comparison_threads

Sets the maximum number of concurrent comparisons that can be executed. In general, the amount configured by the server is the optimal value, given the machines resources. You can lower this number to reduce the impact of the server on your system. When this limit is reached, no new comparisons will start until an active comparison completes.

Syntax

```
server.max_concurrent_comparison_threads {default | number}
```

- `default` allows Oracle GoldenGate Veridata to compute the maximum number of concurrent threads and available resources. The default value is the server.max_sort_memory.
- *number* is a positive integer that sets the maximum number of concurrent comparison threads.

Example

```
server.max_concurrent_comparison_threads 100
```

Default Value

The default value is the maximum of four or the number of available CPUs.

server.mapped_sort_buffers

Indicates whether sort buffers are allocated as a memory mapped file or allocated on the JVM heap.

Syntax

```
server.mapped_sort_buffers [true|false]
```

Example

```
server.mapped_sort_buffers true
```

Default Value

The default is `true`. If an error occurs during initialization, Oracle GoldenGate Veridata uses the JVM heap.

server.max_sort_memory

Sets the maximum amount of sort virtual memory that is available to all running comparisons that use server-side sorting. When a JVM heap sort is allocated using the Java boot option `-Xmx` maximum memory, the default setting is the available heap size less the 200 MB needed for basic tasks. When memory mapped file sort is used, the default is 2G. You can limit this amount to make more memory available for the Oracle GoldenGate Web User Interface.

If a comparison does get enough virtual memory, the currently available sort virtual memory gets decremented by the amount that the comparison reserves. When a comparison completes, it increments the amount of available sort virtual memory by the amount of sort virtual memory that it had reserved.

Syntax

```
server.max_sort_memory {default | number{M | m}}
```

- `default` allows Oracle GoldenGate Veridata to define a maximum value that is dependent on the operating system.
- *number*`{M | m}` specifies a value in megabytes. For example, 1000M means a limit of 1000 megabytes. If this number exceeds the amount of available memory, the value will be reduced to the amount of available memory.

Example

```
server.max_sort_memory 1000M
```

Default Value

The system calculates the default size based on the available virtual memory.

server.concurrent.writers

This parameter specifies the number of writer threads per sort directory.

Syntax

```
server.concurent.writers number
```

Example

```
server.concurent.writers number
```

Default Value

The maximum of 4 or one quarter of the number of available CPUs.

server.concurrent.readers

This parameter specifies the number of reader threads for the entire server.

Syntax

```
server.concurent.readers number
```

Example

```
server.concurent.readers number
```

Default Value

The maximum of 4 or one quarter of the number of available CPUs.

server.number_sort_threads

This parameter specifies the number of threads used to sort input buffers from the Veridata Agent.

> **Note:** The value of `server.number_sort_threads` should not be greater than the number of available processes.

Syntax

`server.number_sort_threads` *number*

Example

`server.number_sort_threads` *number*

Default Value

The maximum of 4 or one quarter of the number of available CPUs.

Parameters for Configuring SSL Communication

This section defines the parameters that you can use to configure SSL communication between your Veridata Server and Veridata Agents:

- server.useSsl
- server.ssl.client.allowTrustedExpiredCertificates
- server.ssl.client.identitystore.keyfactory.alg.name
- server.ssl.client.truststore.keyfactory.alg.name
- server.ssl.algorithm.name

server.useSsl

This parameter specifies whether SSL is enabled for communication between the Veridata Server and all Veridata Agents.

Syntax

```
server.useSsl [true|false]
```

Example

```
server.useSsl true
```

Default Value

The default value is false.

server.ssl.client.allowTrustedExpiredCertificates

If the value of this parameter is set to true, Veridata Server allows SSL communication between the agent and the server when a trusted certificate expires.

> **Note:** The parameter is not applicable if you are running IBM's JVM.

Syntax

```
server.ssl.client.allowTrustedExpiredCertificates [true|false]
```

Example

```
server.ssl.client.allowTrustedExpiredCertificates false
```

Default Value

The default value is true.

server.ssl.client.identitystore.keyfactory.alg.name

This parameter specifies a name for the identity store key factory algorithm used for SSL communication.

Syntax

```
server.ssl.client.identitystore.keyfactory.alg.name=algorithm_name
```

Example

```
server.ssl.client.identitystore.keyfactory.alg.name=IbmX509
```

If you are running on IBM's JVM, set the value to IbmX509.

Default Value

The default value is SunX509.

server.ssl.client.truststore.keyfactory.alg.name

This parameter specifies a name for the trust store key factory algorithm used for SSL communication.

Syntax

```
server.ssl.client.truststore.keyfactory.alg.name=algorithm_name
```

Example

```
server.ssl.client.truststore.keyfactory.alg.name=IbmX509
```

If you are running on IBM's JVM, set the value to IbmX509.

Default Value

The default value is SunX509.

server.ssl.algorithm.name

This parameter specifies algorithm used for SSL communication.

Syntax

```
server.ssl.algorithm.name=algorithm_name
```

Example

```
server.ssl.algorithm.name=TLS
```

Default Value

The default value is TLS.

Parameters for Veridata Command-Line Utility

This section defines the following configurable parameters for your Veridata Server:

- veridata.cli.run_from_managed_server
- veridata.cli.managed_server_name
- veridata.cli.server.listenAddress
- veridata.cli.server.timeout.seconds

veridata.cli.run_from_managed_server

To run the Veridata command-line utility from the Veridata Managed Server, set this parameter value to `true`.

Syntax

```
veridata.cli.run_from_managed_server [true|false]
```

Example

```
veridata.cli.run_from_managed_server false
```

Default Value

The default value is true.

veridata.cli.managed_server_name

This parameter specifies the name of the Veridata Managed Server.

Syntax

```
veridata.cli.managed_server_name server
```

Example

```
veridata.cli.managed_server_name VERIDATA_server2
```

Default Value

The default name of the managed server is `VERIDATA_server1`.

veridata.cli.server.listenAddress

This parameter specifies the listening address of the host machine for the Veridata Managed Server.

Syntax

```
veridata.cli.server.listenAddress host
```

Example

```
veridata.cli.server.listenAddress host.example.com
```

Default Value

The default name of the managed server is `localhost`.

veridata.cli.server.timeout.seconds

This parameter specifies the time period (in seconds) Veridata CLI should wait for the JMX Server to respond to a CLI request.

Syntax

```
veridata.cli.server.timeout.seconds seconds
```

Example

```
veridata.cli.server.timeout.seconds 90
```

Default Value

The default time-out is `60` seconds.

Parameters for Report File Encryption

This section defines the configurable parameters used for report file encryption:

- server.encryption
- server.encryption.bits

server.encryption

When this parameter is set to true, the comparison report artifacts will be encrypted. Otherwise, the report contents will be in clear text.

Syntax

```
server.encryption=[true|false]
```

Example

```
server.encryption=false
```

Default Value

The default value is false.

server.encryption.bits

This parameter specifies the strength of the encryption algorithm. Valid values are 128, 192, and 256. If set to a value other than 128, you must install Java Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy Files.

Syntax

```
server.encryption.bits=[128|192|256]
```

Example

```
server.encryption.bits=128
```

Default Value

The default value is 128.

A

Moving from a Test to Production Environment

This appendix describes how to move an Oracle GoldenGate Veridata installation from a test environment (a source environment) to a production environment (a target environment).

This appendix includes the following sections:

- Moving Installations from a Source Environment to a Target Environment
- Additional Steps for Moving Oracle GoldenGate Veridata Repository

A.1 Moving Installations from a Source Environment to a Target Environment

Oracle Fusion Middleware provides various scripts that you use to move your environment.

To move Oracle Home that contains all binary files of your Veridata installation, use the `copyBinary` and `pasteBinary` scripts. After moving the Oracle Home, use the `copyConfig` and `pasteConfig` scripts to move a copy of the Veridata domain configuration including the Administration Server, Managed Server, and other components in the domain to the target environment.

> **Note:** Test to production migration is not supported for a compact domain or for repository databases other than Oracle and SQL Server.

For more information about using these scripts, see "Common Procedures for Moving to a Target Environment" in *Administering Oracle Fusion Middleware*.

A.2 Additional Steps for Moving Oracle GoldenGate Veridata Repository

In addition to the common procedures described in the guide *Administering Oracle Fusion Middleware*, follow the instructions below for moving the Oracle GoldenGate Veridata repository to a target environment:

A.2.1 Moving Veridata Configuration Data from Test to Production

To export and import Veridata repository configuration data, use the scripts available in the `DOMAIN_HOME/veridata/bin` directory use the following steps:

1. To export the repository from the test environment, run the export script as follows:

```
DOMAIN_HOME/veridata/bin/veridata_export.sh  -export /tmp/export.xml -all
-wluser cmd_user -exportPassword
```

Table A–1 describes the arguments you specify while running the export and import scripts.

Table A–1 Arguments for the Veridata Test to Production Scripts

Argument	Description
`export`	Indicates that the script is exporting Veridata data from the test environment.
`import`	Indicates that the script is importing Veridata data to the production environment.
`wluser cmd_user`	Specifies the administrative WebLogic Server user.
`exportPassword`	Indicates that the script is exporting the *cmd_user* password.

2. Verify that any Veridata Agent host, port, and user password specifiers for the production host are updated in the just created `/tmp/export.xml` file.
3. If the Veridata Agent host or port has changed, then you must manually update the generated `export.xml` file with the new host and port informations for the Connections.
4. The export operation exports all of the data in the repository to XML file without validation. If your environment has some compare pairs for which the Validation Status is not successful, then the import operation will fail with the XML file generated by the export operation. To prevent failure of the import operation, you have the option to disable the compare pair validation. You can do this by updating the generated XML with these steps:
   a. Open the generated XML file.
   b. Search for the `configuration` tag. This tag has the `validation` attribute, which is set to `required`, by default.
   c. Set the `validation` attribute to one of the following values:

      `omit-failures` — Indicates that all successfully validated compare pairs will be added to the repository and other specified compare pairs will be ignored.

      `none` — Indicates that no compare pair validation is done before adding the compare pairs to the repository. You and then use the Veridata GUI to review and fix the validation problems. For example:

      Old tag: `<configuration operation="update" validation="required">`

      Updated tag: `<configuration operation="update" validation="omit-failures">`
5. To import the repository to the production environment, run the import script as follows:

```
DOMAIN_HOME/veridata/bin/veridata_import.sh -update  /tmp/export.xml -wluser
cmd_user
```

A.2.2 Applying Configuration Changes while Moving from Test to Production

While moving from a test to production environment, if there are any configuration changes for the Veridata Agent such as host and port changes *or* if there is any schema

or catalog name changes in the compare pairs, you must first execute the following statements:

Task 1 For all databases

```
Update DEV_VERIDATA.TABLE_INFO set  SRC_SCHEMA_NAME = production_source_schema
Where
    SRC_SCHEMA_NAME  = test_source_schema
 Update TABLE_INFO set  TARG_SCHEMA_NAME = production_target_schema Where
    TARG_SCHEMA_NAME  = test_target_schema
```

Where *DEV_VERIDATA* is the name of the production repository schema.

Where *production_source_schema* is the name of the production source schema and *production_target_schema* is the name of the production target schema.

Where *test_source_schema* is the name of the test source schema and *test_target_schema* is the name of the test target schema.

Task 2 Appropriate to your database

For SQL Server and Sybase databases:

```
Update TABLE_INFO set  SRC_CATALOG_NAME = production_source_catalog Where
    SRC_CATALOG_NAME  = test_source_catalog

Update TABLE_INFO set  TARG_CATALOG_NAME = production_target_catalog Where
    TARG_CATALOG_NAME  = test_target_catalog
```

Where *production_source_catalog* is the name of the production source catalog and *production_target_catalog* is the name of the production target catalog.

Where *test_source_catalog* is the name of the test source catalog and *test_target_catalog* is the name of the test target catalog.

For NSK:

Update the table names in the COMPARE_PAIR table to replace the test node names and disk volume names with the production names using one of the following appropriate for your database:

- **For Oracle:**

```
Update COMPARE_PAIRS SET  SRC_TABLE_NAME = '\SPROD.$PDATA' ||
    SUBSTR(SRC_TABLE_NAME, 12) Where SRC_TABLE_NAME like '\STEST.TDATA%'
Update COMPARE_PAIRS SET  TARG_TABLE_NAME = '\TPROD.$PDATA' ||
    SUBSTR(TARG_TABLE_NAME, 12) Where TARG_TABLE_NAME like '\TTEST.TDATA%'
```

- **For SQL Server:**

```
Update COMPARE_PAIRS SET  SRC_TABLE_NAME = '\SPROD.$PDATA' +
    SUBSTRING(SRC_TABLE_NAME, 12, LEN(SRC_TABLE_NAME) -  12) Where SRC_TABLE_
    NAME like '\STEST.TDATA%'
Update COMPARE_PAIRS SET  TARG_TABLE_NAME = '\TPROD.$PDATA' +
    SUBSTRING(TARG_TABLE_NAME, 12, LEN(TARG_TABLE_NAME) -12) Where TARG_TABLE_
    NAME like '\TTEST.TDATA%'
```

A.2.3 Modifying the Agent details in the Production Environment

Update the Veridata Agent details in the CONNECTIONS table of the production environment host as described below:

- If only the Agent host name needs to be changed, update the database as follows:

```
Update CONNECTIONS set MGR_NAME = 'prod host' where MGR_NAME 'test host'
```

- If there are more changes to the Veridata Agent, such as changes to the port number, User ID, password, and Repair User ID, then you should start the Veridata application and update the environment using the UI or command-line tool.

  For example, create an `/tmp/con.xml` XML file as follows:

```
#Create xml as below by filling placeholders between @ and connections can be
more than one.
    <?xml version="1.0" encoding="UTF-8"?>
    <!DOCTYPE configuration SYSTEM

"http://@VeridataServerHost@:@veridataServerPort@/veridata/configuration.dtd">
    <configuration validation="required">
    <connection name="@conneciotnName@" host="@sqlManagerHostSrc@"
        port="@sqlManagerPortSrc@" user="@sqlConn0User@"
        password="@sqlConn0Password@" repairUser="@repairUsername@"
        repairPassword="@repairPassword@" agent-timeout="4000"
        truncate-spaces="false" fetch-size="3" use-ssl="false">
           <description>
            <![CDATA[
                SQL Scripting Source Connection
            ]]>
            </description>
   </connection>
   </configuration>
```

  Update the Veridata Agent with your XML file using:

```
DOMAIN_HOME/veridata/bin/veridata_import.sh -update /tmp/con.xml -wlUser cmd_
user
```

  Start the Veridata Agent after making these changes.

B

Sample Configuration File

This appendix provides the contents of the following sample configuration file for using with the Oracle GoldenGate Veridata import and export utilities.

For more information about the parameters used in this configuration file, see Section 5.3, "Configuration File Element Reference".

B.1 Sample Configuration File

This section shows the contents of a sample configuration file. For more details about each element in this configuration file, see Section 5.3, "Configuration File Element Reference".

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- Copyright (c) 2011, Oracle and/or its affiliates. All rights reserved. -->
<!DOCTYPE configuration SYSTEM "configuration.dtd">
<configuration validation="required">
    <connection name="sqlScriptingSource" host="localhost" port="7860"
        user="source2" password="source2" agent-timeout="6000"
truncate-spaces="true" fetch-size="4"/>
    <connection name="sqlScriptingTarget" host="localhost" port="7862"
        user="target2" password="target2"/>
<connection name="connection-with-properties" host="localhost"
port="7860" user="source2" password="source2" repairUser="source2"
repairPassword="source2" agent-timeout="4000"
truncate-spaces="false" fetch-size="3" use-ssl="false">
<description>
<![CDATA[ SQL Scripting Source Connection with user defined properties]]>
</description>
        <conn-properties datatype-name="array" format="clob"/>
        <conn-properties datatype-name="binary_double" format="number" scale="3"/>
        <conn-properties datatype-name="binary_float" format="dec_float"
precision="5"/>
        <conn-properties datatype-name="timestamp" format="binary_timestamp"
scale="10" timezone="(UTC+05:30) Kolkata - India Time (IT)"/>
    </connection>
<connection name="nskScriptingSource" host="gg-xxxx.us.company.com" port="9999"/>
    <connection name="nskScriptingTarget" host="gg-xxxx.us.company.com""
port="9999" />


<group name="column-mapping" source-conn="sqlScriptingSource"
target-conn="sqlScriptingTarget"
         source-catalog="" target-catalog="" source-schema="SOURCE2"
target-schema="TARGET2">
         <description>
```

```
            <![CDATA[
                This group has various types of column mapping specifications.
            ]]>
            </description>
        <compare-pair source-table="SYSMAPPING1" name="exlcudeCol6">
            <excluded-column name="COL6"/>
         </compare-pair>
        <compare-pair source-table="SYSMAPPING2" name="userDefinedKeys">
            <key-column source-name="COL1" target-name="COL2"/>
            <key-column source-name="COL2" target-name="COL3"/>
        </compare-pair>
        <compare-pair source-table="SYSMAPPING3" name="userDefinedColsWildCard">
            <column source-name="COL.*" />
        </compare-pair>
        <compare-pair source-table="SYSMAPPING3" name="userDefinedColsLiteral">
            <column source-name="COL5" target-name="COL6" type="literal"/>
            <column source-name="COL.*" />
        </compare-pair>
    </group>

<group name="table-mapping" source-conn="sqlScriptingSource"
target-conn="sqlScriptingTarget"
         source-catalog="" target-catalog="">
         <description>
            <![CDATA[
                 This group has table mapping specifications.
            ]]>
          </description>
        <compare-pair source-table="SYSMAPPING1" target-table="SYSMAPPING1"
name="sameTables"
            source-schema="SOURCE2" target-schema="TARGET2" >
        </compare-pair>
        <compare-pair source-table="SYSMAPPING2" target-table="SYSMAPPING3"
name="diffTables"
            source-catalog="" target-catalog="" source-schema="SOURCE2"
target-schema="TARGET2">
</compare-pair>
<compare-pair source-table="CHAR_*" target-table="*" name="sameTables"
            source-schema="SOURCE2" target-schema="TARGET2" >
        </compare-pair>
    </group>

<group name="delta-processing" source-conn="sqlScriptingSource"
target-conn="sqlScriptingTarget"
        source-catalog="" target-catalog=""   source-schema="SOURCE2"
target-schema="TARGET2">
        <description>
            <![CDATA[
                 This group has delta processing specifications.
            ]]>
        </description>
        <compare-pair source-table="SYSMAPPING1" target-table="SYSMAPPING1"
name="scriptingConfigTest1"
delta-processing="true" >
<key-column source-name="COL1" target-name="COL2"/>
<key-column source-name="COL2" target-name="COL3"/>
<column source-name="COL5" target-name="COL6" type="literal"/>
<delta-config>
<source-config column-name="COL1">
<query><![CDATA[
```

```
SELECT MAX(COL1) from SYSMAPPING1
]]>
</query>
</source-config>
<target-config column-name="COL2">
<query><![CDATA[
SELECT MAX(COL1) from SYSMAPPING1
]]>
</query>
</target-config>
</delta-config>
        </compare-pair>
    </group>

<group name="enscribe-partition" source-conn="SourceNSKConnection"
target-conn="TargetNSKConnection" validation="none">
         <description>
            <![CDATA[
                This group has all the tables for NSK
            ]]>
            </description>

        <compare-pair  source-file-pattern="\ZEUS.$FSS02.FSSVSRC.*"
source-table="ACCTN*"  target-file-pattern="\ZEUS.$FSS03.FSSVTAR.*"
target-table="*" >
        <enscribe-key
        name = "Part1"
        end-key ="1000"
        format  ="hexadecimal"
            default ="false"
        side="source"/>
        <enscribe-key
        name = "Part1"
        start-key ="001"
        format  ="hexadecimal"
            default ="false"
        side="target"/>
        <enscribe-key
        name = "Both"
        start-key ="001"
        end-key ="1000"
            default ="true"/>
        </compare-pair>
    </group>

<group name="sql-partition" source-conn="sqlScriptingSource"
target-conn="sqlScriptingTarget"
        source-catalog="" target-catalog=""  source-schema="SOURCE2"
target-schema="TARGET2">
        <description>
            <![CDATA[
                This group has sql partition specification.
            ]]>
        </description>

        <compare-pair source-table="SYSMAPPING1" name="PART1">
            <sql-partition name="partition_wo_default" >
                <![CDATA[
                    col4 > 50
                ]]>
```

```
            </sql-partition>
            <sql-partition name="part2" side="source">
            <![CDATA[
            col2 > 20
            ]]>
            </sql-partition>
            <sql-partition name="part2" side="target">
            <![CDATA[
            col3 > 30
            ]]>
            </sql-partition>
        </compare-pair>

        <compare-pair source-table="SYSMAPPING2" name="PART2">
        <sql-partition name="partition_default" default="true" >
        <![CDATA[
        col3 > 30
        ]]>
        </sql-partition>
        </compare-pair>
    </group>

<group name="compare-pair-with-pkey" source-conn="sqlScriptingSource"
target-conn="sqlScriptingTarget"
         source-catalog="" target-catalog="" source-schema="SOURCE2"
target-schema="TARGET2">
        <description>
            <![CDATA[
                This group has all the SYSMAPPING tables.
                SYSMAPPING3 uses the user defined index B_SYSMAPPING4_IDX.
            ]]>
        </description>

     <compare-pair source-table="SYSMAPPING3" source-pkey="B_SYSMAPPING3_IDX"/>
        <compare-pair source-table="SYSMAPPING*" target-table="*">
        </compare-pair>
        <compare-pair source-table="SYSMAPPING5" exclude="true"/>
    </group>

<group name="enscribe-expand-ddl" source-conn="SourceNSKConnection"
target-conn="TargetNSKConnection" validation="none">
         <description>
            <![CDATA[
                This group has expand ddl specification for NSK
            ]]>
            </description>
        <compare-pair  source-file-pattern="\ZEUS.$FSS02.FSSVSRC.*"
source-table="TELLER"  target-file-pattern="\ZEUS.$FSS03.FSSVTAR.*"
target-table="TELLER" name="excludeCompKeyCol">
        <enscribe-info side="source"
        dictionary="$FSS04.FSSVDCT" record="ENSSRC-REC">
        <expandddl
        redefined-columns ="include"
        resolvedups="appendAlphaIndex"
        expandGroupArrays="false"
        ddl-separator="underscore"
        zero-fill-length="1"
        fix-long-names="false"
        max-col-name-len="110"/>
        </enscribe-info>
```

```
        <enscribe-info side="target"
        dictionary="$FSS04.FSSVDCT" record="ENSSRC-REC">
        <expandddl />
        </enscribe-info>
            <excluded-column name="ENSCRIBE-NUMBER"/>
        </compare-pair>

        <compare-pair  source-file-pattern="\ZEUS.$FSS02.FSSVSRC.*"
source-table="TELLER"  target-file-pattern="\ZEUS.$FSS03.FSSVTAR.*"
target-table="TELLER" name="userDefined">
        <enscribe-info side="source"
        dictionary="$FSS04.FSSVDCT" record="ENSSRC-REC"/>
        <enscribe-info side="target"
        dictionary="$FSS04.FSSVDCT" record="ENSSRC-REC"/>
            <key-column source-name="KEY1" target-name="KEY1"/>
            <column source-name="ENSCRIBE-STRING" target-name="ENSCRIBE-STRING"/>
            <column source-name="FIRST-NAME" target-name="FIRST-NAME"/>
            <column source-name="LAST-NAME" target-name="LAST-NAME"/>
         <column source-name="ENSCRIBE-NUMBER" target-name="ENSCRIBE-NUMBER"/>

        </compare-pair>
    </group>

<group name="include-exclude-filter" source-conn="sqlScriptingSource"
target-conn="sqlScriptingTarget"
         source-catalog="" target-catalog=""
            source-schema="SOURCE2" target-schema="TARGET2">
         <description>
            <![CDATA[
                This group has include/exclude filter description
            ]]>
         </description>

        <filter type="include" table="SYSMAPPING*">
            <colfilter type ="exclude">
                <colfiltercol name="COL3" />
                <colfiltercol name="COL6" />
            </colfilter>
        </filter>
        <filter type="exclude" table="SYSMAPPING4">
        </filter>
        <compare-pair source-table="SYSMAPPING1" target-table="*"
name="userDefinedCols"> <!-- exclude col6 -->
            <column source-name="COL5" target-name="COL5"/>
            <column source-name="COL6" target-name="COL6"/>
        </compare-pair>
        <compare-pair source-table="SYSMAPPING2" name="userDefinedKeys"> <!--
exclude col3 -->
            <key-column source-name="COL1" target-name="COL2"/>
            <key-column source-name="COL2" target-name="COL3"/>
        </compare-pair>
        <compare-pair source-table="SYSMAPPING3" target-table="*"><!-- exclude
col3, col6 -->
        </compare-pair>
        <compare-pair source-table="SYSMAPPING4" target-table="*"/>

    </group>

<group name="quotedSchemaQuotedTable" source-conn="sqlScriptingSource"
target-conn="sqlScriptingTarget"
```

```
         source-catalog="" target-catalog=""
            source-schema="&quot;abc 11&quot;" target-schema="&quot;abc 11&quot;">
         <description>
            <![CDATA[
                SQL group with simple quoted schema and quoted table name
            ]]>
          </description>
        <compare-pair source-table="&quot;Quoted Table&quot;" target-table="*"  />
        <compare-pair source-table="&quot;Quoted*Table&quot;" target-table="*"  />
    </group>

<group name="group-schema-wildcard" source-conn="sqlScriptingSource"
target-conn="sqlScriptingTarget"
         source-catalog="" target-catalog="" source-schema="source*"
target-schema="*">
        <description>
            <![CDATA[
                SQL group with source-schema wildcard at group level and no
compare-pair schema.
            ]]>
        </description>
        <filter type="include" table="CHAR_TYPES*">
        </filter>
        <filter type="exclude" table="CHAR_TYPES2*">
        </filter>
        <compare-pair source-table="CHAR_TYPE*" target-table="*">
        </compare-pair>
    </group>


    <job name="test" profile="allParams">
        <group name="column-mapping"/>
<group name="table-mapping"/>
<group name="delta-processing"/>
    </job>

<profile name="allParams">
        <description>
            <![CDATA[
                Full Profile description.
            ]]>
        </description>
        <profile-general>
            <param name="oos-format" value="xml" />
            <param name="oos-xml-chunk-size" value="1000" />
            <param name="reports-insync" value="true" />
            <param name="reports-inflight" value="true" />
        </profile-general>
        <sorting-method>
            <param name="sort-method" value="server" />
            <param name="sort-src-temp-dir" value="/dummy/location" />
            <param name="sort-tar-temp-dir" value="/dummy/location" />
        </sorting-method>
        <initial-compare>
            <param name="max-thread" value="6" />
            <param name="max-oos-record" value="777777" />
            <param name="output-oos-rpt" value="true" />
            <param name="update-rpt-second" value="100" />
            <param name="update-rpt-record" value="100" />
            <param name="limit-input-row" value="100" />
```

```
            <param name="src-oracle-hint" value="FIRST_ROWS(10)" />
            <param name="tar-oracle-hint" value="FIRST_ROWS(10)" />

            <param name="rpt-msg" value="both" />
            <param name="rpt-warn-msg-threshold" value="100" />

            <param name="src-agent-static-port" value="777" />
            <param name="tar-agent-static-port" value="777" />

            <param name="src-nsk-name" value="$AA*" />
            <param name="src-nsk-cpu" value="2" />
            <param name="src-nsk-priority" value="1" />
            <param name="tar-nsk-name" value="$AA*" />
            <param name="tar-nsk-cpu" value="2" />
            <param name="tar-nsk-priority" value="1" />
        </initial-compare>
        <confirm-out-of-sync>
            <param name="coos-enable" value="false" />
            <param name="coos-concurrent" value="false" />
            <param name="batch-size" value="15"/>
            <param name="coos-delay" value="2" />
            <param name="max-oos-record" value="777777" />
            <param name="output-oos-rpt" value="true" />
            <param name="update-rpt-second" value="100" />
            <param name="update-rpt-record" value="100" />
            <param name="src-oracle-hint" value="FIRST_ROWS(10)" />
            <param name="tar-oracle-hint" value="FIRST_ROWS(10)" />

            <param name="rpt-msg" value="both" />
            <param name="rpt-warn-msg-threshold" value="100" />

            <param name="src-agent-static-port" value="777" />
            <param name="tar-agent-static-port" value="777" />

            <param name="src-nsk-name" value="$AA*" />
            <param name="src-nsk-cpu" value="2" />
            <param name="src-nsk-priority" value="1" />
            <param name="tar-nsk-name" value="$AA*" />
            <param name="tar-nsk-cpu" value="2" />
            <param name="tar-nsk-priority" value="1" />
        </confirm-out-of-sync>
        <repair>
            <param name="repair-after-compare" value="true" />
            <param name="batch-size" value="15" />
            <param name="txn-size" value="2" />
            <param name="concurrent-operation" value="2" />
            <param name="check-change-value" value="false" />
            <param name="terminate-max-warn" value="77777" />
            <param name="write-success-rpt" value="false" />
            <param name="disable-trigger" value="true" />
        </repair>
    </profile>
</configuration>
```

C

Profile Parameters

This appendix provides the profile parameter decryption for use in configuring profiles used with the Oracle GoldenGate Veridata import and export utilities.

For more information about the parameters used in this configuration file, see Section 5.3, "Configuration File Element Reference".

C.1 General (profile-general)

Name on UI	Name to be used in configuration XML file	Default Values	Allowed Values	Type
Out-Of-Sync Output Format	oos-format	binary	binary, xml, both, none	Enumeration
Maximum Size of Each Out-Of-Sync XML Chunk (Rows)	oos-xml-chunk-size	500	1 to 100000	int
Report in-sync rows to report file	reports-insync	false	true, false	boolean
Report in-sync after in-flight rows to report file	reports-inflight	false	true, false	boolean

C.2 Sorting Method (sorting-method)

Name on UI	Name to be used in configuration XML file	Default Values	Allowed Values	Type
Sort Data Using	sort-method	database	server, database	Enumeration
Maximum Memory Usage (MB)	sort-max-memory	50	1 to 100000	int
Temporary Storage Directory for Source Data	sort-src-temp-dir	string		
Temporary Storage Directory for Target Data	sort-tar-temp-dir	string		

C.3 Initial Compare (initial-compare

Name on UI	Name to be used in config XML file	Default Values	Allowed Values	Type
Max Concurrent Comparison Threads	max-thread	4	1 to 20	Int
Terminate when Maximum Records Out-Of-Sync	max-oos-record	100000	0 to 100000000	int
Output Out-Of-Sync Record Details to Report File	output-oos-rpt	false	true, false	boolean
Update Report file Every (seconds)	update-rpt-second	0	0 to 1000000	int
Update Report file Every (records)	update-rpt-record	0	0 to 100000000	int
Limit Number of Input Rows	limit-input-row	0	0 to 100000000	int
Source Oracle optimizer hint	src-oracle-hint	string		
Target Oracle optimizer hint	tar-oracle-hint	string		
Generate Messages	rpt-msg	none	none, info, warning, both	Enumeration
Generate Warning Messages For Out-Of-Sync Rows After (differences)	rpt-warn-msg-threshold	50	0 to 1000000	int
Use Static Listening Port For Agent During Row Hash On Source (0 to use dynamic port list)	src-agent-static-port	0	0 to 65535	int
Use Static Listening Port For Agent During Row Hash On Target (0 to use dynamic port list)	tar-agent-static-port	0	0 to 65535	int
Source Process Name Starting With (Must start with '$', followed by two letters, and end with '*'. Example: $AA*)	src-nsk-name	string		
Source Process CPU Number	src-nsk-cpu	-1	-1 to 16	int
Source Process Priority	src-nsk-priority	0	0 to 1000000	int

Target Process Name Starting With (Must start with '$', followed by two letters, and end with '*'. Example: $AA*)	tar-nsk-name	string		
Target Process CPU Number	tar-nsk-cpu	-1	-1 to 16	int
Target Process Priority	tar-nsk-priority	0	0 to 1000000	int

C.4 Confirm-Out-Of-Sync (confirm-out-of-sync)

Name on UI	Name to be used in configuration XML file	Default Values	Allowed Values	Type
Perform Confirm Out-Of-Sync Step	coos-enable	true	true, false	boolean
Run Concurrently With Initial Compare	coos-concurrent	true	true, false	boolean
Confirm-Out-Of-Sync Batch Size	Batch-size	10	1 to 100	int
Delay Confirm-Out-Of-Sync By (seconds)	coos-delay	0	0 to 1000000	int
Terminate when Maximum Records Out-Of-Sync	coos-max-oos	100000	0 to 100000000	int
Output Out-Of-Sync Record Details to Report File	coos-output-oos-rpt	false	true, false	boolean
Update Report file Every (seconds)	coos-output-rpt-second	0	0 to 100000000	int
Update Report file Every (records)	coos-output-rpt-record	0	0 to 100000000	int
Source Oracle optimizer hint	coos-src-oracle-hint	string		
Target Oracle optimizer hint	coos-tar-oracle-hint	string		
Generate Messages	rpt-msg	none	none, info, warning, both	Enumeration
Generate Warning Messages For Out-Of-Sync Rows After (differences)	rpt-warn-msg-threshold	50	0 to 1000000	int
Use Static Listening Port For Agent During Row Hash On Source (0 to use dynamic port list)	src-agent-static-port	0	0 to 65535	int

Use Static Listening Port For Agent During Row Hash On Target (0 to use dynamic port list)	tar-agent-static-port	0	0 to 65535	int
Source Process Name Starting With (Must start with '$', followed by two letters, and end with '*'. Example: $AA*)	src-nsk-name	string		
Source Process CPU Number	src-nsk-cpu	-1	-1 to 16	int
Source Process Priority	src-nsk-priority	0	0 to 1000000	int
Target Process Name Starting With (Must start with '$', followed by two letters, and end with '*'. Example: $AA*)	tar-nsk-name	string		
Target Process CPU Number	tar-nsk-cpu	-1	-1 to 16	int
Target Process Priority	tar-nsk-priority	0	0 to 1000000	int

C.5 Repair (repair)

Name on UI	Name to be used in configuration XML file	Default Values	Allowed Values	Type
Run Repair Automatically after Compare	repair-after-compare	False	True,false	boolean
Repair batch size	batch-size	10	1 to 100	int
Repair transaction size	txn-size	1	0 to 100	int
Concurrent Repair Operations	concurrent-operation	1	1 to 100	int
Check changed values	check-change-value	true	true, false	boolean
Terminate when maximum repair warnings	terminate-max-warn	10000	0 to 2147483647	Int
Write Repair Success Messages to Report	write-success-rpt	true	true, false	boolean
Disable DB Triggers Session Based	disable-trigger	false	true, false	boolean
Report				
Disable DB Triggers Session Based	disable-trigger	false	true, false	boolean