

SYBASE®

Overview Guide

Replication Server® Heterogeneous Edition

15.2

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About This Book

Audience

This guide is for administrators who want to set up heterogeneous replication in their enterprise.

How to use this book

This book contains these chapters:

- Chapter 1, “Introduction,” describes the Replication Server® Heterogeneous Edition and its components, licensing requirements, and how to administer the various components.
- Chapter 2, “Migration,” provides instructions for migrating from Data Integration Suite - Replication 1.2 to Replication Server Heterogeneous Edition 15.2.
- Chapter 3, “Sample Solutions,” provides various sample solutions using Replication Server Heterogeneous Edition components.

Related documents

The Replication Server Heterogeneous Edition documentation set includes:

- *Replication Server Heterogeneous Edition Quick Start Guide* – provides step-by-step instructions for installing and setting up a heterogeneous replication environment for Oracle, IBM DB2 UDB, and Microsoft SQL Server databases.
- *Replication Server Heterogeneous Edition Release Bulletin for Microsoft Windows, Linux, and UNIX* – contains last-minute information that was too late to be included in the books.

The Replication Server Heterogeneous Edition documentation set also includes:

- Release bulletins, installation guides, administration guides, and reference manuals for these Sybase® products, which are included in the Replication Server Heterogeneous Edition:
 - Replication Server®
 - Replication Agent™
 - Enterprise Connect™ Data Access
 - PowerDesigner®

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.

❖ Finding 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.

❖ Finding 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.

❖ **Creating 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

❖ **Finding 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.

Conventions

The syntax conventions used in this manual are:

Key	Definition
commands and methods	Command names, command option names, utility names, utility flags, Java methods/classes/packages, and other keywords are in lowercase Arial font.
<i>variable</i>	Italic font indicates: <ul style="list-style-type: none">• Program variables, such as <i>myServer</i>• Parts of input text that must be substituted; for example: <pre>Server.log</pre>• File names
File Save	Menu names and menu items appear in plain text. The vertical bar shows you how to navigate menu selections. For example, File Save indicates “select Save from the File menu.”
package 1	Courier font indicates: <ul style="list-style-type: none">• Information that you enter in a GUI interface, a command line, or as program text• Sample program fragments• Sample output fragments
<i>sybase\bin</i>	A backward slash (“\”) indicates cross-platform directory information. A forward slash (“/”) applies to information specific only to UNIX. Directory names appearing in text display in lowercase unless the system is case sensitive.

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.

The HTML documentation has been tested for compliance with the 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.

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.

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.



Introduction

This chapter introduces Replication Server Heterogeneous Edition (RSHE) and provides information on how to use the various components for your replication needs.

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Integrating data from heterogeneous sources

Integration of data from various sources is a major challenge for organizations. Data sources are often heterogeneous and geographically scattered. Business decisions require information consolidation to be available at the right time and at the right place.

Consolidation of data that resides in different database systems within an organization is often difficult. In such a scenario, it is necessary for the various heterogeneous databases to work together. Each system may have different access interfaces, different datatypes, and different error handling techniques. The RSHE provides a replication-based solution that addresses these problems.

About Replication Server Heterogeneous Edition

RSHE is a replication solution that is designed to address the heterogeneous replication needs of an organization. RSHE supports Adaptive Server® Enterprise and non-Sybase data sources such as Oracle, IBM DB2 UDB, Microsoft SQL Server. The RSHE:

- Ensures availability of data across your enterprise by delivering real-time information to, and maintaining synchronized copies of, distributed data at multiple sites.
- Lets you design the data flow across various systems using a model-driven approach.
- Replicates data across heterogeneous environments using numerous databases, allowing data to be shared among different operational and decision-support systems, without affecting business performance.
- Integrates disparate business systems, including legacy data, into a coordinated, easily accessed, and powerful corporate business enterprise database.
- Allows application development and modeling by providing an easy-to-use enterprise modeling environment. You need not create or learn new tools to access metadata information about heterogeneous database server.

RSHE components

The RSHE includes these replication components:

- Replication Server 15.2
- Replication Agent 15.2
- Enterprise Connect Data Access (ECDA) 15.0

RSHE also includes PowerDesigner 15.1 as your development tool, which is packaged separately. Download PowerDesigner from the Sybase Product Download Center (SPDC) at <https://sybase.subscribenet.com/>. See “Sybase PowerDesigner licenses” on page 6.

Note Sybase Control Center 3.0.1 is not included with RSHE. You can separately download this application by selecting EBFs/Maintenance from the Sybase Support Page at <http://www.sybase.com/support>. You can use Sybase Control Center to monitor your RSHE components.

Replication Server

Replication Server is used for distributing and synchronizing operational data in a heterogeneous replication environment. Replication Server updates multiple databases so that you can access local data instead of remote, centralized databases.

Replication Server works to distribute data over a network by:

- Providing a flexible publish-and-subscribe model for marking data and stored procedures to be replicated
- Managing replicated transactions while retaining transaction integrity across the network

In RSHE, use Replication Server Manager™ (RSM) to manage, monitor, and troubleshoot most replication system components.

See the *Replication Server 15.2 Administration Guides*.

Replication Agent

Replication Agent captures replicated transactions in a primary database and sends those transactions to a Replication Server for distribution to replicate databases. Replication Agent extends the capabilities of Replication Server by allowing non-Sybase data servers to act as primary data servers in a replication system based on Sybase replication technology.

Replication Agent supports replicating data from Oracle, Microsoft SQL Server, and IBM DB2 UDB hosted on UNIX, Linux, and Microsoft Windows.

See the *Replication Agent 15.2 Administration Guide*.

Enterprise Connect Data Access

ECDA is an integrated set of software applications and connectivity tools that provides transparent data access within an enterprise. ECDA extends the capabilities of Replication Server by allowing non-Sybase data servers to act as replicate data servers in a replication system based on Sybase replication technology.

ECDA consists of a DirectConnect™ server and one or more access service libraries that have specific sets of configuration properties. The DirectConnect server provides the framework in which the service libraries operate. Each access service library gives Replication Server the ability to replicate data to a particular target database, including Oracle and Microsoft SQL Server, as well as IBM DB2 UDB hosted on UNIX, Linux, Microsoft Windows, z/OS, and AS400.

See the *Enterprise Connect Data Access 15.0 Overview Guide*.

PowerDesigner

You can use PowerDesigner to set up and manage a heterogeneous replication system. PowerDesigner Information Liquidity Modeling (ILM) provides a model-driven approach to creating replication metadata—such as connections, routes, replication definitions—and improves overall development, maintenance and understanding of simple to complex replication environments.

The ILM is integrated with other parts of PowerDesigner, namely the physical database model, where schema information for both primary and replicate databases can be used in the ILM.

Additionally, because the PowerDesigner repository contains information about both the database schemas and the replication metadata, it can analyze changes and report the impact on the related component, and coordinate those changes across multiple servers.

PowerDesigner also lets you configure the servers, connections, routes, and Replication Agents in a replication environment. You can:

- Diagram and generate complex replication environments.
- Reverse-engineer existing environments.
- Represent and store a replication environment for reference and documentation purposes.

- Iteratively manage change.
- Perform complete impact analysis.
- Model change prior to implementation.

Note PowerDesigner 15.1 supports Replication Server 15.2, but the level of features supported by PowerDesigner is for Replication Server 15.1.

For more information about using PowerDesigner for replication systems, see the PowerDesigner 15.1 documentation.

Sybase Control Center

Sybase Control Center for Replication is a Web-based solution that allows you to monitor your replication environments. Key features include:

- Availability monitoring
- Replication latency

For more information about Sybase Control Center for Replication, see the Sybase Control Center 3.0.1 online help.

License requirements

RSHE uses the Sybase Software Asset Management (SySAM) licensing mechanism for license administration and asset management tasks. After you purchase RSHE components, go to the Sybase Product Download Center (SPDC) at <http://sybase.subscribenet.com> to generate and download the licenses. See the *Sybase Software Asset Management Users Guide*:

Deployment and licensing options for RSHE components

Table 1-1 describes the deployment and license options for RSHE components.

Table 1-1: Deployment and licensing options for RSHE components

RSHE component	Deployment and licensing options
Replication Server	<ul style="list-style-type: none"> • A SysSAM served or unserved license is required to unlock this component. • Installation is allowed on multiple machines in the distributed environment. This depends on the number of CPU licenses you have purchased.
Replication Agent	<ul style="list-style-type: none"> • Obtain the <i>RSHE_lic.tgz</i> license file that contains the Replication Agent license, ECDA license and the Readme file from the SPDC Web site or the Getting Started CD. • Installation is allowed on multiple machines that contain the supported database in the distributed environment. • You can use Replication Agent only with Replication Server covered under the RSHE license.
ECDA	<ul style="list-style-type: none"> • Obtain the <i>RSHE_lic.tgz</i> license file that contains the ECDA license, Replication Agent license, and the Readme file from the SPDC Web site or the Getting Started CD. • Installation is allowed on multiple machines in the distributed environment. However, for improved performance, Sybase recommends that you install ECDA on the same server as the database it supports. • You can use ECDA only with Replication Server covered under the RSHE license.

See the *Replication Server Heterogeneous Edition 15.2 Release Bulletin* for detailed instructions on how to download and install the RSHE static licenses for Replication Agent and ECDA.

Sybase PowerDesigner licenses

To use the development and tooling capabilities for the RSHE components, you must download Sybase PowerDesigner, which is packaged separately. Select PowerDesigner from the Sybase Product Download Center (SPDC) at <http://sybase.subscribenet.com> to generate and download the PowerDesigner development licenses.

Sybase Control Center licenses

If you are on active support for products supported by Sybase Control Center, you do not need a license to use Sybase Control Center. You can download the installer from the Sybase Downloads site at <http://www.sybase.com/downloads>.

Administering RSHE components

This section describes some of the administrative tasks that you can perform for RSHE components using the Replication Manager plug-in and the DirectConnect Manager plug-in for Sybase Central™.

Using Replication Manager Plug-in

Sybase integrates system management tools into Sybase Central, which users can navigate using a central viewer. Each server product, such as Replication Server, is managed by a service provider “plug-in” that coexists with other service providers in the Sybase Central framework.

Replication Server uses the Replication Manager (RM) plug-in, which provides:

- A graphical user interface
- The ability for system administrators to manage, monitor, and troubleshoot most replication system components (including primary and replicate data servers, Replication Agents, and database gateway servers)
- Extensive online help that provides a quick reference for Replication Server concepts and tasks

See the Replication Manager online help.

Using DirectConnect Manager Plug-in

DirectConnect Manager is an administration tool for DirectConnect servers. It allows you to access running DirectConnect servers and perform various administrative tasks, such as:

- Connect DirectConnect Manager to a DirectConnect server.

- Perform server administration tasks, such as starting, stopping, and adding servers.
- Remotely manage server configuration properties.
- Add, copy, and remove access services.
- Redirect client connection requests to the services you designate.
- Manage your Transaction Router Services (TRS) logins, passwords, remote procedure calls (RPC), regions, and more.
- Add an RPC to a gateway-less server.

See the DirectConnect Manager online help.

Using Sybase Control Center to monitor RSHE components

Sybase Control Center for Replication provides status information at a glance, using server dashboards and a heat chart for displaying the availability or status of a specific server. The server dashboards display high-level information, such as server version and platform as well as critical performance counters to aid you in troubleshooting replication performance.

Sybase Control Center for Replication also provides a topology view that graphically shows the servers and the connections between them, and data flow in the environment. Graphs and charts are also available for monitoring performance counters.

This chapter specifies the supported migration path for Data Integration (DI) Suite - Replication 1.2 components to RSHE 15.2 components.

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Migrating to RSHE components

Replication Server	Install Replication Server 15.2 using the Replication Server installer. For information about upgrading Replication Server, see <i>Replication Server 15.2 Release Bulletin</i> for your platform.
Replication Agent	Install Replication Agent 15.2 using the Replication Agent installer. For information about upgrading Replication Agent, see Appendix A, “Upgrading Replication Agent,” in the <i>Replication Agent Primary Database Guide 15.2</i> .
ECDA	<p>If you already have ECDA installed from DI Suite - Replication 1.2, there is no need to re-install it from RSHE. Otherwise, install ECDA 15.0 using the ECDA installer, then download and apply ESD #3.</p> <p>For additional information about ECDA 15.0 ESD #3, see the ECDA 15.0 ESD #3 Release Cover Letter available at the Sybase Downloads site at http://www.sybase.com/downloads.</p>

This chapter shows, through a variety of examples, various ways you can use RSHE components to meet the needs of your enterprise.

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Scenario: Distributing enterprise data between multiple central databases

A large regional supplier maintains its enterprise data in a central database in Sacramento. The company then merges with a second regional supplier of comparable size in Denver. The Sacramento enterprise maintains its data on an Oracle system, but the Denver enterprise uses Adaptive Server Enterprise (ASE). To circumvent the lengthy and expensive process of migrating data in either location to another platform, both organizations implement an integrated, bidirectional replication system

To set up bidirectional, enterprise-wide replication, the Sacramento and Denver enterprises use these components because it is preferable, although not mandatory:

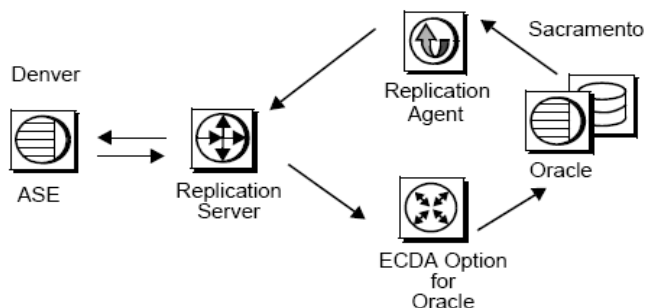
- Replication Server
- Replication Agent for Oracle
- ECDA Option for Oracle

The Replication Agent for Oracle and ECDA Option for Oracle are installed at the Sacramento location where Oracle is installed.

Note Access to ASE in Denver is required, however ASE is not included in RSHE.

Figure 3-1 illustrates the sample scenario that integrates Oracle data in Sacramento with ASE data in Denver. In this case, the Replication Server acts as both the primary Replication Server and the replicate Replication Server.

Figure 3-1: Bidirectional, enterprise-wide replication



Scenario: Consolidating data into a central repository

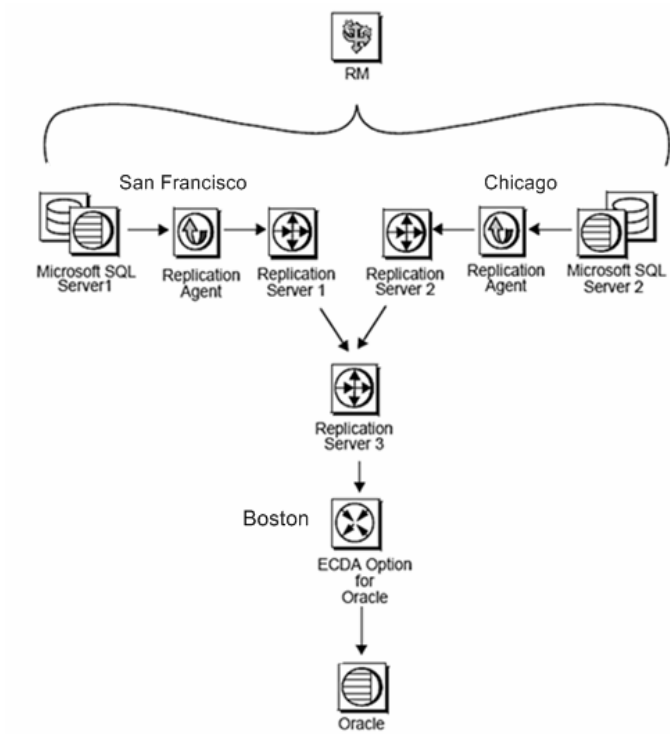
A telecommunications company has satellite offices in San Francisco and Chicago that use Microsoft SQL Server to store local customer information. The head office in Boston uses Oracle to store company-wide customer information. Replication Agent captures the changes in Microsoft SQL Server at the satellite offices and passes them to Replication Server. Replication Server then applies data changes to the headquarters' consolidated customer database, which is stored in Oracle.

To set up unidirectional consolidation into a central repository, the telecommunications company uses these components:

- Replication Server
- Replication Agent for Microsoft SQL Server
- ECDA Option for Oracle

When there are many primary and replicate databases or the volume is very large, multiple Replication Servers are used to improve performance. In Figure 3-2, Replication Server 1 and Replication Server 2 are both primary Replication Servers, while Replication Server 3 is the replicate Replication Server.

Figure 3-2: Unidirectional consolidation into central repository



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