

Oracle9i

Data Guard Broker

Release 1 (9.0.1)

June 2001

Part No. A88807-01

ORACLE®

Oracle9i Data Guard Broker, Release 1 (9.0.1)

Part No. A88807-01

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Preface

This document provides complete information about the Oracle9i Data Guard broker, a management and monitoring interface that helps you configure, monitor, and control an Oracle9i Data Guard configuration.

This preface contains these topics:

- Audience
- Organization
- Related Documentation
- Conventions
- Documentation Accessibility
- Accessibility of Code Examples in Documentation

Audience

Oracle9i Data Guard Broker is intended for database administrators (DBAs) and system administrators who want to use the Oracle9i Data Guard broker to automate many of the tasks involved in configuring and monitoring an Oracle9i Data Guard configuration.

The discussions herein assume that readers are already familiar with Oracle9i Data Guard, Oracle Enterprise Manager, and the network services provided by Oracle Net.

Organization

This document contains:

Chapter 1, "Oracle9i Data Guard Broker Concepts"

This chapter introduces Oracle9i Data Guard broker concepts and terminology.

Chapter 2, "Configuring Oracle9i Data Guard"

This chapter helps you set up and install Oracle9i Data Guard and configure a Data Guard configuration. It also describes states, status, and properties of resources.

Chapter 3, "Database Resources"

This chapter describes configuring and using the database resource object.

Chapter 4, "Using Oracle9i Data Guard Manager"

This chapter shows how to use the Data Guard Manager graphical user interface to create, manage, and monitor a broker configuration.

Chapter 5, "Using the Data Guard Command-Line Interface"

This chapter describes how to use the Data Guard command-line interface to create, manage, and monitor a broker configuration.

Chapter 6, "Data Guard Command-Line Interface Reference"

This chapter provides reference information for the DGMGRL command-line interface.

Appendix A, "Oracle9i Data Guard Error Messages"

This appendix lists and describes messages returned by Oracle9i Data Guard.

Glossary

Related Documentation

Refer to the following documentation for more information about Oracle9i Data Guard:

- For more information about Oracle9i Data Guard, see *Oracle9i Data Guard Concepts and Administration*
- For more information about updates to the software, access to online documentation, and other release-specific information, see the Oracle9i release notes specific to your operating system.
- For installation, deinstallation, and upgrade instructions, see the Oracle9i installation guide specific to your operating system.
- For more information about Oracle9i Data Guard Manager, see the online help and quick tour available with this graphical user interface. To access the online help topics, click Help on the menu bar in Data Guard Manager.

Refer to the following documentation for information about related products:

- For more information about the Oracle database server and how it works, see *Oracle9i Database Concepts*.
- For more information about Oracle Net, see *Oracle Net Services Administrator's Guide*.
- For more information about Oracle Enterprise Manager, see the Oracle Enterprise Manager product documentation.

Conventions

This section describes the conventions used in the text and code examples of this documentation set. It describes:

- Conventions in Text
- Conventions in Code Examples

Conventions in Text

We use various conventions in text to help you more quickly identify special terms. The following table describes those conventions and provides examples of their use.

Convention	Meaning	Example
Bold	Bold typeface indicates terms that are defined in the text or terms that appear in a glossary, or both.	When you specify this clause, you create an index-organized table .
<i>Italics</i>	Italic typeface indicates book titles or emphasis.	<i>Oracle9i Database Concepts</i> Ensure that the recovery catalog and target database do <i>not</i> reside on the same disk.
UPPERCASE monospace (fixed-width font)	Uppercase monospace typeface indicates elements supplied by the system. Such elements include parameters, privileges, datatypes, RMAN keywords, SQL keywords, SQL*Plus or utility commands, packages and methods, as well as system-supplied column names, database objects and structures, usernames, and roles.	You can specify this clause only for a NUMBER column. You can back up the database by using the BACKUP command. Query the TABLE_NAME column in the USER_TABLES data dictionary view. Use the DBMS_STATS.GENERATE_STATS procedure.
lowercase monospace (fixed-width font)	Lowercase monospace typeface indicates executables, filenames, directory names, and sample user-supplied elements. Such elements include computer and database names, net service names, and connect identifiers, as well as user-supplied database objects and structures, column names, packages and classes, usernames and roles, program units, and parameter values. Note: Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.	Enter sqlplus to open SQL*Plus. The password is specified in the orapwd file. Back up the datafiles and control files in the /disk1/oracle/dbs directory. The department_id, department_name, and location_id columns are in the hr.departments table. Set the QUERY_REWRITE_ENABLED initialization parameter to true. Connect as oe user. The JRepUtil class implements these methods.
lowercase monospace (fixed-width font) <i>italic</i>	Lowercase monospace italic font represents placeholders or variables.	You can specify the <i>parallel_clause</i> . Run <i>Uold_release</i> .SQL where <i>old_release</i> refers to the release you installed prior to upgrading.

Conventions in Code Examples

Code examples illustrate SQL, PL/SQL, SQL*Plus, or other command-line statements. They are displayed in a monospace (fixed-width) font and separated from normal text as shown in this example:

```
SELECT username FROM dba_users WHERE username = 'MIGRATE';
```


The following table describes typographic conventions used in code examples and provides examples of their use.

Convention	Meaning	Example
[]	Brackets enclose one or more optional items. Do not enter the brackets.	DECIMAL (<i>digits</i> [, <i>precision</i>])
{ }	Braces enclose two or more items, one of which is required. Do not enter the braces.	{ENABLE DISABLE}
	A vertical bar represents a choice of two or more options within brackets or braces. Enter one of the options. Do not enter the vertical bar.	{ENABLE DISABLE} [COMPRESS NOCOMPRESS]
...	Horizontal ellipsis points indicate either: <ul style="list-style-type: none"> ■ That we have omitted parts of the code that are not directly related to the example ■ That you can repeat a portion of the code 	CREATE TABLE ... AS <i>subquery</i> ; SELECT <i>col1</i> , <i>col2</i> , ... , <i>coln</i> FROM employees;
.	Vertical ellipsis points indicate that we have omitted several lines of code not directly related to the example.	
Other notation	You must enter symbols other than brackets, braces, vertical bars, and ellipsis points as shown.	acctbal NUMBER(11,2); acct CONSTANT NUMBER(4) := 3;
<i>Italics</i>	Italicized text indicates placeholders or variables for which you must supply particular values.	CONNECT SYSTEM/ <i>system_password</i> DB_NAME = <i>database_name</i>
UPPERCASE	Uppercase typeface indicates elements supplied by the system. We show these terms in uppercase in order to distinguish them from terms you define. Unless terms appear in brackets, enter them in the order and with the spelling shown. However, because these terms are not case sensitive, you can enter them in lowercase.	SELECT last_name, employee_id FROM employees; SELECT * FROM USER_TABLES; DROP TABLE hr.employees;

Convention	Meaning	Example
lowercase	<p>Lowercase typeface indicates programmatic elements that you supply. For example, lowercase indicates names of tables, columns, or files.</p> <p>Note: Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.</p>	<pre>SELECT last_name, employee_id FROM employees; sqlplus hr/hr CREATE USER mjones IDENTIFIED BY ty3MU9;</pre>

Documentation Accessibility

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Accessibility of Code Examples in Documentation

JAWS, a Windows screen reader, may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, JAWS may not always read a line of text that consists solely of a bracket or brace.

Oracle9i Data Guard Broker Concepts

This chapter describes the Oracle9i Data Guard broker, its architecture and components, and how it automates and simplifies the creation, control, and monitoring of a Data Guard configuration.

The following sections introduce Data Guard broker terminology and concepts:

- Section 1.1, "Oracle9i Data Guard Broker Overview"
- Section 1.2, "Data Guard Broker Management Model"
- Section 1.3, "Data Guard Broker Architecture and Components"
- Section 1.4, "Benefits of the Data Guard Broker"
- Section 1.5, "Oracle9i Data Guard Prerequisites"

See Also: *Oracle9i Data Guard Concepts and Administration* for complete information about Oracle9i Data Guard concepts and terminology.

1.1 Oracle9i Data Guard Broker Overview

The Oracle9i Data Guard broker is a distributed management framework that automates and simplifies most of the complex operations required to create, control, and monitor a Data Guard configuration.

The following list provides examples of some of the operations that the broker automates and simplifies:

- Creation of local and remote standby databases
- Configuration, control, and monitoring of log transport services
- Configuration, control, and monitoring of log apply services

You can perform all of these operations locally or remotely, using Oracle9i Data Guard Manager, which is the broker's graphical user interface (GUI). With the Data Guard command-line interface (CLI), you can perform all of these operations except for the creation of standby databases.

The creation of local or remote standby databases, which is a very complex operation, is greatly simplified through a wizard that is part of Data Guard Manager. The wizard:

- Automates the creation of the standby control file, the standby initialization parameter file, and the standby datafiles
- Makes all Oracle Net configuration changes necessary to support log transport services

The broker allows you to quickly and easily verify that log transport services and log apply services are configured and functioning properly. For example, the broker allows you to easily view information such as the number of logs ready to be shipped from the primary site, the number of logs to be applied on the standby site, and other data specific to the standby database.

The ability to monitor local and remote databases and to respond to events is also significantly enhanced by the broker through its health check mechanism and its interaction with the Oracle Enterprise Manager event management system.

See Also: *Oracle9i Data Guard Concepts and Administration* for a complete description of the discrete steps that comprise the creation of a standby database and the other monitoring and control operations that have been automated or simplified by the broker.

1.2 Data Guard Broker Management Model

The broker simplifies the management of a Data Guard environment by performing operations against three logical objects:

- Configuration
- Site
- Database resource

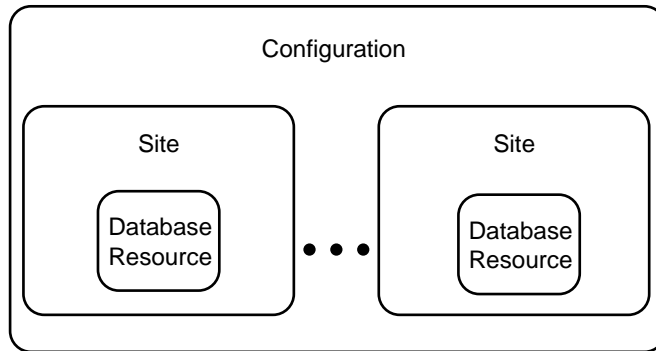
These objects represent the physical configuration, site, and database entities in the actual Data Guard configuration.

The broker currently supports Data Guard configurations that contain one primary and one standby database. A supported broker configuration therefore consists of

one configuration object, which contains two site objects. One of these site objects will contain a database resource object that represents a primary database and the other will contain a database resource object that represents a standby database.

Figure 1–1 shows the hierarchy of these objects.

Figure 1–1 Hierarchy of Objects Managed by the Data Guard Broker



A **configuration** object is at the highest level in the hierarchy of objects managed by the broker. A configuration object is a named collection of sites and the resource objects that those sites contain.

A **site** object is at the middle level in the hierarchy of objects managed by the broker. A site object is a named collection of resource objects that reside on a single host. The broker currently supports one type of resource object, and that is the database resource object.

A **database resource** object is at the lowest level in the hierarchy of objects managed by the broker. It is a named object that corresponds to a primary or standby database instance. The broker uses this object to manage and control the state of a single database.

Because these objects are connected in a hierarchy, you can perform complex operations on a single object or on all objects in an entire configuration with a single mouse click or command. For example, you can bring each database resource and site in a configuration online one at a time, or bring them all online at the same time in a single step by bringing the configuration itself online.

See also: Chapter 2 for more information about how to control an object through its states and properties

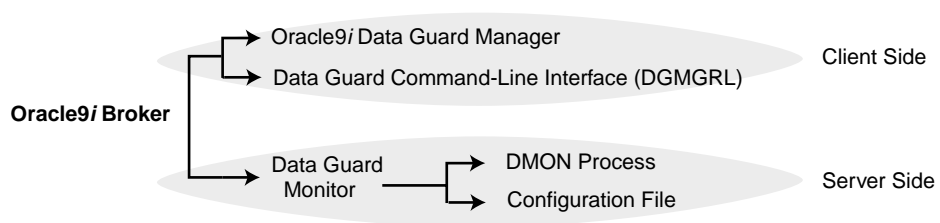
1.3 Data Guard Broker Architecture and Components

The Oracle9i Data Guard broker provides the following components:

- Oracle9i Data Guard Manager
- Data Guard Command-Line Interface (DGMGRL)
- Data Guard Monitor

Figure 1–2 shows the components of the broker.

Figure 1–2 Components of Oracle9i Data Guard Broker



1.3.1 Data Guard Broker User Interfaces

You can use either of the broker's user interfaces to create a broker configuration, and to control and monitor the configuration from any host in the configuration. The broker provides two user interfaces:

- Oracle9i Data Guard Manager
- Data Guard Command-Line Interface (DGMGRL)

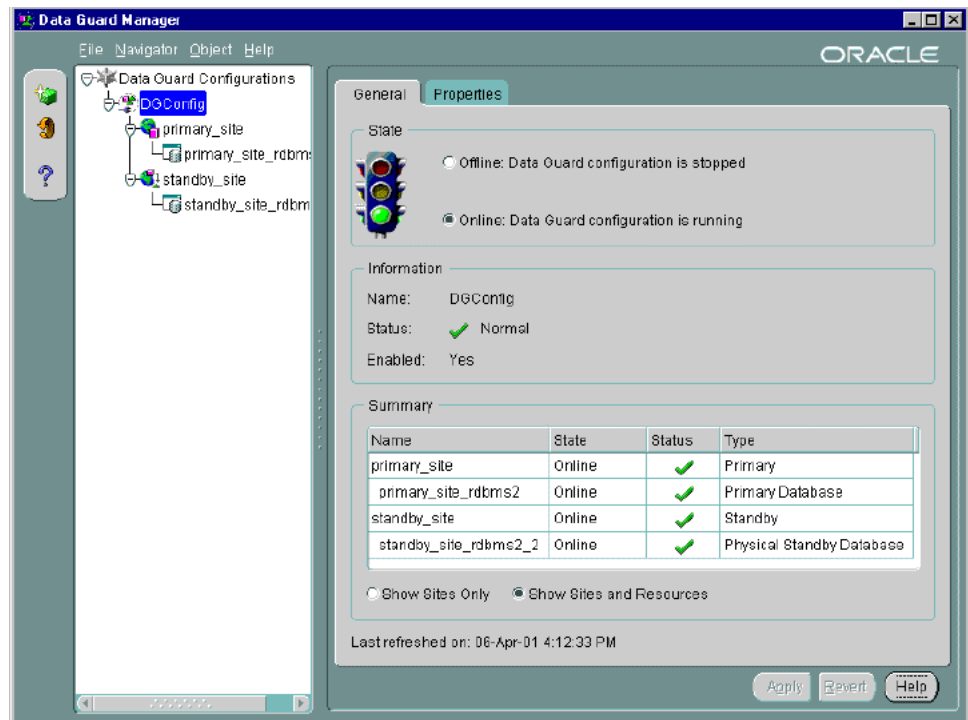
1.3.1.1 Oracle9i Data Guard Manager

The Data Guard Manager is a graphical user interface that works with the broker and Oracle Enterprise Manager to automate and simplify the management of a Data Guard configuration. Because it is integrated with Oracle Enterprise Manager, Data Guard Manager allows you to manage your configuration using a familiar interface and event management system.

Data Guard Manager includes:

- Wizard-driven creation of local and remote standby databases.
 - Wizard-driven import of existing primary and standby databases into a broker configuration.
 - Complete monitoring and proactive event reporting through e-mail or pagers.
- Figure 1–3 shows the general page from the Oracle9i Data Guard Manager console.

Figure 1–3 Oracle9i Data Guard Manager Console



See Also: The Oracle9i Data Guard Manager online help and quick tour

1.3.1.2 Data Guard Command-Line Interface (DGMGRL)

The Data Guard command-line interface (CLI) allows you to control and monitor a Data Guard configuration from the CLI prompt or within scripts. You can perform

most of the activities required to manage and monitor the objects in the configuration using the CLI.

The following example lists the available commands:

```
DGMGRL> HELP
The following commands are available:
quit
exit
show          See "help show" for syntax
enable        See "help enable" for syntax
disable       See "help disable" for syntax
help          [<command>]
connect       <user>/<password> [@<connect>]
alter         See "help alter" for syntax
create        See "help create" for syntax
remove       See "help remove" for syntax
shutdown
startup
```

This manual provides examples and reference information for the Data Guard command-line interface.

See Also: Chapter 6 for complete reference information for the Data Guard command-line interface

1.3.2 Data Guard Monitor

The configuration, control, and monitoring functions of the broker are implemented by server-side software and configuration files that are maintained on each site that the broker manages. The software is called the Data Guard monitor.

The following sections describe how the Data Guard monitor interacts with the Oracle server and with remote Data Guard monitors to manage the sites in a broker configuration.

1.3.2.1 Data Guard Monitor (DMON) Process

The Data Guard monitor process (DMON) is an Oracle background process that runs on every site that is managed by the broker. When you start the Data Guard monitor, a portion of the system global area (SGA) is allocated and a DMON process is created.

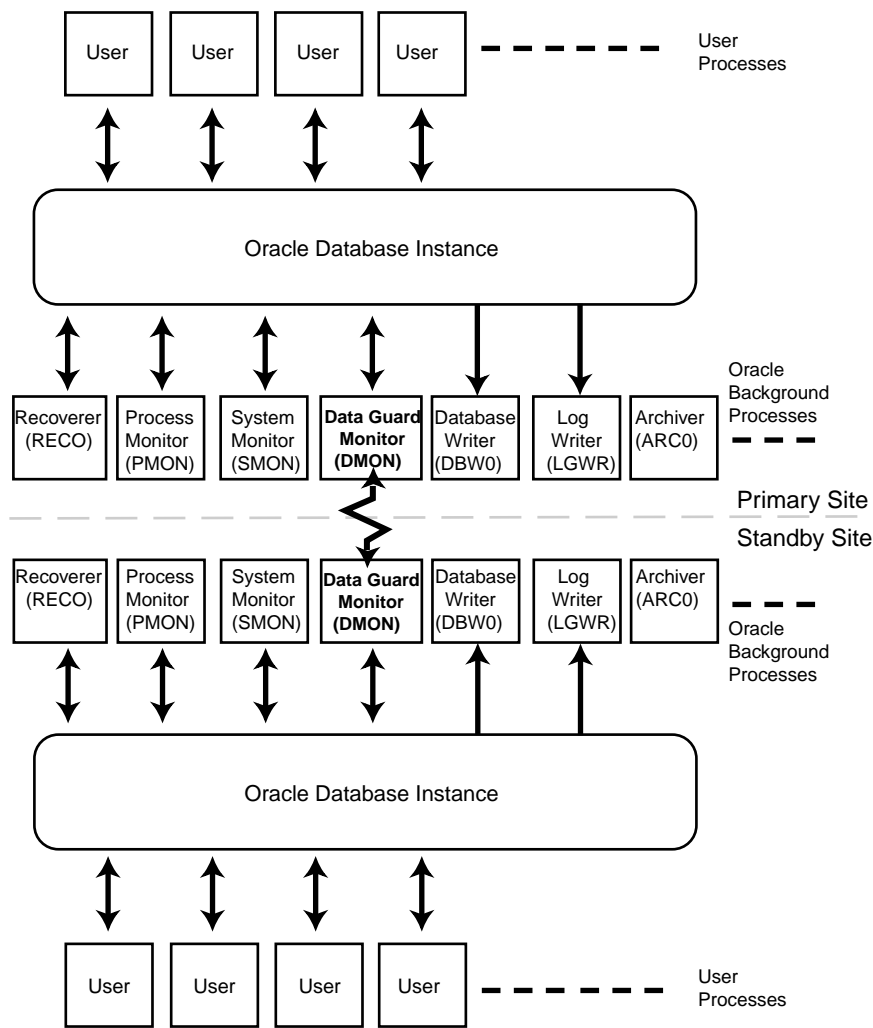
When you use Data Guard Manager or the CLI to manage an object, the DMON process is the server-side component that interacts with the local instance and the

DMON processes running on other sites to perform the requested function. The DMON process is also responsible for monitoring the health of the broker configuration and for ensuring that every site has a consistent copy of the binary configuration files in which the DMON process stores its configuration data.

See Also: *Oracle9i Database Concepts* for more information about the memory structures and processes that are used to implement an Oracle database instance

Figure 1-4 shows the DMON process among the several background processes that perform maintenance work for the Oracle database server.

Figure 1–4 Oracle9i Broker Background Process



The zigzag arrow in the center of Figure 1–4 represents the two-way Oracle Net communication channel that exists between the DMON processes on sites in the same broker configuration.

This two-way communication channel is used to pass requests between sites, and to monitor the health of all of the sites in the broker configuration.

1.3.2.2 Configuration Management

The DMON process maintains persistent configuration data in a binary **configuration file** on each enabled site in the broker configuration. This data is managed transparently by the DMON process to ensure that the configuration information is kept consistent across all of the sites.

The broker uses the data in the configuration file to configure and start the site and resource objects.

1.4 Benefits of the Data Guard Broker

Through the broker's easy-to-use interfaces, you can automate the tasks required to configure and control sites and database resources in a broker configuration. The broker provides an efficient and effective solution for managing a configuration, with the following benefits:

Enhanced high availability and disaster protection.	The broker automates the tasks required to configure and monitor a primary and standby database configuration. The broker's easy-to-use interfaces enhance the high availability and disaster protection capabilities that are inherent in an Oracle9i Data Guard configuration.
Centralized, uniform management interface.	The broker allows DBAs to choose from two different interfaces to configure databases into a single logical configuration: Oracle9i Data Guard Manager graphical user interface or the Data Guard command-line interface.
Automated creation and configuration of physical standby databases.	Data Guard Manager provides a wizard that automatically creates and configures the standby database, including creation of the standby control file, initialization parameter file, and the standby datafiles. Although the CLI interface cannot automatically create a new standby database, the CLI can configure and monitor an existing standby database.
Automated configuration of log transport services and log apply services.	The broker allows you to monitor and control all of the aspects of the Data Guard configuration, including the primary and standby databases, log transport services, and log apply services. The standby site accepts redo logs shipped from the primary site and log apply services apply changes to the standby copy of the database.
Simplified and extended management.	You can coordinate resource state transitions and modify resource properties while ensuring that changes are made to all of the sites in the configuration.

Protection through built-in monitoring and alert and control mechanisms to detect problems.	The broker provides built-in validation that monitors the <i>health</i> of all of the sites in the configuration. You can update parameters for the Data Guard environment, and monitor and control all critical resources from a centralized point.
Unattended operation.	To accomplish unattended operation so that processing can continue without human intervention, the DBA can use scripting through the CLI or by implementing events using Data Guard Manager.
Distributed monitoring and alert and control mechanisms from a single system.	The broker automates and centralizes the management and operational tasks a DBA must perform across multiple sites in a Data Guard configuration. The broker monitors the status of the entire configuration, including all of the sites and resources in the Data Guard configuration
Dynamic altering of properties and states.	In addition to adding and removing sites and resources, you can change properties and operational states of objects in the configuration without incurring any downtime.

1.5 Oracle9i Data Guard Prerequisites

Oracle9i Data Guard is installed automatically when you install the Oracle9i Enterprise Edition database server. You must install the Oracle9i Enterprise Edition database server on each site where you plan to manage broker configurations.

You must install Oracle9i Data Guard Manager separately. It is installed with the Oracle Enterprise Manager software.

The following conditions must be true before you can use the broker:

- The primary and standby databases must be running Oracle9i and installed in a single-instance environment (not an Oracle Real Applications Clusters environment). The database server must be licensed for Oracle9i Enterprise Edition.
- The value of the `DRS_START` parameter must be `TRUE`. See Section 2.2 for more information.
- Oracle Net network files must be set up on the primary database site and on the standby database site if you configure an existing standby database into the broker configuration. Otherwise, Data Guard Manager automatically sets up the network files when it creates a standby database.
- The primary instance must be opened in archivelog mode. If there is an existing standby instance, it must be mounted.

- If you plan to configure an existing standby database into the broker configuration, you must set up a remote login password file to enable management of a remote standby database. Otherwise, Data Guard Manager automatically sets up the remote password file when it creates a standby database.

See Also: Section 2.2 for more information about preparing and starting Oracle9i Data Guard. See *Oracle9i Data Guard Concepts and Administration* for more information about setting up the network files.

Configuring Oracle9i Data Guard

This chapter contains the following sections:

- Section 2.1, "Configuration Support"
- Section 2.2, "Starting the Data Guard Monitor"
- Section 2.3, "Management Cycle of a Broker Configuration"
- Section 2.4, "Enable and Disable Operations"
- Section 2.5, "States"
- Section 2.6, "State Transitions"
- Section 2.7, "Status"
- Section 2.8, "Properties"

2.1 Configuration Support

The most common and currently supported **Data Guard configuration** is a two-site configuration consisting of a primary database and a standby database at a location that can be local to, or remote from, the primary site.

A supported Data Guard configuration contains the following components:

- Primary database
- Standby database
- Oracle Net network configuration that defines a connection between the primary and standby database instances
- Archived redo log destination parameters and configuration properties
- Log transport services that archive the redo logs to the standby databases

- Log apply services that apply the redo log files as they arrive from the primary database
- Physical systems that host the primary and standby database instances

The standby database is updated by archived redo logs that are shipped automatically from the primary database by means of log transport services. The archived redo logs contain a record of all of the database changes except for *unrecoverable* or *unlogged* changes. On the standby site, log apply services apply the archived redo logs to maintain synchronization with the primary database. Thus, the standby database can take over operations if the primary database becomes unusable.

A **broker configuration** is a *logical* grouping of the sites and database resources (including log transport services and log apply services) in a Data Guard configuration. The broker implements the DMON process that configures and maintains the broker configuration components as a unified group of resource objects that you can manage and monitor as a single unit. Thus, when you enter a command through Data Guard Manager or the CLI, the appropriate DMON process:

- Carries out your request on its local database resource object and site object
- Updates its local configuration file
- Communicates with the DMON process on the other site

The broker carries out your requests against a hierarchy of objects that are dependent upon one another. For example, a database resource is dependent upon the site in which the resource resides, and the site is dependent upon the configuration. Thus, a site is the parent for a database resource and the configuration is the parent for a site.

This is important because when you request to take an object offline, its dependents will also be taken offline. For example, if a site is put in an offline state, the database that is dependent on the site will also be put in an offline state. Similarly, if the configuration is offline, all of the sites and resources in the configuration are also offline because all are logically dependent on the configuration. It is in this manner that the DMON process allows you to create, monitor, and control all of the aspects of the configuration together as a unit.

Figure 2–1 shows a broker configuration with the Data Guard monitor (DMON) process running on each site.

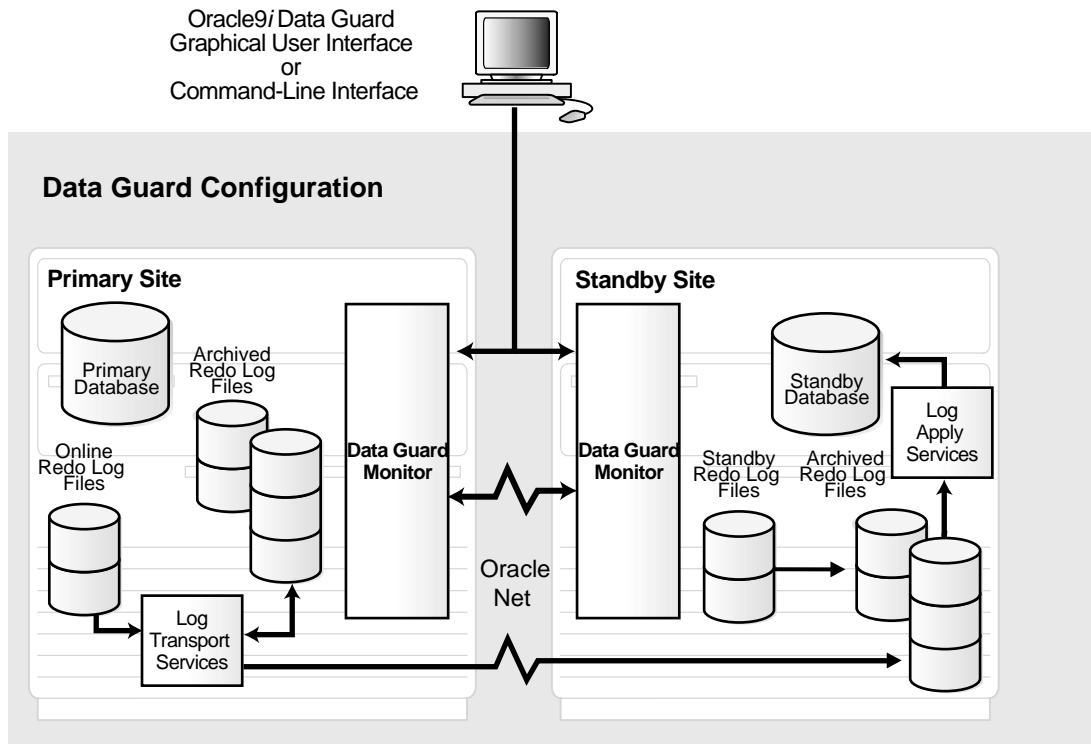
Figure 2–1 Oracle9i Data Guard Broker Configuration

Table 2–1 provides a comparison of configuration management with and without the broker.

Table 2–1 Configuration Management With and Without the Broker

Configuration Management		
	With the Broker	Without the Broker
General	Provides primary and standby database management as one unified configuration.	You must manage the primary and standby databases separately.
Standby Database Creation	Provides the Data Guard Manager wizard that automates and simplifies the complex steps required to create a configuration with a single Oracle database instance on each site, including creating the standby controlfile and initialization parameter file.	You must manually: <ul style="list-style-type: none"> ■ Copy the database files to the standby site. ■ Create a controlfile on the standby site. ■ Create initialization parameter files on the standby site.
Configuration	Provides multisite configuration and management from a single site and automatically unifies all of the sites and resources in the broker configuration.	You must manually: <ul style="list-style-type: none"> ■ Set up log transport services and log apply services on each site in the configuration. ■ Manage the primary database and standby database individually.
Control	<ul style="list-style-type: none"> ■ Automatically opens the primary database, mounts the standby database, and starts log transport services and log apply services. ■ Provides mouse-driven database state changes and a unified presentation of configuration and database status. ■ Provides mouse-driven property changes. 	You must: <ul style="list-style-type: none"> ■ Use SQL*Plus commands to manage database states. ■ Coordinate sequences of multiple commands across multiple sites to execute operations.
Monitoring	<ul style="list-style-type: none"> ■ Provides continuous monitoring of the configuration health, database health, and other runtime parameters. ■ Provides a unified updated status through the database alert log and Data Guard configuration log. ■ Provides an integrated tie-in to Oracle Enterprise Manager events. 	You must: <ul style="list-style-type: none"> ■ Monitor the status and runtime parameters using fixed views on each site—there is no unified view of status for all of the sites and resources in the configuration. ■ Provide a custom method for monitoring events.

2.2 Starting the Data Guard Monitor

After installing the Oracle9i database server on each site in the configuration, the `DRS_START` parameter must be set to `TRUE` on each site to enable the DMON processes.

By default, the `DRS_START` parameter is initially set to `FALSE` in the initialization parameter file. However, its runtime value is determined as follows:

- If you are using Data Guard Manager, the `DRS_START` parameter is set to `TRUE` automatically.
- If you are using the CLI, you must explicitly set the `DRS_START` parameter to `TRUE`; otherwise, the DMON process will not start. You can set the `DRS_START` parameter either before or after you start the Oracle instance:
 - Before starting the Oracle instance, add the `DRS_START=TRUE` record to the initialization parameter file.
 - After starting the Oracle instance, set `DRS_START=TRUE` using the SQL `ALTER SYSTEM` statement.

```
SQL> ALTER SYSTEM SET DRS_START=TRUE;
```

```
System altered.
```

```
SQL> SHOW PARAMETER DRS_START
```

NAME	TYPE	VALUE

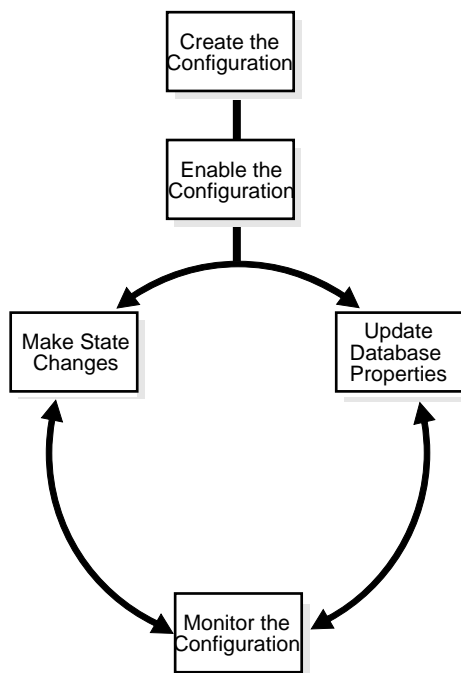
drs_start	boolean	TRUE

Whether you use Data Guard Manager or the CLI, Oracle Corporation recommends that you edit the initialization parameter file on both sites to set the `DRS_START=TRUE` parameter. Doing this ensures that the DMON processes will start automatically the next time you start the database.

2.3 Management Cycle of a Broker Configuration

The broker helps you to create a new configuration or manage an existing configuration. Figure 2-2 shows the life cycle of a broker configuration.

Figure 2–2 *Life Cycle of a Broker Configuration*



Create the broker configuration

When using Data Guard Manager, the Create Configuration Wizard can either add an existing standby database into the configuration or create a new standby database and add it to the configuration.

When using the CLI, the primary database and a standby database must already exist. You construct the standby database from backups of the primary database control files and datafiles, and then prepare it for recovery.

See Also: Chapter 4 and Chapter 5 which describe the preparation requirements if you are using Data Guard Manager or the CLI, respectively

Enable the broker configuration

A broker configuration, when first created, is in a disabled condition. This means its constituent objects are not under the control of the Data Guard monitor. When you finish configuring the sites and resources into a broker configuration, you must

enable the configuration to allow the Data Guard monitor to manage the configuration.

You can enable:

- The entire configuration, including all of its sites and resources
- A standby site, including the standby database resource
- A database resource

Make state changes to the broker configuration, as needed

The Data Guard monitor transitions the configuration, sites, and database resources into an online state, by default, the first time that you enable the configuration.

At any time, you can issue a single command through Data Guard Manager or the CLI to change the state of the entire configuration, or of a single site or database resource. For example, you could bring the primary database resource into an online, paused state to temporarily stop archiving logs to the standby database. Then, you simply issue another command to return the database resource to a full online state.

Update database properties, as needed

The Data Guard monitor allows you to set database properties that map directly to several of the database initialization parameters. You can change these properties to dynamically control such things as log archival, file management, log switching, and more.

See Also: Chapter 3 for complete information about database properties

Monitor the configuration

You can check the health of the configuration, display and update the properties of the database resources, set Oracle Enterprise Manager events, and change the state to online or offline, as required. You can also coordinate failover and switchover operations outside of the broker.

See Also: Chapter 4 and Chapter 5 for scenarios that show examples using Data Guard Manager and the CLI, respectively

2.4 Enable and Disable Operations

A key concept of management with the broker is the notion of enabling and disabling objects in a broker configuration. The enable and disable operations are relevant only to the objects in a broker configuration; you cannot perform these operations on the physical components of a Data Guard configuration. This is because when you enable or disable an object in the broker configuration, you are effectively enabling or disabling the ability of the Data Guard monitor (DMON) process to:

- Manage and monitor the specified configuration, site, or database resource object.
- Manage the configuration information in the Data Guard configuration file on each site.

However, enabling or disabling a broker configuration does not affect services and operations in the actual Data Guard configuration. For example, when you disable a *broker configuration*, log transport services and log apply services in the *Data Guard configuration* continue to function unchanged, but you can no longer manage them through the broker interfaces.

In addition, disabling an object *does not* remove or delete it from the Data Guard configuration file. You can re-enable your ability to manage with the broker using the CLI `ENABLE CONFIGURATION`, `ENABLE SITE`, or `ENABLE RESOURCE` commands, or the `Enable/Disable` option in Data Guard Manager.

2.5 States

While enabled, a broker configuration, site, or database resource can be in one of two states: offline or online. The first time that you enable the broker configuration, each object is automatically entered into the following **default state**:

- The broker configuration is in an online state.
- The primary and standby sites are in online states.
- The primary database resource is in an online state, started and opened in read/write mode.
- The standby database resource is in an online state, started and mounted.
- Log transport services and log apply services are online and started.

When the broker configuration is enabled, the configuration and all of the sites and database resources are also brought online automatically. In addition, note that the

database resources' online states are further qualified by substates (opened in read/write mode and started and mounted).

The database resource substates are related to the role (primary or standby) in which the site is currently running. By default, the first time you enable the configuration and all of the objects are brought online, the database resources are put into the following substates:

- For a primary database, the default is to start the database instance and open it in read/write mode with log transport services started (archiving redo logs to the standby database). This is referred to as the `READ-WRITE-XPTON` substate in the CLI. In Data Guard Manager, you can put the database in this state by selecting **Online** on the primary database property page.
- For a standby database, the database instance is started and mounted. Log apply services apply redo logs to the standby database. This is referred to as the `PHYSICAL-APPLY-ON` substate in the CLI. In Data Guard Manager, you can put the database in this state by selecting **Online** on the standby database property page.

See Also: Chapter 3 for complete information about the online substates for the primary and standby database resources

Running the broker configuration using the *initial* default online states described in this section will be fine, most of the time. However, there may be times when you want to change the state of one or more objects in the broker configuration. Section 2.6 describes state transitions in more detail.

2.6 State Transitions

When enabled, you can transition any object in the broker configuration into another valid state (or substate if it is a database resource), provided such a transition is allowed for the object. When you change the state of an object, you are effectively changing its current run-time state, which is sometimes referred to as its **intended state**.

State transitions occur when:

- You explicitly cause a state change (by selecting the online or offline options in Data Guard Manager or by using the CLI `ALTER` command) to bring the configuration, sites, or resources online or take them offline as necessary.
- You enable the configuration, sites, or resources (using the Data Guard Manager `Enable/Disable` option or using the CLI `ENABLE` command).

When a state change occurs, it only affects the current (intended) runtime state for the object; the default state is not altered. (Section 2.5 described the default state, which is the initial runtime state of an object when the broker configuration is first enabled.)

State transitions may result in a state change to multiple objects. You can request a state transition that affects only one resource, or you can change the state of the broker configuration and affect all of the sites and resources in the configuration. For example, when you change the broker configuration into an offline state, the configuration and all of its dependent sites and resources are also taken offline. The databases in the configuration will be closed and not mounted, log transport services will stop sending archived redo logs, and log apply services will stop applying redo logs to the standby database.

Note: Taking the configuration, primary site, or primary database resource offline will perform an immediate shutdown and startup (nomount) of the primary database.

You can see information about the default and intended (current runtime) states by issuing the CLI `SHOW` commands or viewing the General property page in Data Guard Manager. In Example 2–1, the `SHOW RESOURCE VERBOSE` command displays the default and intended states and other information for the `Sales_db` database resource on site `Boston`. Notice that although the configuration was initially enabled in the `READ-WRITE-XPTON` (default state), its current runtime (intended) state is `READ-WRITE` with log transport services stopped.

Example 2–1 Showing Default and Intended States with the CLI

```
DGMGRL> SHOW RESOURCE VERBOSE Sales_db ON SITE Boston;
```

The CLI returns the following information:

```
Resource
  Name:                Sales_db
  Manager Type:        internal
  Standby Type:        PHYSICAL
Online States:
  ONLINE
  PHYSICAL-APPLY-READY
  PHYSICAL-APPLY-ON
  READ-ONLY
  READ-WRITE
  READ-WRITE-XPTON
```



```

Properties:
    INTENDED_STATE           = 'READ-WRITE'
    ENABLED                  = 'yes'
    STATUS                   = 'SUCCESS'
    IGNORE_STATUS            = 'no'
    LogArchiveDestOptions    = ''
    ArchiveDestDependency    = ''
    StandbyArchiveDest       = ''
    LogArchiveTrace          = '127'
    FalServer                = ''
    FalClient                = ''
    StandbyFileManagement    = 'Manual'
    ArchiveLagTarget         = '0'
    PrimaryLogSeqNumbers     = '(monitor)'
    PrimaryLogTimes          = '(monitor)'
    SendQEntries             = '(monitor)'
    LogXptStatus             = '(monitor)'
    SbyLogSeqNumbers         = '(monitor)'
    SbyLogTimes              = '(monitor)'
    SbyLogQueue              = '(monitor)'
Properties for 'PRIMARY' state:
    DEFAULT_STATE           = 'READ-WRITE-XPTON'
    EXPLICIT_DISABLE        = 'no'
    REQUIRED                 = 'yes'
Properties for 'STANDBY' state:
    DEFAULT_STATE           = 'PHYSICAL-APPLY-ON'
    EXPLICIT_DISABLE        = 'no'
    REQUIRED                 = 'no'

```

2.7 Status

A configuration status reveals the overall health of the configuration. In essence, the status indicates whether or not the configuration, site, or resource is in its intended state.

The following list describes the possible status modes for a configuration:

- Normal

The configuration, including all of the resources configured within it, is operating in the mode specified by the user. All of the resources that are in an online state are operating properly without any warnings or errors.
- Warning

One or more of the resources within the configuration is operating in the presence of a warning condition. To obtain specific information, locate each resource with the warning condition and examine its status. The specific warning status associated with the resource should reveal the source of the warning.

■ Error

One or more of the resources within the configuration has failed to enter the state specified by the user. To obtain specific information, locate each resource with the error condition and examine its status. The specific error status associated with the resource should reveal the source of the problem.

2.8 Properties

There are two types of properties—configurable and monitorable:

- Configurable property values can be viewed and dynamically updated.

Configurable properties affect the operation or configuration of the resource objects. You can change the value of these properties using the Data Guard CLI or Data Guard Manager. You can edit properties whether the configuration and its sites and database resources are enabled, disabled, online, or offline. However, if the state is disabled and/or offline, the new property value will not take affect until you enable the configuration or site or resource, as appropriate.

- Monitorable property values can only be viewed when enabled and online.

Monitorable properties allow you to view information related to resources, but you cannot change the value of these properties.

See Also: Chapter 3 for complete information about database resource properties.

There are a number of configurable and monitorable properties that are common to most of the objects in a broker configuration. Table 2–2 lists common monitorable properties and the default values for each.

Table 2–2 Common Properties

Property	Common to . . .	Default Value
DEFAULT_STATE	Configurations, sites, and resources	Not applicable
ENABLED	Configurations, sites, and resources	'yes'

Table 2–2 (Cont.) Common Properties

Property	Common to . . .	Default Value
EXPLICIT_DISABLE	Configurations, sites, and resources	Not applicable
HEALTH_CHECK_INTERVAL	Configuration	1 minute
INTENDED_STATE	Configurations, sites, and resources	None
STATUS	Configurations, sites, and resources	'SUCCESS'

For example, to see these properties, you might use any of the `SHOW` commands. The following example uses the `SHOW SITE VERBOSE` command to display information about the Boston site:

```

DGMGRL> SHOW SITE VERBOSE 'Boston';
Site
  Name:                               'Boston'
  Hostname:                           'system1'
  Instance name:                       'bstn'
  Service Name:                       'primary'
  Standby Type:                       'physical'
  Number Built-in Processes:          '2'
  Enabled:                            'yes'
  Required:                           'yes'
  Default state:                      'PRIMARY'
  Intended state:                     'PRIMARY'
  Number of resources: 1
  Resources:
    Name: Sales_db (default) (verbose name='Sales_db')
```

See Also: Chapter 6 for complete information about the Data Guard command-line interface

Database Resources

Chapter 2 introduced the database resource states and properties. This chapter describes using the database resource object in the following sections:

- Section 3.1, "Database Resources"
- Section 3.2, "Database Resource States"
- Section 3.3, "Database Resource Properties"

3.1 Database Resources

A database resource object is at the lowest level in the hierarchy of objects managed by the broker. It is a named object that corresponds to a primary or standby database instance. Each DMON process uses this object to manage and monitor the state of a single database.

To predictably and consistently manage database resources, the DMON process uses a **resource guard**, that is preconfigured to monitor the database and manage its state and property transitions. When you use Data Guard Manager or the Data Guard command-line interface (CLI) to make a state change or property change, the request is passed through the DMON process to its built-in resource guard that then services the requests according to a predefined set of functions. It is the resource guard that ensures the correct and consistent functioning of the database resource.

3.2 Database Resource States

The state of a database resource is dependent upon the state of the site on which the resource resides, and the state of the site is dependent upon that of the configuration. Thus, a site is the parent for a database resource and the configuration is the parent for a site.

This is important because when a parent is offline, its dependents must also be offline. For example, if a site is in an offline state, the database that is dependent on the site must also be in an offline state. Similarly, if the configuration is offline, all of the sites and resources in the configuration are also offline because all are logically dependent on the configuration object.

3.2.1 Database Online and Offline States

When enabled, a database resource object can be in an online or an offline state.

- Offline—The database instance is started and not mounted:
 - For a primary database, the database instance is closed and not mounted and log transport services do not archive redo logs to the standby database.
 - For a standby database, the database instance is started, nomount and log apply services do not apply redo logs to the standby database.

Note: When the primary database is brought to an offline state from an online state, the database is automatically shut down first and then restarted (nomount). When the standby database is brought to an offline state from an online state, the standby database is put directly into a started, nomount mode; the standby database is not shut down and restarted.

- Online—The database instance is started and in its default online state:
 - For a primary database, the default is to start the database instance and open it in read/write mode with log transport services started (archiving redo logs to the standby database). The default online state for the primary database is referred to as the `READ-WRITE-XPTON` substate in the CLI and it is referred to as the online selection for the primary database in Data Guard Manager.
 - For a standby database, the database instance is started and mounted. Log apply services apply archived redo logs to the standby database. The default online state for the standby database is referred to as the `PHYSICAL-APPLY-ON` substate in the CLI and it is referred to as the online selection for the standby database in Data Guard Manager.

See Table 3–1 for all of the online substates for the primary and standby database resources.

3.2.2 Database Substates

Section 2.5 provided some background information about configuration, site, and database states and substates. This section provides more detail about the database substate, which is related to the role (primary or standby) in which the site is currently running.

When a database is in an online state, the database state is further qualified to be in one of several substates. For example, when a primary database is in an online state, it might be started and open in read/write mode, or it might be started and mounted in read/write mode with the log transport services archiving redo logs to the standby site.

Table 3–1 describes all of the primary and standby database resource substates. The first two columns of the table show the substate name if you are using Data Guard Manager and the corresponding name if you are using the CLI.

Table 3–1 Database Substate Names and Descriptions

Substate Name in Data Guard Manager	Substate Name in CLI	Description	Applies to
Standby paused	PHYSICAL-APPLY-READY	The standby database is mounted, but log apply services are not running. The standby database is not open for read-only queries.	Standby database
Standby online	PHYSICAL-APPLY-ON	The standby database is mounted and log apply services are started. This is the default state for the standby database.	Standby database
Standby paused, read-only mode	READ-ONLY	The standby database is open for read-only queries, but log apply services are not started.	Standby database
Primary paused	READ-WRITE	The primary database is available for updates, but log transport services are not shipping logs to the standby database.	Primary database
Primary online	READ-WRITE-XPTON	The primary database is available for updates and log transport services are archiving redo logs to the standby site. This is the default state for the primary database.	Primary database

Table 3–2 summarizes all of the possible variations of the database online substates and the implication of each one on the primary and standby databases, and on log transport services and log apply services.

Table 3–2 *Effect of Database Resource States and Substates on Underlying Components*

Component	Offline	Paused	Online	Physical Apply Ready	Physical Apply On	Read- Only	Read- Write	Read-Write XPTON
Primary Database	Started, nomount	Started and opened in read/write mode	Started and opened in read/write mode	Not applicable	Not applicable	Not applicable	Started and opened in read/ write mode	Started and opened in read/write mode
Log transport services	Stopped	Stopped	Started	Not applicable	Not applicable	Not applicable	Stopped	Started
Standby database	Started, nomount	Started and mounted	Started and mounted	Started and mounted	Started and mounted	Open for read-only queries	Not applicable	Not applicable
Log apply services	Stopped	Stopped	Started	Stopped	Started	Stopped	Not applicable	Not applicable

3.2.3 Database State Transitions

Figure 3–1 graphically shows the database states that were described in Table 3–1, and indicates that you can transition from one state to any other state.

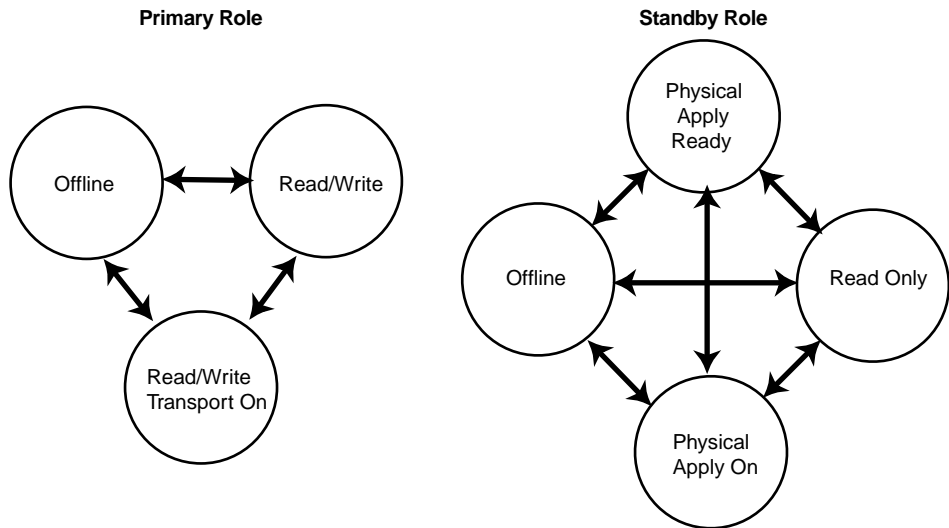
Figure 3–1 Database State Transition Diagrams

Figure 3–1 shows that the primary and standby databases can be in an offline state or, when online, can be in one of several substates:

- Primary database online substates:

READ-WRITE
READ-WRITE-XPTON

Note: For a primary database, the transition from any online state to an offline state includes shutting down and restarting the primary database in nomount mode.

- Standby database online substates:

PHYSICAL-APPLY-READY
PHYSICAL-APPLY-ON
READ-ONLY

When a standby database is taken offline, it is not shut down and restarted as is done for the primary database.

Note: Before you can transition a standby database from a READ-ONLY state to any other state, you must first close all of the open sessions to the standby database. If some of the sessions are not closed, the state transition will fail.

With the CLI, you can use the ALTER RESOURCE command to explicitly change the state of a database resource. For example, the ALTER RESOURCE command in the following example changes the state of the Sales_db resource to read/write.

```
DGMGR> ALTER RESOURCE 'Sales_db' ON SITE 'Boston' SET STATE='read-write';
Succeeded.
```

See Chapter 6 for complete information about the ALTER RESOURCE command. See also Chapter 4 for information about performing state transitions using Data Guard Manager.

3.3 Database Resource Properties

There are two types of properties—configurable and monitorable:

- Configurable property values can be viewed and dynamically updated.
- Monitorable property values can only be viewed.

3.3.1 Configurable (Changeable) Database Resource Properties

Configurable properties affect the operation or configuration of the resource objects. You can change the value of these properties using the CLI or Data Guard Manager.

Note: Although you can change a property whether the configuration is enabled or disabled, the change does not take effect unless the configuration is enabled.

Table 3–3 describes the database resource configurable properties.

Table 3–3 Configurable Properties for Database Resources

Name	Value	Type	Critical or Noncritical	Set On	Description
ArchiveDestDependency					
	Site name	String	Critical	Standby	<p>Specifies the dependency attribute for the LOG_ARCHIVE_DEST_<i>n</i> parameter. The site name (can be the primary or a standby site name) on which this site depends for receiving archived redo logs. If this is not set on the standby database, then log transport services will not be enabled. You can set this critical property to null.</p> <p>For example, consider one primary site (Boston) and one standby site (San Jose). San Jose depends on Boston for its archived redo logs. Then, you update the property ArchiveDestDependency of the San Jose database resource to value Boston.</p>
ArchiveLagTarget					
	Seconds	Integer	Noncritical	Primary	<p>Updates the ARCHIVE_LAG_TARGET=<i>seconds</i> initialization parameter setting. This property limits the amount of data that can be lost and effectively increases the availability of the standby database by forcing a log switch after the amount of time you specify (in seconds) elapses. That way, the standby database will not miss redo records generated from a time range longer than a value of ARCHIVE_LAG_TARGET.</p>
LogArchiveDestOptions					
	Attributes for the log_archive_dest_ <i>n</i> initialization parameter, except for the location, service, and dependency attributes.	String	Critical	Standby	<p>Specifies the log_archive_dest_<i>n</i> parameter attributes (for example, "optional, reopen=30"). You cannot specify the service and location attributes, because they are maintained by the broker. Use the ArchiveDestDependency property to configure the dependency attribute. If this is not set on the standby database, then log transport services will not be enabled. You can set this critical property to null.</p>
LogArchiveTrace					
	Any valid integer value ¹	Integer	Noncritical	Primary and standby	<p>Updates the LOG_ARCHIVE_TRACE=<i>integer</i> initialization parameter. Set this parameter to an integer value to see the progression of the archiving of redo logs to the standby site. Oracle writes an audit trail of the archived logs received from the primary database into a trace file.</p>
FalServer					

Table 3–3 (Cont.) Configurable Properties for Database Resources

Name	Value	Type	Critical or Noncritical	Set On	Description
	Oracle Net service name	String	Noncritical	Standby	<p>Updates the <code>FAL_SERVER=Oracle_net_service_name</code> initialization parameter setting. Set this on the standby site to assign the FAL (Fetch Archive Log) server for the standby database.</p> <p>Note: If you never change the <code>FALSERVER</code> property and the current <code>FAL_SERVER</code> parameter for the standby database is empty, then the database resource guard automatically sets the value to the net service name for the primary site.</p>
FalClient					
	Oracle Net service name	String	Noncritical	Standby	<p>Updates the <code>FAL_CLIENT=oracle_net_service_name</code> initialization parameter setting, which is the Oracle Net service name used by the primary database to refer to the standby database. The <code>FalClient</code> property assigns the FAL (Fetch Archive Log) client name used by the FAL server to refer to the FAL client.</p> <p>Note: If you never change the <code>FalClient</code> property and the current <code>FAL_CLIENT</code> parameter for the standby database is empty, then the database resource guard automatically sets the value to the net service name for the standby site.</p>
StandbyArchiveDest					
	File specification	String	Critical	Standby	<p>Updates the file specification for the <code>STANDBY_ARCHIVE_DEST=filespec</code> initialization parameter. Specifies the location of archived redo logs arriving from a primary database. This property is relevant only for a standby database in managed recovery mode.</p> <p>You can set this critical property to null.</p>
StandbyFileManagement					
	AUTO or MANUAL	String	Noncritical	Standby	<p>Updates the <code>STANDBY_FILE_MANAGEMENT=[AUTO MANUAL]</code> initialization parameter setting. Set this property on standby sites to indicate whether or not the filenames on the standby database are the same as those on the primary database. Set to <code>AUTO</code> only if the <code>COMPATIBILITY</code> parameter is set to <code>9.0.n</code>.</p>

¹ See the *Oracle9i Database Reference* for a list of valid values to the `LOG_ARCHIVE_TRACE` initialization parameter.

Note the following about the configurable properties in Table 3–3:

- Most of the configurable properties map to parameter values that affect log transport services.

- All of the properties are present for all of the databases that are a part of a broker configuration—the values for individual databases can be different. Some subset of properties and associated values are used only when the database is a standby database, while others are used when the database is a primary database.
- You can alter the database resource properties as appropriate for your specific Data Guard environment. However, the value for the changed parameter is *not* changed in the initialization parameter file.

Note: If the database is shut down and restarted outside of Data Guard Manager, the database will revert to the original values that were set in the initialization file and the properties maintained by Data Guard will be inconsistent with the actual database values.

- Configurable properties can be either noncritical or critical, as described in Section 3.3.1.1 and Section 3.3.1.2.

3.3.1.1 Noncritical Database Properties

Noncritical database properties do not need to be set for log transport services and log apply services to function properly. If a noncritical property is not set, then the Data Guard monitor uses the value that is in the parameter file.

3.3.1.2 Critical Database Properties

Critical database properties must be set for log transport services and log apply services to function properly. Only standby resources require that you set the critical database properties. If critical properties are not set for a standby database resource, then log transport services on the primary site will not be enabled and the health check for the configuration will fail and return an error status to the Data Guard monitor.

The `LogArchiveDestOptions`, `ArchiveDestDependency`, and `StandbyArchiveDest` critical database properties map directly to the following database initialization parameters: `LOG_ARCHIVE_DEST_n`, the `DEPENDENCY` attribute of `LOG_ARCHIVE_DEST_n`, and `STANDBY_ARCHIVE_DEST`, respectively.

Depending on how you create the broker configuration, the critical database properties may be set automatically or manually, as follows:

- If you create the configuration with Data Guard Manager, it automatically sets the `LogArchiveDestOptions`, `ArchiveDestDependency`, and `StandbyArchiveDest` properties to the following default values:
 - `LogArchiveDestOptions = ''`
 - `ArchiveDestDependency = ''`
 - `StandbyArchiveDest` takes one of the following defaults:
 - * If you add an existing standby database, `StandbyArchiveDest = ''`
 - * If you create a new standby database, `StandbyArchiveDest` uses the value that you entered in the Create Configuration wizard.
- If you create the configuration with the CLI, you must set the critical properties before the configuration can be successfully enabled. For example, the following SQL statements set the critical properties for the `reportingdb` standby database resource:

```
DGMGRL> ALTER RESOURCE reportingdb SET PROPERTY LogArchiveDestOptions = '';
DGMGRL> ALTER RESOURCE reportingdb SET PROPERTY ArchiveDestDependency = '';
DGMGRL> ALTER RESOURCE reportingdb SET PROPERTY StandbyArchiveDest =
'/archfs/arch/';
```

You do not need to set critical properties for the primary database resource.

3.3.2 Monitorable (Read-Only) Properties

Monitorable properties allow you to view information related to resources, but you cannot change the value of these properties.

The following sections describe the database resource monitorable properties:

- Section 3.3.2.1, "SendQEntries (Send Queue Entries)"
- Section 3.3.2.2, "LogXptStatus (Log Transport Status)"
- Section 3.3.2.3, "SbyLogQueue (Standby Log Queue)"

Note: Information for monitorable properties can be seen only when the database resource is enabled and in an online state.

3.3.2.1 SendQEntries (Send Queue Entries)

The SendQEntries property returns a table that shows all of the log files on the primary site that have not yet been successfully shipped to one or more standby sites. The table contains the following columns:

- **SITE_NAME**

The value can be empty or it can contain the name of the site. If empty, the STATUS column will contain a value of CURRENT or NOT_ARCHIVED.

- **STATUS**

The STATUS column is set to one of the following values:

- **CURRENT**—A log file to which online redo logs are being written currently.
- **NOT_ARCHIVED**—A completed log file that has been archived locally, but has not been shipped to the standby sites.
- **ARCHIVED**—A completed log file that has been archived locally and shipped to the standby sites.

The table contains exactly one row with the value of STATUS=CURRENT. There can be multiple rows with the value STATUS=ARCHIVED or STATUS=NOT_ARCHIVED.

- **LOG_SEQ**

The log sequence number. Multiple rows may have the same LOG_SEQ value (for different SITE_NAME values).

- **TIME_GENERATED**

The time when the log was generated.

- **TIME_COMPLETED**

The time when the log was completed.

For example, the following shows output from a SHOW RESOURCE VERBOSE command:

```
DGMGRL> SHOW RESOURCE VERBOSE 'db' 'SendQEntries';
```

```
PRIMARY_SEND_QUEUE
```

SITE_NAME	STATUS	LOG_SEQ	TIME_GENERATED	TIME_COMPLETED
Standby	ARCHIVED	9	11/21/2000 10:57:49	11/21/2000 10:59:42
Standby	ARCHIVED	10	11/21/2000 10:59:42	11/21/2000 10:59:43
Standby	ARCHIVED	11	11/21/2000 10:59:43	11/21/2000 10:59:49
Standby	ARCHIVED	12	11/21/2000 10:59:49	11/21/2000 10:59:54
	CURRENT	13	11/21/2000 10:59:54	

Note: In Oracle9i Data Guard Manager, information from the SendQEntries property is displayed on the Log Files property page for the primary database resource.

3.3.2.2 LogXptStatus (Log Transport Status)

The LogXptStatus property contains the error status of log transport services for each of the currently enabled standby sites, unless the following conditions are true:

- The standby database for the site is in an offline state.
- The LOG_ARCHIVE_DEST_n parameter includes the OPTIONAL attribute.

The format of the error status is as follows:

```
"standby1_sitename=error_status, standby2_sitename=error_status,..."
```

The error status can be an empty string.

In the following example, the string for Standby1 is empty because there is no error for the Standby1 destination. The standby2 destination returned the ORA-01034 message:

```
DGMGR> SHOW RESOURCE VERBOSE 'Sales_db' 'LogXptStatus';  
LogXptStatus = 'Standby1=',standby2=ORA-01034: ORACLE not available"
```

Note: In Oracle9i Data Guard Manager, information from the LogXptStatus property is displayed on the Properties page for the primary database resource.

3.3.2.3 SbyLogQueue (Standby Log Queue)

The SbyLogQueue property returns a table that indicates all of the logs that were received by the standby site, but have not yet been applied. The table contains the following columns:

- LOG_SEQ
The log sequence number.
- TIME_GENERATED
The time when the log was generated.

- **TIME_COMPLETED**

The time when the log was completed.

For example:

```
DGMGRL> SHOW RESOURCE VERBOSE 'reportingdb' 'SbyLogQueue';  
STANDBY_RECEIVE_QUEUE
```

LOG_SEQ	TIME_GENERATED	TIME_COMPLETED
6	11/21/2000 10:57:16	11/21/2000 10:57:41
7	11/21/2000 10:57:41	11/21/2000 10:57:43
8	11/21/2000 10:57:43	11/21/2000 10:57:49

Note: If you are using Data Guard Manager to monitor properties, you can view information from the SbyLogQueue property on the Log Files property page for the standby database resource.

Using Oracle9i Data Guard Manager

This chapter shows how to use Oracle9i Data Guard Manager to create, manage, and monitor a Data Guard configuration.

This chapter contains the following sections:

- Section 4.1, "Starting Data Guard Manager"
- Section 4.2, "Creating a Configuration"
- Section 4.3, "Connecting to a Configuration"
- Section 4.4, "Enabling the Configuration, Sites, and Resources"
- Section 4.5, "Performing Routine Maintenance"
- Section 4.6, "Performing a Manual Switchover Outside of Data Guard Manager"
- Section 4.7, "Monitoring a Data Guard Configuration"

4.1 Starting Data Guard Manager

Start Data Guard Manager through the Oracle Enterprise Manager Console by taking the following steps.

Step 1 Start Oracle Management Server.

Start the Oracle Management Server from the command-line prompt by entering the `oemctl start oms` command.

Step 2 Launch the Oracle Enterprise Manager Console.

Launch Oracle Enterprise Manager at the command-line prompt by entering the `oemapp console` command. When the Enterprise Manager Console login dialog displays, you must select **Login to the Oracle Management Server**. Do not select

Launch standalone, because Data Guard Manager will not be available from the Enterprise Manager Console if you select this option.

Step 3 Start the Intelligent Agent on the primary and standby nodes.

The Intelligent Agent must be running for Data Guard Manager to execute jobs and monitor events. Follow the directions in the *Oracle Intelligent Agent User's Guide* to configure and use the Intelligent Agent on the primary and standby nodes.

Step 4 Discover the primary and standby nodes.

Run the Enterprise Manager Discovery wizard, also referred to as Discovery wizard to discover the primary and standby nodes and gain access to the databases that you want to configure and administer with Data Guard Manager. To invoke the Discovery wizard from the Enterprise Manager Console menu bar, select: **Navigator > Discover Nodes**

Follow the directions in the Discovery wizard. When finished, all discovered nodes and databases are displayed in the Enterprise Manager navigator tree:

- On the primary node, the wizard discovers the primary database that you want to configure and administer with Data Guard Manager.
- On the standby node, the wizard discovers the following:
 - If you discover a standby node on which a standby database exists, the wizard gains access to the standby database and displays it in the Enterprise Manager navigator tree. When you run the Create Configuration wizard to create a configuration, you can have Data Guard Manager automatically add the existing standby database to the configuration.
 - If you discover a standby node on which a standby database does not exist, the wizard finds the Oracle home where you have installed the Oracle9i Enterprise Edition. When you run the Create Configuration wizard to create a configuration, you can select this Oracle home as the location in which you want Data Guard Manager to create a new standby database.

Step 5 Set Preferred Credentials on the primary and standby nodes.

You must set Preferred Credentials on both the primary and standby nodes to ensure Data Guard Manager can run Enterprise Manager jobs to create the configuration. To set Preferred Credentials from the Enterprise Manager Console menu bar, select: **Configuration > Preferences > Preferred Credentials**

Although setting Preferred Credentials for the databases is not required, you might want to set Preferred Credentials for the primary database and for the standby database if you are adding an existing standby database resource.

Step 6 Start Data Guard Manager.

You can start Data Guard Manager from the Enterprise Manager Console or at the command-line prompt:

- To start Data Guard Manager from the Enterprise Manager Console, use either of the following methods:
 - From the **Tools** menu in the Oracle Enterprise Manager Console, choose **Database Applications > Data Guard Manager**.
 - From the **Database Applications drawer** in the Oracle Enterprise Manager Console, move the cursor over the icons and select the **Data Guard Manager** icon.

Figure 4–1 shows both methods of starting Data Guard Manager from the Enterprise Manager Console.

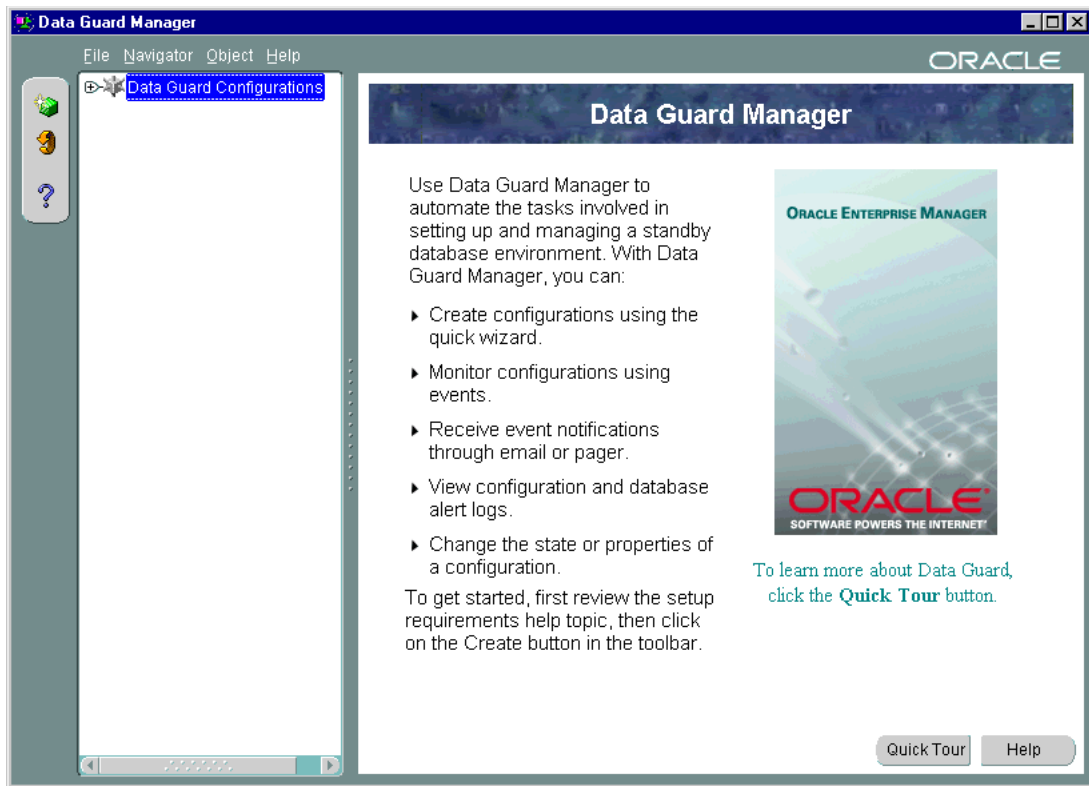
Figure 4–1 Starting Data Guard Manager



- To start Data Guard Manager from the command-line prompt, enter the `oemapp dataguard` command.

When launched, Data Guard Manager displays the informational page shown in Figure 4–2.

Figure 4–2 Oracle Data Guard Manager Main Window



On this page, you can:

- Click **Quick Tour** to call up the Data Guard Manager quick tour for an easy-to-follow product tour covering concepts and basic product operation.
- Click **Help** to display the Welcome to Oracle Data Guard Manager help topic. Once in the help system, you can use the Contents page or Help Search page to locate help topics of interest.
- Right-click **Data Guard Configurations** in the tree view to start the Create Configuration Wizard (described in Section 4.2).

4.2 Creating a Configuration

Creating a configuration is the first thing you must do before you can manage and monitor sites and resources. Data Guard Manager provides the Create Configuration wizard to create a configuration that includes a primary database and one standby database. To start the Create Configuration wizard, right-click **Data Guard Configurations** in the tree view and choose **Create Configuration Wizard**.

The wizard takes you through the following steps.

1. Ensure the Data Guard environment is set up properly.
2. Provide a configuration name.
3. Choose a primary database.
4. Choose how you want to add a standby database:
 - Import an existing standby database
 - Create a new standby database
5. Verify the information you supplied to the wizard and make changes, if necessary.

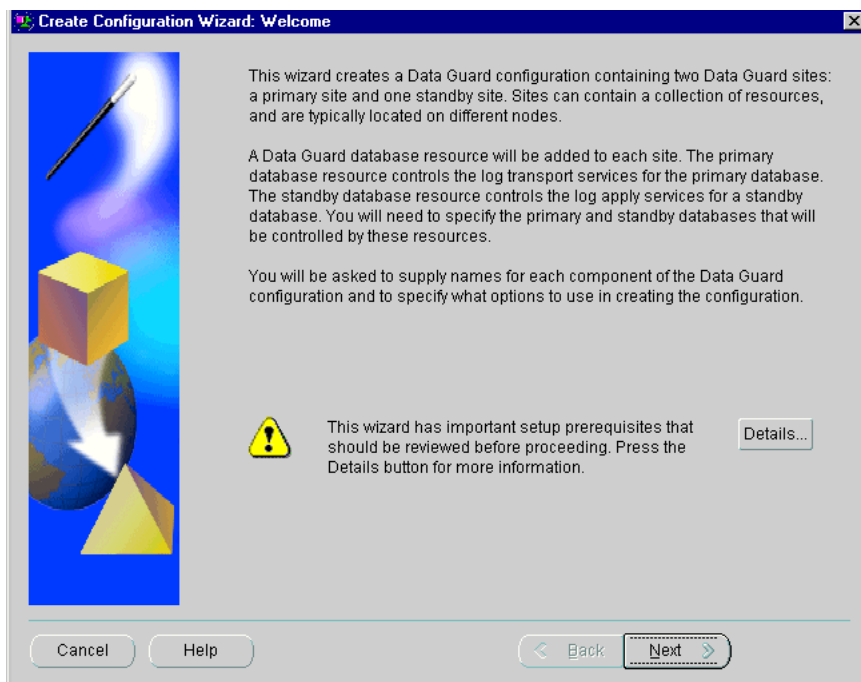
The following steps create a configuration in which a new standby database is created. It shows how to have the wizard use Oracle Recovery Manager (RMAN) to copy datafiles from the primary database to create the standby database.

Step 1 Ensure the Data Guard environment is set up properly.

Before the Create Configuration wizard steps you through the process of creating a Data Guard configuration, you must ensure some basic configuration requirements have been met on the primary and standby nodes.

When you click **Details** on the wizard welcome page shown in Figure 4-3, Data Guard Manager provides a handy checklist of setup requirements and information to help you ensure the environment is properly prepared.

Figure 4-3 Create Configuration Wizard - Welcome Page

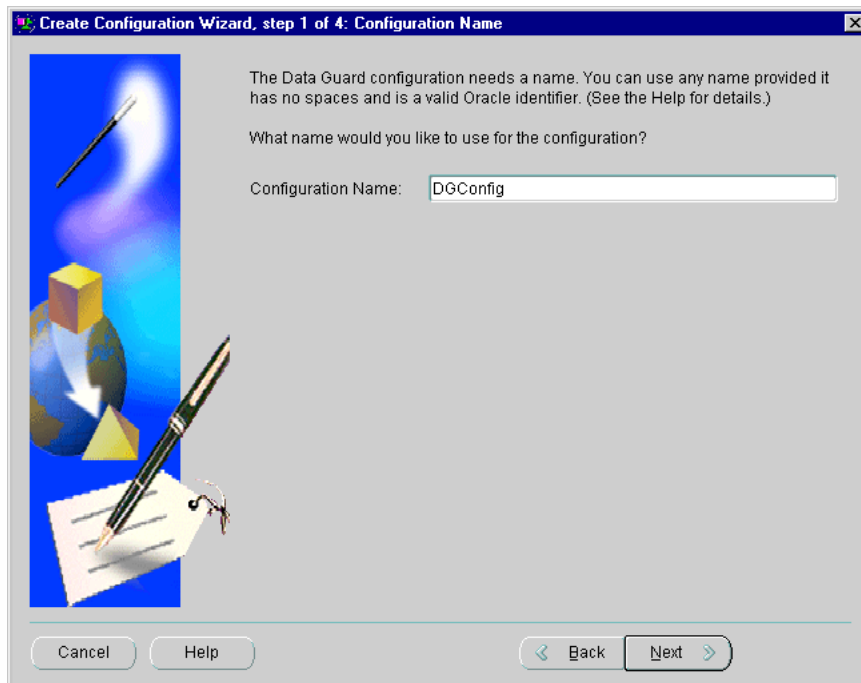


Step 2 Provide a configuration name.

The next dialog asks you to provide the name of the new Data Guard configuration. Each configuration name must be an Oracle identifier that is unique among the configurations that you have created with Data Guard Manager.

Figure 4-4 shows the Configuration Name dialog in which a new configuration, DGConfig, is named.

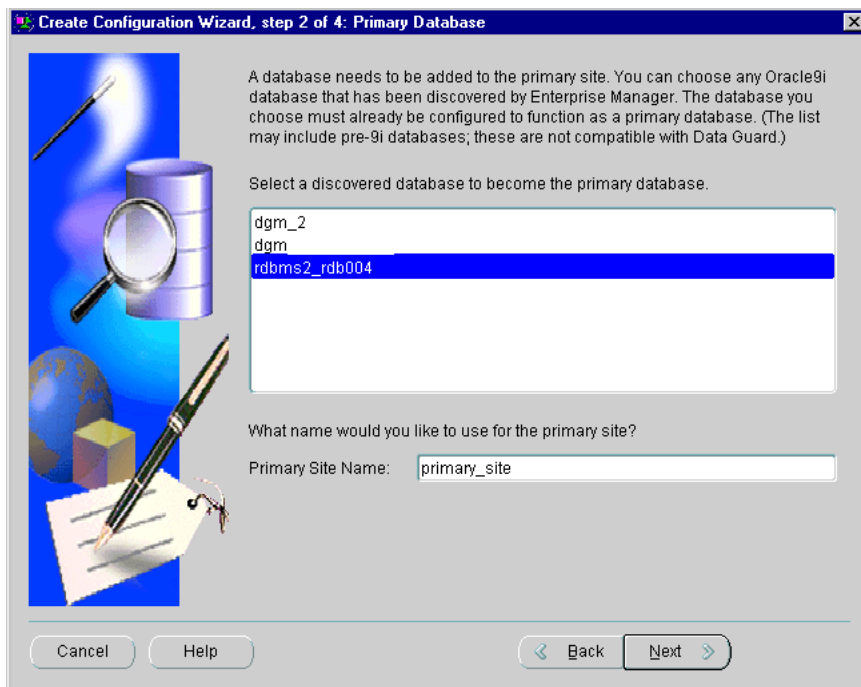
Figure 4-4 Create Configuration Wizard - Configuration Name



Step 3 Choose a primary database.

The list of discovered database instances listed on this page contains all of the instances that have been discovered through the Enterprise Manager Console Discovery wizard. (These were discovered during the setup work performed in Section 4.1 in the step titled, "Discover the primary and standby nodes.")

Figure 4–5 Create Configuration Wizard - Choose Primary Database



To select a primary database, select the Oracle9i database instance that you want to serve in the role of a primary database for this Data Guard configuration. The database instance that you choose must be release 9.0.1 or greater, and it must be a primary database, such that the `CONTROL_FILE_TYPE` in the `V$DATABASE` view must be equal to `CURRENT`.

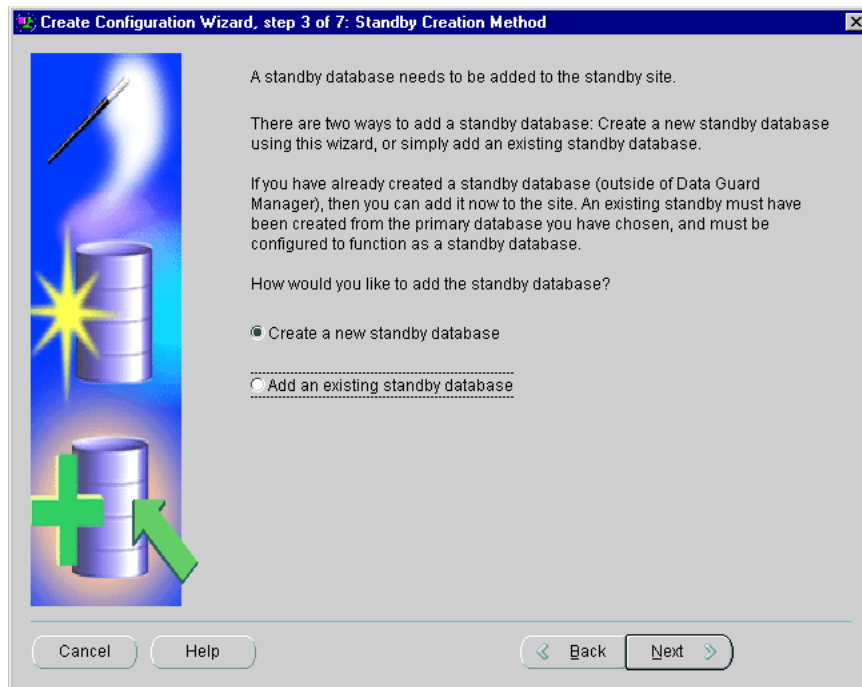
Note: Although the list of instances on this page may include both Oracle9i database instances and older instances (such as Oracle8i) that were discovered, only Oracle9i instances can be used.

Step 4 Choose how you want to add a standby database.

The wizard allows you to create a new standby database or add an existing standby database.

This scenario will create a new standby database, as shown in Figure 4–6.

Figure 4–6 Create Configuration Wizard - Standby Database Creation Method



If you choose to add an existing standby database, the wizard displays a list of discovered database instances from which you select a standby database to import into the Data Guard configuration. The wizard prompts you to name the standby database and connects to that database.

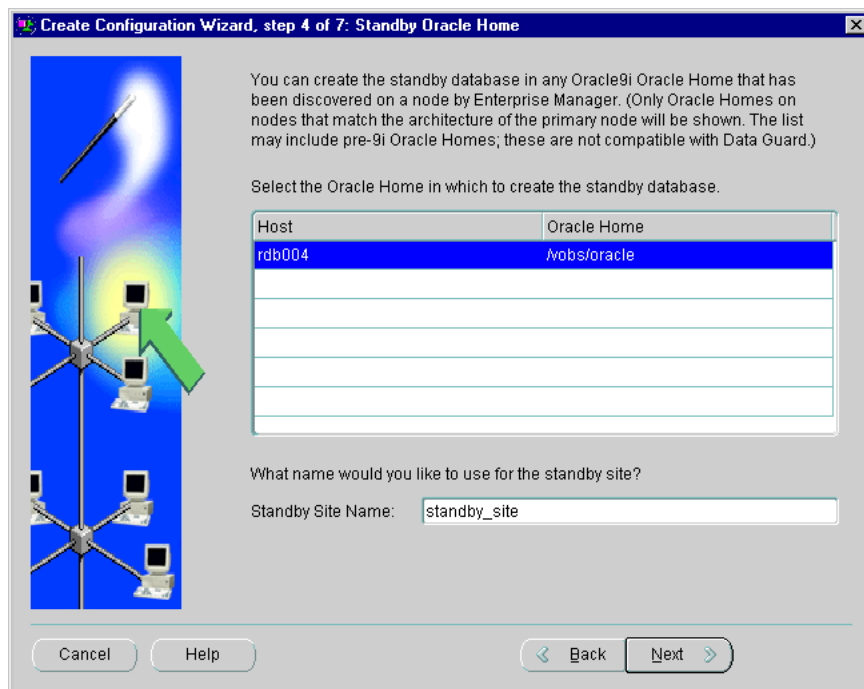
If you choose to create a new standby database, the wizard takes you through the following additional steps:

- Select the Oracle home on the standby node in which you want to create the standby database.

The wizard displays a dialog that lists all of the Oracle homes that have been discovered through the Enterprise Manager Discovery wizard. You must select a discovered Oracle home and provide a unique name for the standby site.

Figure 4-7 shows this step of the configuration process.

Figure 4-7 *Selecting an Oracle Home on the Standby Node*

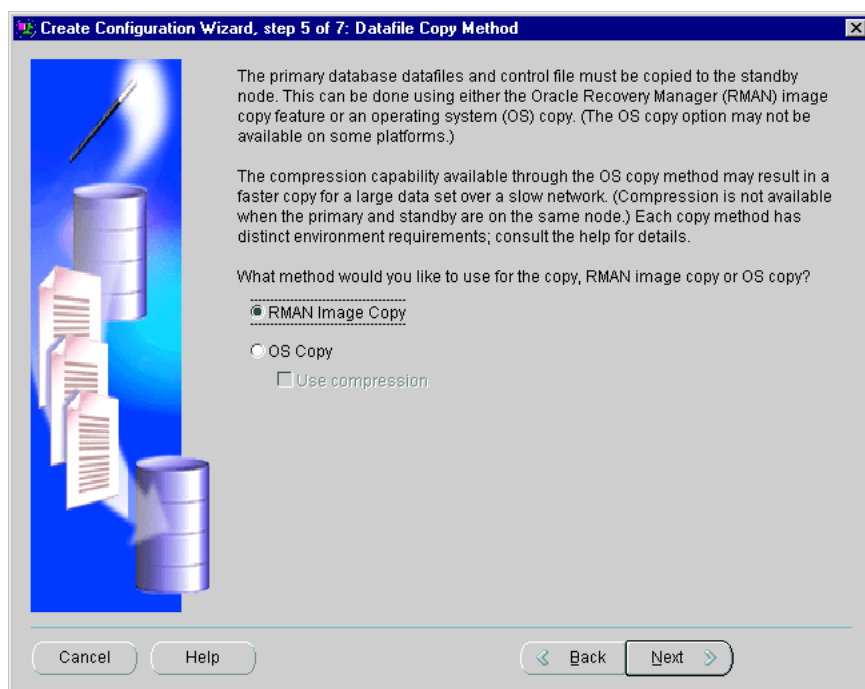


- Select RMAN or OS (operating system) copy method to move datafiles to the standby node.

Part of the creation process involves copying the datafiles for the primary database to the standby node. The Data Guard Manager offers two different ways to do this: using the Oracle Recovery Manager (RMAN) or using the operating system (OS) method.

Figure 4–8 shows this step of the configuration process.

Figure 4–8 Choosing a Datafile Copy Method



This scenario chooses the RMAN method because it is the default and it has the advantage of being available on all supported Oracle platforms. The operating system (OS) method is not available on all platforms and will be dimmed if it is not available.

- Select the location where you want the datafiles to be copied.

When using the RMAN copy method, you must specify path name information for the **network directory on the primary host**, the **destination directory on standby host**, and the **standby archived log file directory** fields. (As you type the destination directory, the wizard assumes your directory structure will be the same on the primary and standby hosts and mirrors your input to the **Standby archived log file directory** field at the bottom of the page.)

Figure 4–9 shows this step of the configuration process.

Figure 4–9 Supplying Datafile Copy Location Information

Create Configuration Wizard, step 6 of 7: Datafile Copy Location

For an RMAN copy, specify the same network directory for all files along with the destination pathname on the standby host corresponding to that directory, or specify a different network and destination directory for each file. For an OS copy, only the destinations are needed.

☒ Copy all files to same directory:

Network directory on primary host:

Destination directory on standby host:

☐ Copy files to different directories:

Primary database files	Network name on primary	Destination name on standby
/vobs/oracle/dbs/t_db1.f	/stdby_mnt/t_db1.f	/private1/stand/t_db1.f
/vobs/oracle/dbs/t_cf1.f	/stdby_mnt/t_cf1.f	/private1/stand/t_cf1.f

Once the standby is operating, archived redo log files will be shipped from the primary to the standby. What directory do you want the log files placed in on the standby node?

Standby archived log file directory:

Cancel Help < Back Next >

Step 5 Verify the information you supplied to the wizard and make changes, if necessary.

Figure 4–10 shows the Options dialog on which all values are set automatically.

Figure 4–10 Create Configuration Wizard - Options

Create Configuration Wizard, step 7 of 7: Options

Optionally change the instance name that will be given to the new standby instance. The instance name must be unique on the standby node.

The standby node's listener configuration file will be changed to support the new standby instance. Also, a new initialization file will be installed for the standby instance. You can examine and/or edit the content of these files.

The standby database will be configured with a password file to allow remote connections using the SYS account with SYSDBA privileges. The default password is "change_on_install". Optionally specify a different password.

Standby Password:

Confirm Password:

For physical standby creation, the primary database will be left open. You can specify that the primary be shutdown prior to beginning the creation process in order to ensure a consistent datafile copy.

☐ Shutdown primary database prior to datafile copy

Although you do not have to provide any input, you can optionally make changes to any of its fields. Table 4–1 describes the default values for each field and includes comments about how the information is used.

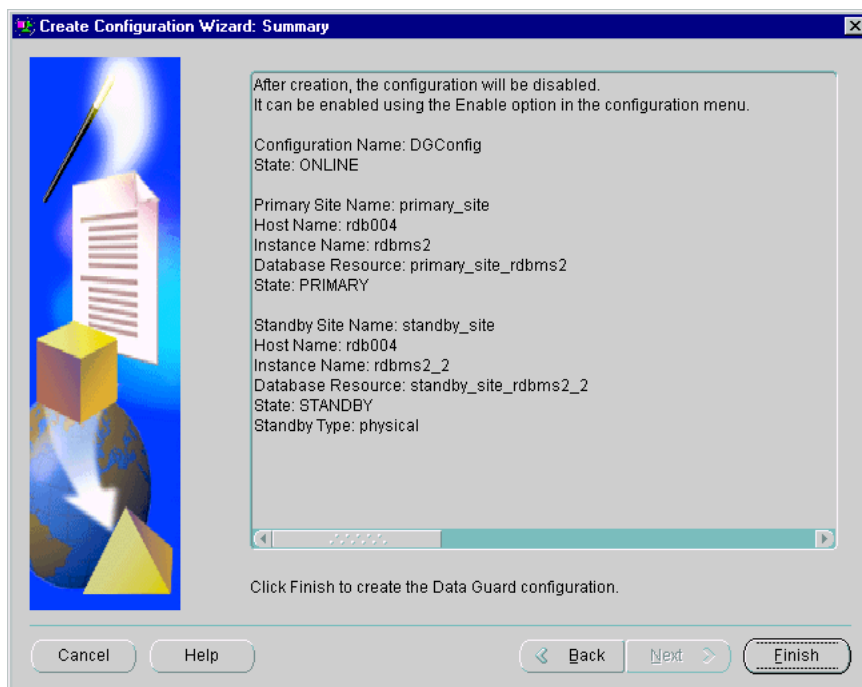
Table 4–1 *Optional Input to the Create Configuration Wizard*

Field	By Default . . .	Comments
Standby instance name	This is the primary database name with _2 appended to it.	If you edit the default name shown, ensure the new name is unique on the standby host. Note that the name is case sensitive. For example, site and SiTe are distinctive names.
Standby initialization file	This file is derived automatically from a combination of the current parameter settings for the primary database and additional standby database settings. You can edit the standby database parameter file to add or modify its contents.	The wizard creates the initialization file for the standby instance in the platform-specific default Oracle home. (For example, on UNIX this would be \$ORACLE_HOME/dbs/initinstance_name.ora). In the DGConfig example, the generated filename would be initrdbms2_2.ora. If a file with this name already exists, you will be prompted to change the instance name.
Standby LISTENER.ORA file	A LISTENER.ORA file must already exist in the default location of the standby Oracle home (for example, \$ORACLE_HOME/network/admin/ on UNIX). Otherwise, the standby creation process will fail.	Whether or not you edit the file, the wizard: <ul style="list-style-type: none"> ■ Installs the modified LISTENER.ORA file in the default location in the Oracle home. ■ Starts the Oracle Net listener (or restarts it, if it is already running) that will listen for the new instance, using the lsnrctl utility.
Standby database SYSDBA password	Although Data Guard Manager does not require a remote login password file for the standby database, this dialog box allows you to create one for the standby database to enable remote connections.	The wizard uses the orapwd utility to create the remote login password file in the default location in the Oracle home where you installed the standby database. For example, on a UNIX system the name of the file is \$ORACLE_HOME/dbs/orapw.
Shutdown primary database prior to datafile copy check box	The primary database remains open during the standby creation process, which results in a hot (inconsistent) backup of the datafiles.	You can select this option to shut down the primary database (with the immediate option) prior to creating the standby database instance. This will result in a cold (consistent) backup of the datafiles.

Next, the wizard provides a summary page on which you can verify the information that you provided as input. If you find an error or decide to rename something, click **Back** to move backward through the screens in the wizard. Otherwise, click **Finish** to begin creating the Data Guard configuration.

Figure 4–11 shows the summary page.

Figure 4–11 Summary Page for the Create Configuration Wizard



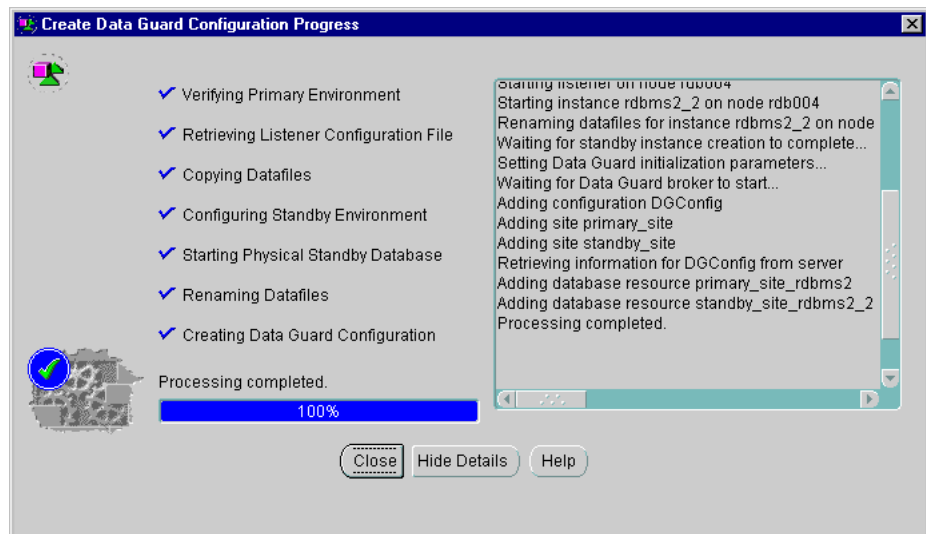
Data Guard Manager opens a dialog box (shown in Figure 4–12) to display the progress of the create operation after you finish providing input to the wizard. The progress information that is displayed varies depending on whether you are importing an existing standby database or creating a new standby database.

You can click **Show Details** to display detailed information as the operation proceeds. When you select this option, the progress dialog window expands and displays all of the output from the Data Guard log file. Click **Hide Details** to hide the right-hand pane.

Click **Close** when the create operation is done to close the progress dialog window and return control to the Data Guard Manager main window.

Figure 4–12 shows the progress dialog after the successful creation of the DGConfig configuration.

Figure 4–12 Progress Dialog Box for Creating the Configuration



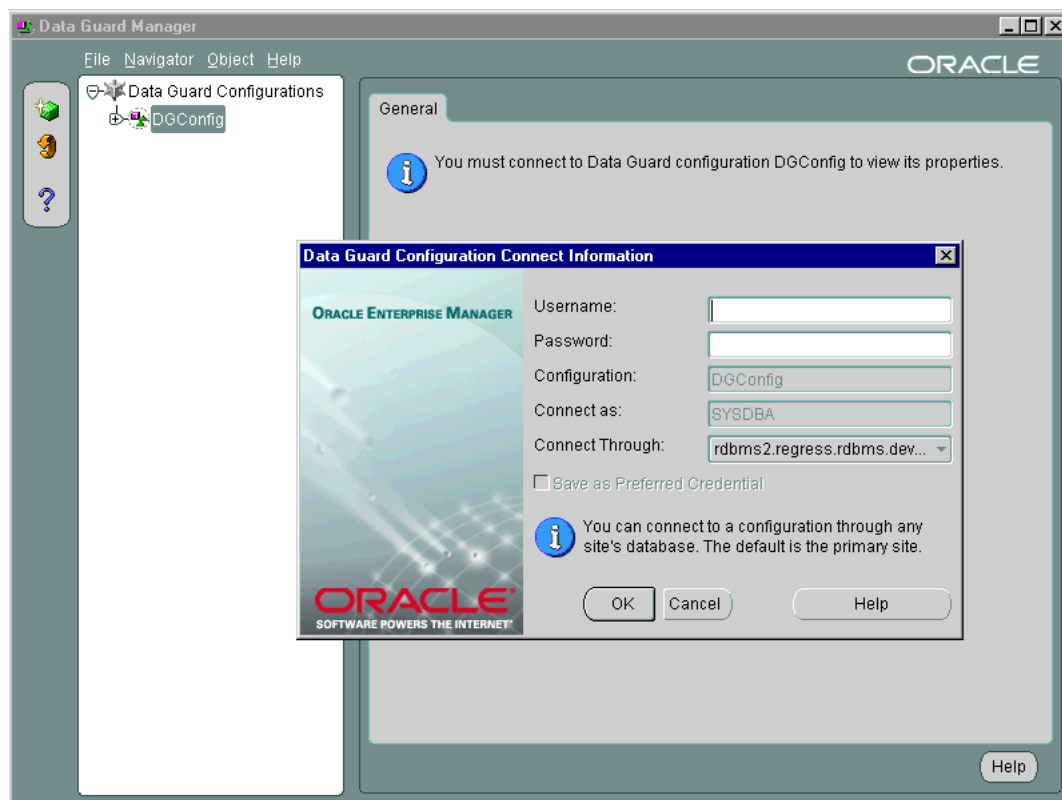
When the Create Configuration Wizard completes, a To Do list is displayed that describes some tasks that you must complete.

4.3 Connecting to a Configuration

You access the new DGConfig configuration (created in Section 4.2) through the Data Guard Configuration Connect Information dialog box. You can connect through either the primary or the standby database.

To connect, double-click the configuration name in the tree view; this launches the Data Guard Connect Information dialog box shown in Figure 4–13.

Figure 4–13 Configuration Connect Information Dialog Box



The connection must be made using an Administrator account that has SYSDBA privileges. You supply the following information in this dialog box:

- **User Name**—Type the username for an account that exists for the database displayed in the Connect Through field.

- **Password**—Enter the password for the account you specified in the Username box.
- **Configuration**—You cannot edit this field. It specifies the name of the Data Guard configuration that you selected in the tree view when you invoked the Data Guard Configuration Connect Information dialog box.
- **Connect as**—You cannot edit this field. Connecting to a Data Guard configuration requires the SYSDBA role.
- **Connect Through**—Select the name of the primary or standby database through which you want to connect. The account specified in the Username box must have SYSDBA privileges for this database displayed in the Connect Through field.
- **Save as Preferred Credential**—If the configuration to which you are connecting was discovered using the Enterprise Manager Console Discovery wizard, save your connection credentials by clicking the Preferred Credentials check box in Enterprise Manager.

4.4 Enabling the Configuration, Sites, and Resources

When the configuration is first created, the configuration, site, and resource objects are disabled, which means that you cannot manage or monitor the objects because they are not under the control of Data Guard Manager.

When you finish configuring the sites and resources and connect to a broker configuration, you must enable the configuration to allow the Data Guard monitor to manage the configuration, and to bring the primary and standby database systems online.

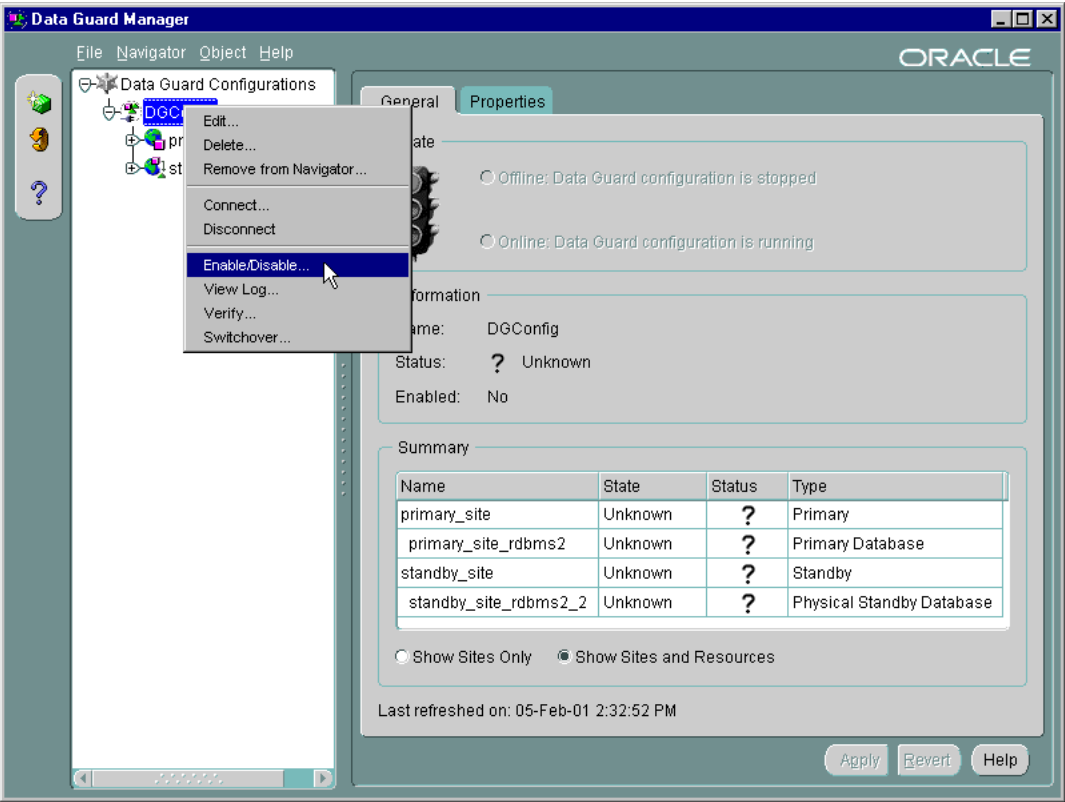
After the configuration is enabled the first time, you can subsequently enable or disable:

- The entire configuration, including all its sites and resources
- A standby site, including the database resource on the standby site
- The primary database resource or the standby database resource

Note: If you disable a configuration while connected to the standby database. You must be connected to the primary database when you re-enable the configuration.

Step 1 Enable the entire configuration.
To enable the entire configuration, right-click the **configuration** and select **Enable/Disable**, as shown in Figure 4–14.

Figure 4–14 Enabling a Configuration



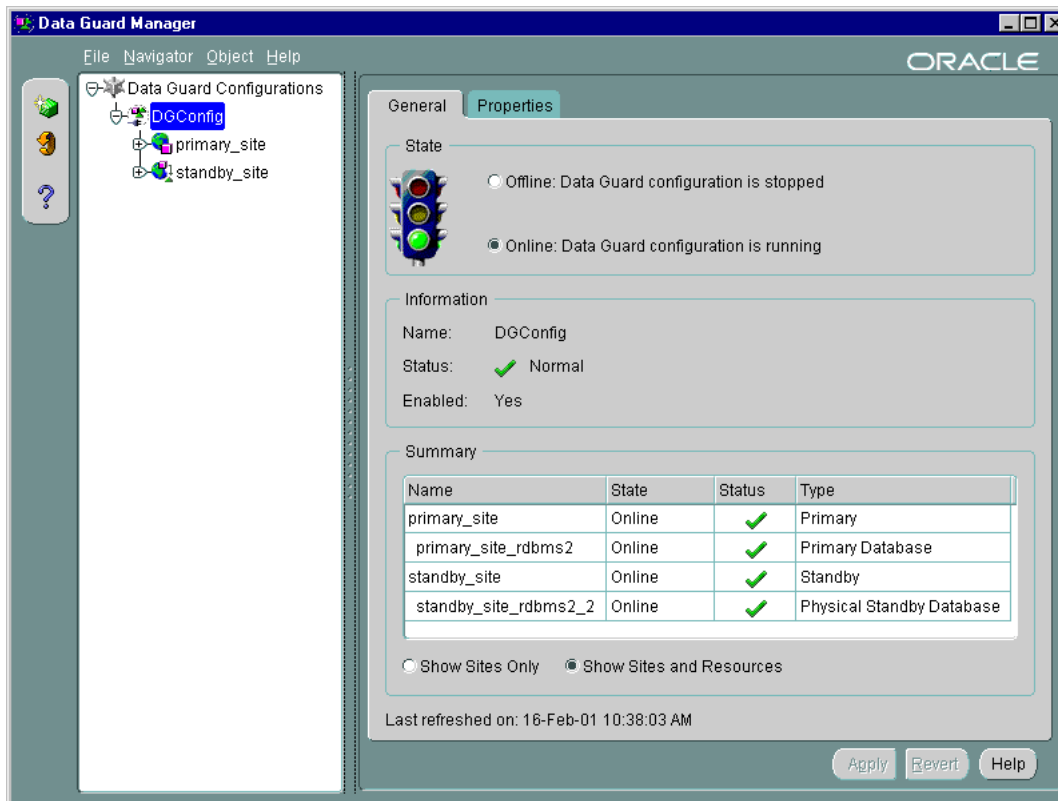
Data Guard Manager displays a progress dialog box as it enables the configuration. When processing completes, click **Close** in the progress dialog box to dismiss the progress dialog box and allow the enable operation to complete.

Step 2 Verify the configuration was successfully enabled.

When processing completes, you should verify the configuration state and status information on the general property page.

For example, the state and status information in Figure 4–15 shows that the DGConfig configuration was successfully enabled. The operating state of the configuration, including its sites and database resources, has changed from unknown to online, and its normal status (checkmarks) verifies that the configuration is operating without errors or warnings.

Figure 4–15 Verifying that a Configuration Is Enabled



4.5 Performing Routine Maintenance

Data Guard Manager can help simplify some of the routine maintenance tasks you must perform in the configuration. The following sections provide two examples: one shows how to take a site offline to replace a faulty disk drive and the other example dynamically changes an attribute of the `LOG_ARCHIVE_DEST_n` parameter.

4.5.1 Changing the State of a Database Resource

This section describes how to take the standby database resource offline for the purpose of replacing a faulty disk drive.

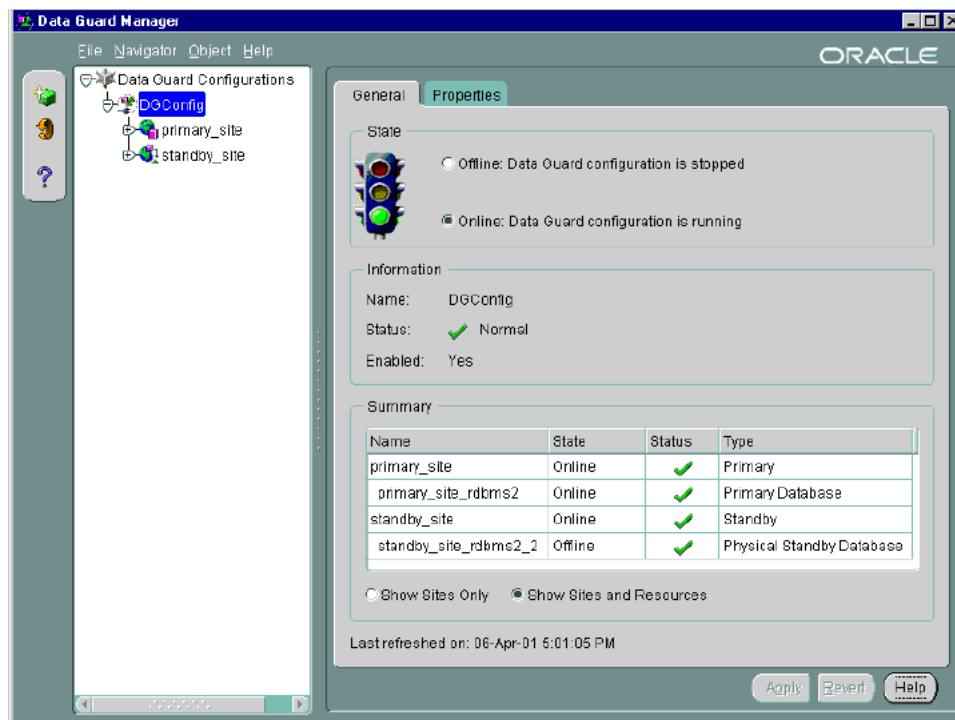
To change the state of the standby database to be offline, follow these steps:

1. In the tree view, select the **standby database**.
2. In the right-hand property sheet, click **Offline**.
3. Click **Apply**.

(If you were changing the state of the primary database to offline, you would also need to click **Yes** in the pop-up dialog box that displays to confirm that you want to change its state.)

When you change the state of the standby database to offline, the standby database instance will be put into a started, nomount state and log apply services will be stopped. This temporarily pauses the application of the archived redo logs to the standby database while you replace the faulty disk drive. (Note that log transport services continue to archive redo logs to the standby site.) After completing your maintenance tasks, you can follow the same sequence of steps to bring the database online again.

Figure 4–16 shows the General property page after you change the state of the standby database to offline.

Figure 4–16 Verifying a State Change to the Standby Database

4.5.2 Changing a Database Property

This section describes how to modify the `LogArchiveDestOptions` property.

Data Guard Manager automatically sets the critical properties for the standby database resource to a null value. Thus, when you created the `DGConfig` configuration with Data Guard Manager, the `LogArchiveDestOptions` critical property on the standby database was set automatically to a null value (`LogArchiveDestOptions = ''`).

However, you can edit critical (and noncritical) properties at any time to tune your current environment. For example, suppose you want to edit the `LogArchiveDestOptions` property to specify the `MANDATORY` attribute. (The `MANDATORY` attribute of the `LOG_ARCHIVE_DEST_n` parameter requires a successful archival to the destination before an online redo log is available for reuse.) All you have to do is specify the attribute on the Properties page for the

standby database resource. The new value overrides the current (null) value of the LOG_ARCHIVE_DEST_ *n* parameter and also propagates the change to the primary site.

You can edit database resource properties if the configuration and its sites and databases are enabled, disabled, online, or offline. To edit the LogArchiveDestOptions property with Data Guard Manager, follow these steps:

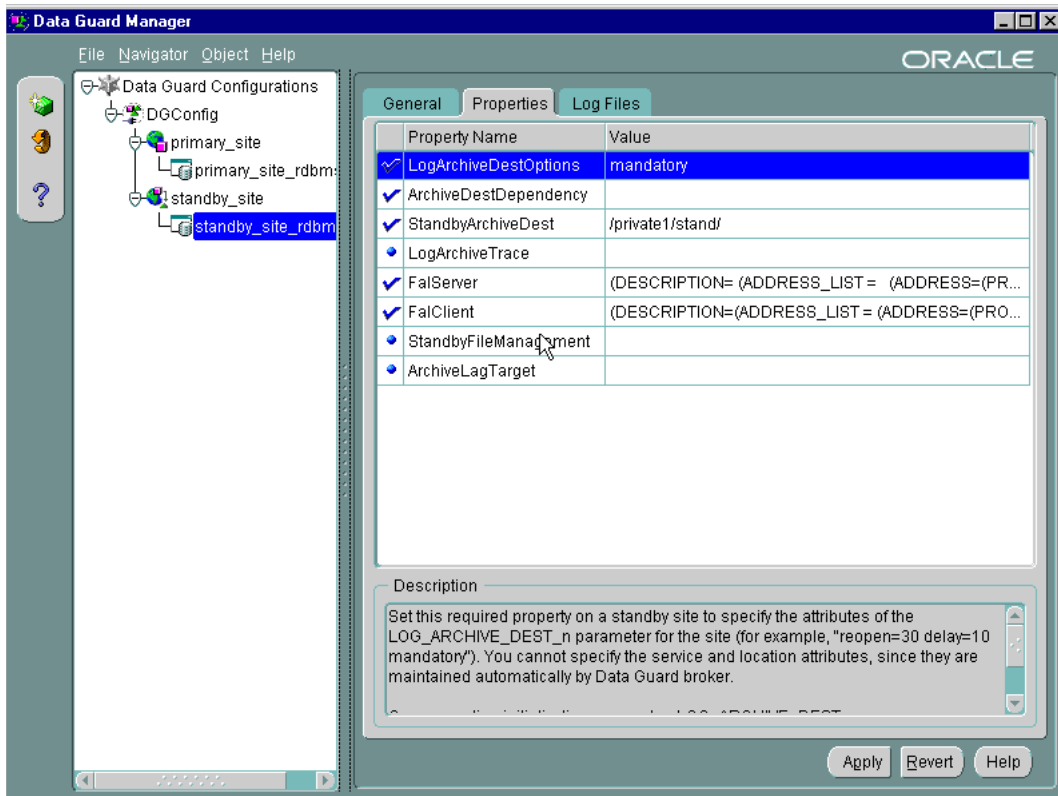
1. In the tree view, select the **standby database** resource.
2. In the property sheet, click the **Properties** tab.
3. On the Properties page, click inside the **Value** column for the LogArchiveDestOptions property.
4. Enter **MANDATORY**.
5. Click **Apply**.

When you edit a property, the new property value dynamically overrides the value of the parameter specified in the initialization parameter file, but it does not modify the contents of the file.

Note: If the database is shut down and restarted outside of Data Guard Manager or the CLI, the database will revert to the original values that were set in the parameter file and the properties maintained by Data Guard will be inconsistent with the actual database values.

Figure 4–17 shows the Properties page for the standby database resource.

Figure 4–17 Properties Page for the Standby Database Resource



See Also: Section 3.3 for complete information about configurable database resource properties

4.6 Performing a Manual Switchover Outside of Data Guard Manager

There may be occasions when you need to perform some operations outside of Data Guard Manager. For example, you might want to temporarily exit from Data Guard Manager so that you can use SQL statements to perform a switchover operation between the primary database and standby databases.

This section provides the steps you must do to exit the GUI, perform a switchover operation, and then return to managing the configuration with Data Guard Manager.

Step 1 Delete the configuration.

When you delete a configuration from Data Guard Manager, you remove all objects in the configuration from management and monitoring through the GUI. It does not affect the underlying operations of the primary and standby databases, log transport services, or log apply services. Operations such as log shipping and log applying continue to function. However, these services are no longer manageable through Data Guard Manager.

To delete the configuration, from the Data Guard Manager menu:

1. Make sure you are connected to the configuration through the primary database.
2. In the tree view, select the **configuration**.
3. From the **Object** menu, select **Delete**.

Data Guard Manager displays a warning and asks you to confirm the delete operation.

Step 2 Exit from Data Guard Manager.

To exit from Data Guard Manager, choose **File > Exit**.

Step 3 Stop the Data Guard monitor.

On both the primary and standby sites, stop the Data Guard monitor by setting the `DRS_START=FALSE` parameter using the SQL `ALTER SYSTEM` statement.

```
SQL> ALTER SYSTEM SET DRS_START=FALSE;
System altered.
```

```
SQL> SHOW PARAMETER DRS_START
NAME                TYPE        VALUE
-----
drs_start            boolean     FALSE
```

Step 4 Use SQL statements to perform a switchover operation.

Follow the instructions in *Oracle9i Data Guard Concepts and Administration* for complete information using the SQL `ALTER DATABASE COMMIT TO`

SWITCHOVER statement on both the primary and standby sites to perform a switchover operation.

Note: After performing this step, you should stop and restart the Intelligent Agent on both nodes to rediscover the nodes and databases. See *Oracle Intelligent Agent User's Guide* for additional information.

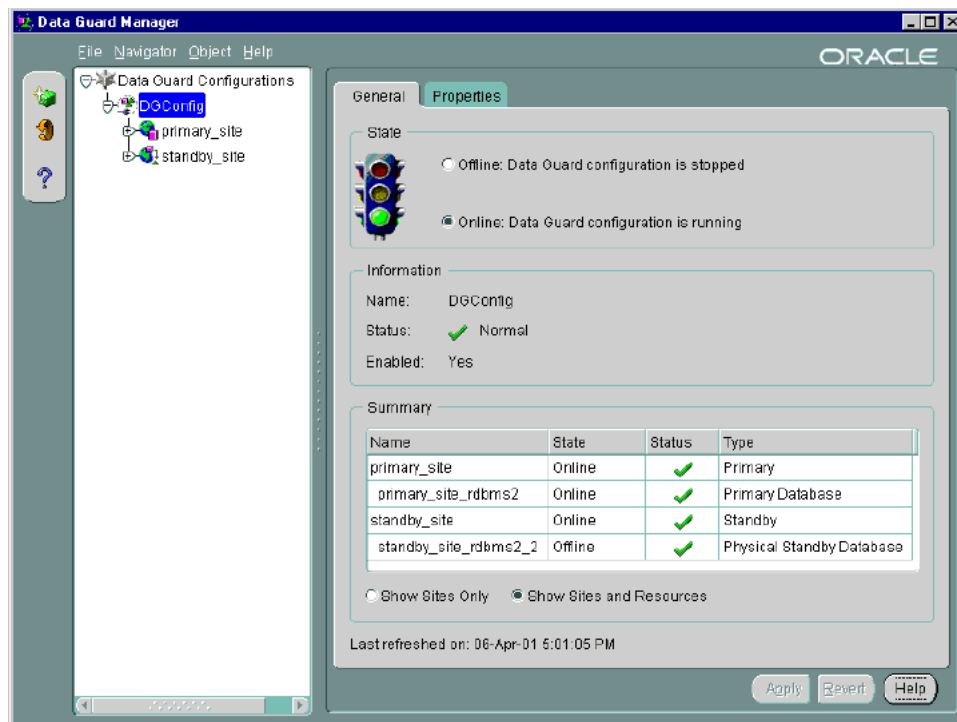
Step 5 Re-create the configuration with Data Guard Manager.

Use the Create Configuration wizard and choose the Create Existing Standby option to create and enable the configuration based on the new primary and standby roles. (Follow the steps in Section 4.2 through Section 4.4.) Because the standby site is already created, you can use the Create Existing Standby method to create the standby database. This method takes only a few minutes to re-create the standby database.

4.7 Monitoring a Data Guard Configuration

Data Guard Manager provides the ability to monitor the status of a configuration as well as the redo log activity of the primary and standby databases.

For example, Figure 4–18 shows general information for all of the objects in the DGConfig configuration.

Figure 4–18 *Displaying General Information About the Configuration*

The General tab for the Data Guard configuration not only displays information about the configuration, but it includes summary information about its sites and database resources. In Figure 4–18, for example, the summary information on the property page shows that the standby database is offline, while all other objects in the configuration are online and running with normal status. If you want to find out more information about why the standby database is offline, select the standby database resource in the tree view and view the database resource’s property pages.

To ensure you are seeing the most current information, you should refresh the display often. To do this, either click the refresh icon on the toolbar or select **Navigator > Refresh** from the menu bar.

4.7.1 Using Event Tests

In addition to monitoring the status and log activity using Data Guard Manager, you can register event tests with Oracle Enterprise Manager to monitor the redo log

activity on the primary and standby databases or monitor the status of the configuration as a whole.

You can create events using predefined event tests that are installed with Data Guard. Table 4–2 describes the six Data Guard event tests.

Table 4–2 Data Guard Event Tests

Event	Description
Actual Apply Delay	Measures the difference (in number of archived redo logs) between the current log at the primary database and the last log applied on the standby database.
Data Not Applied	Measures the time difference (in minutes) between the last archived redo log received and the last log applied on the standby database.
Logs Not Applied	Measures the difference (in number of archived redo logs) between the last log received and the last log applied on the standby database.
Logs Not Shipped	Measures the difference (in number of archived redo logs) between the current log on the primary database and the last log shipped to the standby database.
Potential Data Loss	Measures the time difference (in minutes) between the current redo log on the primary database and the last log received on the standby database.
Status	Checks the status of the Data Guard configuration. Note: If the status is not SUCCESS, then this event test is triggered.

Using the Enterprise Manager Event System, you can register one or more Data Guard event tests against both the primary and standby databases. You can also set up the Paging /Email Services to notify you through your pager or e-mail if any of the event tests are triggered.

In addition to registering the Data Guard event tests, consider registering the Node UpDown event test against each node where the Oracle Intelligent Agent is running. This event test monitors the node and the Intelligent Agent. Because the UpDown event test is triggered if any problems occur with the node or agent, it can be very beneficial in detecting problems that may prevent other event tests, including Data Guard event tests, from running.

See Also: Oracle Enterprise Manager help and documentation for more information about registering event tests and using the Paging/Email Services

4.7.2 Creating and Registering Data Guard Events

The example in this section describes how to create and register Data Guard event tests and set up for notification through e-mail when an event occurs.

Step 1 Ensure Oracle Enterprise Manager is prepared.

To prepare the Enterprise Manager environment for events, it is essential that you have performed the following prerequisite tasks:

- Ensure the Oracle Intelligent Agent is running on both nodes.
- Ensure the primary and standby nodes have been discovered (and therefore the primary and standby databases have been discovered).
- Set Preferred Credentials on both databases.
- Invoke Data Guard Manager and connect to the Data Guard configuration.

Note: These tasks were discussed in detail in Section 4.1.

Step 2 Set up to receive event notification by pager or e-mail.

If you want to receive event notification by pager or e-mail, invoke the Paging/Email Services to set up the SMTP mail gateway and mail address of the person who will receive the event notification. From the menu bar on the Enterprise Manager Console, invoke the Paging/Email Services by selecting: **Configuration > Configure Paging/Email**

See Also: The Oracle Enterprise Manager documentation and help for a complete description of the Paging/Email Services

Step 3 Create the event tests.

From the menu bar on the Enterprise Manager Console, select:

Event > Create Event

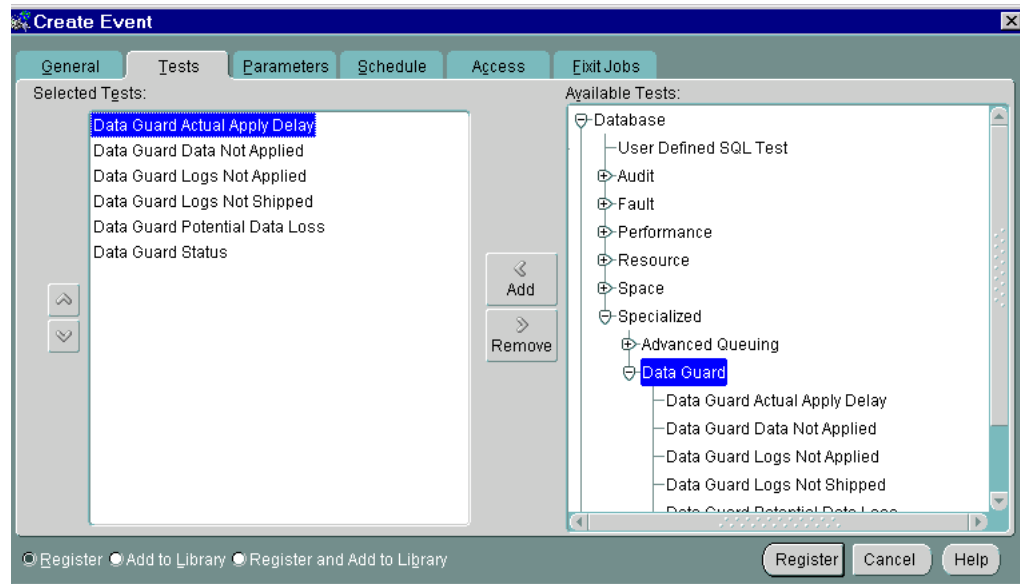
Complete or modify the fields in the following Create Event system property pages:

- **General**—Specifies a name for the event, destination-target type, and event targets. To create one or more the Data Guard event tests, enter a user-friendly name for the Event Name, select **Database** as the Target Type, and add the **primary and standby databases** as the targets you want to monitor.
- **Tests**—Specifies the event tests that you want to create. You can select any event listed in the Available Tests tree view, including any of the Data Guard event tests that were described in Table 4-2. To see the list of Data Guard event tests, select:

Database > Specialized > Data Guard

For each event test that you want to create, select the test from the Available Tests view and click **Add** to move it to the Selected Tests list. In Figure 4-19, all of the Data Guard event tests have been selected.

Figure 4-19 *Predefined Data Guard Event Tests*



- **Parameters**—Specifies settings, such as the number of occurrences and threshold values, that you can customize for each event test. Parameters vary according to the event test selected. The available parameters for an event test are displayed when the event test is selected. Some event tests, such as Data Guard Status, do not have parameters.
- **Schedule**—Specifies how frequently you want the Oracle Intelligent Agent to run event tests. By default, all of the event tests run every 5 minutes (except for the Up/Down event test, which is checked at an interval set by the system itself).

Note: You should experiment with the schedule setting because there is a trade-off between frequency of the test and the performance of your system. Running tests at a more frequent interval increases the workload on your system and may produce a noticeable effect on performance.

- **Access**—Specifies the access permissions that you want to assign for the event. You can allow other DBAs no access, full access, or restricted access so that other DBAs can only view the event or modify the event log. Because the example in this section is set up for e-mail notification, you should ensure that the Notify option is selected for each DBA who requires notification.
- **Fixit Jobs**—Specifies jobs that respond to specific error conditions. There are no fixit jobs for Data Guard event tests.

When you have completed all of the Create Event property sheets, select **Register and Add to Library** option on the bottom left side and then click **Register and Add** to send the event to the selected destinations. This adds the event to the Library and saves the event definitions.

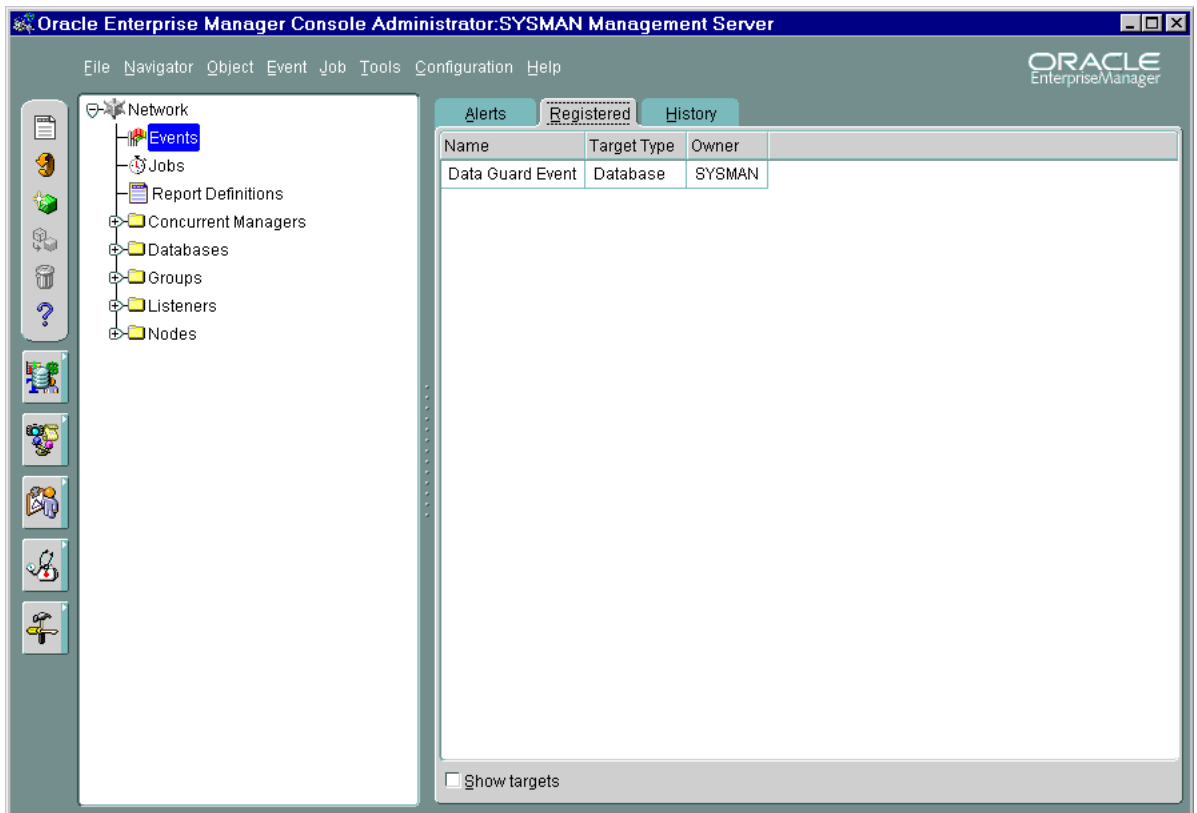
When the event is submitted, the primary and standby database destinations are validated and the Intelligent Agent for each destination processes the event.

Step 4 View registered events.

If the registration is successful, the event displays in the Registered page of the Events pane. For example, Figure 4–20 shows that the event named Data Guard Event was registered successfully.

Note: Remember, the primary and standby nodes must already be discovered, Preferred Credentials must be set, the Intelligent Agent must be running, and you must be connected to the Data Guard configuration for the *registration to be successful*.

Figure 4–20 Viewing Registered Events

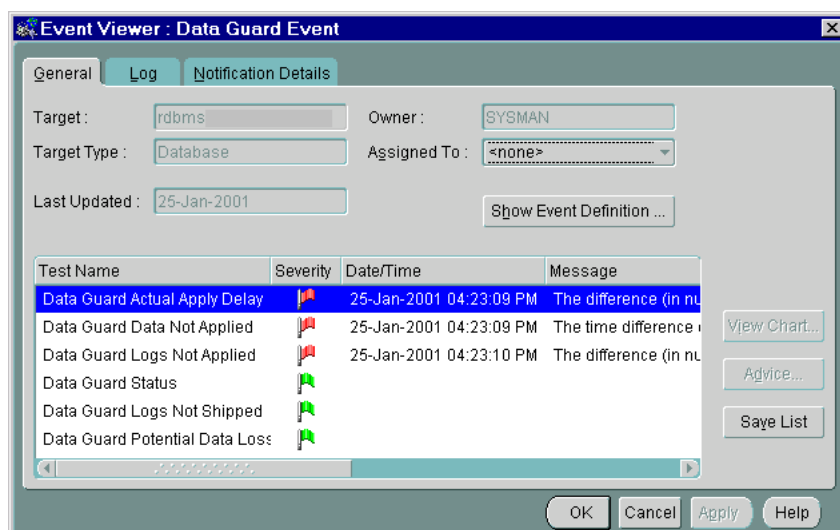


Step 5 View triggered events.

If an event condition is triggered or a threshold value is exceeded, a notification is sent to the General page of the Events pane in the Enterprise Manager Console.

Figure 4–21 shows some Data Guard events that were triggered after log transport and apply stopped between the primary and standby databases.

Figure 4–21 General Property Page of the Event Viewer



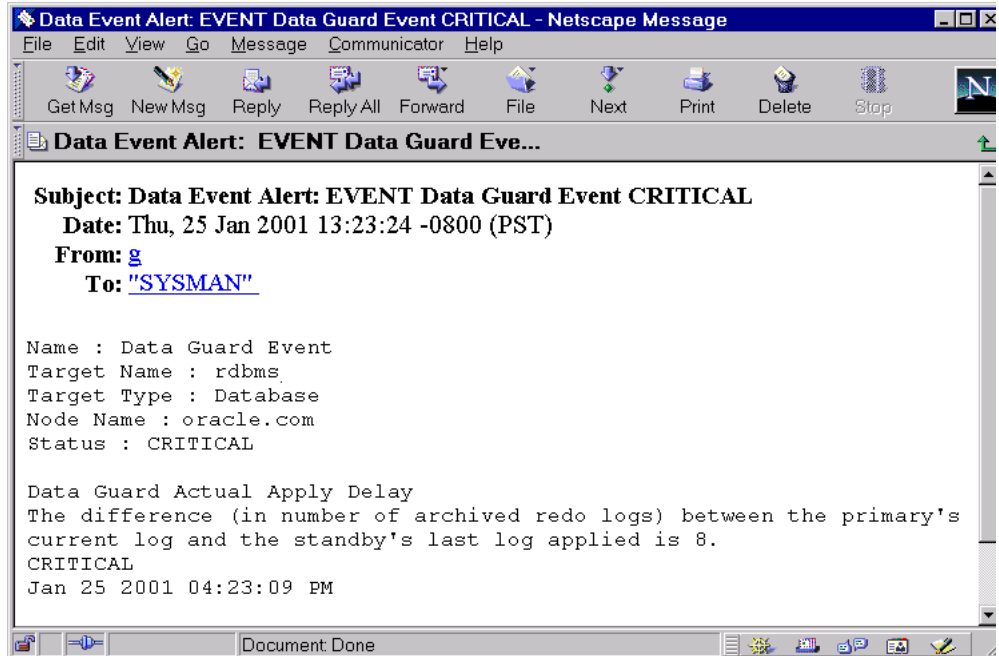
In Figure 4–21, notice how the events return a different flag symbol and message, depending on the severity of the event. The severity levels are determined by the parameters you set for the event tests when you created them. See the Oracle Enterprise Manager online help system for more information about the different symbols.

When running the Data Guard event tests, an error might occur for the following reasons:

- The event test fails to run.
- The event test cannot call the Data Guard monitor (DMON) process.

Because the Paging/Email Services was set up, DBAs are also notified by an e-mail message similar to the one shown in Figure 4–22.

Figure 4–22 E-Mail Notification for the Actual Apply Delay Event



After an event condition is fixed, the event is cleared automatically. You can also clear an event by acknowledging it and moving it to the Events History page.

Using the Data Guard Command-Line Interface

This chapter describes how to use the Data Guard command-line interface (CLI) to create, manage, and monitor a broker configuration, including updating or changing the states and properties. It also shows how to coordinate failover and switchover operations outside of the broker.

This chapter provides the following sections:

- Section 5.1, "Creating a Standby Database"
- Section 5.2, "Creating a Configuration"
- Section 5.3, "Setting Database Critical Properties"
- Section 5.4, "Enabling the Configuration, Sites, and Resources"
- Section 5.5, "Performing Routine Management Tasks"
- Section 5.6, "Performing Activities Outside of the Broker"
- Section 5.7, "Monitoring a Data Guard Configuration"

5.1 Creating a Standby Database

One of the prerequisites for using the CLI is that a primary database and a standby database must already exist. If you are using Data Guard Manager, you can skip the steps described in this section because the graphical user interface (GUI) can automatically create a standby database for you, including configuring the initialization parameter file and setting up the network.

Note: Use Data Guard Manager to automatically create and set up a standby database, or to import an existing standby database into the configuration.

Typically, you will create the standby database on a separate host from the primary database. However, Oracle9i Data Guard does not restrict you from configuring the primary and standby databases on the same host.

To create your Data Guard configuration, you must construct the standby database from backups of the primary database control files and datafiles, and then prepare it for recovery. The following list summarizes the steps:

See Also: *Oracle9i Data Guard Concepts and Administration* for detailed information about creating standby databases.

1. Make a backup of the primary database datafiles (or access a previous backup) and create the standby control file.
2. Transfer the datafiles and control file to the standby site.
3. Configure Oracle Net to enable communication between the primary and standby database instances.
4. Configure the standby initialization parameter files.
5. Start the standby database instance without mounting it.

5.2 Creating a Configuration

This section provides examples that create a broker configuration named Sales that includes a primary and standby site located in two different cities.

Each site in this configuration has a single database instance:

- The primary database is located in Boston.
- A standby database is located in San Francisco.

Creating a configuration requires that you connect to the primary database and then specify an Oracle Net service name to uniquely identify the primary site.

The following steps show how to create a configuration and add one physical standby site:

Step 1 Invoke the Data Guard CLI.

To start the CLI, enter DGMGRL at the command line prompt on a system where Oracle9i Data Guard is installed:

```
% DGMGRL [options]
DGMGRL for Solaris: Version 9.0.1.0.0 - Production.
(c) Copyright 2001 Oracle Corporation. All rights reserved.
Welcome to DGMGRL, type "help" for information.
DGMGRL>
```

Step 2 Connect to the primary database.

Before you specify any command (other than the `HELP`, `EXIT`, or `QUIT` command), you must first connect to the primary database using the `DGMGRL CONNECT` command.

The account from which you connect to the database (`SYS` in this example) must have `SYSDBA` privileges on the primary and standby sites. You do not have to include `AS SYSDBA` on the `CONNECT` command because `SYSDBA` is the default setting for this command.

The following examples show two variations of the `CONNECT` command.

Example 5-1 shows how to connect to the default database on the local system and Example 5-2 includes the Oracle Net service name (`prmy`) to make a connection to a database located on a remote system.

Example 5-1 Connecting to the Default Database on the Local System

```
DGMGRL> CONNECT sys/change_on_install;
Connected.
```

Example 5-2 Connecting to the Default Database on a Remote System

```
DGMGRL> CONNECT sys/change_on_install@prmy;
Connected.
```

Step 3 Create the broker configuration.

To create the broker configuration, you first define the configuration including the primary site, which in this case is called Boston. In a later command, you will add the standby site, San Francisco.

1. Use the `CREATE CONFIGURATION` command to create the Sales configuration and define the primary site, Boston. The Boston site hosts a database resource called `Sales_db`.

```
DGMGRL> CREATE CONFIGURATION 'Sales' AS
PRIMARY SITE IS 'Boston'
RESOURCE IS 'Sales_db'
HOSTNAME IS 'System1'
INSTANCE NAME IS 'bstn'
SERVICE NAME IS 'primary'
SITE IS MAINTAINED AS PHYSICAL;
```

The CLI returns the following information:

```
Configuration "Sales" added with primary site "Boston"
Database resource "Sales_db" added.
```

Step 4 Show the configuration information.

Use the `SHOW CONFIGURATION` command to display a brief summary of the configuration:

```
DGMGRL> SHOW CONFIGURATION;
```

The CLI returns the following information:

```
Configuration 'Sales' is
  Primary Site is 'Boston'
Current status for "Sales":
DISABLED
```

Use the `SHOW CONFIGURATION VERBOSE` command to display a detailed summary of the configuration:

```
DGMGRL> SHOW CONFIGURATION VERBOSE;
```

The CLI returns the following information that shows the broker configuration currently contains only the primary site:

```
Configuration
Name:           'Sales'
Enabled:        'no'
Default state:  'ONLINE'
Intended state: 'OFFLINE'
Number of sites: 1
Sites:
  Name: Boston
```

Step 5 Add a standby site to the configuration.

To add a standby database site to the Sales configuration, use the `CREATE SITE` command.

The following command defines the San Francisco location as a standby site hosting a database resource called `reportingdb`, which is the standby database associated with the primary database called `Salesdb`.

```
DGMGRL> CREATE SITE 'San Francisco'
        RESOURCE IS 'reportingdb'
        HOSTNAME IS 'system2'
        INSTANCE NAME IS 'sfdb'
        SERVICE NAME IS 'dest2'
        SITE IS MAINTAINED AS PHYSICAL;
```

The CLI returns the following information:

```
Site "San Francisco" added to configuration.
Database resource "reportingdb" added.
```

Then, use the `SHOW SITE VERBOSE` command to verify that the San Francisco site was added to the Sales configuration:

```
DGMGRL> SHOW SITE VERBOSE 'San Francisco';
```

The CLI returns the following information:

```
Site
  Name: 'San Francisco'
  Hostname: 'system2'
  Instance name: 'sfdb'
  Service Name: 'dest2'
  Standby Type: 'physical'
  Number Built-in Processes: '2'
  Number Generic Processes: '0'
  Enabled: 'no'
  Required: 'yes'
  Default state: 'STANDBY'
  Intended state: 'OFFLINE'
  Number of resources: 1
  Resources:
    Name: reportingdb (default) (verbose name='reportingdb')
```

5.3 Setting Database Critical Properties

After you create the configuration with the CLI, you must set the `LogArchiveDestOptions`, `ArchiveDestDependency`, and `StandbyArchiveDest` critical properties before the configuration can be successfully enabled. If you do not set values for these properties, the Data Guard configuration will not function properly.

For example, the following SQL statements set the critical properties for the `reportingdb` standby database resource:

```
DGMGRL> ALTER RESOURCE reportingdb SET PROPERTY LogArchiveDestOptions = '';
DGMGRL> ALTER RESOURCE reportingdb SET PROPERTY ArchiveDestDependency = '';
DGMGRL> ALTER RESOURCE reportingdb SET PROPERTY StandbyArchiveDest = '/archfs/arch/';
```

These properties map directly to the following database initialization parameters: `LOG_ARCHIVE_DEST_n`, the `DEPENDENCY` attribute of the `LOG_ARCHIVE_DEST_n` parameter, and `STANDBY_ARCHIVE_DEST`. You do not need to set critical properties for the primary database resource.

Note: You must set the `LogArchiveDestOptions`, `ArchiveDestDependency`, and `StandbyArchiveDest` properties for the standby database resource before you can enable the configuration.

5.4 Enabling the Configuration, Sites, and Resources

So far, the Sales configuration has been disabled, which means it is not under the control of the Data Guard monitor. When you finish configuring the sites and resources into a broker configuration and setting the critical database properties (described in Section 5.3), you must enable the configuration to allow the Data Guard monitor to manage the configuration, and so that you bring the primary and standby database systems online.

You can enable:

- The entire configuration, including all of its sites and resources
- A standby site, including the database resource on the standby site
- A database resource

Step 1 Enable the entire configuration.

You can enable the entire configuration, including all of the sites and resources, with the following command:

```
DGMGRL> ENABLE CONFIGURATION;  
Enabled.
```

When you enable the configuration, its default state is online.

Step 2 Show the configuration.

Use the `SHOW` command to verify that the configuration and its resources were successfully enabled and brought online.

```
DGMGRL> SHOW CONFIGURATION VERBOSE;
```

The CLI returns the following information:

```
Configuration  
Name:           'Sales'  
Enabled:        'yes'  
Default state:  'ONLINE'  
Intended state: 'ONLINE'  
Number of sites: 2  
Sites:  
  Name: Boston  
  Name: San Francisco
```

5.5 Performing Routine Management Tasks

There may be situations in which you want to change the state or properties of the objects in a broker configuration to perform routine maintenance on one or more objects. You might also need to disable objects in a configuration when you want to transition the resources from a managed mode to a state of no longer being managed by the Data Guard monitor. For example, you might want to transition the standby site to the offline state to stop applying archived redo logs temporarily while you replace a faulty disk drive.

5.5.1 Changing States and Properties

As you monitor the configuration, you might need to dynamically modify Data Guard properties. For example, you might choose to change one of the properties that controls log transport services and log apply services, or you might put the

standby database in read-only mode temporarily to run some reporting applications.

The following sections show how to change the state or properties of the objects in the configuration:

5.5.1.1 Alter the State of the Broker Configuration

Example 5-3 shows how to take all objects offline across the entire broker configuration.

Example 5-3 Altering the Broker Configuration

```
DGMGRL> ALTER CONFIGURATION SET STATE = 'OFFLINE';
Succeeded.
```

5.5.1.2 Alter a Database Resource Property

Section 5.3 described how you must set critical database properties before the configuration can be enabled. You can also modify the values of critical and noncritical database properties at any time—you can edit database resource properties if the database is enabled, disabled, online, or offline.

Example 5-4 shows how to use the `ALTER RESOURCE` command to change the `LogArchiveTrace` property to the value 127 for the `Sales_db` database resource

Example 5-4 Altering a Database Resource Property

```
DGMGRL> ALTER RESOURCE 'Sales_db' ON SITE 'Boston'
SET PROPERTY LogArchiveTrace='127';
```

The CLI returns the following message to indicate that the `LogArchiveTrace` property was updated successfully in the Data Guard configuration file:

```
Property "LogArchiveTrace" updated
```

5.5.1.3 Alter the State of a Database Resource

If the configuration is currently disabled, the database resource does not use the new property value until you enable the broker configuration with the `ENABLE CONFIGURATION` command.

You might want to use the standby database temporarily for reporting applications. To change the state of the standby database to read-only, enter the `ALTER RESOURCE` command as shown in Example 5-5.

Example 5–5 Altering a Database Resource State

```
DGMGRL> ALTER RESOURCE 'reportingdb' ON SITE 'San Francisco'
SET STATE='READ-ONLY';
```

Remember that when you put the standby database in the read-only state, it stops log apply services from applying the archived redo logs to the standby database.

The CLI returns the following message to indicate that the command was successfully updated in the Data Guard configuration file:

Succeeded.

5.5.1.4 Alter the State of a Site

By default, a site is in the same state as the configuration. However, you can use the `ALTER SITE` command (shown in Example 5–6) to restrict a site and its dependent database resources from going online when its parent configuration goes online.

Example 5–6 Altering a Site State

```
DGMGRL> ALTER SITE 'Boston' SET STATE='Offline';
```

The CLI returns the following message to indicate that the command was successfully updated in the Data Guard configuration file:

Succeeded.

5.5.2 Disabling the Configuration, Sites, and Database Resources

When you disable the broker configuration or any of its sites or resources, you are effectively removing your ability to use the CLI to manage and monitor the disabled object. However, disabling a broker configuration does not affect the actual operation of the configuration, its sites, or the database resources. For example, the log transport services and log apply services in the Data Guard configuration continue to function unchanged, but you cannot manage them with the CLI.

In addition, disabling an object **does not** remove or delete it from the Data Guard configuration file. You can re-enable your ability to use the CLI (or Data Guard Manager) to manage the object by entering the appropriate `ENABLE CONFIGURATION`, `ENABLE SITE`, or `ENABLE RESOURCE` command.

After you enter a `DISABLE CONFIGURATION`, `DISABLE SITE`, or `DISABLE RESOURCE` command, the CLI returns the following message to indicate that the command successfully updated the Data Guard configuration file:

Disabled.

5.5.2.1 Disable a Configuration

You must use the `DISABLE CONFIGURATION` command to disable the entire broker configuration or to disable the primary site as shown in Example 5–7.

Example 5–7 *Disabling the Configuration or the Primary Site*

```
DGMGRL> DISABLE CONFIGURATION;
```

The only way to disable the primary site is to use the `DISABLE CONFIGURATION` command; the `DISABLE SITE` command only disables the standby site.

Note: If you disable a configuration while connected to the standby database, you must be connected to the primary database when you re-enable the configuration.

5.5.2.2 Disable a Database Resource

You use the `DISABLE RESOURCE` command on the primary database or standby database when you no longer want to use the CLI to manage and monitor it. The `DISABLE RESOURCE` command disables the database, but it does not stop or change actual database operations (for example, log apply services) occurring in the Data Guard configuration. The command shown in Example 5–8 disables management of the `reportingdb` standby database.

Example 5–8 *Disabling a Database Resource*

```
DGMGRL> DISABLE RESOURCE reportingdb ON SITE 'San Francisco';
```

5.5.2.3 Disable the Standby Site

You use the `DISABLE SITE` command when you no longer want to use the CLI to manage and monitor the standby site and the standby database resource.

You can explicitly disable a standby site to prevent it from being brought online when the rest of the configuration is brought online. Example 5–9 shows how to disable the San Francisco standby site.

Example 5–9 *Disabling a Standby Site*

```
DGMGRL> DISABLE SITE 'San Francisco';
```

Note: To disable a primary site, you must use the `DISABLE CONFIGURATION` command.

5.5.3 Removing the Configuration or the Standby Site

When you use either the `REMOVE CONFIGURATION` or `REMOVE SITE` command, you effectively delete the configuration or standby site information from the Data Guard configuration file, removing the ability of the Data Guard monitor (DMON) process to manage the configuration or the standby site, respectively.

A remove operation *does not* remove or delete the actual Data Guard configuration, nor does it affect the operation of the actual Data Guard configuration, its sites, or the database resources.

Caution: After you use the `REMOVE CONFIGURATION` or `REMOVE SITE` command, you cannot recover the configuration information that has been deleted from the Data Guard configuration file. You must go through the steps in Section 5.2, as necessary, to create a broker configuration that can be managed with the CLI (or Data Guard Manager).

Step 1 Remove a standby site from the configuration.

When you use the `REMOVE SITE` command, you remove the standby site and standby database from management and monitoring by Data Guard monitor.

```
DGMGRL> REMOVE SITE 'San Francisco';
```

The CLI returns the following message to indicate that the command successfully removed the San Francisco site information from the Data Guard configuration file:

```
Removed site "San Francisco" from configuration.
```

Step 2 Remove the broker configuration.

Use the following command to remove the entire configuration from management and monitoring by Data Guard monitor:

```
DGMGRL> REMOVE CONFIGURATION;
```

The CLI returns the following message to indicate that the command successfully removed all of the configuration information from the Data Guard configuration file:

Removed configuration.

5.6 Performing Activities Outside of the Broker

There may be occasions when you want to perform some operations outside of the CLI framework. For example, you might want to use the SQL statements that will perform a switchover operation.

Step 1 Remove the broker configuration.

When you remove a configuration, you are removing all of the objects in the configuration from management and monitoring by Data Guard monitor. It does not affect the underlying operations of the primary and standby databases, log transport services, or log apply services. Operations such as log shipping and log applying continue to run. However, these services are no longer manageable through the CLI.

```
DGMGRL> REMOVE CONFIGURATION;
Removed configuration.
```

Step 2 Quit (or exit) the Data Guard command-line interface.

To exit from the CLI, enter the `QUIT` or `EXIT` command. For example:

```
DGMGRL> QUIT;
```

Step 3 Stop the Data Guard monitor.

On both the primary and standby sites, stop the Data Guard monitor by setting the `DRS_START=FALSE` parameter using the SQL `ALTER SYSTEM` statement.

```
SQL> ALTER SYSTEM SET DRS_START=FALSE;
System altered.
```

```
SQL> SHOW PARAMETER DRS_START
```

NAME	TYPE	VALUE

drs_start	boolean	FALSE

Step 4 Use SQL statements to perform a switchover operation.

Use the SQL statement `ALTER DATABASE COMMIT TO SWITCHOVER` on both the primary and standby sites to perform a switchover operation.

See Also: *Oracle9i Data Guard Concepts and Administration* for complete information about performing a switchover operation

Step 5 Re-create the broker configuration.

Follow the steps in Section 5.2 and Section 5.4 to create and enable the broker configuration based on the new primary and standby roles.

5.7 Monitoring a Data Guard Configuration

The scenario in this section demonstrates how to use `SHOW` commands to view database monitorable properties, and identify and resolve a failure situation.

Step 1 Identify the failure.

Assume that a failure occurred when the primary database attempted to transport an archived redo log to the standby site. To identify the failure, examine the `LogXptStatus` (log transport status) property to see the error status of log transport services for the standby site. Use the following command at the `DGMGRL` command-line prompt:

```
DGMGRL> SHOW RESOURCE VERBOSE 'Sales_db' LogXptStatus;
LogXptStatus = 'San Francisco=ORA-16049: simulated error on archive log write'
```

This `LogXptStatus` property indicates that the error `ORA-16049` has been returned during a write operation to the standby site, San Francisco.

Step 2 Obtain additional information.

To obtain additional information, use the `SHOW LOG ALERT LATEST` command to view the database alert log on the primary site, Boston. For example:

```
DGMGRL> SHOW LOG ALERT LATEST ON SITE 'Boston';
DRSLOG
LINE LOG
```

The command returns the following output:

```
-----
7590 Transmitting activation ID 1332649663 (4f6e9ebf)
7591 ARCH: Completed archiving log# 1 thrd# 1 seq# 737
7592 Fri Jan 19 16:23:26 2001
7593 Completed checkpoint up to RBA [0x2e2.2.10], SCN: 0x0000.0000df8d
7594 Fri Jan 19 16:25:07 2001
7595 Beginning log switch checkpoint up to RBA [0x2e3.2.10], SCN:0x0000.0000df91
```

```
7596 Fri Jan 19 16:25:07 2001
7597 ARCH: Beginning to archive log# 2 thrd# 1 seq# 738
7598 Fri Jan 19 16:25:07 2001
7599 Thread 1 advanced to log sequence 739
7600 Current log# 1 seq# 739 mem# 0: /vobs/oracle/dbs/t_log1.f
7601 Fri Jan 19 16:25:07 2001
7602 ARC0: Beginning to archive log# 2 thrd# 1 seq# 738
7603 ARC0: Unable to archive log# 2 thrd# 1 seq# 738
7604 Log actively being archived by another process
7605 Fri Jan 19 16:25:07 2001
7606 Transmitting activation ID 1332649663 (4f6e9ebf)
7607 Transmitting activation ID 1332649663 (4f6e9ebf)
7608 ARCH: I/O error 16049 archiving log 2 to 'standby1'
7609 ARCH: Completed archiving log# 2 thrd# 1 seq# 738
```

In the example, lines 7603 through 7609 (in boldface type) show that the archiver process failed to transmit log file 738 to the standby archive destination identified as standby1. This is probably because an I/O error occurred when archiving the redo log to the standby site.

Step 3 Examine the primary and standby queues for archived redo logs.

To determine the severity of this failure and its effect on the integrity of the Data Guard configuration, use the following commands to examine the state of the archived redo logs from the perspective of both the primary and standby sites.

1. Use the following command to examine the `SendQEntries` (send queue entries) property on the primary database, `Sales_db`. The `SendQEntries` property shows the archive status of all of the log files on the primary site:

```
DGMGRL> SHOW RESOURCE VERBOSE 'Sales_db' SendQEntries;
DGMGRL> PRIMARY_SEND_QUEUE
```

SITE_NAME	STATUS	LOG_SEQ	TIME_GENERATED	TIME_COMPLETED
San Francisco	ARCHIVED	738	01/19/2001 16:23:23	01/19/2001 16:25:07
	CURRENT	739	01/19/2001 16:25:07	

The output shows that log 738 has been archived locally on the primary site and shipped to the San Francisco standby site.

2. Now, examine the `SbyLogQueue` (standby log queue) property to view the archived redo logs that have been received by the standby site, but have not been applied to the standby database, `reportingdb`:

```
DGMGRL> SHOW RESOURCE VERBOSE 'reportingdb' SbyLogQueue;
DGMGRL> STANDBY_RECEIVE_QUEUE
```

LOG_SEQ	TIME_GENERATED	TIME_COMPLETED
738	01/19/2001 16:23:23	01/19/2001 16:25:07

3. Use the same commands again to monitor the problem:

```
DGMGRL> SHOW RESOURCE VERBOSE 'Sales_db' SendQEntries;
DGMGRL> PRIMARY_SEND_QUEUE
```

SITE_NAME	STATUS	LOG_SEQ	TIME_GENERATED	TIME_COMPLETED
San Francisco	ARCHIVED	738	01/19/2001 16:23:23	01/19/2001 16:25:07
San Francisco	ARCHIVED	740	01/19/2001 16:31:26	01/19/2001 16:32:33
	CURRENT	745	01/19/2001 16:51:55	

```
DGMGRL> SHOW RESOURCE VERBOSE 'reportingdb' SbyLogQueue;
DGMGRL> STANDBY_RECEIVE_QUEUE
```

LOG_SEQ	TIME_GENERATED	TIME_COMPLETED
738	01/19/2001 16:23:23	01/19/2001 16:25:07
739	01/19/2001 16:25:07	01/19/2001 16:31:26
740	01/19/2001 16:31:26	01/19/2001 16:32:33
741	01/19/2001 16:32:33	01/19/2001 16:36:28
742	01/19/2001 16:36:28	01/19/2001 16:41:36
743	01/19/2001 16:41:36	01/19/2001 16:46:41
744	01/19/2001 16:46:41	01/19/2001 16:51:55

As you can see, the problem is not resolving itself. The primary send queue contents shown by the `SendQEntries` property show that logs 738 and 740 have not been successfully archived to the standby destination. The initial failure with transporting log 738 to the standby has caused log apply services on the standby database to fall behind the primary database. The output for the `SbyLogQueue` property shows that the standby database receive queue grows with every new archived redo log sent by the primary database.

The failure resulted in only a portion of log 738 being written to the standby database destination.

Step 4 Examine the database alert log on the standby site.

The final step in this process is to examine the database alert log on the standby site to determine a possible solution to the problem. The following command allows you to view the latest entries in the database alert log for the standby site.

```
DGMGRL> SHOW LOG ALERT LATEST ON SITE 'San Francisco';
DRSLOG
LINE LOG
```

```
-----
7571 Fri Jan 19 16:21:15 2001
7572 Media Recovery Log /vobs/oracle/dbs/stdby_1_736.arc
7573 Media Recovery Waiting for thread 1 seq# 737
7574 Fri Jan 19 16:23:30 2001
7575 Media Recovery Log /vobs/oracle/dbs/stdby_1_737.arc
7576 Media Recovery Waiting for thread 1 seq# 738
```

```
7577 Fri Jan 19 16:25:15 2001
7578 Media Recovery Log /vobs/oracle/dbs/standby_1_738.arc
7579 Fri Jan 19 16:25:15 2001
7580 Errors in file /vobs/oracle/rdbms/log/standby1_mrp0_28842.trc:
7581 ORA-00311: cannot read header from archived log
7582 ORA-00334: archived log: '/vobs/oracle/dbs/standby_1_738.arc'
7583 ORA-27091: skgfgio: unable to queue I/O
7584 ORA-27072: skgfdisp: I/O error
7585 SVR4 Error: 25: Inappropriate ioctl for device
7586 Additional information: 1
7587 MRP0: Background Media Recovery failed with error 311
7588 Recovery interrupted.
7589 Recovered data files restored to a consistent state at change 270314464672.
7590 MRP0: Background Media Recovery process is now terminated
```

This output from the database alert log shows that a fatal error reading log 738 (the corrupted log file) has resulted in the shutdown of the background Media Recovery Process. For this reason, no other archived redo logs have been applied to the standby database.

Step 5 Fix the problem.

The solution is to manually copy logs 738 and 740 from the primary site to the standby site. Then, the next log file that is sent automatically to the standby site should trigger the application of all of the log files waiting in the standby queue to the standby database.

If this does not fix the problem, you might need to take the standby database resource offline and then put it back online again.

The `ALTER RESOURCE` command in the following example changes the state of the `reportingdb` database resource to offline and then back into an online state.

```
DGMGRL> ALTER RESOURCE 'reportingdb' ON SITE 'San Francisco' SET STATE='offline';
Succeeded.
```

```
DGMGRL> ALTER RESOURCE 'reportingdb' ON SITE 'San Francisco'
SET STATE='PHYSICAL-APPLY-ON';
Succeeded.
```

Data Guard Command-Line Interface Reference

The Data Guard command-line interface allows you to manage a Data Guard configuration and its site and database resource objects directly from the command line, or from batch programs or scripts. You can use the Data Guard command-line interface as an alternative to the Oracle9i Data Guard Manager graphical user interface for managing a Data Guard configuration.

This chapter provides reference information for the Data Guard command-line interface.

6.1 Starting the Data Guard Command-Line Interface

To run the Data Guard command-line interface, you must have SYSDBA privileges.

Start the command-line interface by entering `DGMGRL` at the command line prompt on a system where Oracle9i Data Guard is installed:

```
% DGMGRL [options]
DGMGRL for Solaris: Version 9.0.1.0.0 - Production.
(c) Copyright 2000 Oracle Corporation. All rights reserved.
Welcome to DGMGRL, type "help" for information.
DGMGRL>
```

6.1.1 DGMGRL Optional Parameters

You can supply optional parameters on the command line to indicate how you want the Data Guard command-line interface to display output such as command prompts, banners, and messages.

Specify none, one, or all of the following keywords when you invoke the DGMGRL command-line interface:

- `-echo`
Echoes command input and output to the default display device. If you do not use this parameter, only the output from the command is displayed.
- `-help`
Accesses the DGMGRL help system. You can enter the word `help` by itself to display `help` for all of the DGMGRL commands, or you can include the name of a command (from Table 6–1) after the keyword `help` to display information about a specific command.
- `-silent`
Displays output from DGMGRL commands in an abbreviated format. This mode is useful if you are directing the command output to a file or to another display tool.

The following subsections specify the command format that you enter at the DGMGRL> prompt.

6.1.2 DGMGRL Command Format and Parameters

The DGMGRL commands allow you to create and maintain one broker configuration at a time. A broker configuration can consist of two sites: a primary site and a standby site.

After you invoke the command-line interface, you can enter any of the DGMGRL commands listed in Table 6–1. Each command and its associated parameters are described in detail in later sections of this chapter.

Table 6–1 *Summary of DGMGRL Commands*

Command	Effect
ALTER CONFIGURATION	Alters a broker configuration state from online to offline, or from offline to online
ALTER RESOURCE (property)	Allows you to change the value of a property for the specified database resource object
ALTER RESOURCE (state)	Allows you to change the state of the specified database resource object
ALTER SITE	Allows you to change the state of a site object from online to offline, or from offline to online

Table 6–1 (Cont.) Summary of DGMGRL Commands

Command	Effect
ALTER SITE (AUTO PFILE)	Allows you to specify the initialization parameter file used to automatically restart the database of the site as needed by the client
CONNECT	Connects a given username to the specified database
CREATE CONFIGURATION	Creates a broker configuration, a primary site object, and a database resource object on the primary site
CREATE SITE	Creates a new standby site object and a database resource object, and adds them to the broker configuration
DISABLE CONFIGURATION	Disables a broker configuration so that the configuration and all of its site objects and database resource objects are no longer managed by the broker
DISABLE RESOURCE	Disables a database resource object in the broker configuration so that the database resource object is no longer managed by the broker
DISABLE SITE	Disables the specified standby site object in the broker configuration so that the standby site object and any database resource objects on the standby site are no longer managed by the broker
ENABLE CONFIGURATION	Enables the broker configuration so that the broker can actively manage it
ENABLE RESOURCE	Enables a database resource object in the broker configuration so that the broker can actively manage it
ENABLE SITE	Enables a standby site object in the broker configuration so that the broker can actively manage it
EXIT	Exits the Data Guard command-line interface
HELP	Displays online help for the Data Guard command-line interface
QUIT	Quits the Data Guard command-line interface
REMOVE CONFIGURATION	Removes the broker configuration including all of its site objects and database resource objects
REMOVE SITE	Removes a standby site object from the broker configuration including all of the database resource objects running on the standby site
SHOW CONFIGURATION	Displays a brief or a detailed summary of information about the broker configuration

Table 6–1 (Cont.) Summary of DGMGRL Commands

Command	Effect
SHOW DEPENDENCY TREE	Displays the dependency tree and default online states for the broker configuration
SHOW LOG	Shows the Data Guard configuration log or the Oracle database alert log
SHOW RESOURCE	Displays a brief or a detailed summary of information about the named database resource object and its status
SHOW SITE	Displays a brief or a detailed summary of information about the site object in the broker configuration
SHUTDOWN	Shuts down a currently running Oracle database instance
STARTUP	Starts an Oracle instance with several options, including mounting and opening a database

6.1.3 DGMGRL Command Usage Notes

To use the Data Guard command-line interface, the following must be true:

- The `DRS_START` dynamic initialization parameter is set to `TRUE`.
- Oracle Net must be properly configured on the hosts that contains the primary and standby database sites. Specifically, the primary and standby database services must be properly registered with the listener, a net service name must have been created for the primary and standby database sites, and the listener must be started.

See Also: Chapter 5 for more information about preparing and starting Oracle Data Guard. See *Oracle9i Data Guard Concepts and Administration* for more information about setting up the network files.

- Before you specify any command (other than the `HELP`, `EXIT`, or `QUIT` command), you must first connect to the primary database using the `DGMGRL CONNECT` command. You must have `SYSDBA` privileges to connect to the database.
- To connect to a remote standby database and manage it, you need to set up a remote login password file.

See Also: *Oracle9i Data Guard Concepts and Administration*, the *Oracle9i Database Administrator's Guide*, and your operating system-specific documentation to set up remote access using the `REMOTE_LOGIN_PASSWORDFILE` initialization parameter.

- If you specify more than one option on the command, you can specify the options in any order.
- A semicolon is required at the end of each DGMGRL command.
- Characters specified in a DGMGRL command string value are interpreted as lowercase characters, unless enclosed in double (") or single (') quotation marks. For example, `site` and `SiTe` are equivalent, but `"site"` and `"SiTe"` are distinctive.

Command Examples

Example 1

This example demonstrates how to connect to the DGMGRL command-line interface on the local system.

```
% DGMGRL
```

```
Welcome to DGMGRL, type "help" for information.
```

```
DGMGRL> CONNECT sys/change_on_install;  
Connected.
```

Example 2

This example demonstrates how to connect to the DGMGRL command-line interface on a remote system.

```
DGMGRL> CONNECT sys/change_on_install@remote-stby;  
Connected.
```

6.2 Stopping the Data Guard Command-Line Interface

When you are done working with the command-line interface and want to return to the operating system, enter the `EXIT` or `QUIT` command at the DGMGRL command prompt. For example:

```
DGMGRL> EXIT;
```

You can use either the `EXIT` or the `QUIT` command to leave the DGMGRL command-line interface.

ALTER CONFIGURATION

Alters the intended (runtime) state of the broker configuration.

Format

ALTER CONFIGURATION SET STATE = *state*;

Command Parameters

state

The state in which you want the configuration to be running when the configuration is enabled. The possible states are:

OFFLINE
ONLINE

Usage Notes

- Use the `SHOW CONFIGURATION` command to display the current default and intended states for the configuration.
- This command changes only the intended (runtime) state for the configuration; the default state is not altered.
- If the configuration is disabled when you enter this command, the state of the configuration does not take effect until the next time you enable the configuration with the `ENABLE CONFIGURATION` command.

Command Examples

Example 1

In the following example, the broker configuration will be in the online state the next time you enable the configuration.

```
DGMGRL> ALTER CONFIGURATION SET STATE = online;  
Succeeded.
```

ALTER RESOURCE (property)

Allows you to change the value of a property for the specified database resource object.

Format

```
ALTER RESOURCE resource-name [ON SITE site-name]  
    SET PROPERTY property-name = value;
```

Command Parameters

resource-name

The name of the database resource object for which you want to set a property value.

site-name

The name of the site object where the database resource object is located.

property-name

The name of the property for which you want to set a new value. Section 2.8 describes the database resource properties in detail.

value

The new value for the property. Section 2.8 describes the values for each property.

Usage Notes

- You do not have to disable the configuration to change a database resource property. However, if the database resource is disabled when you use the `ALTER RESOURCE` command, the property change does not take effect until you enable configuration.
- If you do not specify a site, the broker searches each site for the specified database resource. If it finds more than one database resource with the specified name (for example, if the database resource name you specified is not unique), the `ALTER RESOURCE` command returns an error message. You must re-issue the `ALTER RESOURCE` command and specify a site name with the `ON SITE` option.

- Use the `SHOW RESOURCE` command to display the current property values for the database resource object.
- See Section 2.8 for detailed information about each property.

Command Examples

Example 1

The `ALTER RESOURCE` command in the following example changes the value of the `LogArchiveTrace` property to be 127 for the database resource object named `Sales_db`.

```
DGMGRL> ALTER RESOURCE 'Sales_db' ON SITE 'Boston' SET PROPERTY
LogArchiveTrace='127';
Property "LogArchiveTrace" updated.
```

The command-line interface returns the following message to indicate that the `LogArchiveTrace` property was updated successfully in the Data Guard configuration file:

```
Property "LogArchiveTrace" updated
```

If the configuration is currently disabled, the property does not affect the actual database until the next time you enable the broker configuration with the `ENABLE CONFIGURATION` command.

ALTER RESOURCE (state)

Allows you to change the state of the specified database resource object.

Format

```
ALTER RESOURCE resource-name [ON SITE site-name]  
SET STATE = state;
```

Command Parameters

resource-name

The name of the database resource object for which you want to change the state.

site-name

The name of the site object that contains the database resource object that you want to alter.

state

The state to which the database resource will transition when it is enabled.

Usage Notes

- You do not have to disable the configuration to change the state of a database resource object. However, if the database resource is disabled when you use the `ALTER RESOURCE` command, the state change does not take effect until you enable the configuration with the `ENABLE CONFIGURATION` command.
- Use the `SHOW RESOURCE` command to display information, such as the current runtime state, of a database resource object.
- If you do not specify a site, the broker searches each site for the specified database resource. If it finds more than one database resource with the specified name (for example, if the database resource name you specified is not unique), the `ALTER RESOURCE` command returns an error message. You must re-issue the `ALTER RESOURCE` command and specify a site name with the `ON SITE` option.
- A physical standby database can be in an `ONLINE` or `OFFLINE` state. The `ONLINE` state has the following substates:
`PHYSICAL-APPLY-READY`

PHYSICAL-APPLY-ON (default state for a standby database)
READ-ONLY
READ-WRITE
READ-WRITE-XPTON (default state for a primary database)

Command Examples

Example 1

The ALTER RESOURCE command in the following example changes the state of the Sales_db database resource to read/write.

```
DGMGRL> ALTER RESOURCE 'Sales_db' ON SITE 'Boston' SET STATE='read-write';  
Succeeded.
```

Although the command completes successfully, the state of the Sales_db database resource object does not change until the next time that you enable the configuration with the ENABLE CONFIGURATION command.

ALTER SITE

Allows you to change the state of a site object.

Format

```
ALTER SITE site-name  
      SET STATE = state;
```

Command Parameters

site-name

The name of the site object for which you want to change state.

state

The state to which the site will transition when it is enabled. The possible states are:

OFFLINE
ONLINE

Usage Notes

- You do not have to disable the configuration to change the state of a site object. However, if the site is disabled when you use the `ALTER SITE` command, the state change does not take effect until you next enable the configuration.
- Use the `SHOW SITE` command to display information about a site object.

Command Examples

Example 1

```
DGMGR> ALTER SITE 'Boston' SET STATE='online';  
Succeeded.
```

ALTER SITE (AUTO PFILE)

Allows you to specify an initialization parameter file that will be used to automatically restart the database of the site.

Format

```
ALTER SITE site-name  
      SET AUTO PFILE= initialization-file [ OFF ];
```

Command Parameters

site-name

The name of the site object for which you want to specify the automatic restart initialization parameter file.

initialization-file

The name of the initialization parameter file that will be used to automatically restart the database of the site.

Usage Notes

- If you set the `SET AUTO PFILE=OFF` option and you receive a message telling you to restart a site, use the `SHUTDOWN` and `STARTUP` commands to restart your databases.
- The information you specify with this command is session specific; that is, it resets to the default initialization parameter file when you connect to a database using the `CONNECT` command.
- Use the `SHOW SITE` command with the `VERBOSE` option to display the current PFILE information for a site.

Command Examples

Example 1

```
DGMGRL> ALTER SITE 'Boston' SET AUTO PFILE='/oracle/dbs/initbs.ora';
```

Succeeded.

Example 2

```
DGMGRL> ALTER SITE 'Boston' SET AUTO PFILE=OFF;  
Succeeded.
```

CONNECT

Connects a given username to the specified database.

Format

```
CONNECT username/password[@net-service-name];
```

Command Parameters

username/password

Represents the username and password with which you want to connect to the database.

net-service-name

Consists of the Oracle Net service name of the site to which you want to connect. The exact syntax depends upon the Oracle Net communications protocol your Oracle installation uses. For more information, see the Oracle Net documentation.

Usage Notes

- The username and password must be valid for the database to which you are trying to connect. The username you specify must have the SYSDBA privilege.
- If the `CONNECT` command returns an error, check to see that a valid service name was specified.

Command Examples

Example 1

This example connects to the default database on the local system.

```
DGMGRL> CONNECT sys/change_on_install;  
Connected.
```

Example 2

This example connects to a remote database whose service name is prmy.

```
DGMGRL> CONNECT sys/change_on_install@prmy;  
Connected.
```

CREATE CONFIGURATION

Creates a new broker configuration, and creates and adds a primary site object and a database resource object to the configuration.

Format

```
CREATE CONFIGURATION configuration-name AS  
    PRIMARY SITE IS site-name  
    RESOURCE IS resource-name  
    HOSTNAME IS host-name  
    INSTANCE NAME IS instance-name  
    SERVICE NAME IS net-service-name  
    SITE IS MAINTAINED AS standby-type;
```

Command Parameters

configuration-name

A user-friendly name for the configuration you are creating. Valid names contain any alphanumeric characters. If spaces are included in the name, the name must be enclosed in double or single quotation marks. The name must consist of 30 or fewer characters.

site-name

The user-friendly name of the primary site object.

resource-name

The user-friendly name of the database resource object to be created for the primary site.

host-name

The host name for the primary site.

instance-name

The instance name of the primary database.

net-service-name

Consists of the Oracle Net service name for the primary site. The exact syntax depends upon the Oracle Net communications protocol your Oracle installation uses. For more information, refer to the Oracle Net documentation.

standby-type

Specify physical for the standby-type parameter. This specifies that if this site ever becomes a standby site then it will be maintained as a physical standby site.

Usage Notes

- A broker configuration is a named collection of one or more site objects and database resource objects that you want to manage as a group. You must specify a value for each of the parameters. There are no default values.
- When you create a broker configuration, the `CREATE CONFIGURATION` command does not start the database instance on the primary site. You must use the `STARTUP` command to start the database instance.
- To add standby sites to this broker configuration, use the `CREATE SITE` command.
- The `host-name` and `instance-name` parameters specify information the broker requires to uniquely identify a site in the configuration. To obtain the proper values for the `host-name` and `instance-name` parameters, use the values returned from the `V$INSTANCE` fixed view.

The following example shows a sample SQL*Plus statement that selects these values from the `V$INSTANCE` fixed view:

```
SQL> CONNECT sys/change_on_install AS SYSDBA;
SQL> SELECT host_name, instance_name FROM v$instance;
HOST_NAME                                INSTANCE_NAME
-----
boston                                    bstn
```

In the example, the values `boston` and `bstn` should be supplied for the `hostname` and `instance-name` parameters in the `CREATE CONFIGURATION` command.

Command Examples

Example 1

The following example creates a new broker configuration named `Sales`.

CREATE CONFIGURATION

```
DGMGRL> CREATE CONFIGURATION 'Sales' AS  
PRIMARY SITE IS 'Boston'  
RESOURCE IS 'Sales_db'  
HOSTNAME IS 'boston'  
INSTANCE NAME IS 'bstn'  
SERVICE NAME IS 'bstn'  
SITE IS MAINTAINED AS PHYSICAL;
```

Configuration "Sales" added with primary site "Boston"
Database resource "Sales_db" added.

CREATE SITE

Creates a new standby site object and database resource object and adds it to an existing broker configuration.

Format

```
CREATE SITE site-name  
    RESOURCE IS resource-name  
    HOSTNAME IS host-name  
    INSTANCE NAME IS instance-name  
    SERVICE NAME IS net-service-name  
    SITE IS MAINTAINED AS standby-type;
```

Command Parameters

site-name

A user-friendly name for the site object you are creating. Valid names contain any alphanumeric characters. If spaces are included in the name, the name must be enclosed in double or single quotation marks. The name must consist of 30 or fewer characters.

resource-name

The user-friendly name of the database resource object to be created for the standby site.

host-name

The host name for the standby site.

instance-name

The instance name of the primary database.

net-service-name

Consists of the Oracle Net service name of the standby site that you want to add. The exact syntax depends upon the Oracle Net communications protocol your Oracle installation uses. For more information, see the Oracle Net documentation.

standby-type

Specify `physical` for the `standby-type` parameter. This specifies that if this site ever becomes a standby site, then it will be maintained as a physical standby site.

Usage Notes

- The standby database must already exist on this site before you can add the site object to a broker configuration.

See Also: *Oracle9i Data Guard Concepts and Administration* for information about creating a standby database

- Before you can add standby sites with the `CREATE SITE` command, you must create the broker configuration using the `CREATE CONFIGURATION` command.
- Use the `CREATE SITE` command after you have connected to the primary database using the `CONNECT` command.
- The broker configuration can be in any state (online, offline, and so on) when you create a site.
- If the broker configuration is enabled when you issue the `CREATE SITE` command, the site object is created in a disabled state to allow you to add dependent database resource objects before the site goes online.
- A site can be associated with only one configuration.
- The `host-name` and `instance-name` parameters specify information the broker requires to uniquely identify a site in the configuration. To obtain the proper values for the `host-name` and `instance-name` parameters, use the values returned from the `VSINSTANCE` fixed view.

The following example shows a sample SQL*Plus statement that selects these values from the `VSINSTANCE` fixed view:

```
SQL> CONNECT sys/change_on_install AS SYSDBA;
SQL> SELECT host_name, instance_name FROM v$instance;
HOST_NAME                                INSTANCE_NAME
-----
sf                                         sfdb
```

In the example, the values `sf` and `sfdb` should be supplied for the `host-name` and `instance-name` parameters in the `CREATE SITE` command.

Command Examples

Example 1

The following example demonstrates how to add a standby site called San Francisco to the broker configuration.

```
DGMGRL> CREATE SITE 'San Francisco'
        RESOURCE IS 'reportingdb'
        HOSTNAME IS 'sf'
        INSTANCE NAME IS 'sfdb'
        SERVICE NAME IS 'dest2'
        SITE IS MAINTAINED AS PHYSICAL;
```

Site "San Fransisco" added to configuration.
Database resource "reportingdb" added.

DISABLE CONFIGURATION

Disables a broker configuration so that the configuration and all of its site objects and database resource objects are no longer managed by the broker.

Format

DISABLE CONFIGURATION;

Command Parameters

None.

Usage Notes

- A disabled configuration is no longer managed by the broker.
- The only way to disable the primary site is to use the `DISABLE CONFIGURATION` command.
- This command does not remove or delete the configuration. See the `REMOVE CONFIGURATION` command for more information about removing the configuration.

Command Examples

Example 1

The following example disables the broker configuration and all of its sites and database resources.

```
DCMGRL> DISABLE CONFIGURATION;  
Disabled.
```

DISABLE RESOURCE

Disables a database resource so that it is no longer managed by the broker.

Format

DISABLE RESOURCE *resource-name* [ON SITE *site-name*];

Command Parameters

resource-name

The name of the database resource object that you want to disable.

site-name

The user-friendly name of the site containing the database resource that you want to disable.

Usage Notes

- A disabled database resource is no longer managed by the broker.
- If you do not specify a site, the broker searches each site for the specified database resource. If it finds more than one database resource with the specified name (for example, if the database resource name you specified is not unique), the `DISABLE RESOURCE` command returns an error message. You must re-issue the `DISABLE RESOURCE` command and specify a site name with the `ON SITE` option.
- This command does not remove or delete the database resource from the configuration.

Command Examples

Example 1

The following example demonstrates how to disable the database resource `reportingdb` from the San Francisco site.

```
DCMGRL> DISABLE RESOURCE 'reportingdb' ON SITE 'San Francisco';  
Disabled.
```

DISABLE SITE

Disables the specified standby site object in the broker configuration so that the standby site object and any database resource objects on the site are no longer managed by the broker.

Format

DISABLE SITE *site-name*;

Command Parameters

site-name

The user-friendly name of the standby site that you want to disable.

Usage Notes

- When you disable a standby site in the configuration, all of the database resources configured on the standby site are also disabled.
- You cannot disable the primary site with the `DISABLE SITE` command. Use the `DISABLE CONFIGURATION` command to disable the primary site.
- When you disable a standby site in the configuration, all of the database resources configured on the standby site are also disabled.

Command Examples

Example 1

The following example demonstrates how to disable the San Francisco standby site.

```
DGMGRL> DISABLE SITE 'San Francisco';  
Disabled.
```

ENABLE CONFIGURATION

Enables the broker to actively manage the broker configuration including all of its site objects and database resource objects.

Format

ENABLE CONFIGURATION;

Command Parameters

None.

Usage Notes

- This command enables the broker to manage the broker configuration including all of the sites and database resources in the configuration.
- Use this command to enable the primary site object.
- When you enable a broker configuration, its default state is online. To change the intended runtime state of the configuration, use the `ALTER CONFIGURATION` command.
- By default, the primary database resource object is enabled in the online state with the log shipping turned on (`READ-WRITE-XPTON` state), and the standby database resource object is enabled in the `PHYSICAL-APPLY-ON` state. You can change the state of the database resource using the `ALTER RESOURCE (state)` command.
- See the `SHOW CONFIGURATION` command to display information about the configuration.

Command Examples

Example 1

The following example enables a broker configuration.

```
DGMGRL> ENABLE CONFIGURATION;  
Enabled.
```

ENABLE RESOURCE

Enables the broker to actively manage the specified database resource object.

Format

```
ENABLE RESOURCE resource-name [ON SITE site-name];
```

Command Parameters

resource-name

The name of the database resource object you want to manage with the broker.

site-name

The user-friendly name of the site object containing the database resource object that you want to enable.

Usage Notes

- You can optionally specify the name of the site that contains the database resource object.
- If the site where the database resource is located is disabled, the database resource you specify with the `ENABLE RESOURCE` command will remain disabled (and unmanaged by the broker) until you enable the site. See the `ENABLE SITE` command.
- By default, the standby database resource object is enabled in the `PHYSICAL-APPLY-ON` state. You can change the state of the database resource using the `ALTER RESOURCE (state)` command.
- If you do not specify a site, the broker searches each site for the specified database resource. If it finds more than one database resource with the specified name (for example, if the database resource name you specified is not unique), the `ENABLE RESOURCE` command returns an error message. You must re-issue the `ENABLE RESOURCE` command and specify a site name with the `ON SITE` option.
- Use the `SHOW RESOURCE` command to display information about the database resource, including its default and intended states, and the properties of the database resource.

Command Examples

Example 1

The following example enables the database resource object named Sales_db.

```
DGMGRL> ENABLE RESOURCE 'Sales_db';  
Enabled.
```

ENABLE SITE

Enables the broker to actively manage the specified standby site object, including its database resource objects.

Format

ENABLE SITE *site-name*;

Command Parameters

site-name

The user-friendly name of the standby site object you want to manage with the broker.

Usage Notes

- This command enables the broker to actively manage the standby site object.
- To enable a primary site object, use the `ENABLE CONFIGURATION` command.
- When you enable a standby site object, all of the database resource objects on the standby site are also enabled (unless they have been explicitly disabled with one of the `DISABLE` commands).
- By default, the standby database resource object is enabled in the `PHYSICAL-APPLY-ON` state. You can change the state of the database resource using the `ALTER RESOURCE (state)` command.

Command Examples

Example 1

The following example enables the standby site named Boston.

```
DGMGRL> ENABLE SITE 'San Francisco';  
Enabled.
```

EXIT

Exits the command-line interface.

Format

EXIT;

Usage Notes

- This command has the same effect as the `QUIT` command.
- A database connection is not required to execute this command. However, if you are connected, this command breaks the connection.

Command Examples

Example 1

The following example demonstrates how to exit (quit) the command-line interface.

```
DGMGRL> EXIT;
```

HELP

Displays online help for the Data Guard command-line interface.

Format

HELP [*<topic>*];

Command Parameters

topic

The topic for which you want to display help information. If you do not specify a topic, the command lists all of the topics and the format. Valid topics are:

ALTER
CONNECT
CREATE
DISABLE
ENABLE
EXIT
HELP
QUIT
REMOVE
SHOW
SHUTDOWN
STARTUP

Usage Notes

A database connection is not required to execute this command.

Command Examples

Example 1

The following examples get help on the `HELP` and `CONNECT` commands.

```
DGMGRL> HELP HELP;  
Display the help for a given command  
DGMGRL> HELP CONNECT;  
Connect to a server  
connect <user>/<password>@<connect>;
```

QUIT

Exits the Data Guard command-line interface.

Format

QUIT;

Usage Notes

- This command has the same effect as the EXIT command.
- A database connection is not required to execute this command. However, if you are connected, this command breaks the connection.

Command Examples

Example 1

The following example shows how to quit (exit) the command-line interface.

```
DGMGRL> QUIT;
```

REMOVE CONFIGURATION

Removes all of the configuration information from the Data Guard configuration file, and removes management of all of the site and database resource objects associated with the broker configuration.

Caution: When you use the `REMOVE CONFIGURATION` command, all information is deleted from the Data Guard configuration file and cannot be recovered.

Format

```
REMOVE CONFIGURATION;
```

Command Parameters

None.

Usage Notes

- When you remove a broker configuration, management of all of the site objects and database resource objects associated with that configuration are removed.
- This command does not remove or delete the primary or standby database instances.

Command Examples

Example 1

```
DGMGRL> REMOVE CONFIGURATION;  
Removed configuration.
```

REMOVE SITE

Removes the specified standby site object from the broker configuration.

Caution: When you use the `REMOVE SITE` command, all of the information about the standby site and the database resources on the site is deleted from the Data Guard configuration file and cannot be recovered.

Format

`REMOVE SITE site-name;`

Command Parameters

site-name

The user-friendly name of the standby site that you want to remove.

Usage Notes

- When you remove a standby site, management of all of the database resource objects associated with that standby site are removed. However, this command does not remove or affect the actual standby site and database.
- You cannot remove the primary site with this command. Use the `REMOVE CONFIGURATION` command to remove the primary site object.

Command Examples

Example 1

```
DGMGRL> REMOVE SITE 'San Francisco';  
Removed site "San Fransisco" from configuration.
```

SHOW CONFIGURATION

Displays a brief or a detailed summary about the broker configuration.

Format

```
SHOW CONFIGURATION [VERBOSE] [property-name];
```

Command Parameters

property-name

The name of the property for which you want to display summary information.
Available properties are:

```
ENABLED  
EXPLICIT_DISABLE  
INTENDED_STATE  
HEALTH_CHECK_INTERVAL  
STATUS
```

See Section 2.8 for complete information about properties.

Usage Notes

- The default is to display a brief summary of the configuration. Use the `VERBOSE` option to display a detailed summary of the configuration.
- Use the `ALTER CONFIGURATION` command to change the intended state of a configuration.
- Use the `SHOW DEPENDENCY TREE` command to display the dependency tree and default path information for the configuration.

Command Examples

Example 1

The following example provides a brief summary of the Sales configuration.

```
DGMGRL> SHOW CONFIGURATION;  
Configuration 'Sales' is  
  Primary Site is 'Boston'  
  Standby Site is 'San Francisco'
```



```
Current status for "Sales":  
SUCCESS
```

Example 2

The following example uses the `VERBOSE` option to show complete information about the Sales configuration.

```
DGMGRL> SHOW CONFIGURATION VERBOSE;  
Configuration  
  Name:          'Sales'  
  Enabled:       'yes'  
  Default state: 'ONLINE'  
  Intended state: 'ONLINE'  
  Number of sites: 2  
  Sites:  
    Name: Boston  
    Name: San Francisco
```

Example 3

The following example shows the `STATUS` property for the Sales configuration.

```
DGMGRL> SHOW CONFIGURATION STATUS;  
STATUS = 'SUCCESS'
```

SHOW DEPENDENCY TREE

Displays a dependency tree that shows a static map of what is going to be enabled in the broker configuration and the default online states for each database resource in the configuration.

Format

```
SHOW DEPENDENCY TREE;
```

Usage Notes

For detailed information about the configuration, use the `SHOW CONFIGURATION` command.

Command Examples

Example 1

The following example shows a configuration named Sales with two sites (Boston and San Francisco) and database resource objects called Sales_db and reportingdb. The database resource object (Sales_db) is brought online in its default state of `READ_WRITE_XPTON` when Boston is running as the primary site. The other database resource object, reportingdb, is brought online in its default state of `PHYSICAL_APPLY_ON` when San Francisco is running as the standby site.

```
DGMGRL> SHOW DEPENDENCY TREE;
```

```
Sales
```

```
Sales[ONLINE]->Boston
```

```
Sales[ONLINE]->Boston[PRIMARY]->Sales_db
```

```
Sales[ONLINE]->Boston[STANDBY]->Sales_db
```

```
Sales[ONLINE]->San Francisco
```

```
Sales[ONLINE]->San Francisco[PRIMARY]->reportingdb
```

```
Sales[ONLINE]->San Francisco[STANDBY]->reportingdb
```

```
Default Path:
```

```
Sales[ONLINE]->Boston[PRIMARY]
```

```
Sales[ONLINE]->Boston[PRIMARY]->Sales_db[READ-WRITE-XPTON]
```

```
Sales[ONLINE]->San Francisco[STANDBY]
```

```
Sales[ONLINE]->San Francisco[STANDBY]->reportingdb[PHYSICAL-APPLY-ON]
```

In the example, the reportingdb database resource has a dependency on whether the San Francisco is in the primary or the standby role. That is, the reportingdb database resource object cannot go online until the San Francisco site is a standby site.

SHOW LOG

Displays the Data Guard configuration log or database alert log from the named site object.

Format

SHOW LOG [ALERT] [LATEST] ON SITE *site-name*;

Command Parameters

ALERT

Displays the database alert log for the specified site object.

LATEST

Specifies the last 20 lines of the SHOW LOG command output.

site-name

The user-friendly name of the site for which you want to display the Data Guard configuration log or the database alert log.

Usage Notes

If you omit the ALERT parameter, then the Oracle Data Guard configuration log for the named site is displayed.

Command Examples

Example 1

The following example shows how to display the Data Guard configuration log for the Boston site.

```
DGMGRL> SHOW LOG ON SITE 'Boston';
DRSLOG
LINE  OBJECT_ID DATE                LOG
-----
1      0 2000-11-01-12:19:30  DMON: Starting RSM processes
2      0 2000-11-01-12:19:30  1 built-in RSM process(es) and 1
generic RSM process(es) are enabled.
3      0 2000-11-01-12:19:35  DMON: no configuration found, server ready
4      0 2000-11-01-12:19:42  DMON: DR Server shutting down, DMON process
```

```

exiting
  5          0 2000-11-01-12:19:42 DMON: Shutting down RSMs
  6          0 2000-11-01-12:20:02 DMON: Starting RSM processes
  7          0 2000-11-01-12:20:02 1 built-in RSM process(es) and 1 generic
RSM process(es) are enabled.
  8          0 2000-11-01-12:20:07 DMON: no configuration found, server ready
  9          0 2000-11-01-12:20:15 DMON: DR Server shutting down, DMON process
exiting
 10          0 2000-11-01-12:20:15 DMON: Shutting down RSMs
 11          0 2000-11-01-12:20:20 DMON: Starting RSM processes
 12          0 2000-11-01-12:20:20 1 built-in RSM process(es) and 1
generic RSM process(es) are enabled.
 13          0 2000-11-01-12:20:25 DMON: no configuration found, server ready
 14          1 2000-11-01-12:20:58 DMON: DRS OP 2: success.
 15          2 2000-11-01-12:20:58 Add site Primary succeeded.
 16          2 2000-11-01-12:20:58 DMON: DRS OP 3: success.
 17          3 2000-11-01-12:20:58 Add site Standby succeeded.
 18          3 2000-11-01-12:20:58 DMON: DRS OP 3: success.
 19          4 2000-11-01-12:20:58 Adding internal resource Sales_db pid
16777217 parent_state ONLINE (1) vinst 0
 20          4 2000-11-01-12:20:58 -- default_state OFFLINE (0)
 21          4 2000-11-01-12:20:58 Adding internal resource Sales_db pid
16777217 parent_state PRIMARY (5) vinst 1
 22          4 2000-11-01-12:20:58 -- default_state READ-WRITE-XPTON (11)
 23          4 2000-11-01-12:20:58 Adding internal resource Sales_db pid
16777217 parent_state STANDBY (6) vinst 2
 24          4 2000-11-01-12:20:58 -- default_state PHYSICAL-APPLY-ON (6)
.
.
.
.

```

Example 2

The following example displays the last 20 lines of the `SHOW LOG` command output for the Boston site.

```
DGMGRL> SHOW LOG LATEST ON SITE 'Boston';
```

```
DRSLOG
```

LINE	OBJECT_ID	DATE	LOG
2961	913	2000-11-02-09:29:33	DMON: DRS OP 204: success. (len=61)
2962	914	2000-11-02-09:29:33	DMON: DRS OP 204: success. (len=61)
2963	915	2000-11-02-09:29:33	Parent 33554433 child 33554690 vinst 33554690 state 5 (PRIMARY) name reportingdb
2964	915	2000-11-02-09:29:33	Parent 33554433 child 33554691 vinst

```

33554691 state 6 (STANDBY) name reportingdb
2965      915 2000-11-02-09:29:33 DMON: DRS OP 204: success. (len=219)
2966      916 2000-11-02-09:29:33 DMON: DRS OP 204: success. (len=61)
2967      917 2000-11-02-09:29:33 DMON: DRS OP 204: success. (len=61)
2968      918 2000-11-02-09:29:33 Parent 1 child 16777217 vinst 16777217
state 1 (ONLINE) name Boston
2969      918 2000-11-02-09:29:33 Parent 1 child 33554433 vinst 33554433
state 1 (ONLINE) name San Fransisco
2970      918 2000-11-02-09:29:33 DMON: DRS OP 204: success. (len=204)
2971      920 2000-11-02-09:29:33 Parent 16777217 child 16777474 vinst
16777474 state 5 (PRIMARY) name Sales_db
2972      920 2000-11-02-09:29:33 Parent 16777217 child 16777475 vinst
16777475 state 6 (STANDBY) name Sales_db
2973      920 2000-11-02-09:29:33 DMON: DRS OP 204: success. (len=201)
2974      922 2000-11-02-09:29:33 DMON: DRS OP 204: success. (len=61)
2975      925 2000-11-02-09:29:33 Parent 33554433 child 33554690 vinst
33554690 state 5 (PRIMARY) name reportingdb
2976      925 2000-11-02-09:29:33 Parent 33554433 child 33554691 vinst
33554691 state 6 (STANDBY) name reportingdb
2977      925 2000-11-02-09:29:33 DMON: DRS OP 204: success. (len=219)
2978      928 2000-11-02-09:29:33 DMON: DRS OP 204: success. (len=61)
2979      929 2000-11-02-09:29:33 DMON: DRS OP 207: success. (len=79)
2980      935 2000-11-02-09:29:34 DMON: DRS OP 207: success. (len=79)

```

Example 3

The following example displays the database alert log for the Boston site.

```
DGMGRL> SHOW LOG ALERT ON SITE 'Boston';
```

```
DRSLOG
```

```
LINE LOG
```

```

-----
.
.
.
.
14 Starting ORACLE instance (normal)
15 Wed Nov  1 11:26:30 2000
16 Starting ORACLE instance (force)
17 LICENSE_MAX_SESSION = 0
18 LICENSE_SESSIONS_WARNING = 0
19 LICENSE_MAX_USERS = 0
20 Starting up ORACLE RDBMS Version: 9.0.0.0.0.
21 System parameters with non-default values:
22   _trace_files_public      = TRUE
23   processes                = 30

```

```

24 sessions = 38
25 _ksu_diag_kill_time = 30
29 shared_pool_size = 29360128
30 java_pool_size = 4M
31 _trace_events = 10432:6:ALL, 10435:6:IMON, LMD0, 10427:6:ALL,
10429:6:ALL
32 _trace_buffers = FGS:512;BGS:1024
33 disk_asynch_io = FALSE
34 _imr_max_reconfig_delay = 2000
35 control_files = /ade/ctrezza_bstn/oracle/dbs/t_cf1.f
36 _controlfile_enqueue_timeout= 10800
37 _db_block_cache_protect = TRUE
38 db_block_checksum = TRUE
39 db_block_size = 2048
40 compatible = 9.0.0
41 _kcl_debug = TRUE
42 log_checkpoints_to_alert = TRUE
43 instance_number = 1
44 transactions = 21
45 transactions_per_rollback_segment= 21
46 db_block_checking = TRUE
47 O7_DICTIONARY_ACCESSIBILITY= FALSE
48 db_domain = regress.rdbms.dev.us.oracle.com
49 global_names = FALSE
50 distributed_transactions = 10
51 commit_point_strength = 1
52 instance_name = bstn
53 audit_trail = FALSE
54 db_name = bstn
55 ifile = /ade/ctrezza_bstn/oracle/work/tkinit.ora
56 Wed Nov 1 11:26:34 2000

```

Example 4

The following example displays the last 20 lines of the database alert log for the Boston site.

```

DGMGRL> SHOW LOG ALERT LATEST ON SITE 'Boston';
DRSLOG
LINE LOG

```

```

-----
1672 Thu Nov 2 09:28:07 2000
1673 ALTER SYSTEM SET fal_server='' SCOPE=MEMORY SID='bstn';
1674 ALTER SYSTEM SET fal_client='bstn' SCOPE=MEMORY SID='bstn';
1675 Thu Nov 2 09:29:31 2000
1676 ALTER SYSTEM SET fal_server='' SCOPE=MEMORY SID='bstn';

```

```
1677 ALTER SYSTEM SET fal_client='bstn' SCOPE=MEMORY SID='bstn';
1678 Thu Nov  2 09:29:31 2000
1679 Beginning log switch checkpoint up to RBA [0x11.2.10], SCN:0x0000.00011b11
1680 Thread 1 advanced to log sequence 17
1681   Current log# 2 seq# 17 mem# 0: /ade/ctrezza_bstn/oracle/dbs/t_log2.f
1682 Thu Nov  2 09:29:31 2000
1683 ARC0: Beginning to archive log# 1 thread 1 seq# 16
1684 ARC0: Completed archiving log# 1 seq# 16 thrd# 1
1685 Thu Nov  2 09:29:32 2000
1686 ALTER SYSTEM SET fal_server='' SCOPE=MEMORY SID='bstn';
1687 ALTER SYSTEM SET fal_client='bstn' SCOPE=MEMORY SID='bstn';
1688 ALTER SYSTEM SET fal_server='' SCOPE=MEMORY SID='bstn';
1689 ALTER SYSTEM SET fal_client='bstn' SCOPE=MEMORY SID='bstn';
1690 Thu Nov  2 09:29:33 2000
1691 Completed checkpoint up to RBA [0x11.2.10], SCN: 0x0000.00
```


SHOW RESOURCE

Displays a brief or a detailed summary and status of the specified database resource object.

Format

```
SHOW RESOURCE [VERBOSE] resource-name [property-name] [ON SITE site-name];
```

Command Parameters

resource-name

The name of the database resource object for which you want to display information.

property-name

The name of the property for which you want to display summary information. See Section 2.8 for a list of database resource properties.

site-name

The name of the site object that has the database resource for which you want a brief summary.

Usage Notes

- The default is to display a brief summary of the database resource object. Specify the `VERBOSE` option to display a detailed summary.
- Use the `ALTER RESOURCE (property)` command to alter the properties of a database resource object, or the `ALTER RESOURCE (state)` command to alter the state of a database resource object.
- If you do not specify a site, the broker searches each site for the specified database resource. If it finds more than one database resource with the specified name (for example, if the database resource name you specified is not unique), the `SHOW RESOURCE` command returns an error message. You must re-issue the `SHOW RESOURCE` command and specify a site name with the `ON SITE` option.
- To display dependency information, use the `SHOW DEPENDENCY TREE` command.

Command Examples

Example 1

The following example shows a brief summary of the database resource object called `Sales_db`.

```
DGMGRL> SHOW RESOURCE 'Sales_db';
Resource 'Sales_db' on site 'Boston'
  depends on 'Boston'
Current status for "Sales_db":
SUCCESS
```

Example 2

The following example uses the `VERBOSE` option to show complete information about the database resource object called `Sales_db` on the Boston site.

```
DGMGRL> SHOW RESOURCE VERBOSE 'Sales_db' ON SITE 'Boston';
Resource
  Name:                Sales_db
  Manager Type:        internal
  Standby Type:        PHYSICAL
Online States:
  ONLINE
  PHYSICAL-APPLY-READY
  PHYSICAL-APPLY-ON
  READ-ONLY
  READ-WRITE
  READ-WRITE-XPTON
Properties:
  INTENDED_STATE        = 'READ-WRITE'
  ENABLED                = 'yes'
  IGNORE_STATUS         = 'no'
  LogArchiveDestOptions = ''
  ArchiveDestDependency = ''
  StandbyArchiveDest    = ''
  LogArchiveTrace       = '127'
  FalServer             = ''
  FalClient             = ''
  StandbyFileManagement = 'Manual'
  ArchiveLagTarget      = '0'
  PrimaryLogSeqNumbers  = '(monitor)'
  PrimaryLogTimes       = '(monitor)'
  SendQEntries          = '(monitor)'
  LogXptStatus          = '(monitor)'
```

```
SbyLogSeqNumbers      = '(monitor)'  
SbyLogTimes           = '(monitor)'  
SbyLogQueue           = '(monitor)'  
Properties for 'PRIMARY' state:  
  DEFAULT_STATE       = 'READ-WRITE-XPTON'  
  EXPLICIT_DISABLE    = 'no'  
  REQUIRED             = 'yes'  
Properties for 'STANDBY' state:  
  DEFAULT_STATE       = 'PHYSICAL-APPLY-ON'  
  EXPLICIT_DISABLE    = 'no'  
  REQUIRED             = 'no'
```

SHOW SITE

Displays a brief or detailed summary of the specified site object.

Format

```
SHOW SITE [VERBOSE] site-name [property-name];
```

Command Parameters

site-name

The user-friendly name of the site object for which you want to display information.

property-name

The name of the property for which you want to display summary information.

Available properties are:

ENABLED

EXPLICIT_DISABLE

INTENDED_STATE

HEALTH_CHECK_INTERVAL

STATUS

See Section 2.8 for complete information about properties.

Usage Notes

- The default is to display a brief summary of the site object. Specify the `VERBOSE` option to display a detailed summary.
- Use the `SHOW DEPENDENCY TREE` command to display dependency tree information about a site object.
- Use the `ALTER SITE` command to change the state of a site object.

Command Examples

Example 1

The following example shows a brief summary of the site object called Boston.

```
DGMGR> SHOW SITE 'Boston';
```

```
Site 'Boston' is
  Hostname is 'boston'
  Instance name is 'bstn'
  Service name is 'bstn'
  Standby is maintained as 'physical'
  Site has 1 resource
    Resource is 'Sales_db'
Current status for "Boston":
SUCCESS
```

Example 2

The following example uses the **VERBOSE** option to show complete information about the site object called Boston.

```
DGMGRL> SHOW SITE VERBOSE 'Boston';
Site
  Name: 'Boston'
  Hostname: 'boston'
  Instance name: 'bstn'
  Service Name: 'bstn'
  Standby Type: 'physical'
  Number Built-in Processes: '2'
  Number Generic Processes: '0'
  ENABLED: 'yes'
  REQUIRED: 'yes'
  DEFAULT STATE: 'PRIMARY'
  INTENDED STATE: 'PRIMARY'
  Number of resources: 1
  Resources:
    Name: Sales_db (default) (verbose name='Sales_db')
```

Example 3

The following example shows the status property of the site object called Boston.

```
DGMGRL> SHOW SITE 'Boston' STATUS;
STATUS = 'SUCCESS'
```

SHUTDOWN

Shuts down a currently running Oracle database instance.

Format

```
SHUTDOWN [ ABORT | IMMEDIATE | NORMAL ];
```

Command Parameters

None.

Usage Notes

- Using the `SHUTDOWN` command with no arguments is equivalent to using the `SHUTDOWN NORMAL` command.
- You must be connected to a database as `SYSOPER` or `SYSDBA`. You cannot connect through a multi-threaded process. For more information about connecting to a database, see the `CONNECT` command.
- The following list describes the options to the `SHUTDOWN` command:
 - `ABORT`

Proceeds with the fastest possible shutdown of the database without waiting for calls to complete or for users to disconnect from the database. Uncommitted transactions are not rolled back. Client SQL statements currently being processed are terminated. All users currently connected to the database are implicitly disconnected, and the next database startup will require instance recovery. You must use this option if a background process terminates abnormally.
 - `IMMEDIATE`

Does not wait for current calls to complete or users to disconnect from the database. Further connections are prohibited. The database is closed and dismounted. The instance is shut down, and no instance recovery is required on the next database startup.
 - `NORMAL`

This is the default option which waits for users to disconnect from the database. Further connections are prohibited. The database is closed and

dismounted. The instance is shut down, and no instance recovery is required on the next database startup.

Command Examples

Example 1

The following command shuts down the database in normal mode:

```
DGMGRL > SHUTDOWN;
```

```
Database closed.
```

```
Database dismounted.
```

```
Oracle instance shut down.
```

STARTUP

Starts an Oracle database instance with any of the following options:

- Force—shuts down the current Oracle instance in the `SHUTDOWN ABORT` mode before restarting it.
- Restrict—allows only Oracle users with the `RESTRICTED SESSION` system privilege to connect to the database.
- Pfile—specifies the initialization parameter file to be used when the database instance is started.
- Mount—mounts the specified database without opening it. If you do not specify a database name, the database name is taken from the initialization parameter `DB_NAME`.
- Open—mounts and opens the specified database.
- Nomount—starts the specified database without mounting it.

Format

STARTUP

[FORCE]

[RESTRICT]

[PFILE=*file-name*]

[MOUNT [*database-name*] | OPEN [*open-options*] [*database-name*] | NOMOUNT];

Command Parameters

file-name

The name of the initialization parameter file to be used when starting the database instance. If you do not specify the `PFILE` parameter option, then the default startup parameter file (specific to your operating system) is used.

database-name

The name of the database to mount or open. If you do not specify the `database-name` parameter, the database name is taken from the initialization parameter `DB_NAME`.

open-options

The mode of access in which you want the specified database to start. The possible modes are:

READ ONLY
READ WRITE

Usage Notes

- You cannot use the `STARTUP` command if the broker configuration is enabled.
- You must be connected to a database as `SYSOPER` or `SYSDBA`. You cannot be connected through a multi-threaded process. For more information about connecting to a database, see the `CONNECT` command.
- Using the `STARTUP` command with no arguments is equivalent to using the `STARTUP OPEN` command.
- If you do not use the `FORCE` option when you use the `STARTUP` command and the current database instance is running, an error results. The `FORCE` option is useful when you are debugging and when error conditions are occurring. Otherwise, it should not be used.
- Use the `RESTRICT` option to allow only Oracle users with the `RESTRICTED SESSION` system privilege to connect to the database. Later, you can use the `ALTER SYSTEM` command to disable the restricted session feature.
- If you do not use the `PFILE` option to specify the initialization parameter file, the `STARTUP` command uses your default initialization parameter file. The default initialization parameter file is platform specific. For example:
 - On a UNIX system, the default file might be similar to the following:
`$oracle_home/DBS/INIT$oracle_sid.ORA`
 - On a Windows system, the default file might be similar to the following:
`%oracle_home%\DATABASE\INITORCL.ORA`

See your operating system-specific documentation for more information about the default initialization parameter file.

- Use the `MOUNT` option to mount a database without opening it. If you do not specify a database name, the database name is taken from the initialization parameter `DB_NAME`.
- Use the `OPEN` option to mount and open the specified database.

- The `NOMOUNT` option starts the database instance without mounting it. You cannot use the `NOMOUNT` option with the `MOUNT` or `OPEN` options.
- You cannot use the `STARTUP` command to start an Oracle instance for an Oracle7 database server.

Command Examples

Example 1

The following examples show two different methods for starting a database instance. Each command starts a database instance using the standard parameter file, mounts the default database in exclusive mode, and opens the database.

```
DGMGRL> STARTUP;
```

```
DGMGRL> STARTUP OPEN database;
```

Example 2

The following command shuts down the current instance, immediately restarts it without mounting or opening the database, and allows only database administrators to connect to it.

```
DGMGRL > STARTUP FORCE RESTRICT NOMOUNT;
```

Example 3

The following command starts an instance using the parameter file `testparm` without mounting the database:

```
DGMGRL > STARTUP PFILE=testparm NOMOUNT;
```

Example 4

The following command shuts down a particular database, immediately restarts and opens it in parallel mode, allows access only to database administrators, and uses the parameter file `MYINIT.ORA`.

```
DGMGRL > STARTUP FORCE RESTRICT PFILE=myinit.ora SHARED OPEN database;
```

Example 5

The following example starts and mounts a database instance, but does not open it.

```
DGMGRL> CONNECT / ;
```

```
Connected.
```

```
DGMGRL> STARTUP MOUNT;
```

ORACLE instance started.

Oracle9i Data Guard Error Messages

This appendix lists the error messages returned by Oracle9i Data Guard. The messages are listed in ascending numerical order. For each message, the probable cause of the error and the recommended action to correct it are provided.

ORA-16501 "The Data Guard broker operation failed"

Cause: The Data Guard broker operation failed.

Action: See other messages for details.

ORA-16502 "The Data Guard broker operation succeeded with warnings"

Cause: The Data Guard broker operation succeeded with warnings.

Action: See other messages for details.

ORA-16503 "Site ID allocation failure"

Cause: Number of sites in the Data Guard configuration has exceeded the limit.

Action: Delete unused sites.

ORA-16504 "The Data Guard configuration already exists"

Cause: A request to create a Data Guard configuration was made on a site that is part of an existing configuration.

Action: Delete the existing configuration if you desire to create a new configuration.

ORA-16505 "Site ID is invalid"

Cause: The request contained an invalid site ID.

Action: Make the request again with a valid site ID.

ORA-16506 "Out of memory"

Cause: Process exceeded private or shared memory limits.

Action: Check for memory leaks, increase system parameters and restart.

ORA-16507 "Unrecognized request identifier"

Cause: The specified request identifier was not recognized by the Data Guard broker.

Action: Re-issue the request using a valid request identifier.

ORA-16508 "Channel handle not initialized"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16509 "The request timed out"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16510 "ksrwait"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16511 "ksrget"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16512 "Parameter exceeded maximum size limit"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16513 "Maximum requests exceeded"

Cause: Non-blocking commands were issued but responses are not read or the commands did not complete execution.

Action: Read pending responses or delete outstanding requests and try again.

ORA-16514 "The request was not found"

Cause: An attempt was made to read a response but a matching request was not found.

Action: Verify request identifier is valid and references a previously issued request.

ORA-16515 "No rcv channel"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16516 "The resource state is invalid"

Cause: Specified state is invalid for the resource.

Action: Verify resource state.

ORA-16517 "The object handle is invalid"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16518 "Unable to allocate virtual instance ID"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16519 "The resource handle is invalid"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16520 "Unable to allocate resource ID"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16524 "Unsupported operation"

Cause: A command or option is not supported in this release.

Action: Contact Oracle Support Services.

ORA-16525 "The Data Guard broker is not available"

Cause: The Data Guard broker has not been started yet, is initializing, or failed to start.

Action: If the broker has not been started yet, set `DRS_START` to true and allow the broker to finish initializing before making the request. If the broker failed to start, check the Data Guard log for possible errors. Otherwise, retry the operation.

ORA-16526 "Unable to allocate task element"

Cause: The Data Guard broker was unable to allocate memory for a request.

Action: Increase the size of your system global area (SGA).

ORA-16527 "Unable to allocate SGA heap"

Cause: The Data Guard broker was unable to allocate a heap within the SGA.

Action: Increase system global area (SGA) memory.

ORA-16528 "Unable to allocate PGA heap"

Cause: No space in process global area (PGA) to allocate heap

Action: Increase process virtual memory.

ORA-16529 "Bad sender ID"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16530 "Invalid buffer or length"

Cause: A NULL buffer or a length of zero is specified.

Action: Correct command parameters and retry.

ORA-16531 "Unable to post message"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16532 "Data Guard Configuration does not exist"

Cause: The Data Guard Configuration does not exist.

Action: Create a Data Guard Configuration prior to issuing other requests.

ORA-16533 "Inconsistent Data Guard broker state"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16534 "No more requests accepted"

Cause: The Data Guard broker is not accepting any more requests. The most common cause for this situation is that either a failover or switchover operation is in progress.

Action: Wait until the operation is complete and then re-issue the request.

ORA-16535 "Failover request rejected"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16536 "Unknown object type"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16537 "Child count exceeded"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16538 "No match on requested item"

Cause: The Data Guard broker did not recognize the specified property or state name.

Action: Verify command parameters and re-issue the request.

ORA-16539 "Task element not found"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16540 "Invalid argument"

Cause: One of the arguments for the specified request is invalid for the request type.

Action: Verify arguments and then re-issue the request.

ORA-16541 "Site is not enabled"

Cause: The site specified in the request is not enabled.

Action: Select an enabled site and re-issue the request.

ORA-16542 "Unrecognized operation"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16543 "Invalid request made to broker"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16544 "Unable to make request"

Cause: The Data Guard broker was unable to accept the request.

Action: Contact Oracle Support Services.

ORA-16545 "Unable to get response"

Cause: The Data Guard broker was unable to return the result of a previous request.

Action: Contact Oracle Support Services.

ORA-16546 "Missing or invalid piece"

Cause: The piece of the request to return was not specified or is invalid.

Action: Specify the piece of the response starting from 1.

ORA-16547 "Unable to delete request"

Cause: The Data Guard broker was unable to delete the given request.

Action: Contact Oracle Support Services.

ORA-16548 "The resource is not enabled"

Cause: An attempt was made to modify or query a disabled Data Guard resource.

Action: Enable the resource and re-issue the request.

ORA-16549 "Invalid string"

Cause: A request contains an invalid or NULL string value.

Action: Correct command parameters and retry.

ORA-16550 "Truncated result"

Cause: A string property value was truncated due to insufficient buffer size.

Action: Specify a larger receive buffer.

ORA-16551 "Short string copied"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16552 "The Data Guard broker process (DMON) failed to start"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16553 "The Data Guard broker process (DMON) failed to shutdown"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16554 "Translation not valid"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16555 "The Data Guard resource is not active"

Cause: An operation was attempted on a resource that is currently not active (off path).

Action: Verify resource is active.

ORA-16557 "The resource is already in use"

Cause: An attempt was made to create a duplicate resource.

Action: Check the resource to be added and be sure there are no duplicates.

ORA-16558 "The site specified for switchover is not a standby"

Cause: An attempt was made to switchover to a site that is not a standby site.

Action: Locate an enabled standby site and select that site as the target of the switchover.

ORA-16559 "Out of memory at %s"

Cause: Internal error.

Action: Contact Oracle Support Services

ORA-16560 "Unable to convert document, syntax error at \"%s\" "

Cause: There was an error at the given token.

Action: Correct the errors and submit the request again.

ORA-16561 "Must use ONLINE parent state, syntax error at \"%s\" "

Cause: There was an error at the given token.

Action: Correct the errors and submit the request again.

ORA-16562 "Intended_state not used here, syntax error at \"%s\""

Cause: There was an error at the given token.

Action: Correct the errors and submit the request again.

ORA-16563 "Unable to add value, syntax error at \"%s\""

Cause: There was an error at the given token.

Action: Correct the errors and submit the request again.

ORA-16564 "Lookup failed, syntax error at %s"

Cause: There was an error at the given token.

Action: Correct the errors and submit the request again.

ORA-16565 "Duplicate property, syntax error at \"%s\""

Cause: There was an error at the given token.

Action: Correct the errors and submit the request again.

ORA-16566 "Unsupported document type"

Cause: The XML document submitted is not supported.

Action: Correct the errors and submit the request again.

ORA-16567 "Data Guard broker internal parser error at \"%s\""

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16568 "Cannot set property %s"

Cause: The named property could not be modified. The property may not be editable or may not exist.

Action: Retry the operation with a valid property.

ORA-16569 "Data Guard Configuration is not enabled"

Cause: The requested operation requires the Data Guard Configuration to be enabled.

Action: Enable the Data Guard Configuration and re-issue the request.

ORA-16570 "Restart instance on site"

Cause: Internal error (unused).

Action: Contact Oracle Support Services.

ORA-16571 "Data Guard Configuration data file creation failure"

Cause: The Data Guard broker was unable to create the configuration data on permanent storage.

Action: Verify that your ORACLE_HOME area is available to the broker.

ORA-16572 "Data Guard Configuration data file not found"

Cause: The configuration datafile is either unavailable or does not exist.

Action: Contact Oracle Support Services.

ORA-16574 "Data Guard configuration data file not closed"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16575 "Data Guard configuration data file not un-identified correctly"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16576 "Failed to update Data Guard configuration data file"

Cause: A failure was encountered while the broker was updating the configuration data file on permanent storage.

Action: Contact Oracle Support Services.

ORA-16577 "Corruption detected in Data Guard configuration data file"

Cause: The Data Guard broker detected errors while loading the configuration data file.

Action: Contact Oracle Support Services.

ORA-16578 "Failed to read Data Guard configuration data file"

Cause: A failure was encountered while the broker was reading the configuration data file on permanent storage.

Action: Contact Oracle Support Services.

ORA-16579 "Bad Data Guard NetSlave state detected"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16580 "Bad Data Guard NetSlave network link"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16581 "Data Guard NetSlave failed to send message to DRCX"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16582 "Data Guard connection process received error from NetSlave"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16583 "Bad Data Guard Connection Process DRCX state"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16584 "Illegal operation on a standby site"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16585 "Illegal operation on a primary site"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16586 "Data Guard broker unable to update configuration on site"

Cause: The Data Guard broker was unable to update the configuration data file on a particular site.

Action: Verify that your Oracle Net connections are operational between the Data Guard sites.

ORA-16587 "Ambiguous object handle"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16588 "No more internal buffers"

Cause: See trace file.

Action: Contact Oracle Support Services.

ORA-16589 "Data Guard Connect process detected a network transfer error"

Cause: See trace file.

Action: Contact Oracle Support Services.

ORA-16590 "No primary established in Data Guard configuration"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16591 "Unknown field \"%s\" in document"

Cause: There was an error at the given token.

Action: Correct the errors and submit the request again.

ORA-16592 "Missing field \"%s\" in document"

Cause: There was an error at the given token.

Action: Correct the errors and submit the request again.

ORA-16593 "XML conversion failed"

Cause: There was an error in the XML request document

Action: Correct the errors and submit the request again.

ORA-16594 "%s process discovered that DMON process does not exist"

Cause: The Data Guard NetSlave (NSV*) process(es) discovered that the Data Guard broker process (DMON) is not running.

Action: Check the Data Guard configuration log and DMON process trace file to determine why the DMON process is missing.

ORA-16595 "NetSlave process %s failed to terminate"

Cause: The specified NetSlave process did not terminate at the request of the Data Guard broker.

Action: Contact Oracle Support Services.

ORA-16596 "Site is not a member of the Data Guard configuration"

Cause: A request was made on a site that is not a member of the Data Guard configuration.

Action: Re-issue the request on a site that is a part of the configuration.

ORA-16597 "Data Guard broker detects two or more primaries"

Cause: The Data Guard broker has detected two or more primary sites in the configuration and cannot continue.

Action: Contact Oracle Support Services.

ORA-16598 "The Data Guard broker has detected a mismatch in configuration"

Cause: The Data Guard broker on the site has detected a mismatch in configuration generation. This can occur when the primary site has a stale configuration.

Action: Contact Oracle Support Services.

ORA-16599 "The Data Guard broker has detected a stale configuration"

Cause: The Data Guard broker has detected a stale configuration during initialization on this site.

Action: The broker will automatically resolve this situation once the primary site completes its initialization.

ORA-16601 "Site contains required resources that are disabled"

Cause: The Data Guard broker detected disabled, required resources prior to performing an operation that needs those resources to be enabled.

Action: Enable all required resources and re-issue the request.

ORA-16602 "Resource must be disabled to perform this operation"

Cause: An attempt was made to modify a resource that can only be changed while that resource is disabled.

Action: Disable the resource and re-issue the request.

ORA-16604 "Unable to describe template using package \"%s\""

Cause: The Data Guard broker was unable to execute the OnDescribe function in the named package.

Action: Verify that the named package is loaded on the primary site. Also verify that the OnDescribe function is in the package.

ORA-16605 "Unable to delete template, template is in use"

Cause: The Data Guard broker was unable to delete the template because the template is still being used by one or more resources.

Action: Delete all of the resources using the template before deleting the template. You cannot delete the database template.

ORA-16606 "Unable to find property \"%s\""

Cause: The named property does not exist.

Action: Specify a valid property name and re-issue the request.

ORA-16607 "One or more sites have failed"

Cause: The Data Guard broker detected a failure on one or more sites.

Action: Locate the sites with a failure status and correct them.

ORA-16608 "One or more sites have warnings"

Cause: The Data Guard broker detected a warning status on one or more sites.

Action: Locate the sites with a warning status and correct them.

ORA-16609 "One or more resources have failed"

Cause: The Data Guard broker detected a failure on one or more resources on a site.

Action: Locate the resources with a failure status and correct them.

ORA-16610 "One or more resources have warnings"

Cause: The Data Guard broker detected a warning status on one or more resources on a site.

Action: Locate the resources with a warning status and correct them.

ORA-16611 "Operation aborted at user request"

Cause: The Data Guard broker aborted an operation at the user's request.

Action: No action required.

ORA-16612 "String value too long for attribute \"%s\""

Cause: The string value for the named attribute is too long.

Action: Use a shorter string.

ORA-16613 "Initialization in progress for site"

Cause: The site received a directive to change its initialization state or a change in its configuration before it has completed initialization.

Action: Wait until the site has completed initialization before issuing requests to modify runtime state or configuration.

ORA-16614 "Object has an ancestor that is disabled"

Cause: A request to enable an object that has an ancestor that is disabled was received by the server. The Data Guard broker has enabled the object to the extent that it can, but cannot fully enable the object until its ancestor is enabled.

Action: Determine the ancestor object that is disabled and enable that ancestor prior to enabling the child object.

ORA-16701 "Generic resource guard request failed"

Cause: Request to modify or query the resource failed.

Action: Check the Data Guard configuration log for the reason for the failure, and re-issue the request.

ORA-16702 "Generic resource manager warning"

Cause: Request to modify or query the resource resulted in a warning.

Action: Check the Data Guard configuration log for the reason for the warning, and if necessary re-issue the request.

ORA-16703 "Status of request is unknown"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16704 "A previous set state operation is pending"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16705 "Severe internal error in resource guard"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16706 "No resource guard is available"

Cause: No resource guard is available to service the request.

Action: Contact Oracle Support Services.

ORA-16707 "The value supplied to resource guard is invalid"

Cause: The value specified in the request is invalid.

Action: Check value and re-issue the request.

ORA-16708 "The state supplied to resource guard is invalid"

Cause: The state name specified is invalid for the resource.

Action: Check the state name and re-issue the request.

ORA-16709 "The resource guard is busy and cannot service the request"

Cause: Request to resource guard failed because the guard is busy.

Action: Wait for resource guard to finish the previous request and then re-issue the request.

ORA-16710 "The resource guard is out of memory"

Cause: The resource guard was unable to allocate memory while trying to service a request.

Action: Disable the configuration, shut down the Oracle database, increase system global area (SGA) size, and restart.

ORA-16711 "The resource guard index is out of bounds"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16712 "The resource handle is invalid"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16713 "The resource guard timed out while servicing the request"

Cause: The resource guard timed out while servicing the request.

Action: Verify that the operation is valid for the resource and then re-issue the request.

ORA-16714 "The resource guard exceeded its retry limit"

Cause: The resource guard exceeded its retry limit while trying to service a request.

Action: Verify that the resource is operational and then re-issue the request.

ORA-16716 "Clearing parameter LOG_ARCHIVE_DEST failed"

Cause: An attempt to clear the LOG_ARCHIVE_DEST parameter failed.

Action: Contact Oracle Support Services.

ORA-16717 "Clearing parameter LOG_ARCHIVE_DUPLEX_DEST failed"

Cause: An attempt to clear the LOG_ARCHIVE_DUPLEX_DEST parameter failed.

Action: Contact Oracle Support Services.

ORA-16718 "Failed to locate the database resource"

Cause: The resource guard was unable to locate the database resource in the configuration.

Action: Add the database resource and then re-issue the request.

ORA-16719 "Unable to query V\$ARCHIVE_DEST fixed view"

Cause: SQL statement to query V\$ARCHIVE_DEST failed.

Action: Test and clear the problem using SQL*Plus.

ORA-16720 "No available LOG_ARCHIVE_DEST_n parameters to use"

Cause: All LOG_ARCHIVE_DEST_n parameters have been defined.

Action: Set some of the LOG_ARCHIVE_DEST_n parameters to empty string.

ORA-16721 "Unable to set LOG_ARCHIVE_DEST_n parameters"

Cause: An attempt of setting some of the LOG_ARCHIVE_DEST_n parameters failed.

Action: Contact Oracle Support Services.

ORA-16722 "Unable to set LOG_ARCHIVE_DEST_STATE_n parameters"

Cause: An attempt of setting some of the LOG_ARCHIVE_DEST_STATE_n parameters failed.

Action: Contact Oracle Support Services.

ORA-16723 "The connect descriptor is missing from V\$ARCHIVE_DEST"

Cause: The resource guard was unable to set the LOG_ARCHIVE_DEST_n parameters.

Action: Reset the values of the LOG_ARCHIVE_DEST_n parameter and re-issue the request.

ORA-16724 "The intended state for resource has been set to OFFLINE"

Cause: The intended state of the resource has been set to offline.

Action: If resource is managed, change intended state to online.

ORA-16725 "The phase supplied to resource manager is invalid"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16726 "The external condition supplied to resource manager is invalid"

Cause: Internal error.

Action: Contact Oracle Support Services.

ORA-16727 "Resource guard cannot close database"

Cause: The resource guard could not close the database.

Action: Check if there any active sessions connected to the database, terminate them, then re-issue the request.

ORA-16728 "Log archive destination could not be set"

Cause: The resource guard could not set the log archive destination.

Action: Check the Data Guard configuration log and the database alert log for further details.

ORA-16736 "Standby log archive destination parameter could not be set"

Cause: Resource guard could not set the standby log archive destination parameter.

Action: Check the Data Guard configuration log for further details.

ORA-16737 "Log archive format parameter could not be set"

Cause: Resource guard could not set the log archive format parameter.

Action: Check the Data Guard configuration log for further details.

ORA-16738 "Database file name convert parameter could not be set"

Cause: Resource guard could not set the database file name convert parameter.

Action: Check the Data Guard configuration log for further details.

ORA-16739 "Log file name convert parameter could not be set"

Cause: Resource guard could not set log filename convert parameter.

Action: Check the Data Guard configuration log for further details.

ORA-16740 "Log archive trace parameter could not be set"

Cause: Resource guard could not set log archive trace parameter.

Action: Check the Data Guard configuration log for further details.

ORA-16741 "Control files parameter could not be set"

Cause: Resource guard could not set the control files parameter.

Action: Check the Data Guard configuration log for further details.

ORA-16742 "Lock name trace parameter could not be set"

Cause: Resource guard could not set lock name trace parameter.

Action: Check the Data Guard configuration log for further details.

ORA-16743 "FAL client parameter could not be set"

Cause: Resource guard could not set FAL client parameter.

Action: Check the Data Guard configuration log for further details.

ORA-16744 "FAL server parameter could not be set"

Cause: Resource guard could not set FAL server.

Action: Check the Data Guard configuration log for further details.

ORA-16745 "Resource guard encountered error during database dismount"

Cause: Resource guard could not dismount database.

Action: Check the Data Guard configuration log for further details.

ORA-16746 "Resource guard encountered error during database mount"

Cause: Resource guard could not mount database.

Action: Check the Data Guard configuration log for further details.

ORA-16748 "Resource guard encountered errors during database open"

Cause: Resource guard could not open database.

Action: Check the Data Guard configuration log for further details.

ORA-16751 "Resource guard encountered errors in switchover to primary"

Cause: Resource guard could not prepare to switch to primary.

Action: Check the Data Guard configuration log for further details.

ORA-16752 "Resource guard could not mount standby"

Cause: Resource guard could not mount standby.

Action: Check the Data Guard configuration log for further details.

ORA-16753 "Resource guard could not open standby database"

Cause: Resource guard could not open standby database.

Action: Check the Data Guard configuration log for further details.

ORA-16754 "Resource guard could not activate standby"

Cause: Resource guard could not activate standby.

Action: Check the Data Guard configuration log for further details.

ORA-16755 "Resource guard could not dismount standby"

Cause: Resource guard could not dismount standby.

Action: Check the Data Guard configuration log for further details.

ORA-16756 "Resource guard could not open standby readonly"

Cause: Resource guard could not open standby read-only.

Action: Check the Data Guard configuration log for further details.

ORA-16757 "Resource guard could not get property"

Cause: Resource guard failed to get property.

Action: Check the Data Guard configuration log for further details.

ORA-16758 "Resource guard could not verify property"

Cause: Resource guard failed to verify property.

Action: Check the Data Guard configuration log for further details.

ORA-16762 "Invalid database state"

Cause: Database is not in the intended state.

Action: Determine the reason for invalid state, and re-issue get status request.

ORA-16763 "Log transport service for some site unexpectedly online"

Cause: Log transport services for some site are online when they should be offline.

Action: Check the Data Guard configuration log for further details. If necessary, stop log transport services for the site.

ORA-16764 "Log transport service for some site unexpectedly offline"

Cause: Log transport services for some site are offline when they should be online.

Action: Check the Data Guard configuration log for further details. If necessary, start log transport services.

ORA-16765 "Physical apply service unexpectedly online"

Cause: Physical log apply services are online when they should be offline.

Action: If necessary, stop physical log apply services.

ORA-16766 "Physical apply service unexpectedly offline"

Cause: Physical log apply services are offline when they should be online.

Action: If necessary, start physical log apply services.

ORA-16769 "Error executing apply_set procedure"

Cause: There was an error executing dbms_logstdby\$apply_set procedure.

Action: Check the values for the property, and set configuration property again.

ORA-16770 "Error executing apply_unset procedure"

Cause: There was an error executing dbms_logstdby\$apply_unset procedure.

Action: Check the values for the property, and set configuration set property again.

ORA-16771 "Error starting ARCH process(es)"

Cause: There was an error starting the archival processes.

Action: Check the Data Guard configuration log for further details.

ORA-16772 "Error in switching over between primary and standby databases"

Cause: There was an error during switchover of primary and standby databases.

Action: Check the Data Guard configuration log for further details.

ORA-16773 "Error in starting the physical apply service (MRP process)"

Cause: There was an error in starting physical log apply services (MRP process).

Action: Check the Data Guard configuration log for further details.

ORA-16774 "Error in stopping the physical apply service (MRP process)"

Cause: There was an error in stopping physical log apply services (MRP process).

Action: Check the Data Guard configuration log for further details.

ORA-16775 "The physical apply service terminated prematurely"

Cause: The physical apply service terminated prematurely with an error.

Action: Check the Data Guard configuration log and database alert log for further details.

ORA-16776 "Health check of the log transport service failed"

Cause: Due to some internal failure, the database resource guard cannot complete the health check of log transport services.

Action: Check the Data Guard configuration log and database alert log for further details.

ORA-16777 "Unable to find the destination entry of a site in V\$ARCHIVE_DEST"

Cause: Some destination may be manually deleted, or no entry is available for Data Guard.

Action: Check the Data Guard configuration log and database alert log for further details.

ORA-16778 "The log transport service for some site has an error"

Cause: Some problem in communicating with a standby site causes log transport services to fail.

Action: Check the Data Guard configuration log and database alert log for further details. Query the LogXptStatus property to see the error message.

ORA-16779 "The destination parameter of some site has wrong syntax"

Cause: The destination is defined in the init.ora file with wrong syntax, and the Data Guard broker fails to update the destination when the log transport services are turned on.

Action: Check the Data Guard configuration log to see which site has the problem. Fix the syntax error in the initialization parameter file or remove the entry from the initialization parameter file. Check if the syntax of the property LogArchiveDestOptions is correct.

ORA-16780 "Some site has used up its quota"

Cause: Some site has used up its quota for storing archived redo logs.

Action: Check the Data Guard configuration log to see which site has the problem. Remove some archived logs at the standby site or increase its quota.

ORA-16781 "The status of log transport service for some site is unknown"

Cause: Log transport to some site has an unknown status.

Action: Check the Data Guard configuration log and database alert log for further details.

ORA-16782 "Unable to get values of some critical configurable properties"

Cause: Log transport services cannot be turned on because some critical property values cannot be retrieved from Data Guard metadata.

Action: Check the Data Guard configuration log and database alert log for further details.

ORA-16783 "Some critical configurable property has not been set"

Cause: Log transport services cannot be turned on because some critical property has not been set.

Action: Check the Data Guard configuration log to see which property has not been set, and set it properly.

ORA-16784 "Unable to find a site with the name given in ArchiveDestDependency"

Cause: Property ArchiveDestDependency has a wrong value.

Action: Reset property ArchiveDestDependency to the correct name of the site that the standby depends on.

ORA-16785 "The primary database is not in ARCHIVELOG mode"

Cause: The primary database is in NOARCHIVELOG mode.

Action: Reset the primary database to ARCHIVELOG mode by issuing ALTER DATABASE ARCHIVELOG command.

ORA-16786 "Resource guard cannot access Data Guard metadata"

Cause: The metadata files do not exist or the Data Guard configuration has not been created.

Action: Check the Data Guard configuration log for further details.

ORA-16788 "Unable to set one or more database configuration property values"

Cause: This situation occurs when database resource guard attempts to set database initialization parameters through configuration properties. Typical causes of this error are:

- a. The values of LogArchiveDestOptions have syntax errors.
- b. The value of LogArchiveTrace is out of range.
- c. Database initialization parameter STANDBY_FILE_MANAGEMENT cannot be set to AUTO because the database compatibility is not set to 9.0.0.0.0 or higher.

Action: Check the Data Guard configuration log to see which property has the problem and reset the property correctly.

ORA-16900 "Unable to initialize client"

Cause: The client could not be initialized.

Action: This is an internal error. Contact Oracle support representative.

ORA-16901 "Unable to initialize environment"

Cause: The database environment could not be allocated and initialized.

Action: This is an internal error. Contact Oracle support representative.

ORA-16902 "Unable to allocate handle"

Cause: The database handles could not be allocated.

Action: This is an internal error. Contact Oracle support representative.

ORA-16903 "Unable to connect to database"

Cause: The database specified was unreachable because it does not exist or was not started.

Action: Correct the request or start the database and try again.

ORA-16904 "Unable to set attribute"

Cause: The server attributes could not be set.

Action: Check additional error messages.

ORA-16905 "Failed."

Cause: The given action failed.

Action: Check additional error messages.

ORA-16906 "Unable to accept commands: no memory"

Cause: No memory was available for the program.

Action: Increase memory and try again.

ORA-16907 "Missing field"

Cause: A required field was missing.

Action: Type "help" for syntax and try again.

ORA-16908 "Unknown option: \"%s\""

Cause: The given option is not supported.

Action: Try again using the proper command-line syntax.

ORA-16909 "Fatal Error. quitting..."

Cause: A fatal error was encountered.

Action: See additional error messages or contact Oracle Support Services.

ORA-16910 "Unable to issue command to server"

Cause: Commands cannot be issued to the server.

Action: See additional error messages or contact Oracle Support Services.

ORA-16911 "Warning:"

Cause: An action succeeded with warnings.

Action: See error message and take appropriate action.

ORA-16912 "Unknown command \"%s\". Try \"help\""

Cause: An unknown command was issued.

Action: Try again using a valid command.

ORA-16914 "Missing connect string. Try \"help\""

Cause: The connect string for the database is missing.

Action: Try the command again with a valid connect string.

ORA-16916 "Missing site. Try \"help\""

Cause: The site name is missing.

Action: Try the command again using correct syntax.

ORA-16917 "Missing XML document. Try \"help\""

Cause: The XML document argument was missing.

Action: Try the command again using correct syntax.

ORA-16939 "Could not start up \"%s\" as primary"

Cause: The named site could not be started in the primary role.

Action: See additional messages.

ORA-16940 "Started \"%s\" as new primary"

Cause: The named site was started as the new primary site.

Action: No action is required.

ORA-16942 "Could not start up \"%s\" as standby"

Cause: The named site could not be started in the standby role.

Action: See additional messages.

ORA-16943 "Started \"%s\" as standby"

Cause: The named site was started as the new primary site.

Action: No action is required.

ORA-16944 "Failover succeeded. New primary is \"%s\""

Cause: The failover operation succeeded.

Action: No action is required.

ORA-16945 "Syntax error at \"%s\""

Cause: The given command could not be processed because a syntax error occurred at the named token.

Action: Try the command again using valid syntax.

ORA-16946 "Site \"%s\" was not found"

Cause: The named site could not be found.

Action: Try the command again using a valid site.

ORA-16947 "\"%s\" does not run in the primary role"

Cause: The named resource does not run in the primary role.

Action: Try the command again using a resource that runs in the primary role.

ORA-16948 "\ "%s\" does not run in the standby role"

Cause: The named resource does not run in the standby role.

Action: Try the command again using a resource that runs in the standby role.

ORA-16949 "Resource \ "%s\" was not found"

Cause: The named resource was not found.

Action: Try the command again using a valid resource.

ORA-16950 "Unable to retrieve \ "%s\" for editing"

Cause: The named object could not be retrieved for editing.

Action: This is a bug. Contact Oracle Support Services.

ORA-16952 "Unable to describe configuration"

Cause: The configuration could not be described.

Action: The framework could not be contacted. Check to see that the DMON process is running.

ORA-16953 "Site or resource \ "%s\" does not exist"

Cause: The named site or resource does not exist.

Action: Try the command again using a valid site or resource.

ORA-16954 "A resource cannot run on multiple sites this way"

Cause: An attempt was made to create a resource that depends on multiple sites. This is not possible using one command.

Action: Issue the command twice; once with the first site and a second time using the second site.

ORA-16955 "Unable to create or locate template"

Cause: The template could not be found.

Action: See additional error messages.

ORA-16956 "Missing template name"

Cause: The template name was omitted from the command.

Action: Try the command again using a valid template name.

ORA-16957 "Template \ "%s\" was not found"

Cause: The named template could not be found.

Action: Try the command again using a valid template name.

ORA-16958 "Unable to convert document"

Cause: The document could not be converted.

Action: This is a bug. Contact Oracle Support Services.

ORA-16959 "NULL answer from framework"

Cause: No answer came from the framework.

Action: The framework is not available. Check to see that the DMON process exists.

ORA-16960 "Status not available"

Cause: The status could not be retrieved.

Action: The framework is not available. Check to see that the DMON process exists.

Glossary

broker

A distributed management framework that automates and simplifies most of the complex operations required to create, control, and monitor a Data Guard configuration.

broker configuration

A hierarchical and logical grouping of the sites and database resources (including log transport services and log apply services) in a Data Guard configuration.

See also Data Guard configuration.

configuration object

A named collection of sites and the resource objects that those sites contain. It is an abstraction of an actual Data Guard configuration.

database resource object

A named object that corresponds to a primary or standby database instance. The broker uses this object to manage and control the state of a single database.

Data Guard configuration

A distributed computing system that prevents or minimizes losses due to unplanned events (for example, human errors, environmental disasters, or data corruption) as well as to planned downtime (such as for routine maintenance tasks).

See also broker configuration.

Data Guard environment

The physical configuration of the primary and standby databases. The environment depends on many factors, including the:

- Number of standby databases associated with a primary database
- Number of host machines used by the databases
- Directory structures of the machines used by the databases
- Network configuration
- Log transport services
- Log apply services

The standby database environment can be managed manually by a DBA, automatically using Data Guard Manager or the Data Guard CLI, or a combination of all of these.

default state

The initial runtime state in which the object will run when you enable the configuration. For a database resource, the actual default state can vary depending on the role (primary or standby) in which the database resource is currently running.

See also intended state.

guarded resource

A managed entity in a Data Guard configuration. A guarded resource can be any component that Data Guard can take online and offline using the resource guard.

See also resource guard.

intended state

The runtime state of an object while it is enabled.

See also default state.

physical standby database

A standby database that is *physically identical* to the primary database because recovery applies changes block-for-block using the *physical* row ID. The schema, including indexes, must be the same, and the database cannot be opened; otherwise, the standby database will have different row IDs, making continued recovery impossible.

primary database

A production database from which one or more standby databases is created and maintained. Every standby database is associated with one and only one primary database. A single primary database can, however, support multiple standby databases.

primary site

The location of the primary database. This is the site in a Data Guard configuration from which the database is available to applications and from where the data is shipped, primarily in the form of redo logs.

read-only mode

A standby database mode is initiated using the following SQL statement:

```
ALTER DATABASE OPEN READ ONLY;
```

The read-only mode allows you to query the standby database, but does not allow you to make changes to it. While in this mode, redo logs are archived but are not applied until the standby database reenters managed recovery mode.

resource

A physical or logical component that is available to a computing system. Most commonly, a resource is an Oracle database server.

These resources are categorized by type and can include an Oracle database server resource and other services upon which these items depend. The various resource types are each separately managed on a given Data Guard configuration by a resource guard. Resource guards are registered with Data Guard broker during configuration.

See also guarded resource.

resource guard

A component that acts as an interface between Data Guard broker and resources in a Data Guard configuration. Its jobs include registering resources with Data Guard broker, taking resources online and offline, reporting status for resources, translating parameter changes that affect resources, and conveying messages to resources.

site

A managed unit of failover in a Data Guard configuration. A database is replicated across a set of sites, one replicant per site. Dependent applications are instantiated

on a site. When a site holding a primary role fails, another site holding the standby role transitions to the primary role and provides the desired service to users. Sites may be one of several types of nodes, which vary from one another in the degree of hardware complexity and software management.

site object

A named collection of database resource objects that reside on a single host.

standby database

A copy of a production database created using a backup of your primary database. Standby databases are kept synchronized with the primary database by applying archived redo logs over time from the primary database to each standby database. The standby database can take over processing from the primary database, providing nearly continuous database availability. A standby database has its own initialization parameter file, control file, and datafiles.

standby site

The location of the standby database. One or more server systems can serve as hosts for standby databases. The standby systems accept redo logs shipped from the primary site and apply changes to local copies of the database. The standby site can be on the same host system as the primary database or on a separate host system.

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