Oracle® GoldenGate Director

Administration Guide

Version 2.0

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Administration Guide, Version 2.0

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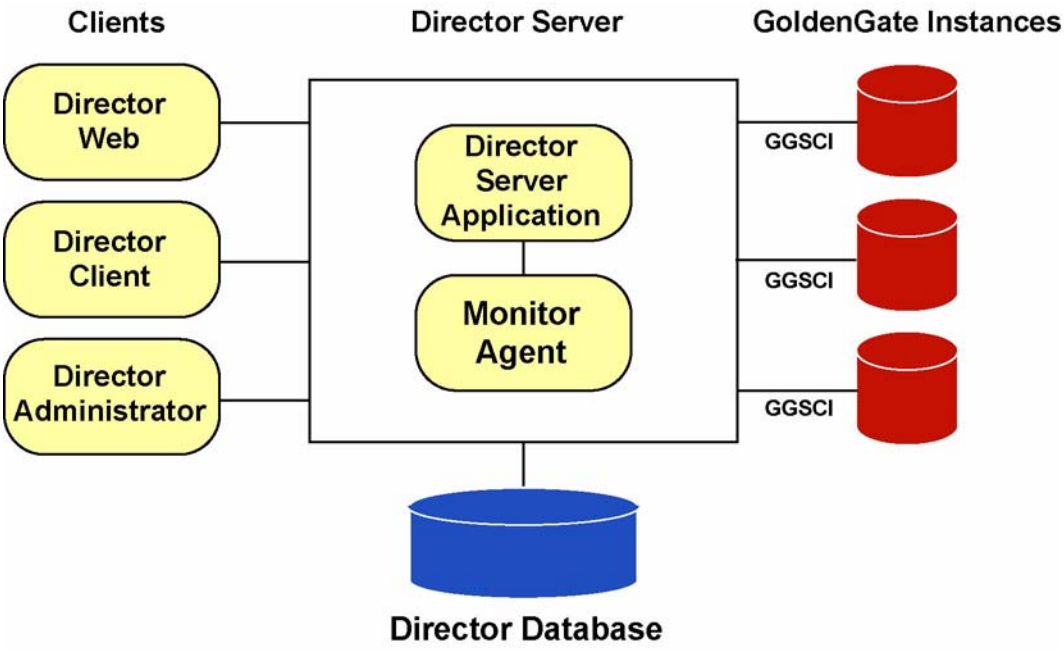
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CHAPTER 1

Overview of GoldenGate Director

GoldenGate Director is a multi-tiered client-server application that enables the configuration and management of GoldenGate instances from a remote client. Director consists of the components shown in the following diagram.



GoldenGate instances

Each instance of a GoldenGate Manger process is identified within Director by the fully qualified domain name of the host, the port on which Manager is listening, and a user-defined data source name. Because a GoldenGate Manager process is associated with a database, this combination is identified as a *data source* within the Director Client application.

GoldenGate Director Server

GoldenGate Director Server coordinates the management of GoldenGate instances. GoldenGate Director Server is installed as an Oracle Weblogic Server domain.

Director Server is composed of the following applications:

- The Director Server application, a collection of services that controls security, host information services, object modeling, diagramming, consolidated event logging, and alert services.
- The Monitor Agent, a client to the GoldenGate hosts that establishes a dedicated session of GGSCI (GoldenGate Software Command Interface). The connection is used to obtain process status and event information.

GoldenGate Director database

GoldenGate Director Server uses a database as a central repository to store information about users and groups, graphical diagrams created by users, consolidated events, and other information. A user can log into any Director Client on any system and retrieve his or her own stored view of the network.

GoldenGate Director Client

GoldenGate Director Client is a client application of Director Server that provides a graphical user interface (GUI) for managing GoldenGate instances. The client runs on any platform that supports Java and enables drag-and-drop manipulation, menus and toolbars, and other functionality expected of a desktop application.

GoldenGate Director Web

GoldenGate Director Web is a web application that is hosted in Director Server. It allows remote, browser-based monitoring and control of GoldenGate instances without the need to install software on the client system.

GoldenGate Director Administrator

GoldenGate Director Administrator is a client of Director Server and is used for configuring Director Server itself. You can use it to add or remove GoldenGate instances and users, and to manage the overall Director configuration.

CHAPTER 2

System Requirements and Installation

System requirements

GoldenGate instances

- GoldenGate Director is compatible with versions of the GoldenGate software that are covered under the current GoldenGate support policy.
- All systems hosting GoldenGate instances must be registered with a Domain Name Server (DNS).

GoldenGate Director Server

Hardware

- Operating system that is one of the following:
  - Windows NT/XP/2000/Vista
  - Solaris
  - AIX
  - Redhat Linux

  Other Linux or UNIX variants may be supported, but have not been tested.
- 1 GB of RAM.
- 1 GB to 1.5 GB (recommended) disk space.
- The port that is selected during the installation process must be dedicated to Director Server. The default port is 7001.

Software

- The Java Runtime Environment (JRE) version 6 (1.6.*x)* must be available on the system where you are installing Director Server. If this environment does not exist on the system, see Appendix 1 on page 24.
- The operating system must be able to support the Java 1.6 (6.0) Runtime Environment, which is installed and used by the Director Server installer and software.
- Oracle Weblogic Server 11g (10.3.1) Standard Edition. This is Oracle's JavaEE application server. *This software must be purchased from Oracle and installed according to the product documentation prior to installing GoldenGate Director Server*. You must obtain a production release version of this software by

contacting Oracle Corporation or an Oracle reseller to obtain the appropriate license. You can download a trial version of Weblogic Server from the Oracle website, but you must have a licensed version to use with GoldenGate Director. Installing this version of Weblogic Server will not interfere with other, existing versions of Weblogic Server.

> **NOTE** You need not create a domain for Director Server. A domain will be created in the correct configuration by the installation program.

- One of the following databases, in which Director Server will install and maintain a repository of some small tables that contain working data, such as user preferences and information about GoldenGate instances.
  - MySQL 5.x Enterprise version.
  - SQL Server 2000 and 2005
  - Oracle 9i or later.

  In order for the installer to properly create and populate a valid database, it makes a JDBC connection to the database, which is provided by the JDBC driver jar that is included with Weblogic Server.
- To use the installer on a UNIX or Linux system, a windowing system such as X Window must be available.
- At least 200 MB of space in the database for Director Server objects and data. The installer creates the following tables and corresponding indexes.

ACCOUNTB	JMS_ROLES
ACLB	JMS_SUBSCRIPTIONS
ACLENTRYB	JMS_TRANSACTIONS
ACNTGROUPREL	JMS_USERS
ACNTPROPB	LOGENTRYB
ACONPROCSB	MANAGERREFB
ACONWATCHB	MONAGENTB
ALERTB	NODESTATEB
AUTOINCB	STAGEB
GDSCVERS	STATSENTRYB
GROUPB	SUFFIXB
HOSTINFOB	UISPROPB
JMS_MESSAGES	

GoldenGate Director Client

- Any Windows or UNIX platform that supports Java Runtime Environment (JRE) version 6.0 and the Oracle Weblogic Server 11g (10.3.1) Standard Edition. *These environments must be installed before installing the Director Client.* If installing the client on a machine where Director Server is installed, a JRE will exist from that installation and can be used for the client. If you need to install a JRE, see Appendix 1 on page 24.
- Monitor display resolution (screen area) of at least 1024 x 768 pixels, preferably 1280 x 1024 or greater.

GoldenGate Director Web

GoldenGate Director Web supports the following web browsers:

- Microsoft Internet Explorer version 5.0 or later
- Mozilla Firefox version 1.3 or later
- Apple Safari version 1.2 or later

No software is installed on the client system for the Director Web.

Installing GoldenGate Director Server

These instructions apply to new installations. For upgrades, see page 13.

A new installation involves the following steps:

- Creating a database user
- Installing the Director Server software

Creating a database user

Before installing Director Server for the first time, create a database (or schema if using Oracle) and a database user for the Director Server repository, or choose an existing database, schema, or user. The user must have privileges to create, update, and delete the tables in the repository.

Table 1 Required database privileges for GoldenGate Director Server

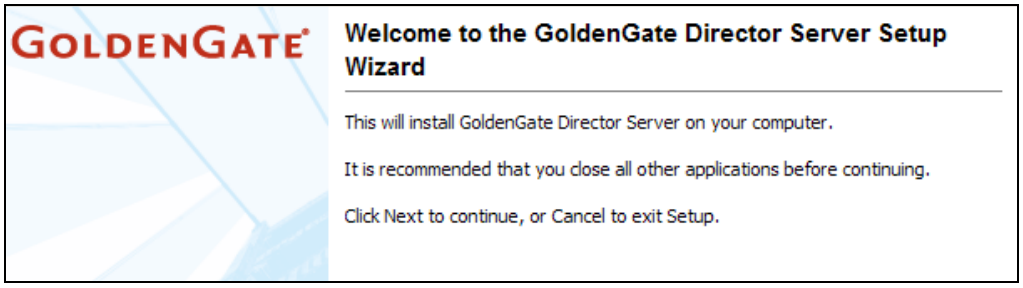
MySQL
1. Create a user and identically named database. The password must contain at least eight alphanumeric characters, with at least one alphabet character and one number. 2. Grant the user all DDL and DML privileges in that database when this user connects to the MySQL server from the host where GoldenGate Director is being installed.
Oracle
1. Create a user and password. The password must contain at least eight alphanumeric characters, with at least one alphabet character and one number. 2. Specify QUOTA UNLIMITED on the user's default tablespace.

Table 1 Required database privileges for GoldenGate Director Server (continued)

SQL Server
1. Create a database and login that is a user of the database where you will be installing the repository. The password must contain at least eight alphanumeric characters, with at least one alphabet character and one number. 2. Grant this login sufficient privileges to perform the following operations: CONNECT to the database CREATE, ALTER, DROP TABLE in the database CREATE and DROP INDEX in the database INSERT, UPDATE, DELETE from tables in the database SELECT from tables in the database ALTER SCHEMA of the login's default schema

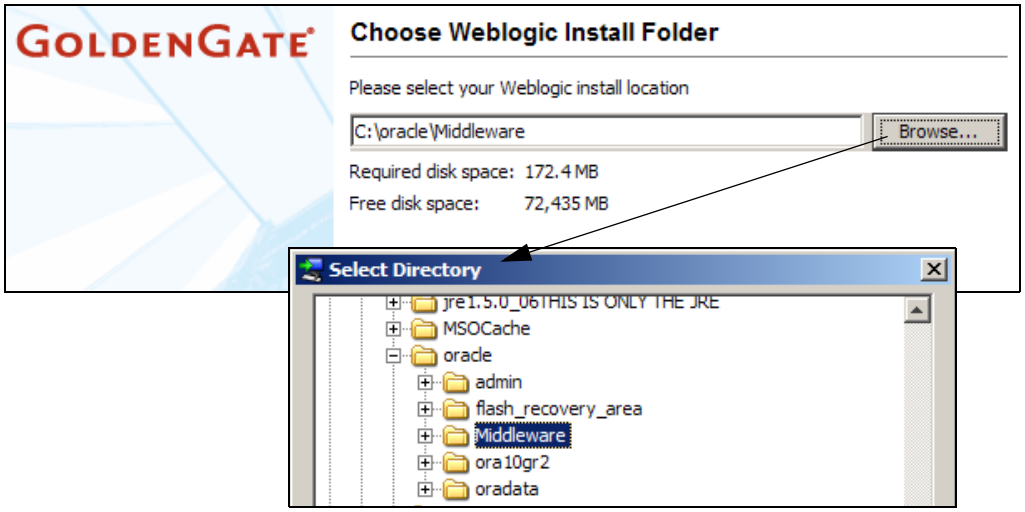
Installing the Director Server software

1. Download the appropriate ggdirector-serversetup_<version> installation program from the GoldenGate support site to the machine that will host Director Server.
2. Close other applications as permissible.
3. Run ggdirector-serversetup_<version>.
4. **Welcome screen**: Click **Next** on the first screen.

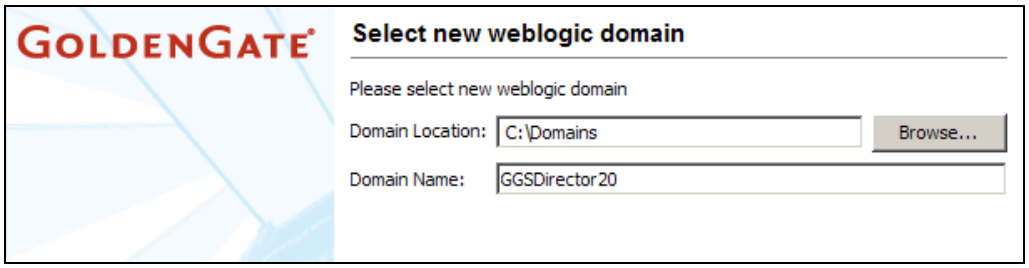


NOTE If you have not yet purchased and installed Oracle Weblogic Server, click Cancel to terminate this installation, and then see the System Requirements on page 6 for more information. GoldenGate Director must be installed as a Weblogic Server domain.

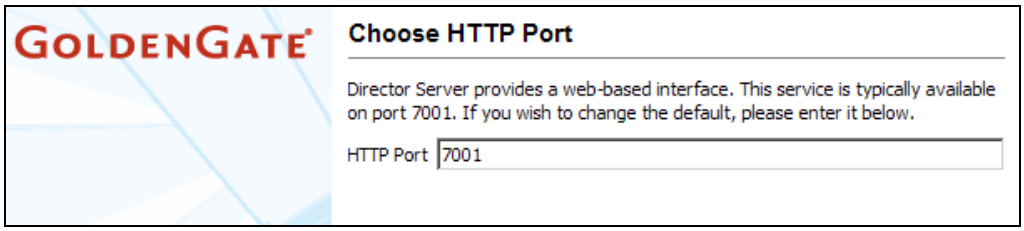
5. **Weblogic Installation Directory**: Enter, or browse to, the location where you installed Oracle Weblogic Server 11g (10.3.1). The selected path should only drill down as far as the **Middleware** directory. Do not include sub-directories beyond **Middleware**.



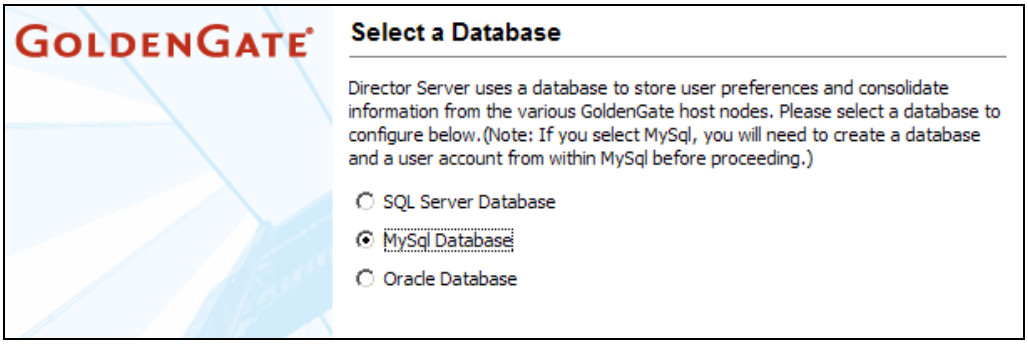
6. **Weblogic domain location**: Enter, or browse to, a location where the installer can create a Weblogic Server domain for Director Server.
   - For **Domain Location**, enter or select an existing directory that will contain the Director Server domain. This directory can be anywhere within or outside the Weblogic Server installation location.
   - For **Domain Name**, type a name for the Director Server domain. This name must satisfy the following conditions:
     - It must contain at least eight alphanumeric characters, with at least one alphabet character and one number.
     - It must be a valid directory name, because a corresponding directory will be created under the **Directory Location** that you specified.



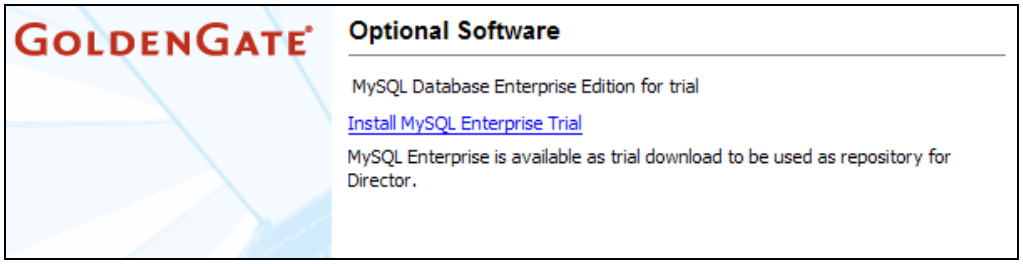
7. **HTTP port**: Confirm, or change, the HTTP port that Director Server will use to communicate with Director Web. This configuration is done in the Weblogic Server domain that you specified in the previous step, and it is specific to Weblogic Server. In most cases, the default of 7001 should be sufficient.



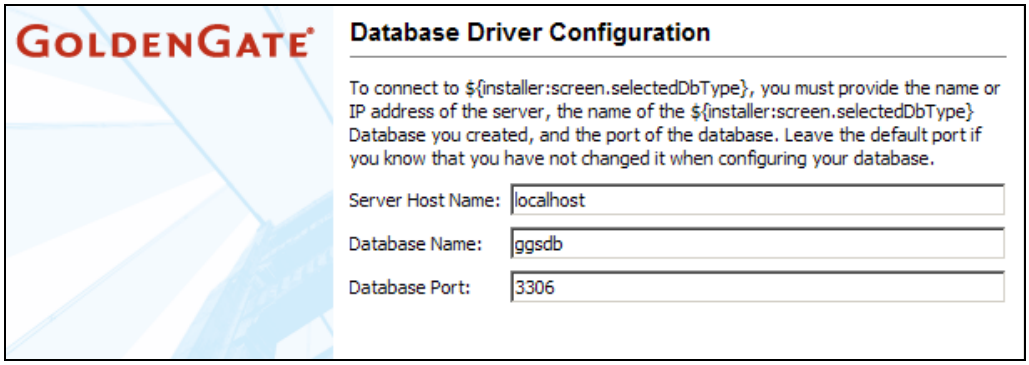
8. **Database**: Select the type of database to use as the Director Server repository. A database (or schema, if Oracle) and user account must exist, be properly configured, and be running.before proceeding with the installation. You can use a repository that was used by a previous version of GoldenGate Director. This will preserve existing user accounts, data source configurations, and user environments.



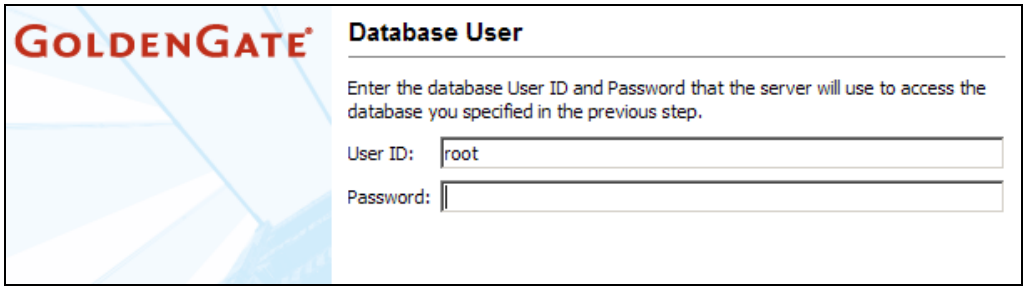
9. **(Optional, if using MySQL)** If you have not yet downloaded and installed MySQL Enterprise Edition, you can install a free trial version for use as the GoldenGate Director repository. To use MySQL, you must use the Enterprise Edition. Click the link to the MySQL website. Install MySQL and then start it. You can leave the installer running while you do this.



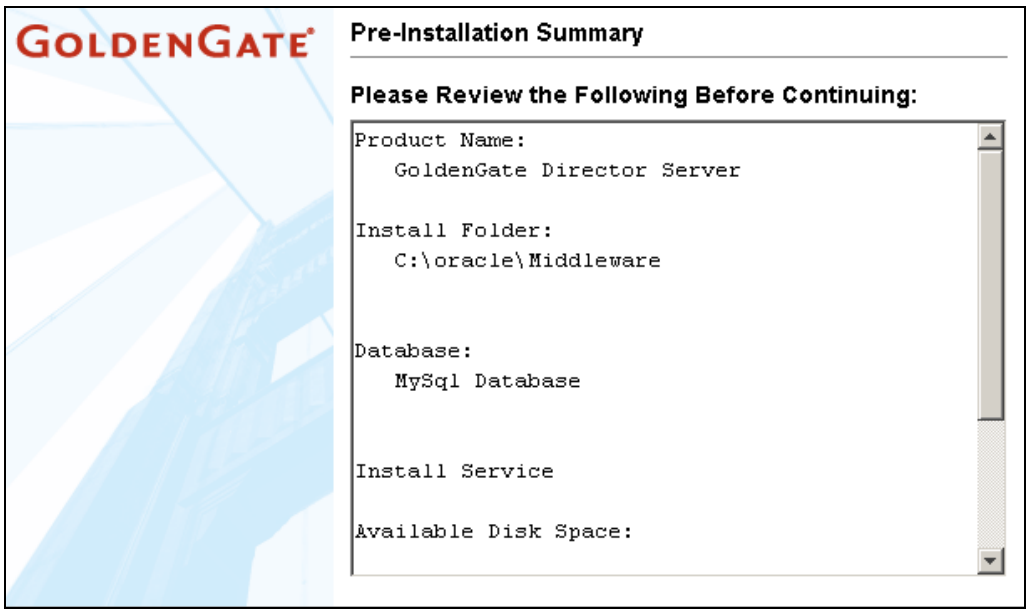
10. **Database driver configuration**: Enter the following information for Director Server to connect to the selected database:
    - the name of the database host server
    - the name of the database, or the Oracle SID if using an Oracle database.
    - the port number of the database. By default, the default port number of the selected database is displayed.



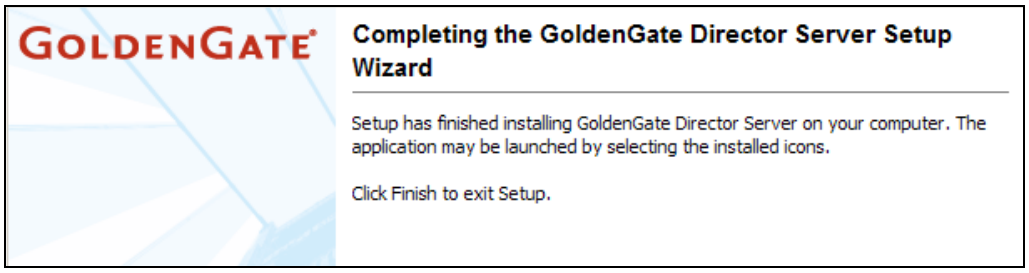
11. **Database User**: Enter the name and password of a database user that can be used to log on to the database. This user must already exist in the database; the installer cannot create one. To use an existing Director Server repository, use the credentials of the user that owns that database or schema. These credentials are used by the Weblogic Server domain to establish authentication within Director Server. The password is stored in encrypted form within the Weblogic Server domain configuration directory. Make certain the password was created with at least eight alphanumeric characters, with at least one alphabet character and one number.



12. **Pre-installation summary**: Review your installation input, and then click **Back** to make changes or **Next** to start the installation.



13. Click **Finish** to exit the installer.



14. (Windows) To create a Windows service for Director Server, see the Weblogic Server documentation.

Controlling GoldenGate Director Server

To start Director Server from the command line

1. Start Weblogic Server.
2. Run the command shell of the operating system.
3. Go to the bin directory within the Weblogic Server domain directory that contains the Director Server installation.

4. Run one of the following programs, depending on the platform.

Table 2 Control commands for Director Server

Windows	UNIX and Linux
startWebLogic.cmd	startWebLogic.sh
stop: stopWebLogic.cmd	stopWebLogic.sh

The command console must remain open. Director Server stops running when the command console is closed.

5. (Optional) Configure the host to start and stop Director Server automatically. Contact your system administrator if you need assistance.

To start Director Server from the Windows Program menu

Click **Start>Programs>GoldenGate Director Server**, and then select either **Start Director** or **Stop Director**.

Installing GoldenGate Director Client

These instructions apply to new installations. For upgrades, see the GoldenGate Technical Support website.

Follow these steps on all Windows, Linux, or UNIX workstations that will be used to connect to GoldenGate Director Server.

1. If you have not yet installed the Java Runtime Environment on the client machine, do so before proceeding. If installing on the same machine as Director Server, you can use the JRE that was provided in that installation.
2. Start Director Server.
3. Close all Windows applications.
4. Run an Internet browser and type the following address:

   ```
   http://<servername>:<port>/download
   ```

   Where: <servername> is the name of the machine hosting Director Server and <port> is the Director Server port number (default is 7001).

   NOTE If Director Server is installed on the local host, using localhost as the host name in the URL may not work. In that case, use the machine's domain name or 127.0.0.1 (the standard IP address for localhost).

5. Select **GoldenGate Director Client for Windows**.
6. Download either ggdirector-clientsetup.exe or ggdirector-clientsetup.sh, depending on the platform, and save it to the workstation.
7. Run the program from the workstation. The installer provides options for choosing:
   - an installation directory

- a location for the Windows shortcut that starts the client

Starting GoldenGate Director Client

- To start Director Client on a UNIX system, run the run-director.sh script from the bin sub-directory of the installation directory.
- To start Director Client on a Windows system, run GoldenGate-Director.exe from the installation directory or from the shortcut specified during installation.

Starting GoldenGate Director Web

NOTE Before you can use the GoldenGate Director Web client, you must first use the GoldenGate Director Administrator to configure the server component with user accounts and connection information for GoldenGate instances. See Chapter 3.

To start GoldenGate Director Web, run an Internet browser and enter the following in the address bar:

```
http://<system name>:<port>/acon/
```

Where: <system name> and <port> are the name of the system and the Director Server port (default is 8809).

Examples:

```
http://localhost:7001/acon
http://ggwebhost:7001/acon
```

Upgrading and updating GoldenGate Director

Software upgrades

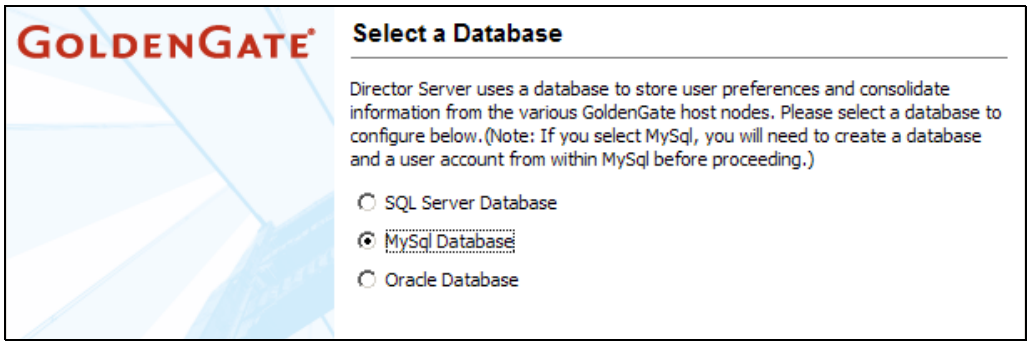
Because Director Server 2.0 must be installed within Oracle Weblogic Server, an upgrade path does not exist in the sense that the old installation files can be updated with the new ones. However, you can point the new installation environment to the database repository that was used by the previous version, so that the existing user accounts, environments, and data sources are preserved and the upgrade is seamless to the Director Clients.

NOTE A MySQL repository must be the Enterprise edition of MySQL.

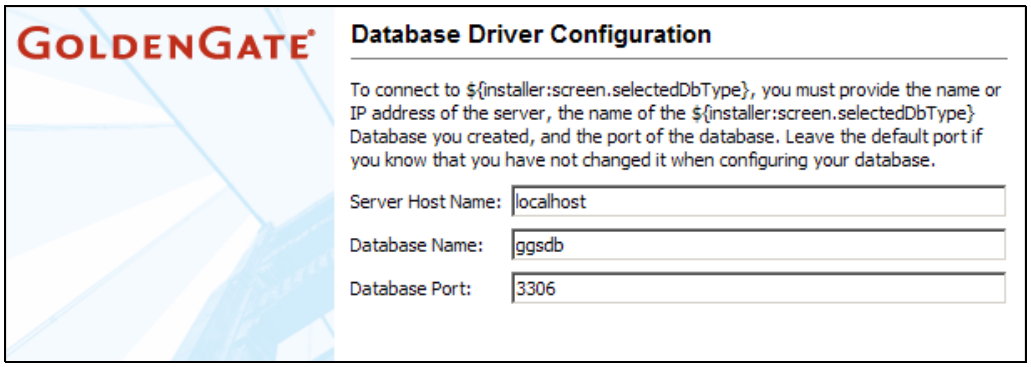
You can upgrade to version 2.0 from version 1.4 of GoldenGate Director.

To point to the existing repository, follow the instructions in “Installing GoldenGate Director Server” on page 6, but do the following:

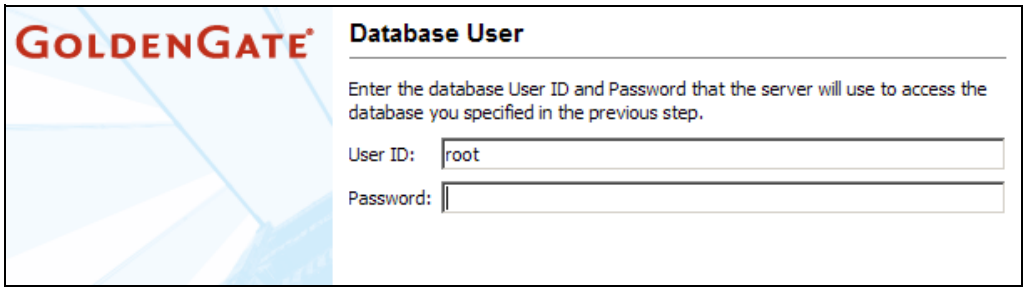
- Select the database type that contains the old repository.



- Select the correct driver information for the old repository database.



- Select the database (or schema, if Oracle) and user that owns the old repository. **Note:** Weblogic Server requires a password to contain at least eight alphanumeric characters, with at least one alphabet character and one number. You might need to change the existing password to satisfy this requirement.



If you need assistance with the upgrade, open a support case with GoldenGate Technical Support at http://www.goldengate.com/services/support.html.

Parameter updates

Whenever a new version of the GoldenGate software is released, the build could include new configuration parameters. Those parameters must be added to any

Director Server that was installed prior to the GoldenGate release, so that they appear in client views and support full compatibility between the two products. For instructions on upgrading the Director parameter dictionary, open a support case with GoldenGate Technical Support at http://www.goldengate.com/services/support.html.

Uninstalling GoldenGate Director

Uninstalling Director Server

The following instructions provide options for removing the Director Server software and, optionally, removing the Director Server database.

1. To drop the Director Server tables, use the drop_indexes.sql and drop_tables.sql scripts within the db directory of the Weblogic Server installation directory before uninstalling Director Server.
2. Stop Director Server (see page 11).
3. (Optional) Remove the Director Server domain.

Uninstalling Director Client

- To uninstall Director Client from a UNIX system, stop the Director Client application and then remove the installation directory and files.
- To uninstall Director Client from a Windows system, stop the Director Client application and then use the **Add/Remove Programs** control panel, or run Uninstall GoldenGate Director.exe from the Director Client directory.

CHAPTER 3

Configuring GoldenGate Director Server

Running Director Administrator

After installing the Director components, configure Director Server by using the Director Administrator program.

Using Director Administrator, you can:

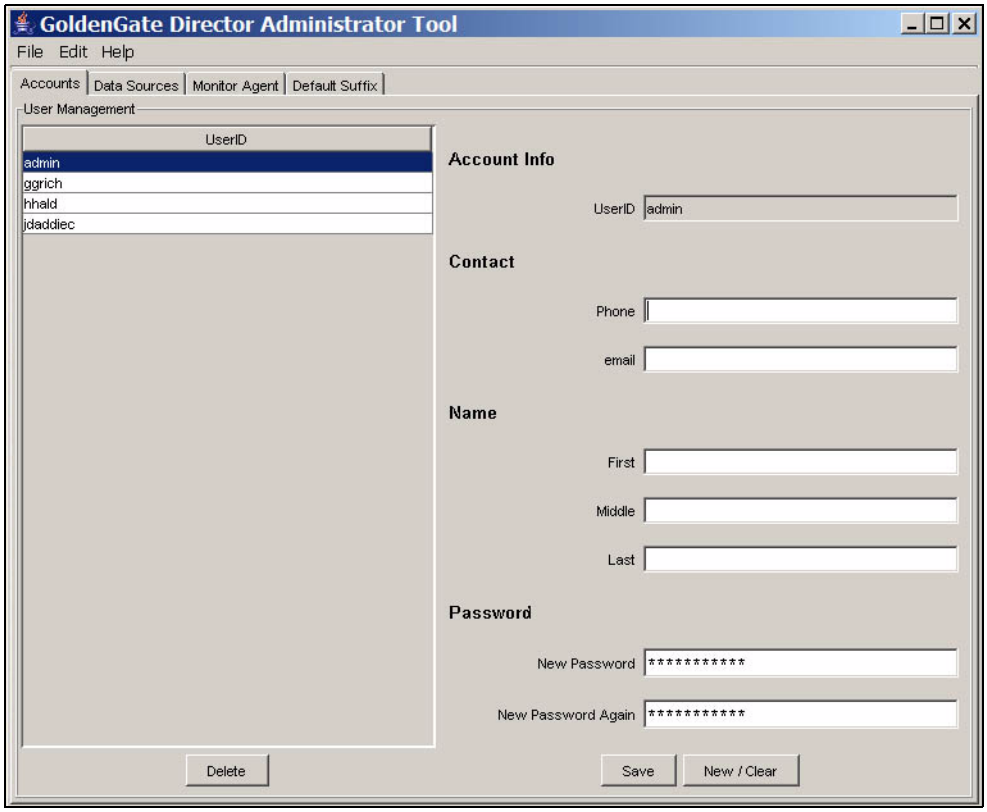
- Change the administrator user information and password
- Manage user accounts
- Manage data sources
- Configure the Monitor Agent
- Set default domain suffixes

To start Director Administrator

1. From the **bin** sub-directory of the Director Client installation location, run GDSC Admin Tool.exe. On Windows systems, you can run Director Administrator from the shortcut specified during the client installation.
2. In the login boxes, enter the admin user's name and password. The first time that you run Director Administrator, log in as admin with the password admin. GoldenGate recommends changing the admin user's password for security purposes. You also can enter or change other information about the admin user. See "To change a user account" on page 17.

Managing user accounts

Users must have an account with Director Server before they can log in from Director Client. Use the **Accounts** tab to manage Director user accounts.



To add a user account

1. At the bottom of the **Accounts** tab, click **New/Clear**.
2. Under **Account Info**, type the name of the user. (Required)
3. Under **Contact**, type the user's phone number and email address. (Optional)
4. Under **Name**, type the user's first, middle, and last names. (Optional)
5. Under **Password**, type and confirm a Director login password for the user. (Required)
6. Click **Save**. The user is added to the **UserID** list.

To change a user account

1. In the **UserID** list of the **Accounts** tab, select the user whose information you want to change.
2. Change the information in the **Account Info**, **Contact**, **Name**, and **Password** boxes as needed.
3. Click **Save**.

To delete a user account

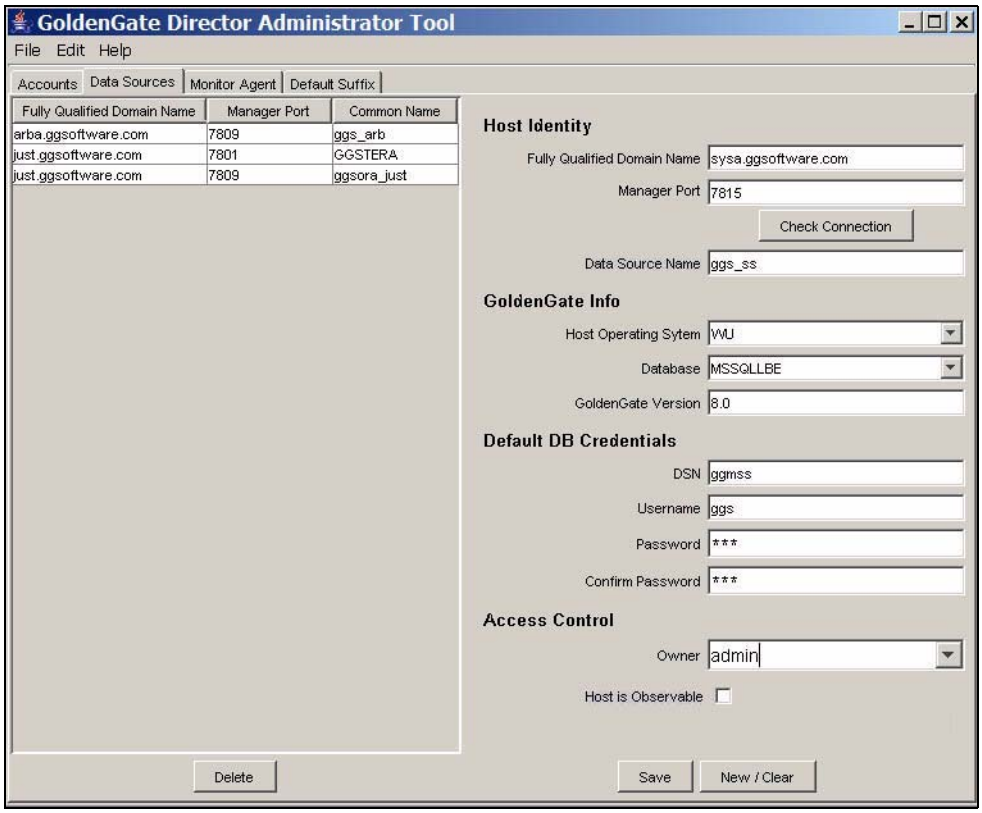
1. In the **UserID** list of the **Accounts** tab, select the user that you want to delete. You will *not* be prompted to confirm your intention to delete the account.

2. Click **Delete** to delete the account.
3. Click **Save**.

Managing GoldenGate data sources

To view a GoldenGate instance from Director Client, its connection information must be stored in the Director Server repository. Users can add any or all defined instances to their personal views within their clients. GoldenGate instances appear as *data sources* within the client diagram.

Use the **Data Sources** tab to manage information about GoldenGate instances.



To add a GoldenGate data source

Adding a GoldenGate instance as a data source adds information about its Manager process to the Director database repository.

1. Start the Manager process of the GoldenGate instance that you want to add as a data source.
2. At the bottom of the **Data Sources** tab, click **New/Clear**.

3. Under **Host Identity**, type the following:
   - **Fully Qualified Domain Name**: The fully qualified domain name of the host system, for example sys1.earth.company.com. This host must be registered with a Domain Name Server (DNS).
   - **Manager Port**: The port where Manager is running. Click **Check Connection** to make certain a connection can be made.
   - **Data Source Name**: A name for the GoldenGate instance (for example GGS1). This name is displayed as a data source in the Director Client interface.

     NOTE Once a GoldenGate instance has been added as a data source, the fully qualified domain name and port number cannot be changed without deleting it and then adding it back again. If that instance is being used as a data source in client diagrams, those diagrams will have to be recreated, and the logging and reporting streams will be reset. Attributes other than the fully qualified domain name and port number can be changed without affecting user diagrams.

4. Under **GoldenGate Info**, type or select the following:
   - **Host Operating System**: The type of operating system of the host. Select **WU** for Windows or UNIX, **NSK** for NonStop Server, or **IBM** for IBM z/OS and OS/390 systems running UNIX System Services.
   - **Database**: The type of database against which the GoldenGate instance is running.

Database Code	Database
DB2	DB2
MSSQL	Microsoft SQL Server
NSK	Enscribe or NonStop SQL
ODBC	ODBC data source (Open Database Connectivity compliant)
ORA	Oracle
SYB	Sybase
TERA	Teradata
VAM-Generic	Any database (other than Teradata) for which a vendor-access module is used to interface with the Extract process.

   - **GoldenGate Version**: The *X.x* version of GoldenGate that is installed on the system, for example 10.0. It is important to specify an accurate version so that the correct parameters are displayed in the Director Client parameter editor.

5. Under **Default DB Credentials**, enter the following:
   - **DSN**: The data source name of the database. Only required for ODBC databases; otherwise leave blank.
   - **Username**: The name of a default user for connecting to the database.

- **Password**: The password for the user.

6. Under **Access Control**, select the following:
   - **Owner**: One of the users listed on the **Accounts** tab that always will have full control of this data source. If no owner is specified, then all users can see and access the processes associated with this data source.
   - **Host is observable**: Select this option to allow other users to see this data source from their Director clients. They will be able to see the host, monitor the Manager and GoldenGate processes, and view the parameters. They can query for status and configuration information, but they cannot control processes or alter configurations.
7. Click **Save**. The new information appears in the **Manager Information** list.

To change a GoldenGate data source

Changing data source information in Director Server does not affect the underlying Manager process in any way.

1. In the **Manager Information** list of the **Data Sources** tab, select the GoldenGate data source that you want to change.
2. Change anything in the **Host Identity**, **GoldenGate Info**, **Default DB Credentials**, and **Access Control** groups except for the fully qualified domain name or port number.
3. Click **Save**.

To delete a GoldenGate data source

Deleting a data source removes its Manager information from the Director Server but does not delete the Manager process itself or affect it in any way. Client diagrams that use this data source no longer will have access to it.

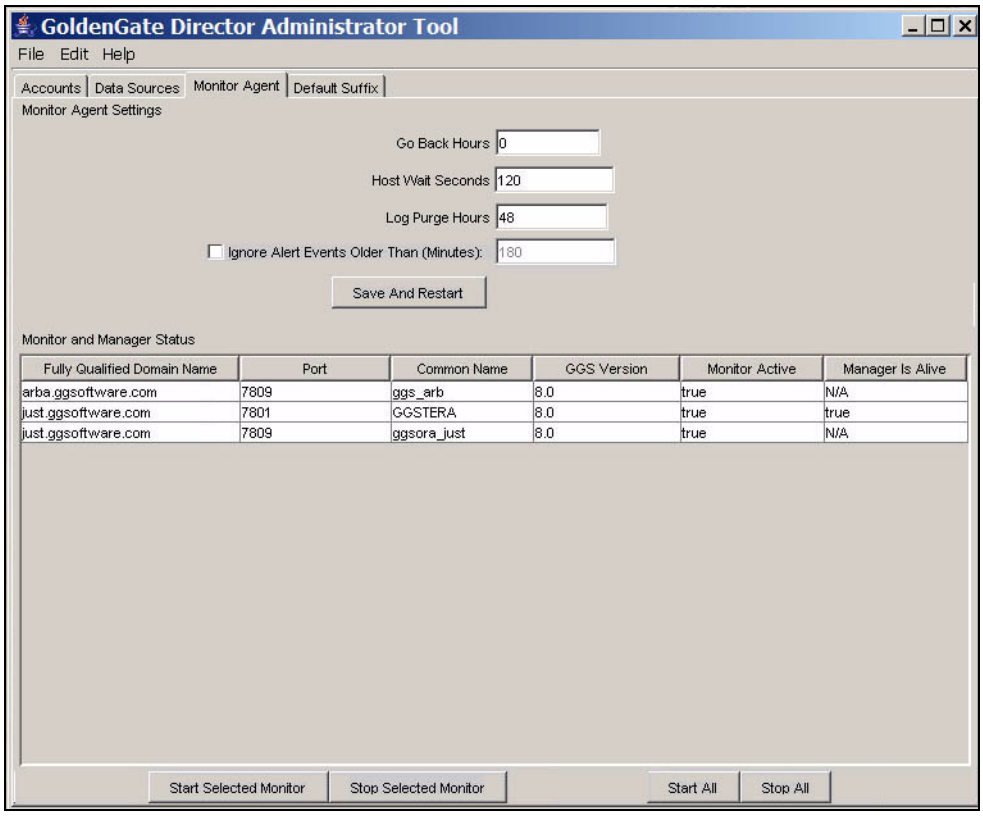
1. In the **Manager Information** list of the **Data Sources** tab, select the GoldenGate data source that you want to delete.
2. Click **Delete**.
3. Click **Yes** to confirm that you want to delete the instance.
4. Click **Save**.

Configuring the Monitor Agent

Director Server creates threads that monitor the Manager processes of the GoldenGate instances registered as data sources within Director Server. Each thread is called a *monitor*.

Use the **Monitor Agent** tab to:

- View Manager processing and monitoring status
- Configure monitor settings
- Start and stop monitor threads



To view Manager processing and monitoring status

1. To view the monitoring status of a GoldenGate data source, view the **Monitor Active** column of the **Monitor and Manager Status** list.
2. To find out whether or not a Manager process is running, view the **Manager is Alive** column of the **Monitor and Manager Status** list.
3. To refresh the **Monitor and Manager Status** list, click **Refresh List**. The status of the monitor agent and Manager process is reset every time the **Monitor Agent** tab is made active. It can take up to the amount of time specified with **Host Wait Seconds** to update the statistics. **Refresh List** starts that interval over again.

To configure monitor settings

1. In the **Go Back Hours** box, type the number of hours of recent event history to capture. Events are displayed in the GoldenGate Log in client diagrams. For example, you can capture the last five hours worth of events. To start monitoring from the present time, type 0.
2. In the **Host Wait Seconds** box, type the amount of time that Manager should wait for an event before sending a status report. The lower the value, the more reports that are sent. The higher the value, the fewer the reports, but the longer it will take for non-event updates to appear on client diagrams. The monitor agent poles the hosts at the specified interval to make certain the

Manager process is alive. If a problem at the level of the operating system were to occur so that GoldenGate could not write to the event log, the polling ensures that this status is reflected within the Director Web interface.

NOTE There is another type of communication between Director Server and hosts (besides Manager polling) that involves the immediate communication of changes made to GoldenGate processes. This communication process is not configurable.

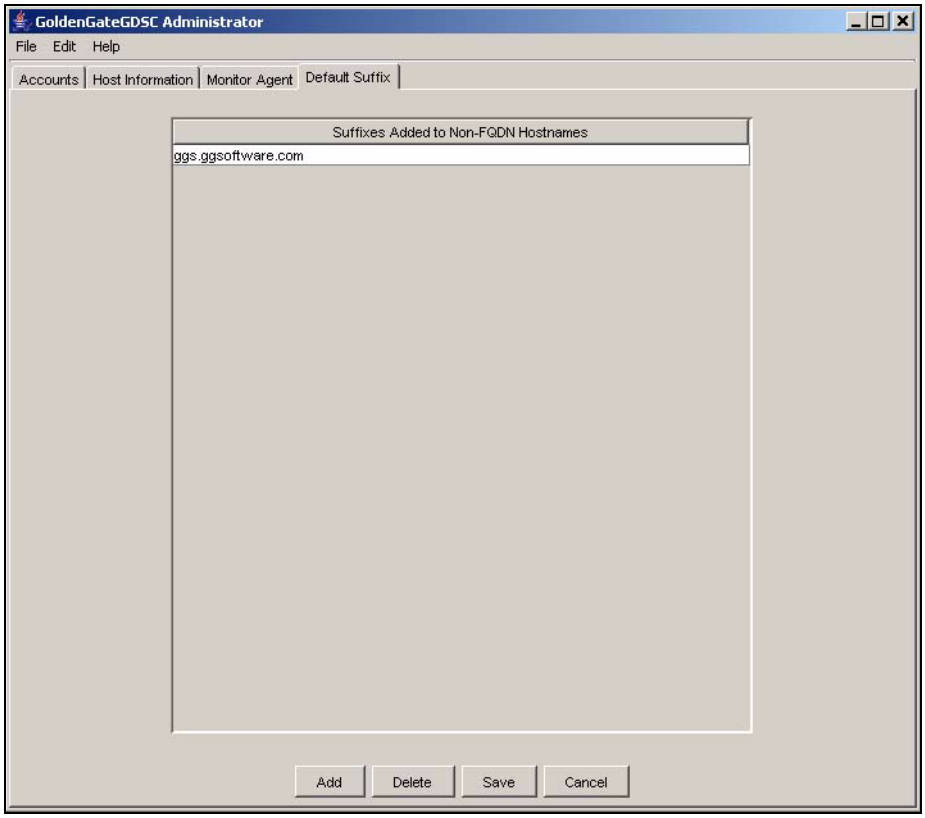
3. In the **Log Purge Hours** box, type the number of hours to keep information in the GoldenGate Log before purging the data. Purging the data maintains the logs at a reasonable size on disk.
4. Use **Ignore Alert Events Older Than (Minutes)** if using Director email alerts. It prevents duplicate alerts from being sent if Director Server is shut down and restarted. Specify the age, in minutes, of the oldest alert to keep.
5. To activate the values that you set, click **Save and Restart**, which restarts the log purge thread and the active monitor threads.

To start or stop monitor threads

- To start or stop monitoring of one or more GoldenGate data sources, use standard selection methods to select them in the **Monitor and Manager Status** list, and then click **Start Selected Monitor** or **Stop Selected Monitor**.
- To start or stop monitoring of all data sources in the list, click **Start All** or **Stop All**.

Setting default suffixes

GoldenGate Director Server always attempts to resolve host names or IP addresses into fully qualified domain names. Use the **Default Suffix** tab to add, change, or delete domain suffixes for Director Server to use when attempting to qualify a non-qualified host name that appears in a GoldenGate parameter file.



For example, if the domain is anycompany.com and the fully qualified domain name of a host is sysa.anycompany.com, you would put anycompany.com into the suffix table. For more complex domain setups, you could use something like office.anycompany.com and offsite.anycompany.com.

To add a domain suffix

1. Click **Add** to display a blank row in the suffixes list.
2. Type the new suffix in the row.
3. Click **Save**.

To change a domain suffix

1. In the suffixes list, select the one that you want to change.
2. Change the suffix as needed.
3. Click **Save**.

To delete a domain suffix

1. In the suffixes list, put the cursor in the row that you want to delete.
2. Click **Delete**.
3. Click **Yes** to confirm that you want to delete the suffix.
4. Click **Save**.

APPENDIX 1

Downloading the Java Runtime Environment (JRE)

The GoldenGate Director software and installer both rely on components in the Java Runtime Environment (JRE) version 6 (1.6). In many cases, this environment already exists because it was installed when the system was configured or when another program was installed. If the system where you are installing the server or client components does not have this environment, you can download it free of charge from the Sun Developer Network website.

1. Go to http://java.sun.com/javase/downloads/index.jsp.
2. Select version 6 (1.6.x) of the JRE (or the JDK, which includes the JRE). Do not use any other version.
3. Download the JRE that is appropriate for your operating system.
4. Follow the installation instructions provided with the JRE.
5. Write down the path to the JRE executable file.
6. Proceed to the next steps in "Verifying the JRE environment (UNIX only)".

Verifying the JRE environment (UNIX only)

After installing the JRE, follow these steps to make certain it was installed correctly and is recognized by the system.

UNIX

1. From the operating system's command line, issue the following command.

   ```
   java -version
   ```

2. This command verifies the version of Java that is recognized by the system. Make certain it is the version that you downloaded.

Windows

After installing the JRE, but before installing Director Server, the path to the JRE must be verified and created, if needed. In this procedure, you will:

- Verify the JRE version that is installed on the server machine.

- Verify that the JAVA_HOME system environment variable points to the JRE that you installed, or create the variable if absent.
- Verify that the JAVA_HOME path appears at the beginning of the Path system environment variable, and change it if needed. Programs such as Oracle place the path to their own JRE installations in the location expected by Director Server.

To verify the JRE version

1. From the **Start** menu, select **Run**.
2. In the **Run** dialog box, type cmd to run the Windows command console.
3. Issue the following command.

   ```
   java -version
   ```

4. Do one of the following:
   - If the results show that the version is 1.4.x, continue to the instructions in "Installing GoldenGate Director Server" on page 6.
   - If the results do *not* show version is 1.4.x, close the command interpreter and continue with the following steps in "To set the JAVA_HOME system variable".

To set the JAVA_HOME system variable

These steps verify, and then create or edit the JAVA_HOME system variable if needed, for the JRE that you installed.

1. On the desktop (Windows 2000) or in the **Start** menu (Windows XP), right-click **My Computer** and then click **Properties**.
2. Click the **Advanced** tab, and then click **Environment Variables**.

3. Under **System Variables**, look for the JAVA_HOME system variable.

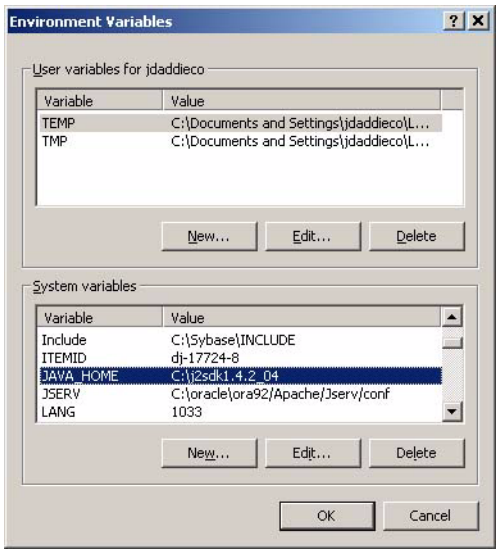


Figure 1 JAVA_HOME variable

The JAVA_HOME path should point to the location that you recorded when you installed the JRE. Typically it is a directory at the root of the C: drive that has a name similar to:

j2sdk<version>

4. Do one of the following:
   - If you see the JAVA_HOME system variable and it points to the correct location, leave the **Environment Variables** dialog box open and follow the instructions in "To set the JAVA_HOME system path" on page 27.
   - If a JAVA_HOME system variable *does not* exist, or if it points to the wrong location, continue to the next step.

5. Under **System Variables**, either click **New** to create a JAVA_HOME variable, or select the existing JAVA_HOME variable and click **Edit**. This opens the **New System Variable** or **Edit System Variable** dialog box.

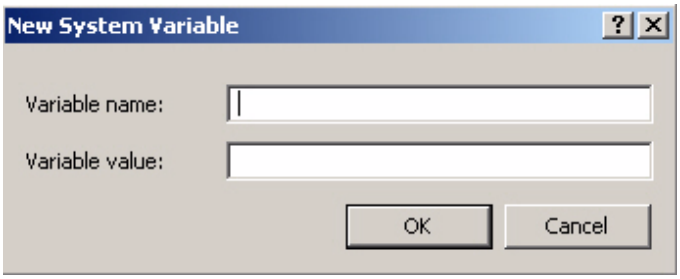


Figure 2 Creating the Java_Home variable

6. In the **Variable Name** box, type JAVA_HOME in capital letters.
7. In the **Variable Value** box, type the correct path to the JRE.
8. Click **OK** to set the path and close the dialog box.
9. Leave the **Environment Variables** dialog box open and follow the instructions in "To set the JAVA_HOME system path" on page 27.

To set the JAVA_HOME system path

These steps ensure that the JAVA_HOME path is in the expected location within the Path system variable.

1. In the **Environment Variables** dialog box, look for the Path variable under **System Variables**.

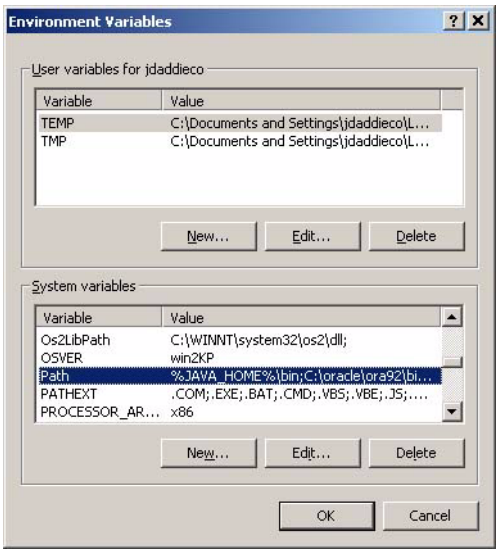


Figure 3 Path variable

2. Confirm that the path to JAVA_HOME shown below appears as the *first* path in the list of paths.

   %JAVA_HOME%\bin;

   Refer to the example in Figure 3 if needed.
3. Do one of the following:
   - If the JAVA_HOME path is the first path in the string, close the **Environment Variables** and **System Properties** dialog boxes and follow the instructions in "Installing GoldenGate Director Server" on page 6.
   - If the JAVA_HOME path is *not* the first path in the string, continue to the next step.
4. Under **System Variables**, double click the Path variable to open the **Edit System Variable** dialog box.

5. In the path string, locate the JAVA_HOME path, then cut and paste it (including the terminating semi-colon) to the *front* of the list.

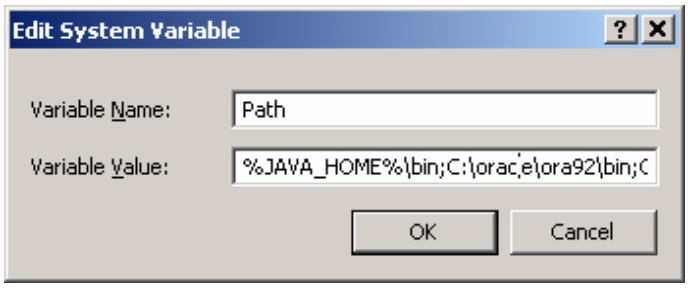


Figure 4 Changing the Path variable

6. Click **OK** to close the **Edit System Variable** dialog box.
7. Close the **Environment Variables** and **System Properties** dialog boxes.

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