SYBASE®

Installation Guide

Mirror Activator™ for Oracle

12.6

[Linux, Microsoft Windows, and UNIX]

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Contents

About This Book

This book describes how to install Sybase® Mirror Replication Agent™ for Oracle on Linux, Microsoft Windows 2000 and 2003, and UNIX platforms.

Audience

This book is for replication System Administrators and Database Administrators who are responsible for managing a replication system within an enterprise network.

How to use this book

Read Chapter 1, "Sybase Software Asset Management (SySAM)," and Chapter 2, "Preparing for Installation," *before* you unload the Mirror Replication Agent software from the Mirror Replication Agent version 12.6 distribution media. Use the Installation and Setup worksheet in Chapter 2 to gather and record the connectivity and configuration information you need to set up the Mirror Replication Agent.

See Chapters 1 and 2 in the Mirror Activator™ for Oracle *Administration Guide* for more information about the Mirror Activator for Oracle system:

- An introduction to the Mirror Activator for Oracle system and an overview of its topology
- Specific configuration requirements for each Mirror Activator for Oracle system component

This book provides the following information:

- Chapter 1, "Sybase Software Asset Management (SySAM)," describes licensing concepts that you need to know before you install any of the Mirror Activator for Oracle components.
- Chapter 2, "Preparing for Installation," describes basic Mirror Activator for Oracle system requirements. It also provides a worksheet to help you gather and record the configuration information that you need to install the Mirror Replication Agent software and set up the Mirror Activator for Oracle system.
- Chapter 3, "Installing Mirror Replication Agent," describes how to install the Mirror Replication Agent 12.6 software on a Linux, Microsoft Windows, or UNIX platform. This chapter also describes how to uninstall the software.

- Appendix A, “Quick Start,” describes a Quick Start installation procedure to install and configure a sample replication environment for Oracle.

Note For information about installing the Replication Server® 12.6 software or the DirectConnect™ for Oracle software, see the Replication Server or DirectConnect installation and configuration guides for your platform.

Related documents

Mirror Activator for Oracle Refer to the following documents to learn more about the Mirror Activator for Oracle:

- Mirror Activator for Oracle Mirror Replication Agent *Reference Manual* – for information about all Mirror Replication Agent commands and configuration parameters, including syntax, examples, and detailed command usage notes
- Mirror Activator for Oracle *Administration Guide* – for an introduction to the Mirror Activator for Oracle system, and information about setting up and administering the Mirror Replication Agent and other components of the Mirror Activator for Oracle system
- The Mirror Activator for Oracle *Release Bulletin* – for last-minute information that was too late to be included in the books

Note A more recent version of the Mirror Activator for Oracle *Release Bulletin* may be available on the World Wide Web. To check for critical product or document information that was added after the release of the product CD, use the Sybase Technical Library Web site.

Replication Server Refer to the following documents for more information about transaction replication systems and the Replication Server software:

- Replication Server *Design Guide* – for an introduction to basic transaction replication concepts and Sybase replication technology
- Replication Server *Heterogeneous Replication Guide* – for detailed information about configuring Replication Server and implementing a Sybase replication system with non-Sybase databases

DirectConnect for Oracle Refer to the following documents for more information about access services and the DirectConnect software:

- **Note** Before ECDA version 12.5, its options were sold as individual DirectConnect products named "DirectConnect for [target]." You will see the name "DirectConnect" used in the software and in documents, including this document.

  For information regarding the installation of DirectConnect for Oracle, use the following guides:

  - Enterprise Connect Data Access *Installation Guide* for Microsoft Windows
  - Enterprise Connect Data Access *Installation Guide* for UNIX

- Enterprise Connect Data Access Option for Oracle *Server Administration and User's Guide* – describes the features, functionality, and how to use DirectConnect™ for Oracle

Java environment The Mirror Replication Agent requires a Java Runtime Environment (JRE) on the Mirror Activator for Oracle host machine.

- The Mirror Activator for Oracle *Release Bulletin* contains the most up-to-date information about Java and JRE requirements.
- Java documentation available from your operating system vendor describes how to set up and manage the Java environment on your platform.

  Additional information about the Java environment is available at the following URL:

  ```
  http://java.sun.com
  ```

Other sources of information

Use the Sybase Getting Started CD, the SyBooks™ CD, and the Sybase Product Manuals Web site to learn more about your product:

- The Getting Started CD contains release bulletins and installation guides in PDF format, and may also contain other documents or updated information not included on the SyBooks CD. It is included with your software. To read or print documents on the Getting Started CD, you need Adobe Acrobat Reader, which you can download at no charge from the Adobe Web site using a link provided on the CD.
- The SyBooks CD contains product manuals and is included with your software. The Eclipse-based SyBooks browser allows you to access the manuals in an easy-to-use, HTML-based format.

Some documentation may be provided in PDF format, which you can access through the PDF directory on the SyBooks CD. To read or print the PDF files, you need Adobe Acrobat Reader.

Refer to the *SyBooks Installation Guide* on the Getting Started CD, or the *README.txt* file on the SyBooks CD for instructions on installing and starting SyBooks.

- The Sybase Product Manuals Web site is an online version of the SyBooks CD that you can access using a standard Web browser. In addition to product manuals, you will find links to EBFs/Maintenance, Technical Documents, Case Management, Solved Cases, newsgroups, and the Sybase Developer Network.

  To access the Sybase Product Manuals Web site, go to Product Manuals at http://www.sybase.com/support/manuals/.

Sybase certifications on the Web

Technical documentation at the Sybase Web site is updated frequently.

❖ **To find the latest information on product certifications**

1. Point your Web browser to Technical Documents at http://www.sybase.com/support/techdocs/.
2. Click Certification Report.
3. In the Certification Report filter select a product, platform, and timeframe and then click Go.
4. Click a Certification Report title to display the report.

❖ **To find the latest information on component certifications**

1. Point your Web browser to Availability and Certification Reports at http://certification.sybase.com/.
2. Either select the product family and product under Search by Base Product; or select the platform and product under Search by Platform.
3. Select Search to display the availability and certification report for the selection.

❖ **To create a personalized view of the Sybase Web site (including support pages)**

Set up a MySybase profile. MySybase is a free service that allows you to create a personalized view of Sybase Web pages.

1. Point your Web browser to Technical Documents at http://www.sybase.com/support/techdocs/.

2 Click MySybase and create a MySybase profile.

Sybase EBFs and software maintenance

❖ **To find the latest information on EBFs and software maintenance**

1 Point your Web browser to the Sybase Support Page at http://www.sybase.com/support.

2 Select EBFs/Maintenance. If prompted, enter your MySybase user name and password.

3 Select a product.

4 Specify a time frame and click Go. A list of EBF/Maintenance releases is displayed.

Padlock icons indicate that you do not have download authorization for certain EBF/Maintenance releases because you are not registered as a Technical Support Contact. If you have not registered, but have valid information provided by your Sybase representative or through your support contract, click Edit Roles to add the "Technical Support Contact" role to your MySybase profile.

5 Click the Info icon to display the EBF/Maintenance report, or click the product description to download the software.

Style conventions

The following style conventions are used in this book:

- In a sample screen display, commands that you should enter exactly as shown appear like this:

  ```
  ra_config
  ```

- In the regular text of this document, variables or user-supplied words appear like this:

  If you specify the *value* option, it changes the setting of the specified configuration parameter.

- In a sample screen display, variables or words that you should replace with the appropriate value for your site appear like this:

  ```
  resume connection to rds.rdb
  ```

  where *rds* and *rdb* are the variables you should replace.

- In the regular text of this document, names of programs, utilities, procedures, and commands appear like this:

Use the pdb_init command to initialize the primary database.

- In the regular text of this document, names of database objects (tables, columns, stored procedures, etc.) appear like this:

  Check the price column in the widgets table.

- In the regular text of this document, names of datatypes appear like this:

  Use the date or datetime datatype.

- In the regular text of this document, names of files and directories appear like this:

  Log files are in the *$SYBASE/MRO-12_6/inst_name/log* subdirectory.

Syntax conventions

The following syntax conventions are used in this book:

Table 1: Syntax conventions

Key	Definition
{ }	Curly braces indicate that you must choose at least one of the enclosed options. Do not type the braces when you enter the command.
[ ]	Brackets mean that choosing one or more of the enclosed options is optional. Do not type the brackets when you enter the command.
( )	Parentheses are to be typed as part of the command.
|	The vertical bar means you can select only one of the options shown.
,	The comma means you can choose as many of the options shown as you like, separating your choices with commas that you type as part of the command.

In reference sections of this document, statements that show the syntax of commands appear like this:

ra_config [*param* [, *value*]]

The words *param* and *value* in the syntax are variables or user-supplied words.

Character case conventions

The following character case conventions are used in this book:

- All command syntax and command examples are shown in lowercase. However, Mirror Replication Agent command names are *not* case sensitive. For example, RA_CONFIG, Ra_Config, and ra_config are equivalent.
- Names of configuration parameters are case sensitive. For example, Scan_Sleep_Max is not the same as scan_sleep_max, and the former would be interpreted as an invalid parameter name.

- Database object names are *not* case sensitive in Mirror Replication Agent commands. However, if you need to use a mixed-case object name in a command (to match a mixed-case object name in the database), you must delimit the object name with quote characters. For example:

```
pdb_get_tables "TableName"
```

Accessibility features

This document is available in an HTML version that is specialized for accessibility. You can navigate the HTML with an adaptive technology such as a screen reader, or view it with a screen enlarger.

Mirror Activator for Oracle and the HTML documentation have been tested for compliance with U.S. government Section 508 Accessibility requirements. Documents that comply with Section 508 generally also meet non-U.S. accessibility guidelines, such as the World Wide Web Consortium (W3C) guidelines for Web sites.

The online help for this product is also provided in HTML, which you can navigate using a screen reader.

Note You might need to configure your accessibility tool for optimal use. Some screen readers pronounce text based on its case; for example, they pronounce ALL UPPERCASE TEXT as initials, and MixedCase Text as words. You might find it helpful to configure your tool to announce syntax conventions. Consult the documentation for your tool.

For information about how Sybase supports accessibility, see Sybase Accessibility at http://www.sybase.com/accessibility. The Sybase Accessibility site includes links to information on Section 508 and W3C standards.

For a Section 508 compliance statement for Mirror Activator for Oracle, see Sybase Accessibility at http://www.sybase.com/detail_list?id=52484.

If you need help

Each Sybase installation that has purchased a support contract has one or more designated people who are authorized to contact Sybase Technical Support. If you cannot resolve a problem using the manuals or online help, please have the designated person contact Sybase Technical Support or the Sybase subsidiary in your area.

CHAPTER 1

Sybase Software Asset Management (SySAM)

This chapter describes licensing concepts that you need to know before you install any of the components for Mirror Activator for Oracle.

Note Sybase recommends that you read this entire chapter before installing any Mirror Activator for Oracle components.

SySAM overview

Sybase Software Asset Management (SySAM) is a licensing mechanism that:

- Allows System Administrators to monitor their site's use of Sybase products and optional features
- Records the Sybase software being used and licensed

SySAM verifies that a valid license exists for Mirror Activator for Oracle.

The basic components of SySAM are:

- A license file
- The SySAM software, which consists of a license manager and management utilities

When you install Mirror Replication Agent, a SySAM license manager is automatically installed. It is used to manage the licenses of all the Mirror Activator for Oracle components. After installation, you have two choices:

- You can run the license manager daemon on your local machine.
- You can run the license manager daemon on a remote machine in a network system and then point to it from your local machine.

Note Sybase recommends using a network license server to manage the licenses of Mirror Activator for Oracle components. For more information, see "Registering licenses using a network license server" on page 4.

Mirror Activator for Oracle component licenses

SySAM checks licenses for the following Mirror Activator for Oracle components:

- Mirror Replication Agent
- Replication Server
- Enterprise Connect™ Data Access (ECDA) Option for Oracle

Note Before ECDA version 12.5, its options were sold as individual DirectConnect products named "DirectConnect for [target]." You will see the name "DirectConnect" used in the software and in documents, including this document.

You must register the Mirror Activator for Oracle license through the license manager in SySAM.

Mirror Activator for Oracle license files

A license file contains a set of information that enables a set of features of a Sybase product set. The LM_LICENSE_FILE environment variable is used to point to a license file.

ODR_AGENT is the license file identifier for Mirror Activator for Oracle.

On HP

You may receive the following error message:

```
(SYBASE) Vendor daemon can't talk to lmgrd (Cannot read
data from license server (-16,287:22 "Invalid
argument"))(lmgrd)
```

❖ **To correct the problem and restart the daemons after editing the start.sh file.**

1 Edit the *$SYBASE/SYSAM-1_0/bin/startd.sh* file and add the following two lines:

```
ulimit -n 1024
ulimit -H -n 1024
```

The file should then look like this:

```
#!/bin/sh
# startd.sh
# P1 = component directory

ulimit -n 1024
ulimit -H -n 1024
cd $1

$1/bin/lmgrd -c $1/licenses/license.dat -l
$1/log/lmgrd.log
2> $1/log/stderr.out &
```

2 Use this file to start lmgrd.

Required license information

When you purchase your Mirror Activator for Oracle product, Sybase provides a Sybase Software Asset Management certificate with the following information, which is required and must be entered for each license. When you configure the SySAM License Manager, it prompts you for the following information for each license:

- Order number – the order number of your software purchase.
- Feature name – the feature name from the certificate package or bundle license.
- Feature count – the number of licenses you purchased for the feature package or bundle.
- Software version – the version number specified on the license certificate.
- Authorization code – the authorization code shown on your license certificate for Mirror Activator for Oracle.

How SySAM works

SySAM consists of two utilities called lmgr and lmutil, which manage licensing activities, and two services: the license management service, lmgrd, and the SYBASE service. The SySAM lmgrd service contains a pointer that locates the license file for verification and can reside either on the primary server, known as the local license host, or on a remote license host. The services handle requests to validate licensed features.

Using information in the license file, each Mirror Activator for Oracle component connects to the SySAM daemon and attempts to check out a license for the base component feature. If the component feature license is checked out successfully (a license exists in the *license* file), the Mirror Activator for Oracle component continues to operate.

If a license does not check out successfully (a license is not found), the Mirror Activator for Oracle component *may* continue to operate; however, it does record this discrepancy in the log.

Registering licenses using a network license server

Because you can install Mirror Activator for Oracle components on different machines or in different Sybase directories on the same machine, Sybase recommends that you use a network license server. You can have *licensee* servers on many different machines, but you must have connectivity pointers to the *license* server. The licenses must be entered with the license server.

If you do not already have a designated network license server, you must choose one. Sybase recommends using the SySAM license manager installation in the Replication Server that is associated with Oracle. See Appendix A in the Replication Server *Installation Guide* for more information on setting up a network license server.

❖ **To register the Mirror Activator for Oracle license with a network license server**

1 Determine the location (the host and path) of your network license server and locate its *$SYBASE/SYSAM-1_0/licenses/license.dat* file.

2 Install Mirror Replication Agent on the platform of your choice.

Note If you do not install Mirror Replication Agent, you will not be able to correctly configure and register your Mirror Activator for Oracle license.

3 Navigate to the *$SYBASE/SYSAM-1_0/licenses* directory in your Mirror Replication Agent installation.

4 Open the *sybpkg.mro* file and copy its contents to the *license.dat* file of the network license server.

5 Start the license manager on the network license server:

On Windows, from a command-line prompt:

```
cd \path\sybase
SYBASE
cd SYSAM-1_0\bin
lmgr
```

On UNIX:

```
cd /path/sybase
source SYBASE.csh
cd SYSAM-1_0/bin
./lmgr
```

The following prompt appears:

```
Do you have Sybase Software Asset Management
Certificates to register?
```

6 Click Yes.

7 The SySAM License Manager window that appears prompts you for:

- Order Number
- Feature Name
- Feature Count
- Software Version
- Authorization Code

8 Click More until you have entered all available licenses. Click Done.

9 Because you edited the *license.dat* file, you must notify the license daemon of the changes by executing the reread command for your platform.

On Windows, from a command-line prompt:

```
%SYBASE%\SYSAM-1_0\bin\lmutil lmreread
```

On UNIX:

```
$SYBASE/$SYBASE_SYSAM/bin/lmutil lmreread
```

All the components of your Mirror Activator for Oracle are now registered with the network license server.

Adding connectivity pointers for Mirror Activator for Oracle component installations

After you install Mirror Activator for Oracle components in your replication environment, you *must* set up a SySAM connectivity pointer from each different component installation to the network license server. If all Mirror Activator for Oracle components are in one installation directory, then you need to do this procedure only once. If you have Mirror Activator for Oracle components in different installation directories, complete this procedure for each one.

❖ **To point Mirror Activator for Oracle component installations to the network license server**

1 Start the license manager in the Mirror Activator for Oracle component installation.

- *On Windows*, from a command-line prompt:
  ```
  cd \path\sybase
  SYBASE
  cd SYSAM-1_0\bin
  lmgr
  ```
- *On UNIX:*

  ```
  cd /path/sybase
  source SYBASE.csh
  cd SYSAM-1_0/bin
  ./lmgr
  ```

The following prompt appears:

```
Do you have Sybase Software Asset Management
```

```
Certificates to register?
```

2 Click No.

The following prompt appears:

```
Have you registered your Sybase Software Asset
Management Certificates at a central license host?
```

3 Click Yes.

The following prompt appears:

```
Please enter the following Sybase Network License
Manager information.
```

4 Enter the host name and port number of your network license server, as defined in the network license server's file *$SYBASE/SYSAM-1_0/licenses/license.dat*.

5 Click OK.

A connectivity pointer is set up for the Mirror Activator for Oracle component installation.

Co-Existing with newer versions of SySAM

The Mirror Activator for Oracle 12.6 components uses SYSAM-1_0 of the Sybase Software Asset Management System (SySAM). You must make some adjustments to co-exist with the newer versions of Sybase Software Asset Management System (SySAM). To make these adjustment, see "Co-existing with earlier versions of SySAM," in Chapter 1, "Before you Begin," in the Replication Server Install Guide for your platform.

SySAM administration

This section describes how to verify the installation and how to start SySAM manually. It also provides additional information for administering SySAM.

Verifying that the license manager is running

Sybase supplies utilities with the license manager to check the status of the license manager daemon.

❖ **To verify that the license manager daemon is running**

1 Enter the following:

On Windows:

```
%SYBASE%\SYSAM-1_0\bin\lmutil lmstat -c
```

On UNIX:

```
lmstat -c
```

2 Verify that both lmgrd and the SYBASE processes are running before you run Mirror Replication Agent.

If the license manager daemon is not running, you see a message similar to the following:

```
lmgrd is not running: Cannot connect to license server
```

As a result, you must start it manually, as described in the following procedure.

❖ **To start the license manager daemon on Windows**

1 From the Windows Start menu, select Select Programs | Sybase Software Asset Management (SySAM).

2 The license manager daemon can run either as a service or as a process.

- To run it as a service:

```
%SYBASE%\%SYBASE_SYSAM%\bin\sysam.bat
```

- To run it as a process:

```
lmgrd -c %LM_LICENSE_FILE% -l %SYBASE%\%SYBASE_SYSAM%\log\lmgrd.log
```

❖ **To start the license manager daemon on UNIX**

- Enter the following command:

```
$SYBASE/$SYBASE_SYSAM/bin/lmgrd -c $LM_LICENSE_FILE -l
$SYBASE/$SYBASE_SYSAM/log/lmgrd.log &
```

Note If you need help, enter lmgrd -h.

CHAPTER 2

Preparing for Installation

This chapter describes the Mirror Activator for Oracle system requirements and other information you need to know *before* you install the Mirror Activator for Oracle version 12.6 software.

Note The Mirror Activator for Oracle *Release Bulletin* might contain more up-to-date information than this guide. Be sure to read the release bulletin for the most recent product information.

In this document, Linux is treated as a UNIX platform, unless the specific context requires a distinction.

Note For a Quick Start guide that provides instructions for installation and sample configuration of all the Mirror Activator for Oracle components, refer to Appendix A, “Quick Start”.

Reviewing installation requirements

Review the following installation requirements before you install the Mirror Activator for Oracle 12.6 software:

- System requirements
- Compatible products
- Graphical user interface

- Team skill requirements

System requirements

Mirror Activator for Oracle 12.6 supports database servers on Linux, Microsoft Windows 2000 and 2003, and UNIX platforms.

Java Runtime Environment (JRE)

Because Mirror Replication Agent is a Java-based application, a Java Runtime Environment (JRE) must be installed on the Mirror Replication Agent host machine. A JRE appropriate for your operating system is installed automatically when you install the Mirror Replication Agent software.

Operating system patch levels must be current to support Java 1.4.2. See the following Web sites to determine which patches are required for your platform, and for current information about JREs for your platform:

- `http://java.sun.com/j2se` for information about JREs on the Linux, Sun Solaris, and Microsoft Windows platforms
- `http://www.ibm.com/developerworks/java/jdk/aix` for information about JREs on AIX platforms
- `http://www.hp.com/products1/unix/java` for information about JREs on HP-UX platforms

Platforms and operating systems

The Mirror Replication Agent 12.6 software requires one of the platforms and operating system versions listed in Table 2-1.

Note Mirror Replication Agent for Oracle must be installed on a machine from which it can directly access a copy of the Oracle redo logs and not the original Oracle redo logs.

Table 2-1: Platform and operating system requirements

Platform	Operating system version
HP 9000(8xx)	HP-UX 11i
IBM RISC System/6000	IBM AIX 5.1, 5.2, and 5.3
Linux/Intel x86	Red Hat Enterprise Linux 2.1 • Kernel version 2.4.9-e.27 or later • RPM version 4.0.4 or later Red Hat Enterprise Linux 3.0 • Kernel version 2.4.21-27.0.2.EL • RPM version 4.2.3
Microsoft Windows 2000	Windows 2000 v.5.0.2195
Microsoft Windows Server 2003	Windows Server 2003 v.5.2.3790
Sun Solaris (SPARC) system	Sun Solaris 2.8, 2.9 or 2.10

Note *Before* you install the Mirror Replication Agent 12.6 software, you must install the most recent operating system patches recommended by your operating system vendor for Java 1.4.2 support.

Table 2-2 lists the minimum physical memory, storage, and media device requirements on the Mirror Replication Agent host machine. Your Mirror Replication Agent configuration may require more memory and disk space than the minimums listed in Table 2-2.

Table 2-2: Memory, disk space, and media device requirements

Memory	Disk space	Media device
128MB RAM	300MB hard disk	CD-ROM drive

Accommodating the Replication Agent System Database

Each Mirror Replication Agent instance uses an embedded Adaptive Server Anywhere database to manage its Replication Agent System Database (RASD).

Because the RASD stores information about primary database structure or schema objects, its size depends partly on the number of tables and procedures replicated, and on the number of database users in the primary database.

When it replicates a DDL transaction, the Mirror Replication Agent creates a new *version* of the affected object's metadata in its RASD. Over time, the size of the RASD can grow significantly, depending on the number and frequency of DDL transactions replicated.

If the RASD runs out of disk space, the Mirror Replication Agent shuts down and suspends replication. To prevent this, you must provide adequate disk space on the Mirror Replication Agent host machine to accommodate the initial size of the RASD, as well as some potential growth.

See the Mirror Activator for Oracle *Administration Guide* for more information about the RASD.

Compatible products

Table 2-3 lists the database server versions supported by Mirror Replication Agent 12.6.

Table 2-3: Databases compatible with Mirror Replication Agent

Database	Versions
Oracle Server	9.0.1, 9.2.0

Mirror Replication Agent requires a JDBC 2.0-compliant driver for the primary data server. Table 2-4 lists the JDBC driver versions required to support connectivity between Mirror Replication Agent 12.6 and the primary data server.

Table 2-4: Drivers compatible with Mirror Replication Agent

Driver	Versions
Oracle JDBC driver	JDBC Thin 9.2.0.5 for JDK 1.4

Mirror Replication Agent 12.6 is compatible with the Sybase products listed in Table 2-5.

Table 2-5: Mirror Replication Agent 12.6 compatibility

Sybase product	Version
Adaptive Server® Enterprise (as the RSSD)	12.x
Adaptive Server Anywhere (as the RASD and RSSD)	8.0.2
jConnect™ for JDBC™	6.0, EBF 12723
Replication Server®	12.5, 12.6
Sybase Software Asset Management (SySAM)	8.3 or later

Graphical user interface

The standard installation procedure for Mirror Replication Agent 12.6 software uses the InstallShield wizard in GUI mode (the GUI wizard).

If you want to use the InstallShield GUI wizard to install Mirror Replication Agent on a server without a display, keyboard, and pointing device, you need access to a remote machine with a GUI environment, networked to the Mirror Replication Agent host. Before you start the InstallShield wizard, verify that the remote machine is configured to provide a GUI environment for the server on which the Mirror Replication Agent software will be installed.

Note You can use the InstallShield wizard in console mode to install Mirror Replication Agent from an operating system command prompt, without using a GUI environment. See “Installing in console mode” on page 47 for more information.

Team skill requirements

You need team members with specific skills to successfully install Mirror Replication Agent 12.6. For your site, identify the person or team responsible for each skill set listed in Table 2-6.

Table 2-6: Mirror Replication Agent installation skill requirements

Role	Skill set
Operating System Administrator	• Understanding of Linux, Sun Solaris, HP-UX, AIX, Windows 2000, 2003 operating system • Knowledge of standards and conventions at the installation site
Communications Administrator	• Understanding of connectivity and communication protocols used at your site, such as TCP/IP • Understanding of your site's network configuration • Ability to design, establish, test, and troubleshoot remote communications between the primary database, Mirror Replication Agent, and Replication Server
Disk Replication System Administrator	Knowledge of the disk replication system, including: • Platform and device configuration • Operation and administration tasks
Replication Server Administrator	• Understanding of Replication Server and the replication system environment • Replication Server administrator privileges
DirectConnect Administrator	• Understanding of DirectConnect and data access to heterogeneous databases • DirectConnect administrator privileges
Primary Database Administrator Standby Database Administrator	• Server configuration and administration tasks • Database administrator privileges • Knowledge of the database design and schema

Reviewing the installation process

Installing Mirror Replication Agent software is just one part of the process of setting up a replication system.

Table 2-7 lists the major steps required to set up a replication system to replicate transactions from an Oracle database in an enterprise network.

Table 2-7: Setting up a Sybase replication system

Step	To do this	Refer to
1	*Install the connectivity drivers for the Oracle database server.* You must install the correct JDBC driver for your primary database server.	• "Setting up connectivity to the primary database" on page 38 in this manual • Vendor documentation or Web site for the primary data server
2	*Install appropriate hardware and software.* Establish active mirroring of the Oracle redo logs.	Disk replication system vendor and device vendor documentation
3	*Implement Disk replication system and devices.* This includes: • Designing the disk mirroring system • Installing appropriate hardware or software • Establishing active mirroring of the Oracle redo logs	Disk replication system vendor and device vendor documentation
4	*Install Replication Server.* This includes: • Designing the replication system • Installing the Replication Server	• Sybase installer documentation • Replication Server documentation
5	*Prepare to install Mirror Replication Agent.* This includes: • Reviewing installation requirements and the installation procedure for Mirror Replication Agent. • Completing the "Installation and Setup worksheet" on page 26.	• Chapter 2, "Preparing for Installation," in this book, and Chapter 1, "Setup and Configuration," in the Mirror Activator for Oracle *Administration Guide* • Mirror Activator for Oracle *Release Bulletin*
6	*Install the Mirror Replication Agent software.* This includes: • Installing the software **Note** Mirror Replication Agent must be installed on a machine from which it can directly access the mirrored Oracle redo logs.	"Installing the Mirror Replication Agent software" on page 41 in this manual

Step	To do this	Refer to
7	*Install ECDA Option for Oracle.* This includes: • Installing the ECDA software • Configuring connectivity to the Standby Oracle database	• Sybase installer documentation • ECDA for Oracle documentation
8	*Configure Replication Server and primary data server connections.* This includes: • Creating a Replication Server database connection to the primary data server • Creating a Replication Server login for the Mirror Replication Agent instance • Configuring Mirror Replication Agent parameters • Testing connections between the Mirror Replication Agent and the primary Replication Server, and between the Mirror Replication Agent and the primary data server	Mirror Activator for Oracle *Administration Guide*, Chapter 3, "Administering Sybase Replication Agent"
9	*Configure Replication Server and standby data server connections.* This includes: • Installing the Heterogeneous support scripts for Oracle. • Creating a Replication Server login for the standby maintenance user. • Creating a Replication Server database connection to the standby data server	Replication Server *Heterogeneous Replication Guide*
10	*Set up the Mirror Replication Agent instance.* This includes: • Creating the Mirror Replication Agent transaction log objects • Marking primary objects for replication	Mirror Activator for Oracle *Administration Guide*, Chapter 2, "Setup and Configuration"
11	*Prepare for replication.* Refer to the checklist to verify that all the replication system components are in place before you start replication.	Mirror Activator for Oracle *Administration Guide*, Chapter 2, "Setup and Configuration"

Step	To do this	Refer to
12	*(optional) Verify your replication system using Mirror Replication Agent test scripts.* Use the test scripts provided with Mirror Replication Agent to set up a test environment and verify replication from a primary database to a standby database.	Mirror Activator for Oracle *Administration Guide*
10	*Prepare for replication.* This includes: • Creating Replication Definitions and Subscriptions. • Materializing the standby database to ensure data is synchronized with the primary database before you start replication.	• Replication Server documentation • Mirror Activator for Oracle *Administration Guide*, Appendix A, "Materializing databases"
11	*Start replication.* Put the Mirror Replication Agent instance in the *Replicating* state.	Mirror Activator for Oracle *Administration Guide*, Chapter 2, "Setup and Configuration"

Completing the Installation and Setup worksheet

The section, "Installation and Setup worksheet," provides a place for you to record the information you need to install and configure your replication system.

Note Record all the information in the Installation and Setup worksheet *before* you begin software installation. The worksheet organizes several configuration parameter values and other values that you need to know to install Mirror Replication Agent properly.

Make a copy of the Installation and Setup worksheet, and record the required information as you read through the following sections. You may need to refer to the worksheet often as you install and set up Mirror Replication Agent.

Save a copy of the completed worksheet for your site records and future Sybase product installations or upgrades.

Section 1: Mirror Replication Agent administration information

Record the Mirror Replication Agent instance name, the administration port number, and the other administration information on the worksheet.

❖ **To complete Section 1 of the Installation and Setup worksheet**

1 Record the name of the Mirror Replication Agent specific instance.

Record the name of the instance as item 1a on the worksheet in "Section 1: Mirror Replication Agent administration information" on page 27.

2 Record the client socket port number of the administration port for this Mirror Replication Agent instance. The port number must be unique on the Mirror Replication Agent host machine.

Note Port numbers have a range of 1 to 65,534.

If you are not the System Administrator for the system on which you are installing the Mirror Replication Agent instance, ask your System Administrator which port number you should use for the Mirror Replication Agent administration port.

Record the port number as item 1b on the worksheet in "Section 1: Mirror Replication Agent administration information" on page 27.

Note Mirror Replication Agent requires two port numbers. The additional one is for the RASD. By default, Mirror Replication Agent assigns the RASD port as *admin port +1*. This number must also be unique on the Mirror Replication Agent host machine.

3 Determine the location of the interfaces file (*sql.ini* on Windows 2000 and 2003, or *interfaces* on Linux and UNIX).

Note The interfaces file must reside on the same machine as the Mirror Replication Agent client (isql or Replication Server Manager), not necessarily the Mirror Replication Agent host machine.

Use this item only if you plan to use the isql or jisql utility or Replication Server Manager (RSM) to administer the Mirror Replication Agent instance.

Record the interfaces file location as item 1c on the worksheet in "Section 1: Mirror Replication Agent administration information" on page 27.

4 Determine the administrative user ID and password for logging in to the Mirror Replication Agent administration port. Use this information to create the administrative user ID during configuration and setup.

Record the administrative user ID as item 1d (admin_user) and the password as item 1e (admin_pw) on the worksheet in "Section 1: Mirror Replication Agent administration information" on page 27.

See the Mirror Activator for Oracle *Administration Guide* for more information.

Section 2: Replication Server parameter values for the primary database connection

Determine the values of the connection parameters for Replication Server. These values are used in the Replication Server create connection command when you create the database connection for the primary database.

See "Setting up connectivity to the primary database" on page 38 for more information about using the Replication Server create connection command.

❖ **To complete Section 2 of the Installation and Setup worksheet**

1 Identify a data server name and a database name representing the primary database connection for the Replication Server.

Replication Server connects to the primary database through the Mirror Replication Agent instance, so the data server name can be the name of the Mirror Replication Agent instance.

The database name can be any name that helps you identify the connection Replication Server uses to communicate with the primary database.

Note These names are case sensitive.

Record the instance name or data server name as item 2a (rs_source_ds) and the database name as item 2b (rs_source_db) on the worksheet in "Section 2: Replication Server parameter values for the primary database connection" on page 28.

2 Identify the Maintenance User ID and password associated with the Replication Server database connection to the primary database and a valid user ID at the primary database.

Note The Maintenance User ID must not be the user ID of a primary database user who applies transactions that might need to be replicated.

Record the Maintenance User ID as item 2c (Maintenance User) and the password as item 2d (Maintenance User password) on the "Installation and Setup worksheet" that is described starting on page 26.

Section 3: Mirror Replication Agent parameter values for Replication Server

Determine and record the values of the Mirror Replication Agent configuration parameters for the primary Replication Server. These values are used with the Mirror Replication Agent ra_config command when you configure the Mirror Replication Agent instance.

See the Mirror Activator for Oracle *Administration Guide* for more information about using the ra_config command for the initial configuration of Mirror Replication Agent parameters.

❖ To complete Section 3 of the Installation and Setup worksheet

1 Identify the name of the Replication Server host machine.

Record the Replication Server host machine name as item 3a (rs_host_name) on the worksheet in "Section 3: Mirror Replication Agent parameter values for Replication Server" on page 29.

2 Identify the port number of the client socket port for Replication Server.

This is the port number Mirror Replication Agent uses to log in to Replication Server.

Note All port numbers have a range of 1 to 65,535.

Record the port number as item 3b (rs_port_number) on the worksheet in "Section 3: Mirror Replication Agent parameter values for Replication Server" on page 29.

3 Identify the user name and password Mirror Replication Agent uses to log in to Replication Server.

This Replication Server client user ID must have connect source permission in Replication Server. See the Replication Server *Reference Manual* for more information about granting connect source permissions.

If you are not the Replication Server Administrator for the system on which you are installing the Mirror Replication Agent instance, ask your Replication Server Administrator for the correct user ID and password for the primary Replication Server.

Record the Replication Server client user ID as item 3c (rs_username) and the password as item 3d (rs_password) on the worksheet in "Section 3: Mirror Replication Agent parameter values for Replication Server" on page 29.

4 Identify Replication Server's character set and record it as item 3e.

Record the character set as item 3e (rs_charset) on the worksheet in "Section 3: Mirror Replication Agent parameter values for Replication Server" on page 29.

Section 4: Mirror Replication Agent parameter values for the ERSSD or RSSD

Determine and record the values of the Mirror Replication Agent configuration parameters for the ERSSD or the RSSD for the primary Replication Server.

Note Mirror Replication Agent supports connection to either ERSSD or RSSD. There is no difference in configuration between the two. This section refers to both RSSD and ERSSD installations as "RSSD".

❖ **To complete Section 4 of the Installation and Setup worksheet**

1 Identify the name of the host machine on which the RSSD resides.

Record the name of the host machine as item 4a (rssd_host_name) on the worksheet in “Section 4: Mirror Replication Agent parameter values for the RSSD” on page 30.

2 Identify the port number of the client socket port for the server where the RSSD resides.

Note All port numbers have a range of 1 to 65,535.

Record the port number as item 4b (rssd_port_number) on the worksheet in “Section 4: Mirror Replication Agent parameter values for the RSSD” on page 30.

3 Identify the RSSD database name for the primary Replication Server.

Record the RSSD database name as item 4c (rssd_database_name) on the worksheet in “Section 4: Mirror Replication Agent parameter values for the RSSD” on page 30.

4 Identify the user ID and password Mirror Replication Agent uses to access the RSSD for the primary Replication Server.

You must have a valid Replication Server ID and password. If you do not, contact your Replication Server System Administrator.

Record this RSSD client user ID as item 4d (rssd_username) and record the password as item 4e (rssd_password) on the worksheet in “Section 4: Mirror Replication Agent parameter values for the RSSD” on page 30.

Section 5: Mirror Replication Agent parameter values for the primary data server

Determine and record the values of the Mirror Replication Agent configuration parameters for the primary data server.

❖ **To complete Section 5 of the Installation and Setup worksheet**

1 Identify the name of the primary data server host machine.

Record the host machine name as item 5a (pds_host_name) on the worksheet in "Section 5: Mirror Replication Agent parameter values for the primary data server" on page 30.

2 Identify the port number of the client socket port for the primary data server.

Note Port numbers have a range of 1 to 65,535.

Record the client socket port number as item 5b (pds_port_number) on the worksheet in "Section 5: Mirror Replication Agent parameter values for the primary data server" on page 30.

3 Identify the name of the primary database on the primary data server.

The value of the pds_database_name parameter (worksheet item 5c) can be identical to the value of rs_source_db (worksheet item 2b), as long as the value of the pds_database_name parameter exists as a valid database at the primary database server.

You must use the value of the ORACLE_SID system environment variable (%ORACLE_SID% on Windows 2000 and 2003, or $ORACLE_SID on UNIX).

Record the database name as item 5c (pds_database_name) on the "Section 5: Mirror Replication Agent parameter values for the primary data server" on page 30.

4 Identify the user ID and password that Mirror Replication Agent uses to log in to the primary data server.

Note This user ID must *not* be the same as the Replication Server maintenance ID for the primary database connection.

This primary data server user ID must have several database-level privileges for the primary database. See the Mirror Activator for Oracle *Administration Guide* for more information.

Record this primary data server user ID as item 5d (pds_username) and the password as item 5e (pds_password) on the worksheet in "Section 5: Mirror Replication Agent parameter values for the primary data server" on page 30.

5 Identify the character set of the primary database.

For a list of valid Java character sets for your primary database, see Supported Encodings on the Internationalization page under Documentation for the J2SE 1.4.2 JDK at http://java.sun.com/j2se/corejava/intl/index.jsp.

Record the name of the equivalent Java character set as item 5f on the worksheet in "Section 5: Mirror Replication Agent parameter values for the primary data server" on page 30.

Section 6: DirectConnect parameter values for the standby database

Determine and record the values of the parameters for the standby DirectConnect database.

❖ **To complete Section 6 of the DirectConnect parameter values worksheet**

1 Identify the DirectConnect for Oracle service name.

This name will be used as an *interfaces* file entry when configuring Replication Server to connect to DirectConnect. The name should be unique and identify the standby Oracle instance that DirectConnect communicates with.

Record the service name as item 6a (DirectConnect service name) on the worksheet in "Section 6: DirectConnect for Oracle parameter values for the standby database" on page 31.

2 Identify the name of the client socket port number for DirectConnect. This port will be used by all clients (including Replication Server) that connect to DirectConnect.

Record the port number as item 6b (DirectConnect port number) on the worksheet in "Section 6: DirectConnect for Oracle parameter values for the standby database" on page 31.

3 Identify the name of the DirectConnect user ID and password that you use to log in to the DirectConnect instance to administer DirectConnect. It must be a valid Oracle ID.

   Record the ECDA user ID and password as items 6c (dc_admin user) and 6d (dc_admin password) on the worksheet in "Section 6: DirectConnect for Oracle parameter values for the standby database" on page 31.

4 Identify the Oracle *tnsnames* file location that allows DirectConnect to connect to the desired Oracle instance. This file, or a copy of this file, must exist on the DirectConnect host machine.

   Record the *tnsnames* file location as item 6e (Oracle tnsnames file location) on the worksheet in "Section 6: DirectConnect for Oracle parameter values for the standby database" on page 31.

5 Identify the name of the Oracle instance connect string value from the *tnsnames.ora* file that identifies the desired Oracle instance the DirectConnect will connect to. It must be a valid connect string that exists in the *tnsnames* file identified in step 4.

   Record the Oracle instance connect string that DirectConnect should connect to in item 6f (Oracle instance connect string) on the worksheet in "Section 6: DirectConnect for Oracle parameter values for the standby database" on page 31.

Section 7: Replication Server parameter values for the standby data server

Determine and record the values of the parameters for the standby data server. These values are used in the materialization step.

❖ **To complete Section 7 of the Installation and Setup worksheet**

1 Identify the DirectConnect service name. The value should be the name of the Oracle instance connect string in item 6a.

   Record the host machine name as item 7a (standby host name) on the worksheet in "Section 7: Replication Server parameter values for the standby data server" on page 32.

2 Identify the name of the standby database on the standby data server. Usually, it is the Oracle SID.

Record the database name as item 7b (standby database name) on the worksheet in "Section 7: Replication Server parameter values for the standby data server" on page 32.

3 Identify the standby database client user ID and password that Replication Server uses to log in to the standby database to apply DDL commands.

This user ID must have authority in the standby database to create any schema or issue any DDL command standby from the primary database.

The Mirror Replication Agent sends this ID and password to Replication Server together with any DDL command executed at the primary database.

Note The value for the ddl_username must not be the same as the value of the maintenance user defined in Replication Server for the standby connection.

Record the name as item 7c (ddl_username) and the password as item 7d (ddl_password) on the worksheet in "Section 7: Replication Server parameter values for the standby data server" on page 32.

Installation and Setup worksheet

If your replication design supports replication back to the primary after failover to the standby site, you will need a second MRO instance (and worksheet) configured to support this topography. Fill out the worksheet before you install the Mirror Replication Agent software.

See the Mirror Activator for Oracle Mirror Replication Agent *Reference Manual* for detailed descriptions of Mirror Replication Agent commands, options, and parameters.

The worksheets that follow will start at the top of each page to allow you to print each of them, if you choose.

Section 1: Mirror Replication Agent administration information

Item	Description	Example value	Your value
1a	Mirror Replication Agent instance name This name must be unique among all Mirror Replication Agent instances.	mro_sales_instance	
1b	admin_port This is the client socket port number for the Mirror Replication Agent administration port. The port number must be unique (not used by any other application on the Mirror Replication Agent host machine). Check with your System Administrator to determine which port numbers are available. **Note** Mirror Replication Agent requires two port numbers. The additional one is for the RASD. By default, Mirror Replication Agent assigns the RASD port as *admin port +1*. This number must be unique.	10000	
1c	Location of the interfaces file Use this item only if you plan to use the isql utility or RSM to administer the Mirror Replication Agent instance.	*$SYBASE/interfaces* on UNIX, or *%SYBASE%\ini\sql.ini* on Windows 2000 or 2003	
1d	admin_user This is the administrative user ID you use to log in to the Mirror Replication Agent instance. The default value is sa.	admin_user	
1e	admin_pw This is the administrative password you use to log in to the Mirror Replication Agent instance. The default value is an empty string ("").	admin_pw	

Section 2: Replication Server parameter values for the primary database connection

Item	Description	Example value	Your value
2a	rs_source_ds This is a data server name representing the primary data server to which Replication Server connects. This value is specified in the Replication Server create connection command used to create the Mirror Activator for Oracle connection in the primary Replication Server. **Note** This name can be the name of the Mirror Replication Agent instance or the name of the primary server machine.	ra_sales_instance	
2b	rs_source_db This is a database name representing the primary database to which Replication Server connects. This value is specified in the Replication Server create connection command used to create the Mirror Replication Agent connection in the primary Replication Server. **Note** This name can be any name that helps you identify this as the connection to the primary database. For Oracle, a good value would be the Oracle SID.	sales_db	
2c	Maintenance User This is the Replication Server Maintenance User ID associated with the connection to the primary database. Replication Server requires a Maintenance User ID for every database connection. This value is used in the create connection command when you create the connection to the primary database. **Note** This user ID must be valid at the primary database.	maint_user	
2d	Maintenance User password This is the Replication Server Maintenance User password associated with the connection to the primary database.	maint_pwd	

Section 3: Mirror Replication Agent parameter values for Replication Server

Item	Description	Example value	Your value
3a	rs_host_name This is the name of the Replication Server host machine.	rs_host	
3b	rs_port_number This is the port number Mirror Replication Agent uses to log in to Replication Server. Check with your System Administrator to determine which port numbers are available.	1111	
3c	rs_username This is the Replication Server client user ID that Mirror Replication Agent uses to log in to the primary Replication Server. This user ID must have connect source authority in the Replication Server. **Note** The value for the rs_username parameter must not be the same as the value for the pdb_maint_user parameter (item 2c).	rauser	
3d	rs_password This is the Replication Server client user password that Mirror Replication Agent uses.	rapwd	
3e	rs_charset This is the character set that Mirror Replication Agent uses when creating LTL commands for Replication Server. It must match Replication Server's character set. **Note** Setting this property to anything other than the character set of the primary Replication Server causes it to incorrectly convert the character set of the LTL commands it receives from Mirror Replication Agent. Character set conversion takes place if this value is different than the character set defined by the RA_JAVA_DFLT_CHARSET value, which should match the primary database character set. See the Mirror Activator for Oracle *Administration Guide* for more information regarding the RA_JAVA_DFLT_CHARSET environment variable. Character set conversion does have a negative affect on performance.	iso_1	

Section 4: Mirror Replication Agent parameter values for the RSSD

Item	Description	Example value	Your value
4a	rssd_host_name This is the name of the host machine on which the RSSD of the primary Replication Server resides.	as_host	
4b	rssd_port_number This is the client socket port number for the RSSD data server.	1111	
4c	rssd_database_name This is the database name of the RSSD of the primary Replication Server.	rsdb_RSSD	
4d	rssd_username This is the RSSD client user ID that Mirror Replication Agent uses to access the RSSD of the primary Replication Server.	rssd_user	
4e	rssd_password This is the RSSD client password that Mirror Replication Agent uses.	rssd_pass	

Section 5: Mirror Replication Agent parameter values for the primary data server

Item	Description	Example value	Your value
5a	pds_host_name This is the name of the host machine on which the primary data server resides.	pds_host	
5b	pds_port_number This is the client socket port number for the primary database gateway server.	1111	
5c	pds_database_name This is the name of the Oracle SID.	sales_db **Note** Item 5c must equal the database name. For Oracle, this must be the Oracle_SID value. Item 2b may have a different value than the Oracle SID, but this value should match the Oracle SID, not item 2b.	

Item	Description	Example value	Your value
5d	pds_username This is the user ID that Mirror Replication Agent uses to log in to the primary database.	pds_user	
5e	pds_password This is the password for pds_username.	pds_pw	
5f	This is the Java-equivalent of the primary database character set. **Note** Unless you want to override the default character set that the JVM finds on your system, you do *not* have to explicitly set the character set-related environment variable RA_JAVA_DFLT_CHARSET. However, the system default character set must match the character set of the primary database.	ISO8859_1	

Section 6: DirectConnect for Oracle parameter values for the standby database

Item	Description	Example value	Your value
6a	DirectConnect service name DirectConnect for Oracle service name. This name will be used as an *interfaces* file entry when configuring Replication Server to connect to DirectConnect. The name should be unique and identify the standby Oracle instance that DirectConnect communicates with.	standby_ora920t	
6b	DirectConnect port number This is the client socket port number for DirectConnect. This port will be used by all clients (including Replication Server) that connect to DirectConnect. The port number must be unique (not used by any other application on the DirectConnect host machine).	15000	
6c	dc_admin user This is the administrative user ID you use to log in to the DirectConnect instance to perform DirectConnect administration. It must be a valid Oracle ID.	system	
6d	dc_admin password The password for the dc_admin user. Must be a valid Oracle password.	manager	

Item	Description	Example value	Your value
6e	Oracle tnsnames file location DirectConnect uses the information in the *tnsnames* file to connect to the desired Oracle instance. This file, or a copy of this file, must exist on the DirectConnect host machine.	/oracle/network /admin/tnsnames.ora	
6f	Oracle instance connect string This is the connect string value from the *tnsnames.ora* file that identifies the desired Oracle instance the DirectConnect should connect to. It must be a valid connect string that exists in the *tnsnames* file identified in 6e.	ORA920.SYBASE. COM	

Section 7: Replication Server parameter values for the standby data server

Item	Description	Example value	Your value
7a	DirectConnect service name This is the DirectConnect for Oracle service name. You need this name when you create subscriptions. See the Replication Server documentation for more information.	rds_host	
7b	Standby database name This is the name of the standby database on the standby database server Typically, it is the Oracle SID. You need this name when you create subscriptions. See the Replication Server documentation for more information.	standby_db	
7c	ddl_username This is the standby database client user ID that Replication Server uses to log in to the standby database to apply DDL commands. This user ID must have authority in the standby database to create any schema or issue any DDL command replicated from the primary database. The Mirror Replication Agent sends this ID and password to Replication Server together with any DDL command executed at the primary database. **Note** The value for the ddl_username must not be the same as the value of the maintenance user defined in Replication Server for the standby connection.	scott	

Item	Description	Example value	Your value
7d	ddl_password This is the standby database client user password that Replication Server uses with the value for ddl_username.	tiger	

See also

- The Mirror Activator for Oracle *Administration Guide* for more information about the initial configuration of Mirror Replication Agent parameters for Replication Server
- The Mirror Activator for Oracle Mirror Replication Agent *Reference Manual* for more general information about the ra_config command
- The Mirror Activator for Oracle Mirror Replication Agent *Reference Manual* for more information about Replication Server commands and parameters
- The ECDA for Oracle *Administration and User Guide*

CHAPTER 3

Installing Mirror Replication Agent

This chapter describes how to install Mirror Activator for Oracle software on a Linux, Microsoft Windows, or UNIX platform, and how to create, configure, and start up a Mirror Replication Agent instance.

Note In this document, Linux is treated as a UNIX platform unless otherwise noted.

Before you begin

Complete the following pre-installation tasks *before* you install the Mirror Activator for Oracle 12.6 software:

- Read the release bulletin.
- Plan for system requirements.
- Verify the system environment.
- Complete the Installation and Setup worksheet.

The following sections describe each pre-installation task.

Note For a Quick Start guide that provides instructions for installation and sample configuration of all the Mirror Activator for Oracle components, refer to Appendix A, “Quick Start”.

Read the release bulletin

Read the Mirror Activator for Oracle *Release Bulletin* for current information about specific requirements of Mirror Activator for Oracle.

The release bulletin provides:

- Product information that might not be included in the Mirror Activator for Oracle guides, such as known issues and documentation updates
- Additional information about installing and setting up the Mirror Replication Agent that was not available until after the software and documentation was released

Plan for system requirements

Installing Mirror Replication Agent requires adequate disk space and RAM on the Mirror Replication Agent host machine. It also requires network connectivity to the primary database and the Replication Server, and local access to the mirror log devices.

See “System requirements” on page 10 for more information about:

- Platform and operating system requirements
- Memory, disk space, and media device requirements
- Compatibility with other Sybase products

See the Mirror Activator for Oracle *Release Bulletin* for additional current information about system requirements.

Warning! Do *not* install the Mirror Activator for Oracle 12.6 software in the same installation directory with the following Sybase products:

- Replication Server version 12.5 or earlier
- Adaptive Server Enterprise version 12.5.0.x or earlier
- Open Client™ or Open Server™ version 12.5.0 or earlier
- OpenSwitch version 12.5 or earlier
- DirectConnect version 12.5 or earlier

Doing so incapacitates these products, and it can adversely affect other Sybase products.

You cannot reverse this with an uninstallation, as that could remove some of the required components of the older Sybase products that were updated by installing Mirror Activator for Oracle version 12.6. For this reason, Sybase recommends that you back up your current Sybase installation directory before installing Mirror Activator for Oracle 12.6.

Verify the system environment

Before you install the Mirror Replication Agent 12.6 software, verify the following in your Mirror Activator for Oracle system environment:

- Primary database

  Verify that the primary data server and primary database are online and configured properly for your production systems. For more information, refer to the documentation provided by your database software vendor.

- Replication Server

  Verify that the Replication Server is installed, configured, and running. For more information, refer to the Replication Server installation and configuration guides for your platform.

- Disk replication system

Verify that the disk replication system is set up and configured to synchronously replicate (or mirror) the primary database transaction log devices to the mirror log devices at the standby site. For more information, refer to the documentation provided by your disk replication system vendor.

Complete the Installation and Setup worksheet

Complete the Installation and Setup worksheet in Chapter 2, “Preparing for Installation.” The worksheet organizes the Mirror Replication Agent configuration parameter values that you need to set up and configure a Mirror Replication Agent instance.

See “Completing the Installation and Setup worksheet” on page 17 for detailed instructions.

Setting up connectivity to the primary database

Mirror Replication Agent connects to primary data servers using a JDBC driver that implements the JDBC 2.0 standard.

You must install the correct connectivity driver for your primary database environment before installing Mirror Replication Agent.

In general, JDBC drivers are available with client/server products for your database server. Check with your Database Administrator if you are not sure that the correct driver is installed.

The following sections contain procedures for setting up the JDBC drivers for primary data servers.

Note Only one version of a vendor's JDBC driver should be in the CLASSPATH. If more than one version is in the CLASSPATH, Mirror Replication Agent will have problems connecting to the primary database.

Oracle JDBC drivers

JDBC drivers for Oracle databases are provided by the database vendor. If the JDBC driver for your database is not already installed, obtain the appropriate driver from the database vendor or the vendor's Web site:

```
http://technet.oracle.com/software/tech/java/sqlj_jdbc/content.html
```

❖ **To set up a JDBC driver for Oracle data servers**

1 Install the JDBC driver on the machine on which Mirror Replication Agent resides or where Mirror Replication Agent can access it.

Note See the release notes for the *exact* version of the JDBC driver to use.

2 Add the location of the JDBC driver to the CLASSPATH environment variable.

- On UNIX, add the following to the *.login* file of the user account that is used to start and stop the Replication Agent instance:

```
setenv CLASSPATH /path_name/ojdbc14.jar:$CLASSPATH
```

  where *path_name* is the path where you installed the Oracle JDBC driver. You must log out and log back in for this change to take effect, or issue the command `source .login` after the change.

- On Windows 2000 or 2003, go to Start | Settings | Control Panel | System | Environment, and add the following to the existing CLASSPATH environment variable, using the semicolon (;) as the path separator, or create the path in the User Variables panel:

```
drive:\path_name\ojdbc14.jar
```

  where:

  - *drive* is the drive letter.
  - *path_name* is the name of the path where you installed the Oracle JDBC driver.

  Click Apply, then OK.

3 Verify that the Oracle primary server is running the Transparent Network Substrate (TNS) Listener Service. See the Oracle networking document for more information about TNS.

Setting up Connectivity to the Replicate Database

❖ **To set up Direct Connect for Oracle.**

1 Install DirectConnect for Oracle. For installation information, refer to the Enterprise Connect Data Access installation guides.

2 Configure DirectConnect for Oracle. For configuration, refer to the Enterprise Connect Data Access Option for Oracle *Server Administration and User's Guide*.

3 Verify that the TNS Listener Service is running.

Connecting Mirror Activator for Oracle to the standby database

Mirror Activator for Oracle connects to the standby database through DirectConnect for Oracle:

- If you have already installed DCO, you may configure a new instance by running DCOConfig, located in the *DCO-12_6/install* directory. This script will prompt you for all the information from Section 6 of the Installation and Setup worksheet.
- If you have not installed the DCO software, you may configure the server as part of the installation process, filling in the appropriate information from Section 6 of the Installation and Setup worksheet. You may also run DCOConfig after the installation is complete to configure a new instance.

DirectConnect for Oracle configuration errors

DirectConnect for Oracle configuration will fail if:

- *tnsnames.ora* file has incorrect Oracle RDBMS information
- Oracle user ID or password is not correct
- Oracle connect string is invalid
- DCO server did not start

For more information, refer to the Enterprise Connect Data Access Option for Oracle *Server Administration and User's Guide*.

Note The Oracle standby server must be running the Transparent Network Substrate (TNS) Listener Service to allow DirectConnect for Oracle to connect to the standby server. For more information regarding TNS, see the Oracle networking document.

Installing the Mirror Replication Agent software

Note For a Quick Start guide that provides instructions for installation and sample configuration of all the Mirror Activator for Oracle components, refer to Appendix A, “Quick Start”.

The Mirror Replication Agent 12.6 product is distributed on the Mirror Replication Agent 12.6 distribution media. See the Mirror Activator for Oracle *Release Bulletin* for the current distribution media catalog numbers.

Note Mirror Replication Agent must be installed on a machine from which it can directly access a copy of the original redo logs.

The following sections describe how to install the Mirror Replication Agent 12.6 software on a Linux, Microsoft Windows, or UNIX platform, using InstallShield:

- “Installing with the GUI wizard” on page 42
- “Installing in console mode” on page 47
- “Using a response file for installation” on page 49

All procedures give you the following installation options:

- *Typical* – The Mirror Replication Agent software product will be installed with the recommended products and features.
- *Full* – All software products and features on the CD will be installed.
- *Custom* – From a list of all products and features on the CD, you can select the specific products and features that you want to install.

The following products and features are included on the Mirror Replication Agent 12.6 distribution media:

- Mirror Replication Agent 12.6
- jConnect (the Sybase JDBC driver)
    - Debug Classes (for advanced jConnect troubleshooting)
    - Javadocs
    - Documentation for jConnect (in English, French, German, and Japanese)

    - Free utilities for jConnect:
        - jisql (the JDBC version of the interactive SQL isql utility)
        - Ribo (a tool for troubleshooting JDBC-to-database communications)
    - Samples (jConnect sample code)
- SySAM (the Sybase Software Asset Management license manager)
- Shared (JREs for each supported platform)

Minimal installation

For a minimal Mirror Replication Agent installation, choose the Custom installation option, and select *only* the Mirror Replication Agent 12.6 product. The following products and features are installed automatically when you select only the Mirror Replication Agent 12.6 product:

- Mirror Replication Agent 12.6
- jConnect
- SySAM
- Shared (JREs for each supported platform)

If you encounter problems during the installation, see "Installation troubleshooting" on page 56.

Note For information about installing ECDA 12.6 or Replication Server 12.6 software, which is included on separate distribution media in the Mirror Activator for Oracle 12.6 solution package for each platform, see the Replication Server 12.6 or the ECDA installation and configuration guides for your platform.

Installing with the GUI wizard

This installation procedure uses the InstallShield wizard in GUI mode (the GUI wizard), which requires either:

- A GUI environment (with a display, keyboard, and pointing device) on the Mirror Replication Agent host machine, or
- A remote machine configured to provide a GUI environment for the Mirror Replication Agent host machine.

See “Installing in console mode” on page 47 for information about installing the Mirror Replication Agent software in an interactive text (or console) mode.

❖ **To install Mirror Replication Agent with the GUI wizard**

1 Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the “sybase” user).

2 Close all non-essential applications, and minimize any open windows.

3 Insert the Mirror Replication Agent 12.6 distribution CD in the CD-ROM drive.

4 Start the InstallShield GUI wizard:

- On Microsoft Windows platforms, the InstallShield GUI wizard should start automatically.

  If the GUI wizard does not start automatically, select Start | Run, and enter the following in the Open box:

  ```
  x:\setupwin32.exe
  ```

  where *x:* is your CD-ROM drive.

  You can also start the GUI wizard from Windows Explorer by double-clicking the *setupwin32.exe* file icon.

- On UNIX platforms, enter the following at the command prompt:

  ```
  cd /cdrom
  ./setup_type
  ```

  where *setup_type* is one of the following strings that corresponds to the UNIX platform type:

  - setupaix
  - setuphp11x
  - setupsolaris
  - setuplinux

5 Click Next to continue.

Note You can click Cancel to exit the GUI wizard and stop the installation at any point before it is complete.

6 Select your geographic location in the license agreement and copyright notice window.

7 Read the Sybase license agreement and select "I agree."

Note You must agree to the terms of the software license before you can continue the installation.

Click Next to continue.

8 Specify an installation directory in the Destination window.

The default installation directory is:

- On Microsoft Windows platforms:

  %SYBASE% or *c:\sybase*

- On UNIX platforms:

  $SYBASE or */opt/sybase*

Click Next to accept the default installation directory, or do one of the following:

- Click Browse to select an installation directory in the file browser, then click Next, or
- Enter a directory name in the Destination Directory box, then click Next.

If you enter a directory name that does not exist, InstallShield prompts:

```
The directory does not exist.
Do you want to create it?
```

Click Yes to create the installation directory you specified.

If the directory you specified (either by default or by entering a directory name) exists, InstallShield prompts:

```
You have chosen to install into an existing
directory. Any older versions of the products you
choose to install that are detected in this
```

```
directory will be replaced. Do you want to
continue with installation into this directory?
```

If you click Yes, and:

- The Sybase products were installed with Studio Installer (for example, Replication Server 12.5), then InstallShield overwrites the common components.
- The products were installed with InstallShield, then InstallShield determines the correct course of action.

Note On Microsoft Windows platforms, if you are prompted to overwrite a DLL, click Yes *only* if the version of the new DLL is newer than the one InstallShield is attempting to overwrite.

9 Select the type of installation from three options:

- Typical
- Full
- Custom

Typical If you choose Typical, InstallShield displays the following products and features:

- Mirror Replication Agent 12.6
- jConnect
  - Free Utilities for jConnect:
    - jisql
- SySAM
- Shared

Full If you choose Full, InstallShield displays the complete list of products and features on the Mirror Replication Agent 12.6 distribution CD:

- Mirror Replication Agent 12.6
- jConnect
  - Debug Classes
  - Javadocs
  - Documentation for jConnect:

        - English documentation
        - French documentation
        - German documentation
        - Japanese documentation
      - Free Utilities for jConnect:
        - jisql
        - Ribo
      - Samples
    - SySAM
    - Shared

    Custom If you choose Custom, InstallShield displays the same products and features as the Full installation list, with check boxes that allow you to select the specific products and features you want to install.

    For a minimal Mirror Replication Agent installation, choose Custom, and select *only* the Mirror Replication Agent 12.6 product. The following products and features are installed automatically when you select only the Mirror Replication Agent product:

    - Mirror Replication Agent 12.6
    - jConnect
    - SySAM
    - Shared

    After you select the products and features for a Custom installation and click Next, InstallShield displays the products and features you selected.

10 Click Next to continue.

    InstallShield installs the components in the installation directory you specified, and displays an installation progress indicator.

    If errors occur during the installation, InstallShield displays error messages. In the event of an installation error, exit the InstallShield wizard to correct the cause of the error, then restart InstallShield. For more information, see “Installation troubleshooting” on page 56.

If the software is installed successfully, InstallShield displays a final window confirming the successful installation, and reminding you to check for updates on the Sybase downloads Web page.

11 Click Next, and then click Finish to complete the installation and shut down InstallShield.

To verify that the software components were installed correctly, see "Verifying the installation" on page 62.

Post-installation tasks

After you complete the Mirror Replication Agent software installation, you must complete the following post-installation tasks:

- Set up the SYBASE environment on the Mirror Replication Agent host machine. See "Setting up the SYBASE environment" on page 58 for more information.
- Register the Mirror Activator for Oracle license certificate with the Sybase Software Asset Management (SySAM) license manager. See "Registering license certificates" on page 59 for more information.

Installing in console mode

You can install the Mirror Replication Agent software in an interactive text (or console) mode, using the same steps as those described in "Installing with the GUI wizard" on page 42, except that:

- You invoke the InstallShield wizard at the command prompt, using the -console option, and
- You use only the keyboard to select all of the installation options.

This installation procedure uses the InstallShield wizard in console mode, which requires either:

- A display and keyboard on the Mirror Replication Agent host machine, or
- A display and keyboard on a remote machine configured to control the Mirror Replication Agent host machine.

Note This installation procedure does *not* require a pointing device or a GUI environment to install the Mirror Replication Agent software.

See "Installing with the GUI wizard" on page 42 for information about installing the Mirror Replication Agent software in a GUI environment.

❖ **To install the Mirror Replication Agent in console mode**

1 Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).

2 Close all non-essential applications, and minimize any open windows.

3 Insert the Mirror Replication Agent 12.6 distribution CD in the CD-ROM drive.

Note If the InstallShield GUI wizard starts automatically on a Windows platform, click Cancel to exit the GUI wizard.

4 Open an operating system command window, and set the CD-ROM drive as the current drive.

5 Start the InstallShield wizard in console mode:

- On Windows:

```
setupwin32 -console
```

- On UNIX:

```
./setup_type -console
```

where *setup_type* is one of the following strings that corresponds to the UNIX platform type:

- setupaix
- setuphp11x
- setupsolaris
- setuplinux

The InstallShield wizard starts and displays the Welcome window.

6 Follow the remaining wizard prompts to install the Mirror Replication Agent 12.6 software.

See "Installing with the GUI wizard" on page 42 for a description of all of the wizard prompts.

InstallShield installs the components in the installation directory you specified, and displays an installation progress indicator.

- If errors occur during the installation, InstallShield displays error messages. In the event of an installation error, exit the InstallShield wizard to correct the cause of the error, then restart InstallShield. For more information, see "Installation troubleshooting" on page 56.
- If the software is installed successfully, InstallShield displays a final window confirming the successful installation, and reminding you to check for updates on the Sybase downloads Web page.

To verify that the software components were installed correctly, see "Verifying the installation" on page 62.

Post-installation tasks

After you complete the Mirror Replication Agent software installation, you must complete the following post-installation tasks:

- Set up the SYBASE environment on the Mirror Replication Agent host machine. See "Setting up the SYBASE environment" on page 58 for more information.
- Register the Mirror Activator for Oracle license certificate with the Sybase Software Asset Management (SySAM) license manager. See "Registering license certificates" on page 59 for more information.

Using a response file for installation

A response file is a file that contains responses to all of the InstallShield wizard prompts. You can install the Mirror Replication Agent 12.6 software using a response file in either console mode or silent mode.

The following sections describe how to use a response file for installation:

- Creating a response file
- Installing in console mode with a response file
- Installing in silent mode

Creating a response file

There are two ways to create a response file:

- Editing a *template* file that contains default responses to all of the wizard prompts

- Recording the actual responses to InstallShield wizard prompts, while the wizard runs in either GUI mode or console mode

Note Recording responses to the InstallShield wizard installs the Mirror Replication Agent software, and then generates the template file *after* the installation is complete.

You can create a template file without running the InstallShield wizard (and installing the software) by invoking the InstallShield wizard at the command prompt with the -options-template option.

You can record your responses to the InstallShield wizard in either GUI mode or console mode, while installing the software, by invoking the InstallShield wizard at the command prompt with the -options-record option.

Use one of the following procedures to create a response file.

❖ **To create a response file from a template**

1. Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).
2. Close all non-essential applications, and minimize any open windows.
3. Insert the Mirror Replication Agent 12.6 distribution CD in the CD-ROM drive.

Note If the InstallShield GUI wizard starts automatically on a Microsoft Windows platform, click Cancel to exit the GUI wizard.

4. Open an operating system command window, and set the CD-ROM drive as the current drive.
5. Invoke the InstallShield wizard at the command prompt, using the -options-template option:
   - On Windows:

     ```
     setupwin32 -options-template MRO.resp
     ```

     where *MRO.resp* is the full path to the response (template) file you want to create.

Note that there is no space in the -options-template string.

- On UNIX:

  ```
  ./setup_type -options-template MRO.resp
  ```

  where:

  - *setup_type* is one of the following strings that corresponds to the UNIX platform type:
    - setupaix
    - setuphp11x
    - setupsolaris
    - setuplinux
  - *MRO.resp* is the full path to the response (template) file you want to create.

  Note that there is no space in the -options-template string.

InstallShield creates a template response file with the name you specified. The template file contains the default responses for each wizard prompt.

6 Use your preferred text editor to edit the template file, and record the values you want to use to install the Mirror Replication Agent software.

❖ **To create a response file by recording a GUI installation**

1 Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).

2 Close all non-essential applications, and minimize any open windows.

3 Insert the Mirror Replication Agent 12.6 distribution CD in the CD-ROM drive.

Note If the InstallShield GUI wizard starts automatically on a Microsoft Windows platform, click Cancel to exit the GUI wizard.

4 Open an operating system command window, and set the CD-ROM drive as the current drive.

5 Invoke the InstallShield wizard at the command prompt, using the -options-record option:

- On Windows:

  ```
  setupwin32 -options-record MRO.resp
  ```

  where *MRO.resp* is the full path to the response (template) file you want to create.

  Note that there is no space in the -options-record string.

- On UNIX:

  ```
  ./setup_type -options-record MRO.resp
  ```

  where:

  - *setup_type* is one of the following strings that corresponds to the UNIX platform type:
    - setupaix
    - setuphp11x
    - setupsolaris
    - setuplinux
  - *MRO.resp* is the full path to the response (template) file you want to create.

  Note that there is no space in the -options-record string.

The InstallShield wizard starts in GUI mode, and it captures all of the prompt responses in a file with the name you specified.

See “Installing with the GUI wizard” on page 42 for a description of all of the wizard prompts.

In the event of an installation error, exit the InstallShield wizard to correct the cause of the error, and then restart InstallShield. For more information, see “Installation troubleshooting” on page 56.

❖ **To create a response file by recording a console installation**

1 Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the “sybase” user).

2 Close all non-essential applications, and minimize any open windows.

3 Insert the Mirror Replication Agent 12.6 distribution CD in the CD-ROM drive.

Note If the InstallShield GUI wizard starts automatically on a Microsoft Windows platform, click Cancel to shut down the GUI wizard.

4 Open an operating system command window, and set the CD-ROM drive as the current drive.

5 Invoke the InstallShield wizard at the command prompt, using the -console and -options-record options:

- On Windows:

  ```
  setupwin32 -console -options-record MRO.resp
  ```

  where *MRO.resp* is the full path to the response (template) file you want to create.

  Note that there is no space in the -options-record string.

- On UNIX:

  ```
  ./setup_type -console -options-record
  MRO.resp
  ```

  where:

  - *setup_type* is one of the following strings that corresponds to the UNIX platform type:
    - setupaix
    - setuphp11x
    - setupsolaris
    - setuplinux
  - *MRO.resp* is the full path to the response (template) file you want to create.

  Note that there is no space in the -options-record string.

The InstallShield wizard starts in console mode, and it captures all of the prompt responses in a file with the name you specified.

See “Installing with the GUI wizard” on page 42 for a description of all of the wizard prompts.

In the event of an installation error, exit the InstallShield wizard to correct the cause of the error, then restart InstallShield. For more information, see “Installation troubleshooting” on page 56.

Installing in console mode with a response file

A console mode installation using a response file allows you to accept all of the defaults as you move through an interactive text installation, because all of the default values are supplied by the response file.

Follow the same steps as you would for a standard console mode installation, but invoke the InstallShield wizard at the command prompt as follows:

- On Windows:

  ```
  setupwin32 -console -options MRO.resp
      -W SybaseLicense.agree=true
  ```

  where *MRO.resp* is the full path to the response file.

- On UNIX:

  ```
  ./setup_type -console -options MRO.resp
      -W SybaseLicense.agree=true
  ```

  where:

  - *setup_type* is one of the following strings that corresponds to the UNIX platform type:
    - setupaix
    - setuphp11x
    - setupsolaris
    - setuplinux
  - *MRO.resp* is the full path to the response file.

Note The -W SybaseLicense.agree=true command option makes your agreement with the Sybase License Agreement the default option in the console mode installation.

See “Installing with the GUI wizard” on page 42 for a description of all of the wizard prompts.

In the event of an installation error, exit the InstallShield wizard to correct the cause of the error, then restart InstallShield. For more information, see "Installation troubleshooting" on page 56.

To verify that the software components were installed correctly, see "Verifying the installation" on page 62.

Post-installation tasks

After you complete the Mirror Replication Agent software installation, you must complete the following post-installation tasks:

- Set up the SYBASE environment on the Mirror Replication Agent host machine. See "Setting up the SYBASE environment" on page 58 for more information.
- Register the Mirror Activator for Oracle license certificate with the Sybase Software Asset Management (SySAM) license manager. For more information, see "Registering license certificates" on page 59.

Installing in silent mode

The InstallShield silent mode, sometimes referred to as an "unattended installation," allows you to install the software with a response file to set default values, without any interaction required on your part.

Follow the same steps as you would for a standard console mode installation, but invoke the InstallShield wizard at the command prompt as follows:

- On Windows:

  ```
  setupwin32 -silent -options MRO.resp
      -W SybaseLicense.agree=true
  ```

  where *MRO.resp* is the full path to the response file.

- On UNIX:

  ```
  ./setup_type -silent -options MRO.resp
      -W SybaseLicense.agree=true
  ```

  where:

  - *setup_type* is one of the following strings that corresponds to the UNIX platform type:
    - setupaix
    - setuphp11x
    - setupsolaris

    - setuplinux
  - *MRO.resp* is the full path to the response file.

Note The -W SybaseLicense.agree=true command option makes your agreement with the Sybase License Agreement the default option in the silent mode installation.

In the event of an installation error, see "Installation troubleshooting" on page 56.

To verify that the software components were installed correctly, see "Verifying the installation" on page 62.

Post-installation tasks

After you complete the Mirror Replication Agent software installation, you must complete the following post-installation tasks:

- Set up the SYBASE environment on the Mirror Replication Agent host machine. See "Setting up the SYBASE environment" on page 58 for more information.
- Register the Mirror Activator for Oracle license certificate with the Sybase Software Asset Management (SySAM) license manager. See "Registering license certificates" on page 59 for more information.

Installation troubleshooting

If you encounter errors during installation, invoke the InstallShield wizard with the -is:log option to record the installation errors in a log file. After the wizard runs, check the log file to view a record of the installation process.

You can record installation errors with the InstallShield wizard in either GUI or console mode (with or without a response file), and in silent mode.

Use the following procedure to record an installation log file with the InstallShield wizard in GUI mode.

❖ **To record an installation log file**

1 Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).

2 Close all non-essential applications, and minimize any open windows.

3 Insert the Mirror Replication Agent 12.6 distribution CD in the CD-ROM drive.

Note If the InstallShield GUI wizard starts automatically on a Microsoft Windows platform, click Cancel to exit the GUI wizard.

4 Open an operating system command window, and set the CD-ROM drive as the current drive.

5 Invoke the InstallShield wizard at the command prompt, using the -is:log option:

- On Windows:

  ```
  setupwin32 -is:log $SYBASE\MRO_err.log
  ```

  where *MRO_err.log* is the full path to the installation error log file you want to create.

- On UNIX:

  ```
  ./setup_type -is:log $SYBASE/MRO_err.log
  ```

  where:

  - *setup_type* is one of the following strings that corresponds to the UNIX platform type:
    - setupaix
    - setuphp11x
    - setupsolaris
    - setuplinux
  - *MRO_err.log* is the full path to the installation error log file you want to create.

Note You can use the -is:log option, along with the -console or -silent options, to record an installation log file in non-GUI wizard modes.

6 Follow the wizard prompts to install the Mirror Replication Agent software. InstallShield attempts to install the software, and creates an installation log file with the name you specified.

For a description of all of the wizard prompts, see "Installing with the GUI wizard" on page 42.

7 After the wizard exits, examine the contents of the installation log file to determine the cause of the errors.

Setting up the SYBASE environment

After you install the Mirror Replication Agent 12.6 software and *before* you start the Mirror Replication Agent or run any Mirror Replication Agent utilities, you must set up the SYBASE environment on the Mirror Replication Agent host machine.

Setting up the SYBASE environment sets the value of an environment variable (%SYBASE% on Windows, and $SYBASE on UNIX) to point to the Mirror Replication Agent installation directory.

Note You must set up the SYBASE environment on the Mirror Replication Agent host machine *before* you register license certificates.

❖ **To set up the SYBASE environment**

1 Log in to the Mirror Replication Agent host machine using an operating system user account with authority to start, stop, and administer the Mirror Replication Agent instance (for example, the "sybase" user).

2 At the command prompt, execute the *SYBASE* batch or script file:

- On Windows:

  ```
  %SYBASE%\SYBASE
  ```

  where *%SYBASE%* is the path to the Mirror Replication Agent installation directory.

- On UNIX:

  ```
  source $SYBASE/SYBASE.csh
  ```

  where *$SYBASE* is the path to the Mirror Replication Agent installation directory.

Registering license certificates

After you successfully install the Mirror Replication Agent 12.6 software and set up the SYBASE environment, register the Mirror Activator for Oracle license certificate with the Sybase Software Asset Management (SySAM) license manager. For more information on SySAM, see Chapter 1, “Sybase Software Asset Management (SySAM).”

Uninstalling the Mirror Replication Agent software

InstallShield includes an *Uninstall* wizard that removes the Mirror Replication Agent 12.6 software and its related components.

You can run the Uninstall wizard in either GUI mode or console mode. Sybase recommends that you use the GUI mode.

InstallShield removes only the files and directories for the products and features that you select in the Uninstall wizard. However, some files (such as log and configuration files) are left intact for administrative purposes, even if you choose to uninstall all of the products and features.

Note InstallShield does *not* remove the root installation directory (*%SYBASE%* or *$SYBASE*), and the *SYSAM-1_0* directory and its subdirectories.

Uninstalling on a Windows platform

Before uninstalling the Mirror Replication Agent software, you must:

- Log in to the Mirror Replication Agent host machine using an account with administrator privileges.
- Shut down all Mirror Replication Agent instances and all other processes for the components you are uninstalling.

Use one of the following procedures to uninstall the Mirror Replication Agent software on a Microsoft Windows platform.

❖ **To uninstall in GUI mode on Windows platforms**

1. Choose one of the following methods to start the Uninstall wizard in GUI mode:
   - From the Start menu, select Settings | Control Panel | Add/Remove Programs.
   - At the command prompt, enter the following:

     ```
     %SYBASE%\uninstall\MRO-12_6\uninstaller
     ```
   - Click Start | Run and enter:

     ```
     %SYBASE%\uninstall\MRO-12_6\uninstaller
     ```
   - In Windows Explorer, double-click the *uninstaller.exe* file icon.

   The Uninstall wizard window opens.
2. Click Next.
3. Select the products and features that you want to uninstall from the list of installed products and features, then click Next.

   The default option is *all* installed products and features.
4. Verify the summary information and then click Next.

   InstallShield removes the files and directories associated with the products and features you selected.
5. Click Finish.

Note You may be prompted to decide whether to remove shared files. Sybase recommends that you do *not* remove shared files.

❖ **To uninstall in console mode on Windows platforms**

1. Open an operating system command window.
2. Set the Sybase installation directory as the current directory:

   ```
   cd %SYBASE%
   ```

   where *%SYBASE%* is the path to the Mirror Replication Agent installation directory.
3. Invoke the Uninstall wizard at the command prompt, using the -console option:

   ```
   uninstall\MRO-12_6\uninstaller -console
   ```

The Uninstall wizard displays the Welcome window.

4 Follow the remaining Uninstall wizard prompts to uninstall the Mirror Replication Agent software.

Note You may be prompted to decide whether to remove shared files. Sybase recommends that you do *not* remove shared files.

Uninstalling on a UNIX platform

Before uninstalling the Mirror Replication Agent software, you must:

- Log in to the Mirror Replication Agent host machine using an account with administrator privileges.
- Shut down all Mirror Replication Agent instances and all other processes for the components you are uninstalling.

Use one of the following procedures to uninstall the Mirror Replication Agent software on a UNIX platform.

❖ **To uninstall in GUI mode on UNIX platforms**

1 Invoke the Uninstall wizard at the command prompt:

```
$SYBASE/uninstall/MRO-12_6/uninstaller
```

where *$SYBASE* is the path to the Mirror Replication Agent installation directory.

The Uninstall wizard window opens.

2 Click Next.

3 Select the products and features that you want to uninstall from the list of installed products and features and then click Next.

The default option is *all* installed products and features.

4 Verify the summary information and then click Next.

InstallShield removes the files and directories associated with the products and features you selected.

5 Click Finish.

Note You may be prompted to decide whether to remove shared files. Sybase recommends that you do *not* remove shared files.

❖ **To uninstall in console mode on UNIX platforms**

1 Open an operating system command window.

2 Set the Sybase installation directory as the current directory:

```
cd $SYBASE
```

where *$SYBASE* is the path to the Mirror Replication Agent installation directory.

3 Invoke the Uninstall wizard at the command prompt, using the -console option:

```
uninstall/MRO-12_6/uninstaller -console
```

The Uninstall wizard displays the Welcome window.

4 Follow the remaining Uninstall wizard prompts to uninstall the Mirror Replication Agent software.

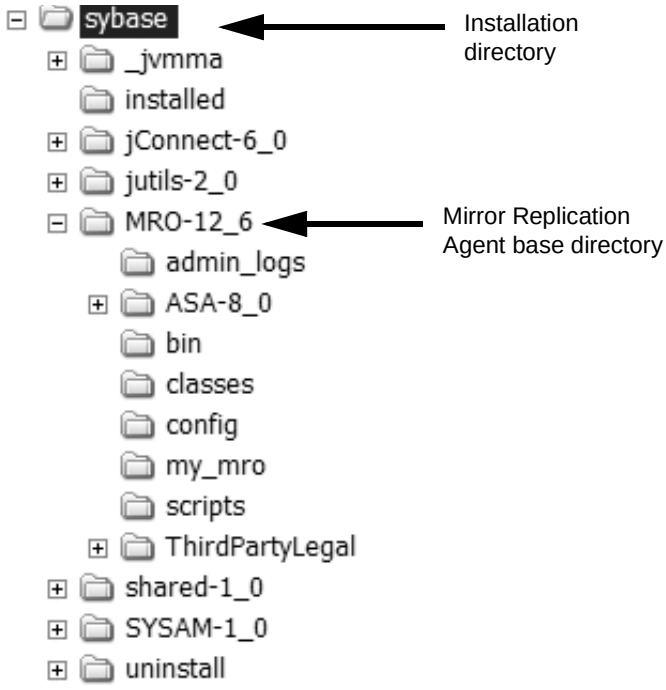
Note You may be prompted to decide whether to remove shared files. Sybase recommends that you do *not* remove shared files.

Verifying the installation

InstallShield creates subdirectories in the Mirror Replication Agent installation directory (*%SYBASE%* on Windows and *$SYBASE* on UNIX) for the Mirror Replication Agent 12.6 software, and in certain other software that the Mirror Replication Agent requires. Figure 3-1 shows a typical Mirror Replication Agent software installation on Windows.

Note The same subdirectories are created in a UNIX installation directory.

Figure 3-1: Example installation on Microsoft Windows platform



SYBASE environment scripts

InstallShield creates SYBASE environment scripts that set PATH and other environment variables on the Mirror Replication Agent host machine. These scripts allow you to run the Mirror Replication Agent software and its utilities from any directory on the host machine.

The SYBASE environment scripts are created in the Sybase installation directory and named as follows:

- *SYBASE.bat* on Microsoft Windows platforms
- *SYBASE.sh* and *SYBASE.csh* on UNIX platforms

You can use these scripts to permanently set the environment variables, or you can temporarily change environment variables by running (or sourcing) the scripts each time you log in to the Mirror Replication Agent host machine.

Note On Microsoft Windows platforms, InstallShield sets up the SYBASE environment automatically when you install the Mirror Replication Agent software.

For more information, see "Setting up the SYBASE environment" on page 58.

What's next

Refer to the Mirror Activator for Oracle *Administration Guide* for information about creating a Mirror Replication Agent instance, and setting up the Mirror Activator for Oracle system.

APPENDIX A

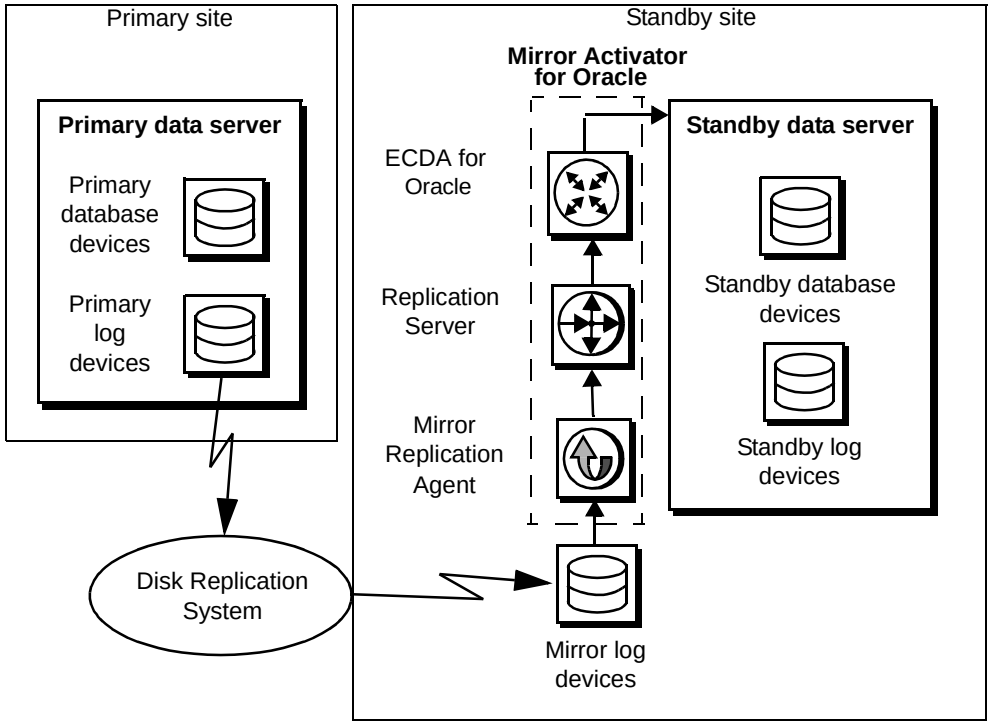
Quick Start

Follow the instructions in this Quick Start installation procedure to install and configure a sample replication environment for Oracle.

Overview

The following Figure A-1 illustrates a Sybase replication system with non-Sybase data servers. It shows the flow of data between the data servers, through the Mirror Replication Agent, Replication Server, and Enterprise Connect Data Access database gateway.

Figure A-1: Sybase replication system with non-Sybase data servers



Assumptions

Before using this Quick Start procedure:

- You should be familiar with Oracle and have an understanding of Sybase replication.
- Mirror Replication Agent for Oracle must have direct access to the Oracle *redo* logs or a mirrored copy of the *redo* logs.
- This procedure does not describe the steps for creating a mirrored copy.
- Because some directories, files, executable commands, and examples are shown only for Sun Solaris, you must adjust accordingly for Windows and for other UNIX platforms.

- This Quick Start procedure is for Proof of Concept (POC) or test and not for production.

Installing Mirror Activator for Oracle components

The following describes the installation of the components of Mirror Activator for Oracle (MAO):

- Mirror Replication Agent for Oracle (MRO)
- Replication Server (Rep Server)
- Enterprise Connect Data Access (ECDA) Option for Oracle (also referred to as Direct Connect for Oracle (DCO))

Identify the Sybase installation directory

ECDA, Rep Server, and MRO are installed in the same base directory ($SYBASE), which is identified by the SYBASE environment variable. Select a path on a host drive to be the recipient of the Sybase installation and configuration activities. For example:

```
/software/sybase
```

Installing MRO

This section describes the steps for MRO installation.

Step 1. Installing MRO

The MRO installation process is a simple process that creates a directory structure containing the MRO binaries, scripts, JRE and associated files. There are no configuration steps during installation.

❖ **To install MRO software**

1 Verify that the operating system (OS) patch levels are at the current level required to support Java 1.4.2. This is needed to support the java runtime environment (JRE) that is installed with MRO.

For more information about this requirement, see the Mirror Replication for Oracle *Installation Guide.*

2 Download the MRO product from either the Sybase download site or from the CD that is provided.

- From the download site, navigate to the directory where the MRO software has been downloaded, uncompressed, and extracted. Download the Mirror Activator for Oracle 12.6 for Sun Solaris (CD20119-55-1260-01.tgz).
- From the CD – insert the MRO CD into your CD drive.

3 Launch InstallShield by executing the setup routine for Solaris:

```
./setupsolaris
```

4 If you see an error message saying that there is not enough temporary disk space, add the following to your setup command:

```
./setupsolaris –is:tempdir someDirectory
```

where *someDirectory* is a directory with at least 100MB of disk space that the installation program can use.

Note If you are installing from a remote machine and do not have an X-windows client, execute ./setupsolaris –console, to run in console mode.

5 On the Welcome window, click Next.

6 Select a geographic location that displays the license agreement. Select I agree and click Next.

7 Enter the directory where you want to install MRO:

- If the directory does not exist, the installation program prompts you to create it. Click Yes to create it.
- If the destination directory exists, you receive a warning message that you are installing into an existing directory. Click Yes.

8 Select Typical for the installation setup type and click Next.

9 The installation program displays a summary of what is to be installed. Click Next.

10 The installation program starts to install MRO, displaying the progress status. If you see a message, “there are newer files already installed and do you want to replace them?” Click No, to all.

11 When you receive a message that indicates that the installation was successful, click Next.

12 When you receive a message indicating that MRO was successfully installed, click Finish.

For additional information about the installation process and the installation program, see the Mirror Replication Agent for Oracle *Installation Guide*.

Installing Replication Server

This section describes the steps for a Rep Server installation:

Step 1. Installing Rep Server
Step 2. Verify the installation

Note If Rep Server is already installed go to the next section called "Installing ECDA."

Step 1. Installing Rep Server

❖ **To install Rep Server**

1 Download Rep Server either from the Sybase download site or from the CD that is provided.

- From the download site, navigate to the directory where the Rep Server software has been downloaded, uncompressed, and extracted. Download the Rep Server – Replication Server 12.6 for Sun Solaris (CD62122-55-1260-03.tgz).
- From the CD, insert the Rep Server CD into your CD drive.

2 Launch InstallShield by executing the setup routine for Solaris:

```
./setup
```

3 If you see an error message saying that there is not enough temporary disk space, add the following to your setup command:

```
./setup –is:tempdir someDirectory
```

where *someDirectory* is a directory with at least 100MB of disk space that the installation program can use.

4 On the Welcome window, click Next.

5 Select a geographic location that displays the license agreement. Select I agree and click Next.

6 Enter the directory where you want to install Rep Server:

- If the directory does not exist, the installation program prompts you to create it. Click Yes to create it.
- If the destination directory exists, you receive a warning message that you are installing into an existing directory. Click Yes.

7 Select Typical for the installation setup type and click Next.

8 The installation program displays a summary of what is to be installed. Click Next.

9 The installation program starts to install Rep Server, displaying the progress status. If you see a message, "there are newer files already installed and do you want to replace them?" Click '"No, to all."

10 When you receive a message indicating that Rep Server is successfully installed, click Next.

Note This procedure uses the SAMPLE_RS Rep Server.

11 To start the SAMPLE_RS Rep Server, select Yes and click Next.

12 The following information is displayed and should be recorded:

```
This page contains detailed information regarding
the sample Replication Server.Please record this
information.

The sample Replication Server will be called
SAMPLE_RS and will run on port 11752. It will be
configured with a user of sa and no password.

The sample Replication Server will use an embedded
RSSD called SAMPLE_RS_ERSSD that runs on port
11751. It will be configured with a user of
SAMPLE_RS_RSSD_prim and a password of
SAMPLE_RS_RSSD_prim_ps.

The installer has updated the appropriate interfaces
file or sql.ini file.

All files and logs associated with the sample
Replication Server will be located in the directory
$SYBASE/REP-12_6/samp_repserver.

The sample Replication Server will be configured
using the file $SYBASE/REP-12_6/samp_repserver
/SAMPLE_RS.res.
```

Click Next.

13 At this point, the SAMPLE_RS is running. After the "Installation was successful" message appears, click Finish.

Step 2. Verify the installation

❖ **To verify the installation**

1 Change to the directory ($SYBASE) where you installed Rep Server.

2 Set the environment variables by sourcing the *SYBASE.csh* file.

3 Use isql to log in to Rep Server:

```
isql -Usa -P -SSAMPLE_RS
```

You should successfully login to the Rep Server.

4 Exit isql.

Installing Enterprise Connect Data Access (ECDA) Option for Oracle

This section describes the steps for installing the ECDA Option for Oracle:

Step 1. Prepare for installing ECDA for Oracle
Step 2. Installing ECDA Option for Oracle
Step 3. Verify the ECDA installation

Note If the ECDA Option for Oracle (also referred to as DCO) is installed, go to the next section called "Configuring ECDA."

Step 1. Prepare for installing ECDA for Oracle

This section describes how to install ECDA to replicate into Oracle.

❖ **To prepare to install ECDA for Oracle software**

1 Prepare the environment for installation:

- Review the ECDA *Installation Guide*, Chapter 6, for hardware, software, and operating system software requirements.

- Review sections 4 and 5 in the ECDA release bulletin for any recent updates to requirements for installation.

2 Identify an Oracle standby database. To do so, obtain the Oracle SID, which is usually the value $ORACLE_SID and record the Oracle database name.

Note To verify that the Oracle version is certified for use with ECDA 12.6, see the certification report at http://certification.sybase.com/ucr/search.do.

3 Verify the complete path name to the *tnsnames.ora* file, for example:

```
$ORACLE_HOME/network/admin/tnsnames.ora
```

The *tnsnames.ora* file must be accessible to the machine where installation is taking place, because ECDA makes another copy of the *tnsnames.ora* file and places it under the *$SYBASE/DCO-12_6* directory structure during the installation process.

Step 2. Installing ECDA Option for Oracle

Note If the ECDA Option for Oracle (also referred to as DCO) was already installed and a directory was created perform the following:

- Set the environment variables by sourcing the *$SYBASE/SYBASE.csh* file and the *$SYBASE/DCO_SYBASE.csh* file.
- Execute the *$SYBASE/$SYBASE_DCO/install/DCConfig* to configure a new DCO and proceed to step 11.

Download the ECDA product either from the Sybase download site or from the CD that is provided.

- From the download site, navigate to the directory where the ECDA software has been downloaded, uncompressed, and extracted. Download the ECDA 12.6 (CD68121-55-1260-01.tgz).

  Use the GNU utilities to unzip and untar the software download to a new directory. When untarred, the directory should contain the following files; *media.inf*, *suite*, *archives*, *setupSolaris*.

- From the CD, insert the ECDA 12.6 Options for Sun Solaris CD.

❖ **To install ECDA for Oracle in GUI mode**

Note If you want to install using the console mode or a response file, refer to the ECDA *Installation Guide* for Linux and UNIX.

1 Launch InstallShield by executing the Sun Solaris setup routine:

```
./setupSolaris
```

2 If you see an error message saying that there is not enough temporary disk space, add the following to your setup command:

```
./setupSolaris –is:tempdir someDirectory
```

where *someDirectory* is a directory with at least 100MB of disk space that the installation program can use.

3 On the Welcome window, click Next.

4 Select a geographic location that displays the license agreement. Select I agree and click Next.

5 Enter the directory where you want to install ECDA:

- In the destination directory, enter the directory where the MRO software is installed. Click Yes to install into an existing directory.
- If the destination directory exists, you receive a warning message that you are installing into an existing directory. Click Yes

6 Select the Custom setup and click Next.

7 Select the ECDA Option for Oracle. Deselect any extra language modules. For English, deselect all the language modules, leaving only the “Language Modules” line selected. Click Next.

8 Verify the modules to install. At a minimum, ECDA Option for Oracle, Connectivity, and Language Modules should be listed. Click Next.

9 The software begins to load into the destination directory. After it has successfully finished building the directory, click Next.

10 By default, ECDA for Oracle (DCO) can be configured during installation. If you want to configure a new DCO now, click Next.

11 Enter the following options in the configuration window:

- DCO name – the name of the DCO server. For example, DCOServer.
- Port number – an unused port number that the server will use.

- DCO Admin Account name – the name of a valid Oracle account that will be used to administer DCO, usually the *SYSTEM* account.
- Oracle Password for DCO Admin Acct – the password for the account named previously to administer the DirectConnect for Oracle server. The password is not written into a configuration file, but it appears in the *log.txt* file if the installer was invoked with the -is:debug argument.
- Confirm Oracle Password for the DCO Admin Acct – a confirmation of the password for the account named previously to administer the DirectConnect for Oracle server.
- ORACLE Connect String – the name of the entry for the Oracle instance in the *tnsnames.ora* file.

12 Enter location and file name of the existing *tnsnames.ora* file, usually located in the *network/admin* directory under the *ORACLE_HOME* directory. The *tnsnames.ora* identified must be locally accessible. If the file is not available locally, then it must be copied onto a local drive before configuring DirectConnect for Oracle. DirectConnect for Oracle copies the existing *tnsnames.ora* file into its directory (enter the full path and file name.)

13 Click Next.

14 After receiving a message that indicates that the installation was successful, click Next.

15 At this time, the DCO Server should be up and running. Click Next.

16 After receiving an ECDA successful installation message, click Finish.

In the rest of this document, the DCO Server that you have set up will be called "DCOServer."

Step 3. Verify the ECDA installation

❖ **To verify that you can connect to Oracle**

1 Open a command window in the *$SYBASE* directory of your DirectConnect installation.

2 Change to the *$SYBASE/DCO-12_6* directory.

3 Set the environment variables by sourcing the *$SYBASE/SYBASE.csh* file and the *$SYBASE/DCO_SYBASE.csh* file.

4 Use isql to log in to Oracle through DirectConnect:

```
isql –Uvaliduser –Ppassword –SDCOServer
```

where:

- *validuser and password* – any valid user and password
- *DCOServer* – the DCO Server name identified in the previous step.

5 To verify the connection to the standby Oracle database, enter the following:

```
select banner from v$version
go
```

The string returned from DCO should look similar to the following:

```
BANNER

 ----------------------------------------------

 Oracle9i Enterprise Edition Release 9.2.0.1.0 -
Production

 PL/SQL Release 9.2.0.1.0 - Production

 CORE   9.2.0.1.0       Production

 TNS for Solaris: Version 9.2.0.1.0 - Production

 NLSRTL Version 9.2.0.1.0 - Production
```

6 Exit isql.

Configuring Mirror Activator for Oracle components

The following describes the configuration of the components for MAO.

Configuring ECDA

This section describes the required steps to configure ECDA Option for Oracle:

Step 1. Create a maintenance user and DDL user for replication
Step 2. Create objects and public synonyms
Step 3. Verify the ECDA installed objects

Step 1. Create a maintenance user and DDL user for replication

The maintenance user is a valid Oracle user that the Rep Server uses to apply commands to the standby Oracle database. It should not be the same name as the "DCO admin account name" used in configuring DCO.

❖ **To create a maintenance user in Oracle**

1 Using SQLPLUS, enter the following command:

```
create user maintuser identified by password ;
```

2 Grant permissions to the maintenance user, who must have the highest privilege of all users who have data or work that will be replicated:

- Grant dba to maintuser
- Grant create session to maintuser

❖ **To create a DDL user in Oracle**

1 Create a DDL user in Oracle, enter the following command:

```
create DDLuser identified by password;
```

2 Grant permissions to the DDL user, who must have privileges to perform DDL activities that can include create user, create, alter, drop procedures, indexes, tables and any DDL command issued on the correct database.

Step 2. Create objects and public synonyms

❖ **To create objects and public synonyms**

- Create rs_info table and rs_lastcommit in the Oracle database as follows:

  a Sign on to Oracle through DCO as the maintenance user (assuming that the maintenance user that you created has the resource role to create tables) and execute the script:

```
isql –Umaintuser –Ppassword –SDCOServer
-i $SYBASE/REP-12_6/scripts/hds_oracle_setup_for_replicate.sql
```

Note You may receive a ORA-00942 message that a table or view does not exist. You may ignore the message.

b Create the public synonym rs_info for maintuser.rs_info.

Note Do this when Oracle is the target of only one Rep Server connection. If multiple Rep Server connections connect into this Oracle, do not create public synonyms.

```
isql –Umaintuser –Ppassword –SDCOServer
create public synonym rs_lastcommit for maintuser.rs_lastcommit
go
commit
go
```

c Exit isql.

Step 3. Verify the ECDA installed objects

❖ **To verify the ECDA installed objects**

1 Open another command window in the *$SYBASE* directory of your DirectConnect installation.

2 Set the environment variables by sourcing the *$SYBASE/SYBASE.csh* file and the *$SYBASE/DCO_SYBASE.csh* file.

3 Use isql to log in to Oracle through DirectConnect as maintuser:

```
isql –Umaintuser –Ppassword –SDCOServer
select * from rs_info
go
```

The following is returned:

```
 RSKEY                RSVAL
 -------------------- --------------------
 charset_name         iso_1
 sortorder_name       bin_iso_1
(2 rows affected)
```

4 Exit isql.

Configuring Rep Server

This section describes the required steps to configure Rep Server for Oracle:

Step 1. Configure Rep Server for Oracle replication
Step 2. Configure Rep Server for replication to standby
Step 3. Configure Rep Server for replication from the primary database

For more information about configuring Rep Server, see the Mirror Activator for Oracle *Administration Guide*, Appendix C, "Mirror Replication Agent and Oracle Databases."

Step 1. Configure Rep Server for Oracle replication

This section describes the required configurations for Rep Server for Oracle.

❖ **To apply Heterogeneous Datatype support (HDS) scripts to RSSD**

1 Open a command window in the *$SYBASE* directory of your Rep Server installation.

2 Set the environment variables by sourcing the *SYBASE.csh* file.

3 Change directories to the *$SYBASE/$SYBASE_REP/scripts* directory.

4 Load the following scripts into the RSSD:

```
isql -U SAMPLE_RS_RSSD_prim -P SAMPLE_RS_RSSD_prim_ps –SSAMPLE_RS_ERSSD
–ihds_clt_ase_to_oracle.sql -DSAMPLE_RS_ERSSD

isql -U SAMPLE_RS_RSSD_prim -P SAMPLE_RS_RSSD_prim_ps –SSAMPLE_RS_ERSSD
–ihds_oracle_udds.sql -DSAMPLE_RS_ERSSD

isql -U SAMPLE_RS_RSSD_prim -P SAMPLE_RS_RSSD_prim_ps –SSAMPLE_RS_ERSSD
–ihds_oracle_funcstrings.sql -DSAMPLE_RS_ERSSD
```

Note The message "ASA -157 cannot convert to a timestamp" is displayed. You can ignore this message.

5 Change directories to the *$SYBASE/MRO-12_6/scripts* directory.

6 Load the script into the RSSD:

```
isql -U SAMPLE_RS_RSSD_prim -P SAMPLE_RS_RSSD_prim_ps –SSAMPLE_RS_ERSSD
–ihds_oracle_new_udds.sql -DSAMPLE_RS_ERSSD
```

7 Shutdown Rep Server:

```
isql –Usa –P –SSAMPLE_RS

shutdown
```

```
go
```

A message indicating that Rep Server is shutdown.

8 Go to *$SYBASE/REP-12_6/samp_repserver* directory.

9 Run the startup script:

```
./RUN_SAMPLE_RS
```

Step 2. Configure Rep Server for replication to standby

This section describes the required configurations for Rep Server for replication to standby.

❖ **To create a Rep Server connection to standby**

1 Change directories to the *$SYBASE/MRO-12_6/scripts* directory.

2 Create the Oracle error class:

- Execute the following three scripts:

> **Note** The *oracle_error_class_1_rs.sql* and *oracle_error_class_3_rs.sql* scripts are executed to the Rep Server. The *oracle_error_class_2_rs.sql* script is executed in the RSSD.

```
isql –Usa –P –SSAMPLE_RS -i oracle_create_error_class_1_rs.sql

isql -U SAMPLE_RS_RSSD_prim -P SAMPLE_RS_RSSD_prim_ps
–SSAMPLE_RS_ERSSD –i oracle_create_error_class_2_rssd.sql
-DSAMPLE_RS_ERSSD

isql –Usa –P –SSAMPLE_RS -i oracle_create_error_class_3_rs.sql
```

3 Before executing the *oracle_create_rs_standby_connection.sql* script against your Rep Server, change *all* occurrences of value *{rds}.{rdb}* to the name of the connection Rep Server will use to connect to DirectConnect for Oracle, where:

- *rds* – the DCO Server name
- *rdb* – any valid identifier (It is recommended that you use the Oracle SID name.)
- *maintuser* and *password* – the user name and password created in DCO

The following is an example

```
create connection to DCOServer.oratest2
set error class oracle_error_class
set function string class rs_oracle_function_class
set username maintuser
set password "password"
set batch to "off"
go
```

4 Execute the script in Rep Server:

```
isql –Usa –P –SSAMPLE_RS -i oracle_create_rs_standby_connection.sql
```

The connection to the standby database is created.

5 To verify the Rep Server connection to the standby database, log in to SAMPLE_RS and run the admin who command:

```
isql –Usa –P –SSAMPLE_RS
admin who
go
```

You should see a message returned for the DSI connection *{rds}.{rdb}*. Verify that the status is "Awaiting Message" or "Awaiting Command."

Step 3. Configure Rep Server for replication from the primary database

This section describes the following configuration steps required for replication from the primary database:

- Create a Rep Server connection to the primary database
- Create a database replication definition
- Create the database replication subscription
- Set up sequence replication support

❖ To create a Rep Server connection to the primary database

1 Verify you are at the *$SYBASE/MRO-12_6/scripts* directory.

2 Before executing the *oracle_create_rs_primary_connection.sql* script against your Rep Server, change *all* occurrences of value *{pds}.{pdb}* to the name of the Rep Server connection used to connect to Oracle where:

- *pds – rs_source_ds* (located in $SYBASE/mro-12_6/init/mro.rs)

- *pdb – rs_source_db* (located in $SYBASE/mro-12_6/init /mro.rs)

For example, *NY.NYora92*.

3 Change *sys* and *sys_pwd* to the user ID and password of the Oracle user who will have permission to apply DML operations against all user tables that will be replicated where:

- *sys* – the user ID of the Oracle user (sys)
- *sys_pwd* – the password of the Oracle user (change_on_install)

Note While not immediately used, this user must be a valid user in the Oracle database.

The following command creates a Rep Server connection to the primary database example:

```
create connection to NY.NYora92
set error class rs_sqlserver_error_class
set function string class rs_oracle_function_class
set username sys
set password change_on_install
with log transfer on, dsi_suspended
go
```

4 Execute the script in Rep Server:

```
isql –Usa –P –SSAMPLE_RS -i oracle_create_rs_primary_connection.sql
```

A message is displayed that indicates the Rep Server connection to the primary database is created.

❖ **To create the database replication definition**

1 Before executing the *oracle_create_rs_db_repdef.sql* script, change the value of "{pds}.{pdb}" to the name of the connection string you defined for the primary database, where:

- *pds – rs_source_ds* (located in $SYBASE/mro-12_6/init/mro.rs)
- *pdb – rs_source_db* (located in $SYBASE/mro-12_6/init/rs)

For example,

```
NY.NYora92
```

The following is a database replication definition example:

```
create database replication definition NY_repdef1
with primary at NY.NYora92
replicate DDL
go
```

2 Connect to the Rep Server and execute the following command:

```
isql -Usa -P –SSAMPLE_RS -i oracle_create_rs_db_repdef.sql
```

A message is displayed that indicates the database replication definition is created.

❖ **To create the database replication subscription**

1 Before executing the *oracle_create_rs_db_sub.sql* script, change the "{pds}.{pdb}" and "{rds}.{rdb}'"to the appropriate connection name, where:

- *pds – rs_source_ds* (located in $SYBASE/mro-12_6/init/mro.rs)
- *pdb – rs_source_db* (located in $SYBASE/mro-12_6/init/mro.rs)
- *rds* – DCO Server name (DCOServer)
- *rdb* – any valid identifier (It is recommended that you use the Oracle SID name)

The following is a create database replication subscription example:

```
create subscription NY_sub1
for database replication definition NY_repdef1
with primary at NY.NYora92
with replicate at DCOServer.oratest2
without materialization
go
```

2 Connect to Rep Server and execute the following command:

```
isql -Usa -P –SSAMPLE_RS -i oracle_create_rs_db_sub.sql
```

A message is displayed that indicates the subscription is in the process of being created.

❖ **To set up sequence replication support**

1 Install the rs_update_sequence stored procedure. Use SQLPLUS to run the oracle_create_replicate_sequence_proc.sql stored procedure at the standby site:

```
sqlplus maintuser/password@oracle_create_replicate_sequence_proc.sql
```

The following is returned:

```
SQL*Plus: Release 9.2.0.1.0 - Production on Tue Jun
20 10:32:03 2006

Copyright (c) 1982, 2002, Oracle Corporation.  All
rights reserved.

Connected to:
Oracle9i Enterprise Edition Release 9.2.0.1.0 -
64bit Production With the Partitioning, OLAP and
Oracle Data Mining options

JServer Release 9.2.0.1.0 - Production Procedure
created.

Grant succeeded.
```

Exit sqlplus.

For more information about sequence replication, see the Mirror Activator for Oracle *Administration Guide*, Appendix C, "Mirror Replication Agent and Oracle Databases."

2 To create a function replication definition for rs_update _sequence, edit the *oracle_create_rs_sequence_repdef.sql* script, changing all occurrences of the value *{pds}.{pdb}* to the name of the MRO connection used by your MRO, where:

- *pds – rs_source_ds* (located in $SYBASE/mro-12_6/init/mro.rs)
- *pdb – rs_source_db* (located in $SYBASE/mro-12_6/init/mro.rs)

The following is the function replication definition for sequence replication after editing:

```
create function replication definition
REP_UPDATE_SEQUENCE
with primary at NY.NYora92
deliver as RS_UPDATE_SEQUENCE
(
@"SEQUENCENAME"  varchar(32768),
@"SEQUENCEVALUE" numeric,
@"INCREMENT"     numeric
)
send standby all parameters
go
```

3 Connect to the Rep Server and execute the following command:

```
isql -Usa -P –SSAMPLE_RS -i oracle_create_rs_sequence_repdef.sql
```

A message is displayed that indicates a functional sequence replication definition is created.

Configuring MRO

This section describes the steps for configuring MRO:

Step 1. Configure and verify the primary Oracle database for replication
Step 2. Create the MRO instance
Step 3. Verify the MRO instance installation
Step 4. Initialize the MRO instance
Step 5. Test replication
Step 6. Reset the primary Oracle database for replication

Step 1. Configure and verify the primary Oracle database for replication

Before you install MRO, you must configure the primary Oracle database for replication.

To ensure that Oracle *redo* log data is not overwritten before it is read by the MRO, you must complete the following tasks:

- Verify the current archiving setting of the *redo* logs
- Verify the automatic archive setting
- Verify the supplemental logging of primary key data
- Create an Oracle user and grant Oracle permissions

❖ **Verify the current archiving setting of the redo logs**

1 Use SQLPLUS and connect to Oracle as a system administrator.

2 Run the following command from SQLPLUS:

```
select log_mode from v$database;
```

- If the archive log is on, the result should be:

```
LOG_MODE

-------

ARCHIVELOG
```

- To turn on log archiving:
  - Use SQLPLUS to connect to Oracle as a system administrator

- Run the following commands from SQLPLUS:

```
shutdown;
startup mount;
alter database archivelog;
alter database open;
```

For more information about Oracle redo logs and archiving, see the Mirror Activator for Oracle *Administration Guide*, Appendix C, "Mirror Replication Agent and Oracle Databases."

❖ **Verify the automatic archive setting**

Archiving of *redo* logs must be enabled to prevent *redo* log data from being overwritten before it is archived. MRO will request Oracle to manually archive a *redo* log after the MRO has processed a *redo* log.

- Run the following command from SQLPLUS:

```
show parameter log_archive_start;
```

- If automatic archiving is off, the result should be:

```
NAME   TYPE      VALUE

---------------------------------

log_archive_start boolean FALSE
```

- To turn off automatic archiving:
  - Run the following command from SQLPLUS to adjust the setting and restart the Oracle instance:

```
alter system set log_archive_start=false
scope=spfile;
```

For more information about Oracle redo logs and archiving, see the Mirror Activator for Oracle *Administration Guide*, Appendix C, "Mirror Replication Agent and Oracle Databases."

❖ **Verify the supplemental logging of primary key data**

By default, Oracle does not log data from primary keys and unique indexes to the redo log output. You must include the logging of these values for a successful replication of all table values.

1 Use SQLPLUS to connect to Oracle as a system administrator.

2 Run the following command from SQLPLUS:

```
SELECT SUPPLEMENTAL_LOG_DATA_PK,
SUPPLEMENTAL_LOG_DATA_UI FROM V$DATABASE;
```

- If logging of primary key and unique index values is enabled, the return values should be:

```
SUP SUP

--- ---

YES YES
```

- To turn on supplemental logging:
  - Use SQLPLUS to connect to Oracle as a system administrator.
  - Run the following command from SQLPLUS:

```
ALTER DATABASE ADD SUPPLEMENTAL LOG DATA (PRIMARY
KEY, UNIQUE INDEX) COLUMNS;
```

For more information about supplemental logging, see the Mirror Activator for Oracle *Administration Guide*, Appendix C, "Mirror Replication Agent and Oracle Databases."

❖ **To create an Oracle user and grant permissions**

An Oracle database user needs to be created for use by MRO when connected to the primary database.

Note Permission to grant access to objects owned by "SYS" may require the command to be executed by an Oracle user with *sysdba* privileges.

---

1 From the following list of Oracle commands, create an Oracle user named "MRO_USER" with the password "sybase," and grant permissions to the user.

```
CREATE USER "MRO_USER" PROFILE "DEFAULT" IDENTIFIED
BY "sybase" DEFAULT TABLESPACE "USERS" ACCOUNT
UNLOCK;

GRANT "CONNECT" TO "MRO_USER";

GRANT "RESOURCE" TO "MRO_USER";

GRANT "SELECT_CATALOG_ROLE" TO "MRO_USER";

GRANT ALTER SESSION TO "MRO_USER"

GRANT ALTER SYSTEM TO "MRO_USER"

GRANT EXECUTE ON "SYS"."DBMS_FLASHBACK" TO
"MRO_USER"

GRANT ALTER ANY PROCEDURE TO "MRO_USER";
```

```
GRANT CREATE SESSION TO "MRO_USER";
GRANT CREATE TABLE TO "MRO_USER";
GRANT CREATE PROCEDURE TO "MRO_USER";
GRANT CREATE PUBLIC SYNONYM TO "MRO_USER";
GRANT DROP PUBLIC SYNONYM TO "MRO_USER";
GRANT SELECT ON SYS.OBJ$ TO "MRO_USER";
GRANT SELECT ON SYS.LOB$ TO "MRO_USER";
GRANT SELECT ON SYS.COLLECTION$ TO "MRO_USER";
GRANT CREATE SEQUENCE TO "MRO_USER";
GRANT SELECT ON SYS.CON$ TO "MRO_USER";
GRANT SELECT ON SYS.COLTYPE$ TO "MRO_USER";
GRANT SELECT ON SYS.COL$ TO "MRO_USER";
GRANT SELECT ON SYS.CDEF$ TO "MRO_USER";
GRANT SELECT ON SYS.USER$ TO "MRO_USER";
GRANT SELECT ON SYS.SEQ$ TO "MRO_USER";
```

2 To verify the individual table permissions, run the following command from SQLPLUS as the new Oracle user:

```
SELECT TABLE_NAME,  PRIVILEGE FROM USER_TAB_PRIVS;
TABLE_NAME                     PRIVILEGE
------------------------------ ---------
OBJ$                           SELECT
USER$                          SELECT
CON$                           SELECT
CDEF$                          SELECT
SEQ$                           SELECT
LOB$                           SELECT
COLTYPE$                       SELECT
COLLECTION$                    SELECT
DBMS_FLASHBACK                 EXECUTE
```

Verify the Primary Oracle configuration for replication

As described in the previous section, the following Oracle commands can be issued to validate the required Oracle settings.

❖ **Verify the current archiving setting of the archive log in an Oracle instance**

1 Run the following command from SQLPLUS:

```
select log_mode from v$database;
```

2 If the archive log is on, the result should be:

```
LOG_MODE

-------

ARCHIVELOG
```

❖ **Verify the roles of the Oracle user created for use by the MRO**

- Using SQLPLUS, run the following command as the new Oracle user:

```
select GRANTED_ROLE from USER_ROLE_PRIVS;

GRANTED_ROLE

--------------------

CONNECT

RESOURCE

SELECT_CATALOG_ROLE
```

Step 2. Create the MRO instance

A single installation of the MRO can support replication from multiple databases. Each Oracle database to be replicated can be connected by one MRO instance. This section describes how to prepare for an instance creation.

❖ **To prepare the MRO instance**

1 Obtain the Oracle JDBC driver, which must be acquired from Oracle, and update the classpath.

To find the JDBC connection that communicates with the primary Oracle instance, locate the JDBC driver that was available when the Oracle release was originally created, usually found at *$ORACLE_HOME/jdbc/lib/ojdbc14.jar.*

MRO requires a newer version of the JDBC driver with the latest corrections, which you can obtain from Oracle at http://technet.oracle.com/software/tech/java/sqlj_jdbc/content.html.

Refer to the release bulletin or EBF letter of your MRO to obtain the correct version of the JDBC driver.

2 Add the JDBC driver to the CLASSPATH environment variable. For example, you could append the existing CLASSPATH to the new JDBC driver that was downloaded and add the following command to the *.login* script of a UNIX user:

```
setenv CLASSPATH /path_name/ojdbc14.jar:$CLASSPATH
```

Additional information about the JDBC driver requirements and setup can be found in the Mirror Activator Replication Agent *Installation Guide*, Chapter 2, Setup and Configuration, in section titled "Setting up Mirror Replication Agent connectivity."

3 Record the Oracle connectivity details for the primary Oracle database. You can find these values from any machine where an Oracle SQLPLUS session can be used to connect to the desired Oracle instance. The ORACLE_SID is from the environment variable, *$ORACLE_SID*. Obtain host and port information from the file called *$ORACLE_HOME/network/admin/tnsnames.ora.*

Record the following:

- Host name of the Oracle database that the TNS listener is operating on (*$ORACLE_SID*)
- Port number the TNS listener is monitoring
- ORACLE_SID value for the instance you wish to connect to

4 (Optional) If your operating system has a Java 1.2.x compatible JRE or JDK installed, you can use Oracle's isql demo items to verify Java 1.2.x, and to connect to Oracle using the JDBC driver and the connection information.

To perform this validation, refer to the *Oracle9i JDBC Developer's Guide and Reference* guide, in the section titled, "Verifying a JDBC Client Installation."

5 Obtain a local copy of the Oracle *timezone* file, so MRO can correctly process the Oracle timestamp with timezone datatype.

Note This step is only required if the MRO is on a different machine (host) than the Oracle host and does not have access to the Oracle files.

There are two *timezone* files under the Oracle installation directory:

- The following binary file is the default file that contains the most commonly used time zones and is smaller:

  ```
  * $ORACLE_HOME/oracore/zoneinfo/timezone.dat
  ```

- The following binary file contains the larger set of defined time zones:

  ```
  * $ORACLE_HOME/oracore/zoneinfo/timezlrg.dat
  ```

The Oracle instance uses the *timezone* file from the ORA_TZFILE environment variable. If ORA_TZFILE is not set, use the default *timezone* file.

Determine which *timezone* file is used by the primary Oracle instance and make a copy of that file available on the machine hosting the MRO.

Note These files are platform dependent. You cannot use a *timezone* file from a little endian platform on a big endian platform, or visa versa.

6 Determine the desired default settings

By default, MRO is configured to mark every user table in the primary oracle database for replication, and to create a replication definition for every table marked.

While these settings may be reasonable for production environments, they may not be desired in a test or proof of concept environment, where only a subset of tables are being replicated. If automatic table marking or replication definition generation options are not desired, you should change the settings of MRO configuration parameters pdb_automark_tables and pdb_auto_create_repdefs.

Additional information about the configuration parameters can be found in the Mirror Replication Agent for Oracle *Reference Guide*.

7 Locate the sample *resource* file.

The majority of configuration values required to create and initialize a MRO can be recorded and stored in a *resource* file. Using it provides a means to record or retain the configuration information for a MRO instance, allowing an instance to be removed and re-created.

A sample resource file can be found in the MRO directory *$SYBASE/MRO-12_6/init/mro.rs*.

8 Create an instance resource file.

Copy the *resource* file template *$SYBASE/MRO-12_6/init/mro.rs* to another file that contains the configuration information for a new instance, for example:

```
cp mro.rs mymro.rs
```

Using a text editor, alter the values assigned to properties in the *resource* file so that they match the values required for your environment. The majority of these values are host, port, user, and password information for the Oracle, RS, and RSSD connections.

The *resource* file is self-documenting, with each parameter described. If you require additional information about the *resource* file or its usage, refer to the Mirror Replication Agent *Administration Guide*, Chapter 2, Setup and Configuration, in section titled, “Creating a Mirror Replication instance using resource files.”

Table A-1: Resource file parameters

Parameter	Description	Values (for example)
instance name	any valid name	my_mro
admin_port	port number that MRO will use	9030 (if in use, select a different port number)
pds_host_name	machine (host) where Oracle is installed	crane
pds_port_number	port number for Oracle	1521 (if in use, select a different port number)
pds_database_name	$ORACLE_SID	testoral
pds_username	same as created previously in step 1, page 6	MRO_USER
pds_password	password for pds_username	sybase
pds_sa_username	system admin name	system
pds_sa_password	system admin name password	manager
rs_host_name	machine where Rep Server is installed	localhost
rs_port_number	port where Rep Server is installed	11752
rs_username	Rep Server user with connect source capability	SAMPLE_RS_ra
rs_password	password for rs_username	SAMPLE_RS_ra_ps
rs_source_ds	valid name representing data server of Oracle primary database	NY
rs_source_db	valid name representing database of Oracle primary database	NYora92
rssd_host_name	machine where RSSD resides	localhost
rssd_port_number	port number where RSSD resides	11751
rssd_database_name	database name for RSSD	SAMPLE_RS_ERSSD
rssd_username	valid user for RSSD	SAMPLE_RS_RSSD_maint

Parameter	Description	Values (for example)
rssd_password	password for rssd_username	SAMPLE_RS_RSSD_maint_ps
ddl_username	user name that can execute DDL commands	DDLuser
ddl_password	password created for ddl_ username	password (created previously)
pdb_timezone_file	path to the pdb_timezone-file	/software/oracle/Ora9i/oracore /zoneinfo/timezone.dat

Warning! The rs_source_ds and the rs_source_db values must match the "pds.pdb" values of your Replication Server's primary connection name.

9 Create and execute the new instance resource file.

Note Be sure your CLASSPATH environment variable points to the correct Oracle JDBC driver before proceeding.

a Using the MRO mro_admin utility, validate the settings in the *resource* file using the –vr parameter, for example:

```
$SYBASE/MRO-12_6/bin/mro_admin.sh -vr mymro.rs
```

where *mymro.rs* is the path name of the *resource* file.

b Validation results are returned as either:

- Response_file processing completed, or
- Response_file processing completed with errors.

  If any validation fails, the mro_admin utility returns an error message and information about the failure. You can repeat the validation process as many times as necessary until it executes without error. No entities are changed or created because of this process.

c After the *resource* file has been validated, allow the mro_admin utility to create the MRO instance, using the –r parameter, for example:

```
$SYBASE/MRO-12_6/bin/mro_admin.sh -r mymro.rs
```

d Validation results are returned as either:

- Response_file processing completed, or

- Response_file processing completed with errors

If you require additional information about the *resource* file or its use, refer to the Mirror Replication Agent *Administration Guide*, Chapter 2, "Setup and Configuration," in the section titled, "Creating a Mirror Replication instance using resource files."

10 Change to the $SYBASE directory and run the MRO:

```
$SYBASE/MRO-12_6/my_mro
```

Execute the *RUN* file. For example:

```
./RUN_my_mro &
```

Your MRO is now running.

Step 3. Verify the MRO instance installation

This section describes the required steps to verify an MRO instance:

- Update the Rep Server *interfaces* file with the MRO location
- Verify the connection to MRO
- Verify the MRO connection to Oracle

❖ **To verify the MRO installation**

1 Using dsedit, update the MRO *interfaces* file to include an entry for the MRO location.

Note You can use any TDS client utility (isql, isqlApp, or SQLAdvantage) that you prefer.

2 Verify the connection to MRO:

a Open a command window in the *$SYBASE* directory of your MRO installation.

b Set the environment variables by sourcing the *SYBASE.csh* file.

c Use isql to log in to MRO:

```
isql -Usa -P -Smy_mro
```

3 Verify the MRO connection to Rep Server:

a Enter the following command:

```
test_connection RS
```

```
go
```

b The following is displayed:

```
 Type Connection
 ---- ----------
 RS   succeeded
(1 row affected)
```

c If the result indicates a failure, either the server is not responding, or the connection properties (host, port, user, or password) are incorrect.

Verify the host and port configuration values, and manually log into the Rep Server as the configured user to determine which property is incorrectly defined.

For additional information, refer to the Mirror Replication Agent *Administration Guide*, Chapter 2, Setup and Configuration, in the section titled, "Testing network connectivity."

4 Verify the MRO connection to the primary Oracle database:

a Enter the following command:

```
test_connection PDS
go
```

The following message appears:

```
Type Connection
 ---- ----------
 PDS  succeeded
(1 row affected)
```

b If the result indicates a failure:

- The server is not responding, or
- The connection properties; host, port, pds_database_name usually oracle_sid, user, or password are incorrect.

Check the host and port configuration values, and manually log in to the primary Oracle database as the configured user to find which property is incorrectly defined.

For more information about connection failures, see the Replication Agent *Administration Guide* section titled, "Testing network connectivity."

Step 4. Initialize the MRO instance

This section describes the commands you must issue to initialize a MRO Instance:

❖ **To initialize the MRO instance**

1 The pdb_init command verifies that the primary Oracle database is correctly configured to provide archived logging and supplemental logging, and that the Oracle user ID used by the MRO has the necessary permissions. It also creates objects in the database to support stored procedure replication.

The pdb_init command includes the move_truncpt keyword that executes an archiving operation in Oracle to archive all *redo* log files. This establishes the current position in the *redo* log as the beginning of the log, from a replication standpoint.

To verify correct configuration for archived and supplemental logging, issue the following pdb_init command:

```
pdb_init move_truncpt

go
```

A message that indicates the procedure was successful is displayed.

For more information, see the Mirror Replication Agent *Administration Guide*, Chapter 2, Setup and Configuration, in the section titled, "Initializing the Mirror Replication Agent transaction log."

2 The ra_init command initializes the Replication Agent System Database (RASD) by reading schema information and *redo log* location information from the primary Oracle database. If this is a production setup, this step should coincide with creating the dump, copy, or data that is used to materialize the standby database.

To initialize the MRO to read schema and *redo log* location information from the primary Oracle database, issue the following ra_init command:

```
ra_init

go
```

A message that indicates the procedure was successful is displayed.

The ra_init command also causes pdb_automark_tables and pdb_auto_create_repdefs settings to take effect.

Note If this is a production setup, this step should coincide with creating the dump (copy) of data that is used to materialize the standby database.

3 The resume command puts the MRO in an *Active* state, reading the Oracle redo log and sending commands to MRO.

To place the MRO in an *Active* state, enter the resume command:

```
resume
go
```

If the MRO successfully transfers to a *Replicating* state, the following result is returned:

```
State        Action
 ------------ -------------------------
 REPLICATING  Ready to replicate data.
```

If the state returned is *ADMIN*, an error prevented the *Replicating* state from being achieved. To determine the error, review the contents of the MRO system log. Also, see the Mirror Replication Agent *Administration Guide*, Chapter 2, "Troubleshooting Mirror Replication Agent," in the section titled, "Examining the Mirror Replication Agent when replication failure occurs."

4 The ra_status command returns the state of the MRO. It is good practice to verify that the MRO remains in *Replication* state, even after the resume command executes successfully.

To detect an error that occurred after replication startup, execute the ra_status command:

```
ra_status
go
```

If the MRO is in *Replicating* state, the following result is returned:

```
State        Action
 ------------ -------------------------
 REPLICATING  Ready to replicate data.
```

If the state returned is *ADMIN*, an error prevented the *Replicating* state from being achieved. To determine the error, review the contents of the MRO system log.

Changes that were made may require execution of ra_init force before retrying status.

Also, see the Mirror Replication Agent *Administration Guide*, Chapter 2, "Troubleshooting Mirror Replication Agent," in the section titled, "Examining the Mirror Replication Agent when replication failure occurs."

5 The Rep Server admin who command validates that the primary and standby connections are active. To validate that both primary and standby connections are active, issue the admin who command:

```
isql -Usa -P -SSAMPLE_RS
admin who
go
```

Note Be aware of the following:

- The DSI connection for the primary database connection is usually down, because you are not replicating data *back to* the primary database.
- The MRO connection if established for the standby database connection is usually down, because you are not replicating data *from* the standby database.

Do not proceed until admin who has similar status for threads to the following:

```
admin who
go
```

The following is displayed:

```
 Spid Name       State               Info
---- ---------- -------------- --------------------------------
13 DSI EXEC Awaiting Command    101(1) SAMPLE_RS_ERSSD.SAMPLE_RS_ERSSD
9 DSI       Awaiting Message     101 SAMPLE_RS_ERSSD.SAMPLE_RS_ERSSD
8 SQM       Awaiting Message    101:0 SAMPLE_RS_ERSSD.SAMPLE_RS_ERSSD
54 DSI EXEC Awaiting Command     102(1) DCOServer.oratest2
53 DSI       Awaiting Message     102 DCOServer.oratest2
```

```
17 SQM       Awaiting Message    102:0 DCOServer.oratest2
DSI EXEC   Suspended            103(1) NY.NYora92
DSI        Suspended            103 NY.NYora92
24 DIST      Awaiting Wakeup     103 NY.NYora92
25 SQT       Awaiting Wakeup     103:1  DIST NY.NYora92
23 SQM       Awaiting Message    103:1 NY.NYora92
22 SQM       Awaiting Message    103:0 NY.NYora92
62 REP AGENT Awaiting Command     NY.NYora92
```

Step 5. Test replication

The following section describes the steps required to test replication.

- Create a test table.
- Grant permissions to the test table.
- Mark the table for replication.
- Insert data into the test table and commit it.

❖ **To test replication**

1 Connect to the primary Oracle instance as a regular user.

2 To create a test table to replicate (unless it already exists) enter the following command:

```
create table T1( a int b char(10), primary key(a,b));
```

This statement is replicated by the user defined in the MRO configuration parameter ddl_user. After the elapsed time referenced by the MRO setting, in scan_sleep_max, the T1 table should be replicated to the target Oracle instance.

3 Grant permissions to any new or existing object to be replicated, so that the Rep Server maintenance user can update this table:

```
grant all on T1 to public;
```

This statement is also replicated to the standby database by the ddl_user defined in the MRO configuration.

4 Mark the table for replication using the pdb_setreptable command and the mark keyword. For example:

```
isql -Usa -P -Smy_mro
```

```
pdb_setreptable T1, mark

go
```

For additional information about pdb_setreptable, see the Mirror Replication Agent *Administration Guide*, Chapter 2, "Troubleshooting Mirror Replication Agent", the section titled, "Marking objects in the primary database."

5 After the table is marked and the MRO is in a *Replicating* state, insert test data into the test table and commit it.

By default the work performed by the maintenance user of the primary connection will not be replicated. The userID used to insert transactions cannot be the same as the maintenance user defined in the primary connection. See the section titled "Step 3. Configure Rep Server for replication from the primary database" on page 80.

MRO only applies committed transactions to a standby database. However, because Oracle expects a commit command to be issued, follow simple test commands with an explicit commit command:

```
insert into T1 values ( 42, 'foo' ) ;

commit;
```

6 Using your preferred Oracle query tool, examine the standby site for results and compare the contents of your test table from both the primary and standby sites.

What to do if replication fails

If replication fails, refer to the Mirror Replication Agent *Administration Guide*, in Chapter 2, "Troubleshooting Mirror Replication Agent," the section titled, "Examining the Mirror Replication Agent when replication failure occurs."

Step 6. Reset the primary Oracle database for replication

In a test environment, there may be times when the replication environment should be *reset*. Instead of deleting and re-creating a new MRO instance, use the following procedure to facilitate resetting the environment.

❖ **To reset the primary Oracle database for replication**

1 Protect your new environment from old log information by using the following command in MRO to archive all current redo log data:

```
pdb_init move_truncpt
```

Or, use the Oracle command:

```
SQL> alter system archive log current ;
```

2 To retain marking and log device information, re-initialize the MRO using ra_init with the force option, which forces the MRO repository to be refreshed instead of overwritten:

```
ra_init force
```

Note If you prefer to delete and replace all the information in the MRO repository, issue the ra_deinit command followed by a normal ra_init command (without the force option):

For more information about the ra_init command, see the Mirror Replication Agent *Reference Manual*.

3 If you adjust or zero-out the locator stored in Rep Server, the following is an example of a rs_zeroltm command:

```
isql -USAMPLE_RS_RSSD_prim -PSAMPLE_RS_RSSD_prim_ps
-SSAMPLE_RS_ERSSD -DSAMPLE_RS_ERSSD

rs_zeroltm NY, NYora92

go
```

The following is displayed:

```
Locator has been reset to zero.

(return status = 0)
```

References

In addition to Sybase documents mentioned, you can also refer to the following documents:

- Oracle9i *Database Administrator's Guide* at http://download-west.oracle.com/docs/cd/B10501_01/server.920/a96521/toc.htm
- Oracle9i *Application Developer's Guide* at http://download-west.oracle.com/docs/cd/B10501_01/appdev.920/a96590/toc.htm
- Oracle9i *SQL Reference* at http://download-west.oracle.com/docs/cd/B10501_01/server.920/a96540/toc.htm

Glossary

This glossary describes Mirror Activator for Oracle terms used in this book.

Adaptive Server

The brand name for Sybase relational database management system (RDBMS) software products.

- *Adaptive Server Enterprise* manages multiple, large relational databases for high-volume online transaction processing (OLTP) systems and client applications.
- *Adaptive Server IQ* manages multiple, large relational databases with special indexing algorithms to support high-speed, high-volume business intelligence, decision support, and reporting client applications.
- *Adaptive Server Anywhere* manages relational databases with a small DBMS footprint, which is ideal for embedded applications and mobile device applications.

See also **DBMS** and **RDBMS**.

atomic materialization

A materialization method that copies subscription data from a primary database to a standby database in a single, atomic operation. No changes to primary data are allowed until the subscription data is captured at the primary database. See also **bulk materialization** and **nonatomic materialization**.

BCP utility

A bulk copy transfer utility that provides the ability to load multiple rows of data into a table in a target database. See also **bulk copy**.

bulk copy

An Open Client interface for the high-speed transfer of data between a database table and program variables. It provides an alternative to using SQL insert and select commands to transfer data.

bulk materialization

A materialization method whereby subscription data in a standby database is initialized outside of the replication system. You can use bulk materialization for subscriptions to table replication definitions or function replication definitions. See also **atomic materialization** and **nonatomic materialization**.

client — In client/server systems, the part of the system that sends requests to servers and processes the results of those requests. See also **client application**.

client application — Software that is responsible for the user interface, including menus, data entry screens, and report formats. See also **client**.

commit — An instruction to the DBMS to make permanent the changes requested in a transaction. See also **transaction**. Contrast with **rollback**.

data client — A client application that provides access to data by connecting to a data server. See also **client**, **client application**, and **data server**.

data distribution — A method of locating (or placing) discrete parts of a single set of data in multiple systems or at multiple sites. Data distribution is distinct from data replication, although a data replication system can be used to implement or support data distribution. Contrast with **data replication**.

data replication — The process of copying data to remote locations, and then keeping the replicated data synchronized with the primary data. Data replication is distinct from data distribution. Replicated data is stored copies of data at one or more remote sites throughout a system, and it is not necessarily distributed data. Contrast with **data distribution**. See also **disk replication** and **transaction replication**.

data server — A server that provides the functionality necessary to maintain the physical representation of a table in a database. Data servers are usually database servers, but they can also be any data repository with the interface and functionality a data client requires. See also **client**, **client application**, and **data client**.

database — A collection of data with a specific structure (or schema) for accepting, storing, and providing data for users. See also **data server**, **DBMS**, and **RDBMS**.

database connection — A connection that allows Replication Server to manage the database and distribute transactions to the database. Each database in a replication system can have only one database connection in Replication Server. See also **Replication Server** and **route**.

datatype — A keyword that identifies the characteristics of stored information on a computer. Some common datatypes are: char, int, smallint, date, time, numeric, and float. Different data servers support different datatypes.

DBMS An abbreviation for *database management system*. A DBMS is a computer-based system for defining, creating, manipulating, controlling, managing, and using databases. The DBMS can include the user interface for using the database, or it can be a stand-alone data server system. Compare with **RDBMS**.

DirectConnect (ECDA) A Sybase solution that gives client applications ODBC data access. It combines the functionality of the DirectConnect architecture with ODBC to provide dynamic SQL access to target data, as well as the ability to support stored procedures and text and image pointers.

disaster recovery A method or process used to restore the critical business functions interrupted by a catastrophic event. A disaster recovery (or business continuity) plan defines the resources and procedures required for an organization to recover from a disaster, based on specified recovery objectives.

disk replication A data replication method that copies blocks or pages from a primary disk device to a standby device. Sometimes referred to as *disk mirroring*. See also **data replication** and **transaction replication**.

ERSSD An abbreviation for embedded *Replication Server System Database*. The ERSSD manages replication system information for a Replication Server.

failback A procedure that restores the normal user and client access to a primary database, after a failover procedure switched access from the primary database to a standby database. See also **failover**.

failover A procedure that switches user and client access from a primary database to a standby database, particularly in the event of a failure that interrupts operations at the primary database, or access to the primary database. Failover is an important fault-tolerance feature for systems that require high availability. See also **failback**.

function A Replication Server object that represents a data server operation such as insert, delete, or begin transaction. Replication Server distributes operations to standby databases as functions. See also **function string**.

function string A string that Replication Server uses to map a function and its parameters to a data server API. Function strings allow Replication Server to support heterogeneous replication, in which the primary and standby databases are different types, with different SQL extensions and different command features. See also **function**.

gateway Connectivity software that allows two or more computer systems with different network architectures to communicate.

inbound queue A stable queue managed by Replication Server to spool messages received from a Mirror Replication Agent. See also **outbound queue** and **stable queue**.

interfaces file A file containing information that Sybase Open Client and Open Server applications need to establish connections to other Open Client and Open Server applications. See also **Open Client** and **Open Server**.

isql An interactive SQL client application that can connect and communicate with any Sybase Open Server application, including Adaptive Server, Mirror Replication Agent, and Replication Server. See also **Open Client** and **Open Server**.

Java An object-oriented programming language developed by Sun Microsystems. A platform-independent, "write once, run anywhere" programming language.

Java VM The Java Virtual Machine. The Java VM (or JVM) is the part of the Java Runtime Environment (JRE) that is responsible for interpreting Java byte codes. See also **Java** and **JRE**.

JDBC An abbreviation for *Java Database Connectivity*. JDBC is the standard communication protocol for connectivity between Java clients and data servers. See also **data server** and **Java**.

JRE An abbreviation for *Java Runtime Environment*. The JRE consists of the Java Virtual Machine (Java VM or JVM), the Java Core Classes, and supporting files. The JRE must be installed on a machine to run Java applications, such as the Mirror Replication Agent. See also **Java VM**.

LAN An abbreviation for "local area network." A local area network is a computer network located on the user's premises and covering a limited geographical area (usually a single site). Communication within a local area network is not subject to external regulations; however, communication across the LAN boundary can be subject to some form of regulation. Contrast with **WAN**.

latency In transaction replication, the time it takes to replicate a transaction from a primary database to a standby database. Specifically, latency is the time elapsed between committing an original transaction in the primary database and committing the replicated transaction in the standby database.

In disk replication, latency is the time elapsed between a disk write operation that changes a block or page on a primary device and the disk write operation that changes the replicated block or page on a mirror (or standby) device.

See also **disk replication** and **transaction replication**.

LOB — An abbreviation for *large object*. A LOB is a type of data element that is associated with a column that contains extremely large quantities of data.

Log Reader — An internal component of the Mirror Replication Agent that interacts with the primary database and mirror log devices to capture transactions for replication. See also **Log Transfer Interface** and **Log Transfer Manager**.

Log Transfer Interface — An internal component of the Mirror Replication Agent that interacts with Replication Server to forward transactions for distribution to a standby database. See also **Log Reader** and **Log Transfer Manager**.

Log Transfer Manager — An internal component of the Mirror Replication Agent that interacts with the other Mirror Replication Agent internal components to control and coordinate Mirror Replication Agent operations. See also **Log Reader** and **Log Transfer Interface**.

Maintenance User — A special user login name in the standby database that Replication Server uses to apply replicated transactions to the database. See also **Replication Server**.

materialization — The process of copying the data from a primary database to a standby database, initializing the standby database so that the Mirror Activator for Oracle system can begin replicating transactions. See also **atomic materialization**, **bulk materialization**, and **non-atomic materialization**.

Mirror Activator for Oracle — An application that reads a primary database transaction log to acquire information about data-changing transactions in the primary database, processes the log information, and then sends it to a Replication Server for distribution to a standby database. See also **primary database** and **Replication Server**.

nonatomic materialization — A materialization method that copies subscription data without a lock on the primary database. Changes to primary data are allowed during data transfer, which may cause temporary inconsistencies between the primary and standby databases. Contrast with **atomic materialization**. See also **bulk materialization**.

ODBC — An abbreviation for *Open Database Connectivity*. ODBC is an industry standard communication protocol for clients connecting to data servers. See also **JDBC**.

Open Client — A Sybase product that provides customer applications, third-party products, and other Sybase products with the interfaces needed to communicate with Open Server applications. See also **Open Server**.

Open Client application — An application that uses Sybase Open Client libraries to implement Open Client communication protocols. See also **Open Client** and **Open Server**.

Open Server — A Sybase product that provides the tools and interfaces required to create a custom server. See also **Open Client**.

Open Server application — A server application that uses Sybase Open Server libraries to implement Open Server communication protocols. See also **Open Client** and **Open Server**.

outbound queue — A stable queue managed by Replication Server to spool messages to a standby database. See also **inbound queue** and **stable queue**.

primary data — The version of a set of data that is the source used for replication. Primary data is stored and managed by the primary database. See also **Mirror Replication Agent**, **primary database**, and **Replication Server**.

primary database — The database that contains the data to be replicated to another database (the standby database) through a replication system. The primary database is the database that is the source of replicated data in a replication system. Sometimes called the *active database*. Contrast with **standby database**. See also **primary data**.

primary key — The column or columns whose data uniquely identify each row in a table.

primary site — The location or facility at which primary data servers and primary databases are deployed to support normal business operations. Sometimes called the *active site* or *main site*. See also **primary database** and **standby site**.

primary table — A table used as a source for replication. Primary tables are defined in the primary database schema. See also **primary data** and **primary database**.

primary transaction — A transaction that is committed in the primary database and recorded in the primary database transaction log. See also **primary database**, **replicated transaction**, and **transaction log**.

quiesce — To cause a system to go into a state in which further data changes are not allowed. See also **quiescent**.

quiescent — In a replication system, a state in which all updates have been propagated to their destinations. Some Mirror Replication Agent and Replication Server commands require that you first quiesce the replication system.

In a database, a state in which all data updates are suspended so that transactions cannot change any data and the data and log devices are stable.

This term is interchangeable with *quiesced* and *in quiesce*. See also **quiesce**.

RCL — An abbreviation for *Replication Command Language*. RCL is the command language used to manage Replication Server.

RDBMS An abbreviation for *relational database management system*. An RDBMS is an application that manages and controls relational databases. Compare with **DBMS**. See also **relational database**.

relational database A collection of data in which data is viewed as being stored in tables, which consist of columns (data items) and rows (units of information). Relational databases can be accessed by SQL requests. See also **SQL**.

replicated data A set of data that is replicated from a primary database to a standby database by a replication system. See also **primary database**, **replication system**, and **standby database**.

replicated transaction A primary transaction that is replicated from a primary database to a standby database by a transaction replication system. See also **primary database**, **primary transaction**, **standby database**, and **transaction replication**.

replication definition A description of a table or stored procedure in a primary database, for which subscriptions can be created. The replication definition, maintained by Replication Server, includes information about the columns to be replicated and the location of the primary table or stored procedure. See also **Replication Server** and **subscription**.

Replication Server The Sybase software product that provides the infrastructure for a robust transaction replication system. See also **Mirror Activator for Oracle**.

RSSD An abbreviation for *Replication Server System Database*. The RSSD manages replication system information for a Replication Server. See also **Replication Server**.

replication system A data processing system that replicates data from one location to another. Data can be replicated between separate systems at a single site, or from one or more local systems to one or more remote systems. See also **disk replication** and **transaction replication**.

rollback An instruction to a database to back out of the changes requested in a unit of work (called a transaction). Contrast with **commit**. See also **transaction**.

SQL An abbreviation for *Structured Query Language*. SQL is a non-procedural programming language used to process data in a relational database. ANSI SQL is an industry standard. See also **transaction**.

stable queue A disk device-based, store-and-forward queue managed by Replication Server. Messages written into the stable queue remain there until they can be delivered to the appropriate process or standby database. Replication Server provides a stable queue for both incoming messages (the inbound queue) and outgoing messages (the outbound queue). See also **database connection**, **Replication Server**, and **route**.

standby data The data managed by a standby database, which is the destination (or target) of a replication system. See also **data replication** and **standby database**.

standby database A database that contains data replicated from another database (the primary database) through a replication system. The standby database is the database that receives replicated data in a replication system. Sometimes called the *replicate database*. Contrast with **primary database**. See also **standby data**.

standby site The location or facility at which standby data servers and standby databases are deployed to support disaster recovery, and normal business operations during scheduled downtime at the primary site. Sometimes called the *alternate site* or *replicate site*. Contrast with **primary site**. See also **standby database**.

subscription A request for Replication Server to maintain a replicated copy of a table, or a set of rows from a table, in a standby database at a specified location. See also **replication definition** and **Replication Server**.

table In a relational DBMS, a two-dimensional array of data or a named data object that contains a specific number of unordered rows composed of a group of columns that are specific for the table. See also **database**.

transaction A unit of work in a database that can include zero, one, or many operations (including insert, update, and delete operations), and that is either applied or rejected as a whole. Each SQL statement that modifies data can be treated as a separate transaction, if the database is so configured. See also **SQL**.

transaction log Generally, the log of transactions that affect the data managed by a data server. Mirror Replication Agent reads the transaction log to identify and acquire the transactions to be replicated from the primary database. See also **Mirror Replication Agent**, **primary database**, and **Replication Server**.

transaction replication A data replication method that copies data-changing operations from a primary database transaction log to a standby database. See also **data replication** and **disk replication**.

transactional consistency A condition in which all transactions in the primary database are applied in the standby database, in the same order that they were applied in the primary database.

WAN An abbreviation for “wide area network.” A wide area network is a system of local-area networks (LANs) connected together with data communication lines. Contrast with **LAN**.

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