SYBASE®

Configuration Guide

Replication Server®

15.5

[Windows]

Contents

About This Book

Audience

This guide is for system administrators or other qualified installers who are familiar with their system environment, networks, disk resources, and media devices.

How to use this book

This book explains how to:

- Set up and configure a replication system

- Start and stop a Sybase® Replication Server®

- Upgrade or downgrade Replication Server software

See the Replication Server release bulletin for your platform for the operating system and platforms that Replication Server supports.

Use this book with the *Replication Server Installation Guide for Windows* to install and set up Replication Server.

The information in this book is organized as follows:

- Chapter 1, "Preparing to Install and Configure Replication Server" describes what you need to know and do before you install Replication Server. Worksheets help you organize the installation information.

- Chapter 2, "Configuring Replication Server and Adding Databases with rs_init" explains how to install Replication Servers and use rs_init to add Sybase Adaptive Server® Enterprise databases to your replication system.

- Chapter 3, "Upgrading or Downgrading Replication Server" describes how to upgrade from an earlier version of Replication Server. It also explains how to downgrade your replication system to revert to an earlier version.

- Chapter 4, "Using Password Encryption" describes how to use rs_init to enable password encryption for a Replication Server. It also explains how to alter passwords in configuration files.

- Chapter 5, "Secure Sockets Layer" describes how to enable SSL for a Replication Server.

- Chapter 6, "Starting or Stopping a Replication Server" explains how to begin using Replication Server.

- Chapter 7, "Replication Monitoring Services" explains how to configure Replication Monitoring Services (RMS).

- Chapter 8, "Installing and Implementing Non-ASE Support Features" explains how to install and configure support for non-Adaptive Server (non-ASE) data servers.

- Appendix A, "Worksheets" includes the Replication Server Installation Worksheet, which you can use to collect and record the information you need to install and configure a Replication Server, and the Database Setup Worksheet, which you can use to collect and record the information you need to add a database to your replication system.

- Appendix B, "Using rs_init with Resource Files" explains how to run rs_init in batch mode using resource files.

- Appendix C, "Sample Replication System" explains how to set up a simple replication system using the pubs2 database provided with Adaptive Server. This exercise is a good introduction to Replication Server.

Related documents   The Replication Server documentation set consists of the following:

- The *Release Bulletin* for your platform – contains last-minute information that was too late to be included in the books.

  A more recent version of the *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 Product Manuals at http://www.sybase.com/support/manuals/.

- *Installation Guide* for your platform – describes installation and upgrade procedures for all Replication Server and related products.

- *Configuration Guide* for your platform (this book) – describes configuration procedures for Replication Server and related products.

- *Getting Started with Replication Server* – provides step-by-step instructions for installing and setting up a simple replication system.

- *ASE-to-ASE Replication Quick Start Guide* – provides information for Adaptive Server users who want to set up a Replication Server to replicate data from one Adaptive Server database to another.

- *New Features Guide* – describes the new features in Replication Server.

- *Administration Guide* – contains an introduction to replication systems. This manual includes information and guidelines for creating and managing a replication system, setting up security, recovering from system failures, and improving performance.

- *Design Guide* – contains information about designing a replication system and integrating heterogeneous data servers into a replication system.

- *Heterogeneous Replication Guide* and the Replication Server Options documentation set – describes how to use Replication Server to replicate data between databases supplied by different vendors.

- *Reference Manual* – contains the syntax and detailed descriptions of Replication Server commands in the Replication Command Language (RCL); Replication Server system functions; Adaptive Server commands, system procedures, and stored procedures used with Replication Server; Replication Server executable programs; and Replication Server system tables.

- *System Tables Diagram* – illustrates system tables and their entity relationships in a poster format. Available only in print version.

- *Troubleshooting Guide* – contains information to aid in diagnosing and correcting problems in the replication system.

- Replication Manager plug-in help, which contains information about using Sybase Central™ to manage Replication Server.

For information about specific Windows commands, see the documentation or online help for your Windows operating system.

Other sources of information

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

- The Getting Started CD is included with your software and contains release bulletins, installation guides in PDF format, and other documents or updated information. 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.

  You can also access the documents available on the Getting Started CD from the Sybase Product Manuals Web site.

- The Sybase Product Manuals Web site, which can be accessed using a standard Web browser, includes the Replication Server documents that are not included in the Getting Started CD. 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 Partner Certification Report.

3 In the Partner Certification Report filter select a product, platform, and timeframe and then click Go.

4 Click a Partner 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   This section describes the stylistic and syntactic conventions used in this book.

Style conventions   Syntax statements (displaying the syntax and options for
a command) are printed as follows:

alter user *user*
set password *new_passwd*
[verify password *old_passwd*]

Examples that show the use of Replication Server commands are printed as
follows:

```
alter user louise
set password hFE5t
verify password hFE5t
```

Command names, command option names, program names, program flags,
keywords, configuration parameters, functions, and stored procedures are
printed as follows:

•   Use alter user to change the password for a login name.

•   Variables, parameters to functions and stored procedures, and user-
supplied words are in italics in syntax and in paragraph text, as follows:

The set password *new_passwd* clause specifies a new password.

- Names of database objects, such as databases, tables, columns, and datatypes, are in italics in paragraph text, as follows:

  The base_price column in the Items table is a money datatype.

- Names of replication objects, such as function-string classes, error classes, replication definitions, and subscriptions, are in italics.

Syntax conventions   Syntax formatting conventions are summarized in Table 1. Examples combining these elements follow.

Table 1: Syntax formatting conventions

Key	Definition
variable	Variables (words standing for values that you fill in) are in italics.
{ }	Curly braces mean you must choose at least one of the enclosed options. Do not include braces in the command.
[ ]	Brackets mean you may choose or omit enclosed options. Do not include brackets in the command.
|	Vertical bars mean you may choose no more than one option (enclosed in braces or brackets).
,	Commas mean you may choose as many options as you need (enclosed in braces or brackets). Separate your choices with commas, to be typed as part of the command. Commas may also be required in other syntax contexts.
( )	Parentheses are to be typed as part of the command.
...	An ellipsis (three dots) means you may repeat the last unit as many times as you need. Do not include ellipses in the command.

Obligatory Choices:

- Curly braces and vertical bars – choose only one option.

```
{red | yellow | blue}
```

- Curly braces and commas – choose one or more options. If you choose more than one, separate your choices with commas.

```
{cash, check, credit}
```

Optional choices:

- One item in square brackets – choose it or omit it.

```
[anchovies]
```

- Square brackets and vertical bars – choose none or only one.

```
[beans | rice | sweet_potatoes]
```

- Square brackets and commas – choose none, one, or more options. If you choose more than one, separate your choices with commas.

```
[extra_cheese, avocados, sour_cream]
```

Repeating elements:

An ellipsis (...) means that you may repeat the last unit as many times as you need. For the alter function replication definition command, for example, you can list one or more parameters and their datatypes for either the add clause or the add searchable parameters clause:

```
alter function replication definition function_rep_def
    {deliver as 'proc_name' |
    add @parameter datatype[, @parameter
        datatype]... |
    add searchable parameters @parameter
        [, @parameter]... |
    send standby {all | replication definition}
        parameters}
```

Terminology

In this book, Replication Agent is the generic term used for describing the Replication Agents for Adaptive Server Enterprise, Oracle, IBM DB2 UDB, and Microsoft SQL Server. The specific names are:

- RepAgent – Replication Agent thread for Adaptive Server Enterprise

- Replication Agent for ODBC – Replication Agent for IBM DB2 UDB and Microsoft SQL Server

- Replication Agent for Oracle – Replication Agent for Oracle

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.

Replication Server HTML documentation has 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.

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.

Preparing to Install and Configure Replication Server

Topic	Page
Before you begin	1
Planning the replication system	1
Using the Replication Server installation worksheet	4
Completing the database setup worksheet	20

Before you begin

Sybase recommends that you read this guide to plan your replication system before installing Replication Server. The installer includes a sample Replication Server that you can install. You can begin installing Replication Server now and return to this guide to configure Replication Server. See the *Replication Server Installation Guide* to install and use the sample Replication Server.

You can use the "Worksheets" on page 83 to collect and record the information you need to install and configure a Replication Server, and to collect and record the information you need to add a database to your replication system.

Planning the replication system

Answer these questions before you begin to install and configure the software.

Where is the primary data?	Determine which Adaptive Server databases contain the data you want to replicate to other databases.

Note Although this guide refers to Adaptive Server databases, you can use non-Adaptive Server databases with Replication Server. See Chapter 8, "Installing and Implementing Non-ASE Support Features."

Where will you replicate the data?	Determine the Adaptive Server databases where Replication Server will maintain copies of the data.
What Replication Servers will you need?	When you design a replication system, you decide how many Replication Servers will be installed, which databases they will manage, and on which machine they will execute.

A Replication Server can manage one or more databases. One Replication Server is adequate for some replication systems. Other systems require a Replication Server at each geographic site to manage all of the databases at that site. Still others require multiple Replication Servers at each site to handle many databases or heavy transaction volumes.

When you upgrade Replication Servers, you can phase in the upgrades and install newer versions of Replication Servers initially only at certain sites. Consider the timing of such upgrades with care, and assess the need at each site for the new Replication Server features. See Chapter 3, "Upgrading or Downgrading Replication Server."

Where is the RSSD for each Replication Server?	Replication system data is stored in a dedicated Adaptive Server Enterprise database called the Replication Server System Database (RSSD), or in an embedded Replication Server System Database (ERSSD) using SQL Anywhere®. RSSD must be actively managed, while ERSSD is automatically created, configured, and maintained by Replication Server. If you choose to use RSSD, it is created when the Replication Server is installed.

Before you begin the installation, decide which Adaptive Server will store the RSSD for the Replication Server and the devices on which the database and its log will be stored. You can create the Adaptive Server database devices during installation, but identify their physical disk location before you install the Replication Servers.

If you use ERSSD, decide the directory paths for the ERSSD database file, transaction log, and backup. For better performance and recoverability, the database file, transaction log, and backup directory should be on different disk devices.

Where is the initial disk partition for each Replication Server?	Replication Server stores messages, such as replicated transactions, on disk in stable queues. Disk space for the queues is allocated from disk partitions you create. Disk partitions are Windows disk files.

You must allocate a disk partition of at least 20MB for each Replication Server you install. You can add more partitions later if necessary. Check each partition to make sure that it is available and that the Windows System Administrator can write to it. To use an operating disk for a partition, create an empty file. Verify that there is enough space on the file system for Replication Server to extend the disk partition file to full partition size.

Allocate the entire partition to the Replication Server. If you allocate only a portion of the partition to Replication Server, you cannot use the remainder for any other purpose. Allow read or write permissions on the partition only if the user must have permission to start Replication Server.

Which Replication Server is the ID Server?

The first Replication Server you install is the ID Server. It must be running when you install new Replication Servers or add databases to the replication system.

The ID Server assigns a unique site ID to each Replication Server and a unique database ID to each database in the replication system. It also maintains replication system version information.

Which databases require Replication Agents?

A Replication Agent retrieves transactions from a database log, and passes them to the replication system via the Replication Server that manages the database.

There is one Replication Agent per database. Because the Replication Agent is configured when a database is set up for replication, you must know whether a Replication Agent is required before you add a database to the replication system. A user database requires a Replication Agent if:

- The database holds primary data that is replicated to other databases managed by the same or different Replication Servers.

- The Replication Server manages a database that is a source of replicated stored procedure execution.

  You can replicate a stored procedure execution from a primary to replicate databases or from a replicate to a primary database. Replication Agent retrieves the procedure call information from the database transaction log. See the *Replication Server Administration Guide Volume 1*.

- The database is the active or standby database in a warm standby application. Replication Agent for a standby database is needed only when you switch to the standby database. See the *Replication Server Administration Guide Volume 1*.

An RSSD requires a Replication Agent if the Replication Server using that RSSD has a route to another Replication Server; for example:

- The Replication Server manages primary data that is replicated to databases managed by other Replication Servers.

- The Replication Server manages a database that is a source of replicated stored procedure execution.

- The Replication Server is an intermediate site in an indirect route.

An RSSD does not require a Replication Agent if the replication system has only one Replication Server. Replication Agent for ERSSD is managed by Replication Server. It is automatically started when a route is created. You do not need to decide the ERSSD Replication Agent requirements at installation or configuration time of Replication Server.

Which databases require warm standby?

Replication Server can maintain a warm standby database for an Adaptive Server or Oracle database. If the active database fails, clients can switch to the standby database with little interruption.

To set up a warm standby application, you must perform some tasks in Replication Server before and after you add databases to the replication system. Read Chapter 3, "Managing Warm Standby Applications" in the *Replication Server Administration Guide Volume 2*, before you install Replication Server. See Chapter 14, "Managing Heterogeneous Warm Standby" in the *Replication Server Heterogeneous Replication Guide* to configure warm standby for Oracle databases.

Using the Replication Server installation worksheet

Make copies of the "Replication Server installation worksheet" on page 84. Use the copies to record information as you read the rest of this section. You can use the copies if you reconfigure your replication system.

The program used to configure Replication Server software is called rs_init. The sections on the worksheets correspond to the rs_init menus, so you can enter information from the worksheets directly into rs_init. See "Using rs_init" on page 25.

Completing the worksheet

Fill out each section of the installation worksheet.

rs_init supplies default values for most of the items in "Replication Server installation worksheet" on page 84 and "Database setup worksheet" on page 87. Many of the defaults are constructed from values that you enter. For example, if you enter "TOKYO_RS" for the Replication Server name, rs_init names the log file *TOKYO_RS.log*. You can accept the displayed value or enter a different value.

To use the rs_init defaults, complete the required items in the worksheet, which are marked with an asterisk (*). When you run rs_init, copy the default values from the menu to the worksheet to have a complete record of the configuration.

Replication Server reserves identifiers that begin with "rs_". Do not use names that begin with "rs_" for Adaptive Servers, Replication Servers, database objects, or login names. See the *Replication Server Reference Manual* for other restrictions.

The first eight characters of the Adaptive Server and Replication Server names must be unique on your network.

Release directory

The release directory—also called the installation directory—is where you install Replication Server. Replication Server creates a new directory structure that allows you to use multiple versions of some components.

You can install Replication Server version 15.5 in the existing directory structure of Replication Server version 12.0 and later.

Installing SQL Server or Adaptive Server in the same directory.

Usually, Replication Server is installed in the same %SYBASE% directory as other Sybase software. This allows the products to share common files and simplifies management of the interfaces file (*sql.ini*) used by all servers and client programs.

If you are installing SQL Server 11.0.x or Adaptive Server 11.5.1 and later, and Replication Server 15.5 in the same directory, you must install the products in this order:

1   SQL Server 11.0.x or Adaptive Server 11.5.1 or later

2   Replication Server 15.5

3   All required Emergency Bug Fixes (EBFs)

Choosing a Sybase installation directory

1   If this is the first Sybase software you are installing on your computer, select a path for the release directory. The installation program performs these steps when it sets the default release directory:

   a   If the SYBASE variable exists, it sets the default release directory to the directory to which SYBASE points.

   b   If the SYBASE variable does not exist, but the Registry entry *HKEY_LOCAL_MACHINE\Software\Sybase\Setup\Sybase* exists, it sets the default release directory to the directory specified by the Registry.

   c   If neither the SYBASE variable nor the Registry entry exists, the installation program creates the default release directory by concatenating the drive name of the system disk with \SYBASE. For example, if the system drive is C, then the default directory is *C:\SYBASE*.

2   Record the Sybase release directory on your worksheet.

Using more than one release directory

If you do not install Replication Server in the same directory with other Sybase software, you must:

1   Set the SYBASE environment variable to point to the correct release directory before you start each Sybase software.

   > **Note** Replication Server uses a directory structure that installs all Replication Server files in a directory called *REP-15_5*, which you can set with the %SYBASE_REP% environment variable.

2   Set the PATH variable so that it uses the correct DLL versions.

3   Keep a copy of *sql.ini* in each release directory, or use command line options to specify the correct *sql.ini* file when you start each Sybase software.

Replication Server information

This section explains how to complete the "Replication Server information" section of the worksheet:

•   **Replication Server name**   *Required* – enter a name for the Replication Server. The name must be unique in the replication system.

The name is not case-sensitive. However, if the Replication Server is part of a multiplatform replication system, ensure the same case is used in all instances.

> **Warning!** The first eight characters of Adaptive Server and Replication Server must be unique on your network.

- **Is this Replication Server the ID Server?** *Required* – select Yes if you are installing the ID Server. See "ID Server information" on page 12.

- **Replication Server error log**   Enter the path for the Replication Server error log file. Replication Server writes informational and error messages to this text file.

- **Replication Server configuration file**   Enter the path for the Replication Server configuration file, which contains parameters that Replication Server reads at start-up. See Chapter 4, "Managing a Replication System" in the *Replication Server Administration Guide Volume 1*.

- **Replication Server password encryption**   Select Yes if you want passwords to be encrypted in the Replication Server configuration file and in the RSSD.

> **Warning!** If you do not encrypt passwords, anyone with the required permissions can look at the passwords in the configuration files and in the RSSD rs_users system table.

- **Replication Server character set**   Enter the character set that the Replication Server will use. You can specify any Sybase-supported character set that is available for your language.

  For replication to work properly, the character set used by the Replication Server should match the character set used by the data servers and Replication Agents it controls. Additionally, it should be compatible with the character sets of the other Replication Servers in the system.

  By default, rs_init configures Replication Server with the native character set for your platform.

  The supported character sets in the English language version of Replication Server include:

  - cp437 (Code Page 437) – character set used in IBM PCs.

- cp850 (Code Page 850) – IBM/Microsoft Multilingual Character Set, used in IBM PCs.

- deckanji – DEC Kanji Code for JIS-X0208.

- eucgb – EUC GB encoding for Simplified Chinese character sets.

- eucjis – extended UNIX Code for JIS-X0201 and JIS-X0208.

- eucksc – (Code Page 949) EUC KSC Korean encoding.

- gb18030 – GB 18030-2000 standard for Chinese characters, established by the government of the People's Republic of China.

- iso15 – similar to iso_1.

- iso_1 (ISO-8859/1) – 8-bit character set for many systems. This is the default for Adaptive Server with Sun, NCR System 3000, Silicon Graphics IRIX, Digital OpenVMS, and IBM RISC System 6000 AIX.

- mac – default Macintosh character set.

- roman8 – Hewlett-Packard character set.

- roman9 – the same as roman8, except for codepoint 0xBA, previously treated as the universal currency symbol, now representing the euro currency symbol.

- sjis (Shift-JIS) – IBM/Microsoft Code for JIS-X0201 and JIS-X02081.

- utf8 – an ASCII-preserving encoding method for Unicode.

The Chinese language includes these character sets:

- eucgb

- gb18030

- utf8

The Japanese language includes these character sets:

- deckanji

- eucjis

- sjis

- utf8

The Korean language includes these character sets:

- eucksc

- utf8

The French, German, and Spanish languages include these character sets:

- cp437

- cp850

- iso15

- iso_1

- mac

- roman8

- roman9

- utf8

When you create a subscription, Replication Server copies the requested data from the primary database to the replicate database in a process known as subscription materialization. During subscription materialization, the primary data server converts character data to the replicate Replication Server character set. Make sure that the replicate Replication Server character set, if it is different from the primary data server character set, is installed at the primary data server.

Similarly, when you create a route, make sure that the character set of the destination Replication Server is installed at the data server of the source Replication Server RSSD.

- **Replication Server language**   Enter the language Replication Server should use to print messages to the error log and to clients. It can be any language that is compatible with the character set you install. Additional information about character sets is available in the *Adaptive Server Enterprise Configuration Guide*

  By default, rs_init configures Replication Server to print messages in U.S.English.

  Other available languages are Chinese, French, German, Japanese, Korean, and Spanish. rs_init uses the same identifiers for language names as Adaptive Server.

  If the language for the Replication Server and the language for its connected data servers are different, the language for the Replication Server must be installed at the data servers. This lets the data servers return messages to Replication Server in the configured language and recognize and format dates for the configured language.

For example, the date format "01/02/99" is equivalent to "January 2, 1999" in us_english but "February 1, 1999" in french. Data servers can format the date correctly only if the Replication Server configured language is installed.

- **Replication Server sort order**   Enter the sort order for the Replication Server. The sort order controls which rows of a table belong in a subscription that has a where clause involving character data. The sort order also controls how the identifiers you enter are recognized with regard to case sensitivity, accents, and so forth.

    You can specify any Sybase-supported sort order that is compatible with your character set. For replication to work properly, all sort orders in your replication system should be the same.

    By default, rs_init configures Replication Server with the binary sort order. Available sort orders vary, depending on the character set you plan to install. Sort orders are located in the Sybase release directory in the directory *charsets/charset_name*, where *charset_name* is the name of the character set.

    See the *Replication Server Design Guide* for guidelines on configuring languages, character sets, and sort orders in your replication system.

Replication Server security information

This section explains how to fill out the "Replication Server security information" section of the worksheet.

- **Enable network security**   *Required* – select Yes to enable external network security.

- **Type of security system**   If you are enabling network security, select DCE or Kerberos.

- **Login name**   Enter the name of the primary user who will make the secure connections. Sybase recommends that you use the name of the Replication Server as the principle user name.

- **Keytab file name**   Enter the full path to the location of the keytab file.

- **Use SSL security**   Select Yes if you are using Secure Sockets Layer (SSL) security.

- **SSL identity file**   Enter the full path to the location of the SSL identity file.

- **SSL private key password**   Enter the private key password. The default password is `password`.

See Chapter 5, "Secure Sockets Layer" in this guide for information specific to configuring SSL, and Chapter 8 "Managing Replication Server Security" in the *Replication Server Administration Guide Volume 1*, for more information on security.

Replication Server interfaces information

Use the "Replication Server interfaces information" section of the worksheet to record information that defines the network port where Replication Server listens for connections. Each entry in the interfaces file (*sql.ini* in the *ini* subdirectory of the Sybase release directory) is called a **listener service**.

- **Network driver** *Required* – check the box next to the type of network you want to use: Windows Sockets, Named Pipes, or NWLink IPX/SPX.

- **Connection information** *Required* – your entry depends on your choice of network driver. Table 1-1 lists the formats for each network driver.

Table 1-1: Connection information syntax

Protocol	Syntax

Windows Sockets TCP/IP	Two formats:
	`computer_name,port_number`
	`ip_address,port_number`
	where:
	• *computer_name* – is the name of your machine.
	• *ip_address* – is the IP address.
	• *port_number* – is a number between 1025 and 65535 that is unique on the machine.
	Examples:
	`FASTCAR,8877`
	`130.214.30.25,8877`

Named Pipes	`(Local) \pipe\`*identifier_1*`\[`*identifier_2*`]`
	`(Remote) \\computer_name\pipe\`*identifier_1*`\`
	`[identifier_2]`
	
	"\pipe" is a required prefix to all pipe names. *identifier_1* and *identifier_2* are unique names that conform to the eight-character MS-DOS naming convention. *identifier_2* is optional; however, each pipe name should be uniquely defined. Server pipes can only be local.
	Example (local):
	`\pipe\sybase\tokyo`
	Example (remote):
	`\\FASTCAR\pipe\sybase\sydney`

Protocol	Syntax
NWLink IPX/SPX	Three formats:

```
computer_name
net_number, node_number, socket_number
computer_name, socket number
```

where:

- *computer_name* – is the name of the machine.
- *net_number* and *node_number* – are obtained from the network.
- *socket_number* – is in hexadecimal format.

Example:

```
FASTCAR
16,1,83BD
FASTCAR,83BD
```

ID Server information

One Replication Server in a replication system is the ID Server. In addition to the usual Replication Server tasks, the Replication Server acting as the ID Server assigns a unique ID number to every Replication Server and database in the replication system. The ID Server also maintains version information for the replication system. Otherwise, the ID Server is like any other Replication Server.

When you install a new Replication Server or add a database to your replication system, the ID Server must be running. This allows the new Replication Server, or the Replication Server that manages the new database, to log in and retrieve an ID number. The ID Server must also be running whenever you create a route.

You must install the ID Server before you install any other Replication Server. If you have only one Replication Server, or if you are installing Replication Server for the first time, then that Replication Server is also the ID Server. If you are adding a Replication Server to an existing replication system, you must know the name of the Replication Server in the system that is the ID Server.

Warning! The ID Server is critical to your replication environment, and is difficult to move once it has been installed.

- **ID Server name**   *Required* – if the Replication Server you are installing is the ID Server, rs_init assigns an ID Server name identical to this Replication Server name.

If you are installing a new Replication Server in an existing Replication Server domain, enter the name of the Replication Server that is acting as the ID Server.

- **ID Server user**   If the Replication Server you are installing is the ID Server, enter the login name that other Replication Servers will use to connect to this ID Server.

  If you are installing a new Replication Server to an existing Replication Server domain, copy the ID Server user name from the worksheet you completed when you created the ID Server.

- **ID Server password**   If the Replication Server you are installing is the ID Server, enter the password for the ID Server user.

  If you are adding a new Replication Server to an existing Replication Server domain, copy the ID Server password from the worksheet you completed when you created the ID Server.

Note "Starting Replication Server ID" and "Starting Database ID" in the worksheet apply only to the ID Server. If you are not installing the ID Server, skip to "Replication Server System Database information" on page 14.

- **Starting Replication Server ID and starting database ID**   These two configuration parameters allow you to specify separate ranges of Replication Server ID numbers and database ID numbers that an ID Server will assign. Although you are not required to specify ranges, specifying ranges makes it easier to merge replication systems later.

  Some organizations have multiple independent replication systems. Each replication system has its own ID Server, which assigns unique IDs to its Replication Servers and databases. Since the ID Server determines member Replication Servers and databases in a replication system, one replication system in an organization with multiple replication systems is also called an ID Server domain.

  No special steps are required to set up multiple ID Server domains. Every Replication Server or database belongs to one replication system and has a unique ID number in that ID Server domain.

  If you decide to merge ID Server domains into one replication system, the task is easier if no two Replication Servers or databases in the organization have the same ID. To establish unique IDs, allocate non-overlapping ranges of ID numbers to the ID Servers at installation.

An ID Server assigns ID numbers sequentially. Separate ranges of values are maintained for databases and Replication Servers. The default ranges are shown in Table 1-2.

Table 1-2: Database and Replication Server default ID number ranges

Object type	Minimum ID number	Maximum ID number
Database	101	16777215
Replication Server	16777216	33554431

Minimum values for each ID Server must be within the ranges specified. For example, if your organization has three separate ID Server domains, you could set the minimum ID numbers as shown in Table 1-3.

Table 1-3: Example ID number allocation for ID Server domains

ID Server domain	Starting database ID	Starting Replication Server ID
Finance division	101	16777216
Manufacturing division	100101	16877216
Sales division	200101	16977216

This arrangement provides the ID Server in each domain at least 100,000 ID numbers for databases and 100,000 ID numbers for Replication Servers. You need not set a maximum value, since it is unlikely that you will install more than 100,000 Replication Servers or add more than 100,000 databases to a replication system.

See Chapter 4, "Managing a Replication System" in the *Replication Server Administration Guide Volume 1*, for more information about adding replication system domains.

Replication Server System Database information

Replication Server maintains its system tables in its system database. You can choose to set up a Replication Server System Database (RSSD) in an Adaptive Server Enterprise database, or an Embedded Replication Server System Database (ERSSD) in a SQL Anywhere (SA) database. Use the information in this section to complete the "Replication Server System Database" section of the worksheet.

If you want an RSSD with Adaptive Server Enterprise, see "Adaptive Server Enterprise RSSD information" on page 15. If you want an ERSSD with SQL Anywhere, see "SQL Anywhere ERSSD information."

SQL Anywhere ERSSD information

If you want an ERSSD, you must enter all of this information in your worksheet:

- **ERSSD name**   Enter the name of the SQL Anywhere server that will hold the system database for the Replication Server.

- **ERSSD database file directory**   Enter the directory for the SQL Anywhere server database file.

- **ERSSD transaction log directory**   Enter the directory for the SA server transaction log.

- **ERSSD backup directory**   Enter the directory for the SQL Anywhere server backup files.

- **ERSSD error log directory**   Enter the directory for the SQL Anywhere server error log file.

Note rs_init automatically fills these fields with default values on the same device. However for better performance and recoverability, place the ERSSD database directory, ERSSD transaction log directory, and ERSSD backup directory on separate devices.

See Chapter 4, "Managing a Replication System" in the *Replication Server Administration Guide Volume 1* for more information on ERSSDs.

Adaptive Server Enterprise RSSD information

If you want an RSSD using Adaptive Server Enterprise, enter the following:

- **RSSD Adaptive Server name**   *Required* – enter the name of the Adaptive Server that will hold the system database for the Replication Server.

- **RSSD name**   Enter the name of the database where the Replication Server system tables will be stored.

- **Will RSSD be replicated?**   *Required* – select Yes if the RSSD for the Replication Server requires a Replication Agent. See "Which databases require Replication Agents?" on page 3.

- **Allow HA failover for RSSD connections?**   Select Yes if the Adaptive Server managing the RSSD supports HA failover and you want RSSD connections to fail over to an alternative Adaptive Server.

- **Create RSSD**   *Required* – select Yes if you want rs_init to create the system database.

  Select No if the system database already exists or if you want to create it manually.

If the database already exists, it should be dedicated to this Replication Server. The database must have at least 10MB for data and 10MB for log space.

- **SA user**   Enter the login name for the "sa" user for the Adaptive Server that will hold the RSSD. The default is "sa."

- **SA password**   *Required* – enter the "sa" password for the Adaptive Server that will hold the RSSD. rs_init uses the "sa" login name to create user login names and the system tables in the RSSD.

- **Primary user**   Enter the login name for the RSSD primary user. Replication Server uses this login name for system table updates. rs_init creates the primary user.

- **Primary password**   Enter the password for the RSSD primary user.

- **Maintenance login**   Enter the name of the maintenance user for the RSSD. Replication Server uses this login name to perform operations on the system tables that are replicated from other sites. rs_init creates the maintenance user and adds the maintenance user to the RSSD.

- **Maintenance password**   Enter the password for the RSSD maintenance user.

Adaptive Server Enterprise RSSD device information

If you want rs_init to create the RSSD and you selected Yes for "Create RSSD," complete the "RSSD Device Information" section of the worksheet.

However, if you do not want rs_init to create the RSSD, skip this section and go to "Disk partition information" on page 18.

The RSSD device is the Adaptive Server database device where rs_init creates the Replication Server RSSD. Therefore, choose a database device other than the default master device, that has the minimum amount of space required. Use sp_helpdevice to list the available devices.

Note rs_init by default uses a minimum of 40MB for the database size, and 16MB for the RSSD log size.

Select one of the following if the Adaptive Server does not have a device available for the RSSD:

- Add a device and record the information on your worksheet

- Have rs_init create the device when it installs Replication Server

  > **Note** If the Adaptive Server is not on the local machine, you must create the device yourself. rs_init incorrectly evaluates the local machine's file system instead of the remote machine's file system when it validates the path name and disk space requirements of the device.

If you want rs_init to create the device, verify that the Windows System Administrator account can create the file you specify and that there is sufficient disk space for the file. Execute sp_configure devices in Adaptive Server to verify that the value for devices is high enough to allow you to add a new device. See the *Adaptive Server Enterprise System Administration Guide* for information about device requirements.

- **Size of the RSSD database**   Enter the size, in megabytes, of the data portion.

- **RSSD device name**   *Required* – enter the name of the Adaptive Server logical device where you want to create the RSSD. If the device already exists, it must have enough space available to create the new database.

- **Create the RSSD device**   *Required* – select Yes if you want rs_init to create the RSSD data device on the Adaptive Server database device.

  Select No if the RSSD data device already exists, or if you will create it before you run rs_init.

- **RSSD device physical name**   If you want rs_init to create the RSSD device, enter the physical device name for the database device on which you want to store the RSSD.

  In Windows, the physical name is the name of the disk file.

  If you do not want rs_init to create the RSSD data device, leave this field blank.

- **RSSD device size**   If you want rs_init to create the RSSD device, enter the capacity, in megabytes, of the physical device. The device size must be at least the size you specified for the data portion of the RSSD database.

  If you do not want rs_init to create the RSSD device, leave this entry blank.

- **Size of the RSSD log**   Enter the size, in megabytes, for the RSSD database log.

    Note Sybase recommends that you store the RSSD log on a device other than the master device, and on a different device from the RSSD database.

- **RSSD log device name**   *Required* – enter the logical name for the device you want rs_init to use for the RSSD log.

- **Create the RSSD log device**   *Required* – select Yes if you want rs_init to create the RSSD log device in Adaptive Server.

    Select No if the device already exists or if you will create it before you run rs_init.

- **RSSD log device physical name**   If you want rs_init to create the RSSD log device, enter the physical device name for the device.

    This is a Windows file name.

    If you do not want rs_init to create the RSSD log device, or if you are using a single device for both the RSSD and its log (this is not recommended), leave this field blank.

- **RSSD log device size**   If you want rs_init to create the RSSD log device, enter the capacity, in megabytes, of the physical device. The device size must be at least the size you specified for the RSSD log.

    If you do not want rs_init to create the RSSD log device, or if you are using a single device for both the RSSD and its log (this is not recommended), leave this field blank.

Disk partition information

Replication Server uses disk partitions for stable queues, which temporarily store the data it receives and sends.

On Windows, Replication Server uses operating system files for partitions.

The minimum partition size is 20MB. You can add more partitions after the Replication Server is installed.

Use the information in this section to complete the "Disk partition information" section of the worksheet:

- **Disk partition path**   *Required* – enter the name of the physical disk device or the full path name of a file to be used for the disk partition. If you use an operating system file, there must be enough space on the file system for Replication Server to extend the file to the size you specify. You must have already created the operating system file.

- **Logical identifier for disk partition**   *Required* – enter a logical identifier for the partition. This name is used in commands and in Replication Server messages to identify the disk partition.

  See "Identifiers," in Chapter 2, "Topics" in the *Replication Server Reference Manual*.

- **Size of disk partition**   Enter the size, in megabytes, of the disk partition. The partition must be at least 20MB.

  See "Partitions for stable queues," in Chapter 2, "Replication Server Technical Overview" in the *Replication Server Administration Guide Volume 1* and Appendix A "Capacity Planning" in the *Replication Server Design Guide*.

- **Start value for partition**   This value prevents Replication Server from using the beginning of a raw disk partition. It is required if your operating system stores information, such as configuration maps, at the beginning of the disk partition. Enter the number of megabytes Replication Server should ignore. For example, if you enter 1, Replication Server will not use the first megabyte of the raw disk partition.

Remote site connections information

The "Remote site connections information" section of the worksheet defines a login name for other Replication Servers to use when logging in to this Replication Server. rs_init creates this login after installing the Replication Server.

- **Replication Server login name**   Enter the login name that other Replication Servers will use to connect to this Replication Server.

- **Replication Server password**   Enter a password for the Replication Server login name.

Database Replication Agent information

Use the information in this section to complete the "Database Replication Agent information" section of the worksheet:

- **RS user**   Enter the login name that the RSSD Replication Agent will use to connect to the Replication Server.

- **RS password**   Enter a password for the RS user login name.

See "Planning the replication system" on page 1 for more information about when an RSSD requires a Replication Agent.

Completing the database setup worksheet

Make a copy of "Database setup worksheet" on page 87 for each database you plan to add to the replication system.

Each primary or replicate database in your replication system is managed by a Replication Server. The database may also require a Replication Agent. See "Which databases require Replication Agents?" on page 3 for more information.

See the *Replication Server Design Guide* for guidelines on configuring character sets, languages, and sort orders in your replication system.

Replication Server information

Use the information in this section to complete the "Replication Server information" section of the worksheet, which identifies the Replication Server that will manage the database. The Replication Server must be installed and running before you can add the database to the replication system:

- **Replication Server name** *Required* – enter the name of the Replication Server that will manage the database.

- **RS SA user** *Required* – enter the Replication Server System Administrator (RS SA) login name (usually "sa").

- **RS SA password** *Required* – enter the password for the Replication Server SA user.

Replication Server interfaces information

Copy the information you have provided in the "Replication Server interfaces information section" of the Replication Server installation worksheet for the Replication Server that will manage this database. Since the Replication Server is already installed, you do not have to enter this information again unless you run rs_init in a release directory that uses a different *sql.ini* file.

- **Network driver** *Required* – check the box next to the type of network the Replication Server uses: Windows Sockets, Named Pipes, or NWLink IPX/SPX.

- **Connection information** *Required* – copy the connection information for the Replication Server from the "Replication Server installation worksheet" on page 84.

Database information

The "Database information" section of the worksheet identifies the database you are adding to the replication system:

- **Adaptive Server name** *Required* – enter the name of the Adaptive Server where the database resides.

- **SA user** Enter the "sa" login name for the Adaptive Server managing the database.

- **SA password**   Enter the password for the SA user login name.

- **Database name**   Enter the name of the database.

- **Will the database be replicated?**   *Required* – select Yes if the database requires a Replication Agent. See "Which databases require Replication Agents?" on page 3 for more information.

- **Maintenance user**   Enter a login name for Replication Server to use when updating replicated data. This user must be granted all permissions necessary to maintain the replicated data. rs_init creates this login, if it does not already exist, and grants the necessary permissions.

  See the *Replication Server Administration Guide Volume 1* for more information about login names for replication system components.

- **Maintenance password**   Enter the password for the maintenance user.

- **Is this a physical connection for an existing logical connection?**

  Select Yes if you are adding an active or standby database for a warm standby application, and No if you are not.

  See the instructions for setting up warm standby databases in Chapter 3, "Managing Warm Standby Applications" in the *Replication Server Administration Guide Volume 2*.

Logical connection information

If you are adding a database that is part of a warm standby database application, complete the "Logical connection information" section of the worksheet.

Note Setting up a warm standby application requires that you perform additional tasks in the Replication Server before and after you use rs_init to add the databases to the replication system. See Chapter 3, "Managing Warm Standby Applications" in the *Replication Server Administration Guide Volume 2* for more information and to configure warm standby for Adaptive Server databases. See Chapter 14, "Managing Heterogeneous Warm Standby" in the *Replication Server Heterogeneous Replication Guide* to configure warm standby for Oracle databases.

- **Is this an active connection or standby connection?**   *Required* – select Active if you are adding the active database for the warm standby application.

  Select Standby if you are adding the standby database for the warm standby application.

- **Logical DS name**   *Required* – enter the name of the logical data server for the logical connection. You must have already created it using create logical connection.

- **Logical DB name**   *Required* – enter the name of the logical database for the logical connection. You must have already created it using create logical connection.

  Complete the rest of the items in this section only if you have selected a standby connection over an active connection.

- **Active DS name**   *Required* – enter the name of the data server with the active database. Enter the actual data server name, not the logical data server name defined for the warm standby database pair.

- **Active DB name**   *Required* – enter the name of the active database. Enter the actual database name, not the logical database name defined for the warm standby database pair.

- **Active DB SA user**   *Required* – enter the login name of the System Administrator for the data server of the active database. Replication Server uses this login name to set up warm standby applications.

- **Active DB SA password**   *Required* – enter the password for the System Administrator login name of the data server of the active database.

- **Initialize standby using *dump* and *load*?**   *Required* – select Yes if you plan to initialize the standby database with the contents of the active database with the dump and load commands.

  Select No if you plan to initialize the standby database with the bcp utility, or if you do not need to initialize the standby database.

- **Use dump marker to start replicating to standby?**   *Required* – select Yes if transactions will be executed in the active database while the standby database is initialized.

Database RepAgent
information

If the database requires a Replication Agent and if you have selected to replicate the database, complete the "Database RepAgent information" section of the worksheet.

- **RS user**   Enter the Replication Server login name that the Replication Agent will use to connect to the Replication Server.

The default RS user login name and password for this Replication Agent is the default login name and password for the RS user for the RSSD RepAgent, which you noted in the "RSSD RepAgent" section of the Replication Server installation worksheet. If you want this user to use a different login name and password, you must first create the user in the Replication Server and then grant connect source permission to the user.

• **RS password**   Enter the password for the RS user login name.

CHAPTER 2 **Configuring Replication Server and Adding Databases with *rs_init***

Topic	Page
Using rs_init	25
Starting rs_init	26
Configuring a new Replication Server	27
Adding a database to the replication system	33

Using *rs_init*

rs_init is a utility used to configure Replication Server and add databases to a replication system. You can use rs_init interactively or with a resource file.

Using *rs_init* interactively

rs_init in interactive mode is easier to use than a resource file. The interactive mode provides command keys and menu prompts to help you make selections and move between windows. rs_init rejects invalid entries and displays warnings or error messages when you make improper selections. If you make a mistake, you can change your entry and continue with the installation session.

In interactive mode, these command buttons help you make selections and move between dialog boxes:

Command button	Action
Continue	Accept the values currently listed in the dialog box and move to the next dialog box.
Back	Exit the current dialog box or prompt and return to the previous dialog box.
Exit	Quit rs_init and return to the shell prompt.

Command button	Action
Help	Display an online help window.

rs_init **with a resource file**

If you plan to install multiple Replication Servers, and many of the rs_init values are similar, using resource files to install, configure, upgrade, or downgrade may save time. See Appendix B, "Using rs_init with Resource Files" for more information.

A resource file is an ASCII-formatted file that contains configuration information for rs_init. Instead of entering configuration variables during an interactive rs_init session, you edit the resource file to contain the variables, then type that file name on the rs_init command line.

Starting *rs_init*

This section provides instructions on how to start rs_init. Enter the information from the Replication Server installation worksheet based on the preparation you did in Chapter 1, "Preparing to Install and Configure Replication Server." Each section of the worksheet corresponds to a window or a menu in rs_init.

❖ **Starting *rs_init***

1 Log in to Windows using the Replication Server System Administrator account.

2 Select Start | Programs | Sybase | rs_init. You see the RS_Init dialog box.

Choose Configure a Server Product, then choose Replication Server. From the Configure Replication System menu you can:

- Install a new Replication Server – see "Configuring a new Replication Server" on page 27.

- Add a database to your Replication System – see "Adding a database to the replication system" on page 33.

- Upgrade or downgrade your software – see Chapter 3, "Upgrading or Downgrading Replication Server."

   • Enable password encryption for a Replication Server or alter
     passwords in configuration files – see Chapter 4, "Using Password
     Encryption."

Configuring a new Replication Server

This section explains how to configure a new Replication Server using rs_init.
Configuring a new Replication Server involves:

   • Entering Replication Server information

   • Editing the interfaces file

   • Entering ID Server information

   • Entering RSSD information

   • Entering RSSD RepAgent information

   • Entering disk partition information

   • Entering remote site connections information

   • Completing the Replication Server configuration

To use these instructions, you need the completed Replication Server
installation worksheet. If you have not completed the worksheet, read Chapter
1, "Preparing to Install and Configure Replication Server" and complete it
before you continue.

❖ **Configuring a new Replication Server**

   1   In the RS_Init dialog box, select Configure a Server Product, then choose
       Continue. You see the Configure Server Products dialog box.

   2   Select Replication Server.

   3   Select Install a New Replication Server.

       You see a list of tasks you must complete to install a new Replication
       Server.

       Note The Install a New Replication Server option only lets you configure
       a new Replication Server; it does not allow you to install additional
       software.

Select each task and complete the windows until the status of each task is "Complete."

❖ **Entering Replication Server information**

1 In the New Replication Server window, select Replication Server Information. You see the Replication Server Name window.

2 Enter the name you recorded in the "Replication Server Information" section of the worksheet, then click Continue. You see the Replication Server Information window.

3 Select each item on the Replication Server Information window and enter the value you recorded on your worksheet. If you use a default value, record it on your worksheet.

Note For more information on the character sets and sort orders, read Chapter 6, "Customizing Localization for Adaptive Server," in the *Adaptive Server Enterprise Configuration Guide*.

To change a default value, select it and click Continue.

In some configurations, if you set Replication Server language before you set its character set, you receive an error message. To avoid this, set the character set before you set the language.

If the Replication Server Interfaces Information item is "Incomplete," select it and click Continue. You see an interfaces file editor dialog box. Follow the instructions provided in "Editing the interfaces file" on page 28, to add a listener service for Replication Server.

4 Click Continue to save the information and return to the New Replication Server window.

Editing the interfaces file

The interfaces (*sql.ini*) file contains network address information for each Adaptive Server and Replication Server in your replication system.

To reach the interfaces file screen, select Replication Server Interfaces Information from the Replication Server Information screen.

Select Start | Programs | Sybase | Connectivity | Open Client Directory Service Editor. Using dsedit, edit the interfaces (sql.ini) file.

See the *Open Client and Open Server Configuration Guide* for more information on dsedit.

Note Sybase recommends that if you are using Replication Server with network-based security, you use the directory services of your network security mechanism to register Replication Servers, Adaptive Servers, and gateway software. See the documentation that comes with your network security mechanism for details.

❖ **Entering ID Server information**

The ID Server is a Replication Server that registers all Replication Servers and databases in a replication system. It assigns and maintains ID numbers for these components and maintains version information for the entire replication system.

When you:

• Configure the ID Server, you determine the login name and password (ID Server User/Password) that all Replication Servers use to log in to the ID Server.

• Install a Replication Server that is not the ID Server, copy the ID Server Name, ID Server User, and ID Server Password from the "ID server" section of the worksheet.

To complete the ID Server Information dialog box:

1 From the New Replication Server window, select ID Server Information.

   • If the Replication Server you are installing is not the ID Server, you see the ID Server Name window. Enter the name of the ID Server for the replication system, then click Continue. You see the ID Server Information window.

   If the Replication Server you are configuring is the ID Server, the ID Server Information window appears.

   The Starting Replication Server ID and Starting Database ID appear only when you configure the ID Server.

2 Complete the ID Server Information window with the information from the "ID Server" section of your worksheet.

   If you do not make entries for the Starting Replication Server ID and starting database ID, the default ranges are used, as shown in Table 1-2 on page 14.

3   Click Continue to save your changes and return to the New Replication
     Server windows.

RSSD information   **Selecting RSSD type**

Before you can enter your Replication Server System Database (RSSD)
information, you must determine if you want an RSSD, or an ERSSD.

In the Replication Server System Database Choice window, select one of:

• Yes – if you want an ERSSD using SQL Anywhere. The text on the second
  line changes to:

  ```
  2. Embedded Replication Server System
  Database    INCOMPLETE
  ```

  Select the Embedded Replication Server System Database option, to go to
  the ERSSD Name window, and follow the steps in "Entering ERSSD
  information" on page 30 to complete the information for your ERSSD.

• No – if you do not want an ERSSD. This is the default value, and assumes
  you are creating a regular Replication Server System Database with
  Adaptive Server Enterprise. The second line on the window appears as:

  ```
  2. Replication Server Database on ASE    INCOMPLETE
  ```

  Select the Replication Server System Database on ASE option, to go to the
  Replication Server System Database window, and follow the steps in
  "Entering Replication Server System Database information" on page 31
  to complete the information for your RSSD.

❖ **Entering ERSSD information**

1   If you selected an ERSSD in "Selecting RSSD type", enter the name of
     your SQL Anywhere server in the ERSSD Name window, and click
     Continue to accept the name. The Embedded Replication Server System
     Database window appears.

2   You see the following options, each filled with a default value:

     • ERSSD Database Directory

     • ERSSD Transaction Log Directory

     • ERSSD Backup Directory

     • ERSSD Error Log Directory

     • ERSSD Interface Information

Select each item to change the default value to the value you recorded in the Replication Server installation worksheet. See Chapter 4, "Managing a Replication System" in the *Replication Server Administration Guide Volume 1,* for more information on value requirements for ERSSDs.

3   Choose Continue to accept the values and return to the Replication Server System Database Choice window. You see the New Replication Server window.

4   Choose Continue to return to the New Replication Server window.

❖   **Entering Replication Server System Database information**

1   In the New Replication Server window, select Replication Server System Database, then click Continue.

2   Complete the window with the information from your worksheet. If you use a default value, copy it from the window to your worksheet.

   For "RSSD will be replicated," select Yes if you will have more than one Replication Server in your environment.

3   Choose Continue to accept the values. You see the New Replication Server window.

❖   **Entering RSSD device information**

If you selected Yes for the Create RSSD option in the Replication Server System Database window, the "RSSD Device Information" option appears in the New Replication Server window.

Warning! If you selected No for Create RSSD in the Replication Server System Database window, you must already have created the RSSD. Skip this section and go to "Entering disk partition information" on page 32.

---

1   From the New Replication Server window, select RSSD Device Information, then choose Continue.

2   Complete the window using information from your worksheet. If you use a default value, copy it from the window to your worksheet.

3   Click Continue to save your entries and return to the New Replication Server window.

❖ **Entering RSSD RepAgent information**

If you selected Yes for the "RSSD will be replicated" option in the Replication Server System database window, the "Database Replication Agent" option appears in the New Replication Server window:

1   Select Database Replication Agent. Enter the RSSD Replication Server user name, and the Replication Server password from your worksheet.

> **Note** Where necessary, rs_init uses the settings established for the Replication Server when configuring an RSSD RepAgent.

2   Click Continue to save this information.

❖ **Entering disk partition information**

In Windows, operating system files are used as disk partitions for stable queues. If such a file does not already exist, rs_init creates it.

1   From the New Replication Server window, select Disk Partition.

Click Continue.

2   Complete the window using the information you recorded on your worksheet.

You can add more partitions after Replication Server is installed. See the *Replication Server Design Guide* for help in determining how much space you need.

3   Click Continue to accept the values and return to the New Replication Server window.

❖ **Entering remote site connections information**

rs_init completes the Remote Site Connections window with default values based on the Replication Server name you entered.

To view or change any of these values:

1   From the New Replication Server window, select Remote Site Connections.

Click Continue.

2   Complete the window using the information on your worksheet. If you use a default value, copy it to the "Remote site connections" section of the worksheet.

3   Click Continue to save your changes and return to the New Replication Server window.

❖   **Completing the Replication Server configuration**

When the status of each task in the New Replication Server window is "Complete," follow these steps to complete the configuration.

1   At the prompt that asks if you want to execute Replication Server tasks now:

   •   Select Yes to have rs_init configure the new Replication Server.

   •   Select No to return to the New Replication Server window, where you can modify values in any of the windows.

   Status messages display while rs_init sets up the Replication Server. If errors occur, use the error messages that display to correct the information in the configuration windows or to modify your environment.

   When the configuration is complete, rs_init displays the message "Configuration completed successfully."

2   Click Continue.

3   Click OK to return to the Configure Replication System window.

   Note If you are configuring other Replication Servers on the same computer, go back to "Configuring a new Replication Server" on page 27 and repeat the procedure for each additional Replication Server.

4   Click OK to quit rs_init.

You can find out more about the progress of the installation by looking at the rs_init log files, which are stored in the *init\logs* subdirectory of the *%SYBASE_REP%* directory.

Adding a database to the replication system

Each primary or replicate database in a replication system is managed by a Replication Server.

Follow the steps below to add a database to the replication system. To use these instructions, you need the completed "Database Setup Worksheet." If you have not completed the worksheet, read Chapter 1, "Preparing to Install and Configure Replication Server" and complete it before you continue.

❖ **Adding a database to the replication system**

1   From the RS_INIT menu, select Configure a Server Product.

Click Continue.

2   Select Replication Server. You see the Configure Replication System window.

3   Select Add a Database to the Replication System, then click Continue. You see the status of each part of the installation with "Incomplete" or "Complete."

4   Select Replication Server Information.

Click Continue.

5   Enter the name of the Replication Server from your worksheet. Click Continue to save your changes.

6   Complete the window, using the information you recorded on your worksheet, then click Continue.

If the status of Replication Server Interfaces Information is "Incomplete," select it, then click Continue. You see an interfaces file editor window. Follow the instructions in "Editing the interfaces file" on page 28 to add an entry for the Replication Server.

7   Click Continue to save your changes and return to the Add Database to Replication System window.

❖ **Completing database information**

Follow these steps to add a database.

1   In the Add Database to Replication System window, select Database Information, then click Continue.

2   Complete the window, using the information you recorded on the worksheet. If you use a default value, copy it from the window to your worksheet. The label refers to Adaptive Server as "SQL Server."

> **Note** The password you specify in this step must be valid to log in to Adaptive Server as "sa". You cannot change the password in rs_init by specifying a different password in this window. To change the Adaptive Server "sa" password, log in to the Adaptive Server after installation and change the password using the alter user command.

3   Choose Yes for "Will the Database Be Replicated?" if:

   •   It contains primary data.

   •   It is part of a warm standby application.

   •   Applications execute replicated stored procedures in it.

   See "Planning the replication system" on page 1 for more information about when a database requires a RepAgent.

4   If you are adding the active or standby database for a warm standby application:

   a   Choose Yes for "Is This a Physical Connection for Existing Logical Connection?"

   b   Specify the additional information in the Logical DB Setup window. See "Logical connection information" on page 35 for details.

5   Click Continue to save your changes, then go to "Completing the configuration" on page 36.

❖   **Logical connection information**

This section describes entries you make in the Logical Connection Information window when you add an active or standby database for a warm standby application.

Before performing the steps described in this section, see Chapter 3, "Managing Warm Standby Applications" in the *Replication Server Administration Guide Volume 2,* to set up a warm standby application between Adaptive Server databases, and see Chapter 14, "Managing Heterogeneous Warm Standby" in the *Replication Server Heterogeneous Replication Guide,* to set up a warm standby application between Oracle databases.

Before you add a database for a warm standby application, you must create the logical connection in the Replication Server.

1   If you selected Yes to "Is This a Physical Connection for Existing Logical Connection?" in the Database Information window, Logical Database Setup selections appear. You must specify logical connection parameters.

In the Database Information window, select Logical DB Setup, then choose Continue.

The Logical Connection Information window appears. When you choose "active" for the first item, only these options appear:

• Logical DS Name

• Logical DB Name

2   Complete the Logical Connection Information window, using the information you recorded on your worksheet. If you use a default value, copy it from the window to your worksheet.

3   Click Continue to save your changes, and rs_init returns you to the Database Information window.

❖   **Completing the configuration**

1   If the Database Information window indicates that there are incomplete tasks on the Add Database to Replication System window, select each one and complete the required information.

When all tasks are "Complete," click Continue. A message is displayed asking you if you want to execute the configuration.

2   Messages appear on the window as the configuration progresses; these messages require no action.

Do not interrupt the configuration. Most configurations require several minutes (sometimes longer) to complete.

When the configuration is complete, rs_init displays "Configuration completed successfully."

3   Click OK to return to the Configure Replication System window.

Note To add other databases to the replication system, go to "Adding a database to the replication system" on page 33, and repeat the procedure for each database.

4   Click Exit to quit rs_init.

You can find out more about the progress of the installation by looking at the current rs_init log file. rs_init log files are stored in the *init\logs* subdirectory of the *%SYBASE_REP%* directory.

Upgrading or Downgrading Replication Server

Topic	Page
Requirements for upgrading to version 15.5 and later	39
Preparing to upgrade	40
Upgrading Replication Server	41
Upgrading Adaptive Server in a replication system	51
Downgrading Replication Server to an earlier version	55
Migrating between 32-bit and 64-bit platforms	58

Requirements for upgrading to version 15.5 and later

If a replication system domain has Replication Server 15.5 and later, then the system version and route versions in the replication system domain must be version 12.6 and later. With Replication Server 15.5, mixed-version environments containing versions earlier than 12.6 are not supported.

You can upgrade directly to Replication Server 15.5 from versions 12.6, 15.0, 15.0.1, and 15.2 and subsequent ESDs.

If any of the Replication Server version, the site version, and the route version are earlier than 12.6, you must upgrade Replication Server to version 12.6 or later, set site version to 12.6 or later, and upgrade routes to 12.6 or later, before you can install Replication Server 15.5.

You must upgrade the Adaptive Server containing the RSSD to version 15.0 or later, before you can install Replication Server 15.5.

Preparing to upgrade

Before you start the upgrade process:

1   Back up your replication system. The upgrade process makes changes to the system databases that you cannot roll back if the upgrade fails. Restore the system databases if the upgrade fails.

  If you plan to install the Replication Server software in a directory other than an existing Sybase version directory, verify that the interfaces (*sql.ini*) file is accessible.

2   See "Requirements for upgrading to version 15.5 and later" on page 39 and read the release bulletin for your platform for any special installation instructions about mixed-version environments, installing, or upgrading.

3   Use rs_helpsub to check that all subscriptions are valid. The upgrade fails if there are subscriptions that are not in a valid state before upgrading.

4   Install Replication Server, following the instructions in the *Replication Server Installation Guide* for your platform.

5   Verify the system-wide and route versions and upgrade to version 12.6 if necessary:

  a   Execute sysadmin system_version on the current Replication Server. If the system version is 1260 or later, you can upgrade your Replication Server now. If the system version is earlier than 12.6, proceed to step 5b.

```
sysadmin system_version
go
```

  An example of the output is:

```
The current system version is 1102.
```

  b   Set the system version on the ID Server to 1260:

```
sysadmin system_version,1260
go
```

  If setting the system version is unsuccessful, this message appears and you must proceed to step 5c:

```
The system version could not be set.  The specifed
version '1260' is higher than the lowest
Replication Server version in the system '1250'
```

  If setting the system version is successful, this message appears and you can proceed to step 5d:

```
The system version has been reset from 1102 to
1260
```

c   Upgrade Replication Server to 12.6 and set the site version to 12.6 for any Replication Server with version earlier than 12.6 in the domain. Repeat step 5b.

d   Execute sysadmin system_version again on the current Replication Server. If the system version is 12.6 or later, proceed to step 5e.

e   Execute admin show_route_version to verify all route versions are 1260 or later. If the route version is lower than 12.6, see "Upgrading routes," in Chapter 6, "Managing Routes" in the *Replication Server Administration Guide Volume 1* to upgrade the route version. After you upgrade the routes, you can upgrade the current Replication Server.

Upgrading Replication Server

To upgrade Replication Server from version 12.6 and later:

1   Stop Replication Agent and quiesce Replication Server. This is because Replication Server 15.5 is available only on 64-bit platforms on most UNIX systems. Therefore, upgrading to version 15.5 involves upgrading from a 32-bit platform in most cases and requires a purge of inbound queues. See "Stopping Replication Agent and quiescing Replication Server" on page 42. See the *Replication Server Release Bulletin* for supported 64-bit platforms.

2   Upgrade the RSSDs or ERSSDs so they are compatible with the new executable programs. See "Upgrading a RSSD or an ERSSD" on page 43.

3   Retry the upgrade process at this point if it fails. See "If an upgrade fails" on page 46.

4   Apply upgrades to your user databases, if required, to accommodate the changes due to the upgrade of Replication Server. See "Upgrading a user database in a replication system" on page 46 for instructions.

5   Restart the Replication Servers. See "Restarting Replication Server" on page 47.

6   Decide whether to set the replication site version to the new version and whether to upgrade the route version to the new version. See "Committing a local site to a new version level" on page 47

7   Back up the RSSD or ERSSD after the upgrade. See "Backing up the RSSD" on page 50.

8   If you are also separately upgrading Adaptive Server in your replication system, see "Upgrading Adaptive Server in a replication system" on page 51.

Warning! Do not modify the secondary truncation point of Replication Agent, truncate the transaction log, or increase the generation number while upgrading to version 15.5.

Stopping Replication Agent and quiescing Replication Server

You must stop Replication Agent and quiesce Replication Server because Replication Server version 15.5 is available only on 64-bit platforms for all UNIX operating systems, and on 64-bit and 32-bit platforms on Linux and Windows.

Your current Replication Server may be on a 32-bit platform. Therefore, you must purge inbound queues when you upgrade Replication Server to version 15.5 and later. See "Migrating between 32-bit and 64-bit platforms" on page 58 to migrate to a 64-bit platform and see the *Replication Server Release Bulletin* for supported 64-bit platforms.

❖   **Stopping Replication Agent and quiescing Replication Server**

1   On Replication Server, stop Replication Agent for all primary databases and system databases:

```
suspend log transfer from all
```

2   Stop RepAgent for the RSSD if you are using Adaptive Server as the RSSD:

```
sp_stop_rep_agent emb
```

3   If you are going to upgrade a replicate Replication Server, log in to the primary Replication Server and suspend all the routes to the replicate Replication Server:

```
suspend route to replicate_Replication_Server
```

4   Verify that the Replication Server queues have been drained out and
     Replication Server has been quiesced by executing:

```
admin quiesce_check
```

Retry using admin quiesce_force_rsi if Replication Server is not quiesced
yet.

Warning! You may lose data if you proceed with the upgrade process and
Replication Server is not quiesced.

Upgrading a RSSD or an ERSSD

Complete the steps below in the order shown to upgrade an RSSD based on the
information from the "Replication Server installation worksheet" on page 84
for the Replication Server you are upgrading. Upgrading an RSSD may add
new Replication Server system tables, add new rows or columns to existing
tables, or install new stored procedures.

❖ **Upgrading an RSSD or an ERSSD**

1   Verify that RSSD and Replication Servers that you are upgrading are
     running.

2   If the Replication Server uses Adaptive Server for the RSSD, grant sa_role
     to the primary user at the RSSD:

     sp_role 'grant', sa_role, *primary_user*

     You can revoke the "sa" role after the upgrading by executing:

     sp_role 'grant', sa_role, *primary_user*

     Note The *RSSD_primary_user* in the *.cfg* file must have a replication role
     or "sa" role, not the sa user ID or the user that has been entered in the
     rs_init panel.

     ---

3   If the Replication Server uses an ERSSD, edit the *rs_name.cfg* file, where
     rs_name is your Replication Server:

     a   Add the erssd_release_dir parameter to specify the location of the pre-
          upgrade SQL Anywhere. For example:

          ```
          erssd_release_dir=c:\sybase\REP-15_1\ASA9
          ```

    b   Add the erssd_start_cmd parameter to specify the command to start ERSSD.

You can find an example of the parameter in the Replication Server log file by searching for "ERSSD start command". For example:

```
erssd_start_cmd=c:\sybase\REP-15_5\ASA11\bin\dbspawn
-f -q c:\sybase\REP-15_5\ASA11\bin\dbsrv11
-ct- -ti 0 -x "tcpip(PORT=11751;DOBROAD=NO;BLISTENER=NO)"
-o c:\sybase\REP-15_5\samp_repserver\errorlog\SAMP_RS_ERSSD.out
c:\sybase\REP-15_5\samp_repserver\dbfile\SAMP_RS_ERSSD.db
```

    c   Obtain the name and location of the Replication Server you are upgrading, and the port number of the Replication Server RSSD, from the *sql.ini* file.

4   If the Replication Server uses an ERSSD, and it is doing routing, edit the *rs_name.cfg* file, where *rs_name* is your Replication Server:

    a   Add the erssd_ra_release_dir parameter to specify the location of the pre-upgrade SQL Anywhere. For example:

```
erssd_ra_release_dir=c:\sybase\REP-15_1\ASA9
```

    b   Add the erssd_ra_start_cmd parameter to specify the command to start ERSSD.

Obtain the name of the ERSSD Replication Agent and the location of the *sql.ini* file from the Replication Server log file by searching for "Starting embedded RSSD Replication Agent" and using the same command format from the next line: "Executing command:". For example:

```
erssd_ra_start_cmd=c:\sybase\REP-15_5\ASA11\bin\dbltm
-ud -S SAMP_RS_ERSSD_ra
-C c:\sybase\REP-15_5\samp_repserver\SAMP_RS_ERSSD_ra.cfg
-ot c:\sybase\REP-15_5\samp_repserver\SAMP_RS_ERSSD_ra.out
-I c:\sybase\sql.ini
```

5   Select Start | Programs | Sybase | rs_init.

You see the RS_INIT dialog box.

6   Select Configure a Server Product. Choose Continue.

7   Select Replication Server.

Then choose Continue.

8   Select Upgrade an Existing Replication Server.

Then choose Continue.

9   Complete the Upgrade Existing Replication Server window with the information from the "Replication Server installation worksheet" on page 84 for the Replication Server you are upgrading.

    a   Enter the name of the Replication Server with the RSSD you are upgrading.

    b   Enter the login name for the Replication Server "sa" user. The default value is "sa."

    c   Enter the password for the "sa" user on the Replication Server.

    d   Enter the path name of the Replication Server Configuration file.

    e   Choose Continue to save your changes. You see:

```
Execute the Replication Server tasks now?
```

10 Choose Continue to continue the RSSD upgrade.

If the Replication Server is running, rs_init shuts it down.

rs_init displays informational messages as it loads the upgrade script into the RSSD. When the upgrade is complete, you see:

```
RSSD successfully upgraded from old_rel_no to
new_rel_no. Replication Server 'rs_name' can now be
restarted. Task to upgrade the RSSD succeeded.
Configuration completed successfully.
```

where:

•   *old_rel_no* – is the Replication Server version from which you are upgrading.

•   *new_rel_no* – is the new Replication Server version.

•   *rs_name* – is the name of the Replication Server.

11 If you have more Replication Servers to upgrade, return to "Upgrading Replication Server" on page 41 and repeat the procedure.

12 If you installed the new Replication Server software in a different directory from the earlier version, modify the runserver files for the Replication Servers so that they use the programs in the new version directory.

13 Restart Replication Server using the appropriate executables for the new version.

Warning! Some Replication Server configuration options with newer versions may have a wider valid range. If you increase any of these configuration options after upgrading, you must reinstate the old values before downgrading. Otherwise, the Replication Server may not start or may behave incorrectly. The Replication Server upgrade process prints all the current configuration option values in rs_config to rs_init log, so that you can restore the former settings before downgrading. See "Downgrading Replication Server to an earlier version" on page 55.

If an upgrade fails

If a Replication Server upgrade fails because of an error, restart the old Replication Server against the RSSD and fix any problem that may have caused the error. After you fix the problem, re-run the upgrade process. You can do this multiple times until the upgrade succeeds.

Note You cannot start a new Replication Server against a partially upgraded RSSD.

Upgrading a user database in a replication system

Apply upgrades to a primary, replicate, or standby database in the replication system to accommodate changes, such as installing new stored procedures to support the new version of Replication Server you are upgrading to.

❖ **Upgrading an Adaptive Server user database in a replication system**

1 Start rs_init.

2 Select "Upgrade an existing database in the replication system" from the Configure Replication System window, then choose Continue.

3 Complete the window with the information from the "Database Setup Worksheet" for the upgraded Replication Server.

a Enter the name of the Adaptive Server that manages the database you are upgrading.

   b   Enter the name of the database you are upgrading.

   c   Enter the login name for the "sa" user on the Adaptive Server that manages the database that you are upgrading. The default value is "sa."

   d   Enter the Adaptive Server "sa" user password.

   e   Enter the login name for the maintenance user on the Adaptive Server that manages the database that you are upgrading. The default is "*database*_maint," where "*database*" is the name of the database you are upgrading.

4   Select Continue. rs_init performs the upgrade.

5   If you have more Replication Servers or databases to upgrade, return to "Upgrading Replication Server" on page 41 and repeat the procedure.

Upgrading non-ASE user databases

You cannot use rs_init for non-ASE databases. Instead, use the corresponding upgrade scripts for your non-ASE database, which are in the *scripts* subdirectory of your Replication Server installation directory. For example, to upgrade an Oracle user database, run the *hds_oracle_upgradedb.sql* script on the user database.

Restarting Replication Server

1   Modify the old runserver file, *run_servername.bat*, where *servername* is your Replication Server name, to replace the old binary with the new binary in *%SYBASE%\REP-15_5\bin\repserver*, and then start Replication Server from *%SYBASE%\REP-15_5\bin\repserver*.

2   If you are using Adaptive Server as the RSSD, restart the RepAgent for the RSSD:

```
sp_start_rep_agent emb
```

Committing a local site to a new version level

After you upgrade a Replication Server and its user databases, you must decide whether to commit to the new Replication Server version level.

| Mixed-version replication system | In a replication system that includes Replication Server versions 12.6 through 15.5, and for which the site version is set to its software release level and the system version is 1260 or higher, each Replication Server can use all the features of its release. Such a system is called a *mixed-version system*. |

In a mixed-version system, interaction between Replication Servers of different version levels is limited, and information associated with new features may not be available to Replication Servers of earlier versions. Replication Servers of the same version can exchange full information about the software features they support.

| Using new features | If, for example, you are upgrading to version 15.5, you can use new Replication Server features that interact with other Replication Servers only if all these conditions are true: |

- The system version has been set to 1260. See "Preparing to upgrade" on page 40.

- The site version for both Replication Servers has been set to the current site version, such as 1550. See "Setting the Replication Server site version" on page 49.

- The routes between the Replication Servers have been upgraded. See "Upgrading routes" on page 49.

| System version and software version | Table 3-1 illustrates the relationship between the software version number and the system version number. Note especially the ability to use the full capabilities of version 15.5 when the system version is at 1260. |

Table 3-1: Relationship between software version and system version

Replication Server software version	System version 1260 and higher
15.5	Full capability when site version is set to 1550
15.2	Full capability when site version is set to 1520
15.1	Full capability when site version is set to 1510
15.0 and 15.0.1	Full capability when site version is set to 1500
12.6	Full capability when site version is set to 1260

For example, new features of version 15.5 are available only when the system version is at least 1260 and the site version is set to 1550.

If a software version is supported with full capability at a given system version, you can install new Replication Servers of that software version.

Setting the Replication Server site version

The site version determines which Replication Server features you can use.

If, for example, you have Replication Servers with a site version set to version 15.0, you can create replication definitions for tables containing bigint datatype. Such replication definitions are distributed to other Replication Servers with site versions that are at the same version level or higher. Replication Servers of earlier versions do not receive information about these replication definitions.

After you upgrade Replication Server and its user databases, and set the system version to the new version, you must set the Replication Server site version to the new software version level before you can use the new Replication Server features.

Once the site version is set, you cannot downgrade. You must set the site version for all Replication Servers that require it, and upgrade the routes. Information needed for the new features cannot be propagated to other sites until the corresponding routes are upgraded. See "Upgrading routes" on page 49.

❖ **Setting the Replication Server site version to the new version**

1   Log in to the current Replication Server.

2   Execute:

    sysadmin site_version, 1550

The *Replication Server Release Bulletin* may instruct you to set the site version to a more recent version level.

Upgrading routes

The route version is the lower of the two site version numbers of the source and destination Replication Servers of the route.

Replication Server version 11.5 or later uses route version information to determine which feature set you can use with the route and which data to propagate to other sites. If the route version is lower than the earliest site version, you must perform a route upgrade. For example, information necessary for version 15.5 features is not propagated to other sites until the corresponding route versions are upgraded to 1550.

Upgrade any routes for which the upgraded Replication Server is the source or destination server, and the site versions of the source and destination servers are at version 1550 or higher.

After you upgrade to Replication Server 15.5 and set the site version to 1550, you must upgrade each route for which this Replication Server is a source or destination, and the site versions of the source and destination are at 1550 or later. How you upgrade routes depends on how you use Replication Server, and whether you are using a mixed-version system. See "Mixed-version replication system" on page 48.

Replication Server uses the Replication Manager (RM) plug-in to upgrade routes. RM provides a list of all the routes that require an upgrade. You can select a single route to be updated.

See Chapter 6, "Managing Routes" in the *Replication Server Administration Guide Volume 1*. For a full description of the route upgrade commands, see Chapter 3, "Replication Server Commands" in the *Replication Server Reference Manual*.

Restarting distributor thread

After you upgrade the route, you must restart the primary Replication Server distributor thread to support the replication of features included with the new version of Replication Server. For example, to restart primary data server— PDS, and primary database—pdb:

```
suspend distributor PDS.pdb
go
resume distributor PDS.pdb
go
```

Backing up the RSSD

After you upgrade a Replication Server, set its site version to 1550, and perform route upgrades to the relevant routes, use the Adaptive Server commands dump database or dump transaction to back up the RSSD, and the Replication Server sysadmin erssd, backup command to back up the ERSSD.

You can restore the RSSD with the Adaptive Server commands load database or load transaction, or restore the ERSSD using the ERSSD recovery procedure. See Chapter 4, "Managing a replication system" in the *Replication Server Administration Guide Volume 1*, for information on recovery procedure. If you have a current backup, you can avoid potential problems that can occur if you load an RSSD that corresponds to an earlier version level. After you load the backup, all queued messages from other Replication Servers can be recognized by this Replication Server and RSSD.

If you restore the RSSD from a backup performed before you set the site version, Replication Server may receive messages that the RSSD cannot accept.

Upgrading Adaptive Server in a replication system

If you are also separately upgrading Adaptive Server in your replication system, use this general database upgrade procedure:

1   Suspend transaction processing and replication system activities.

2   Drain transaction logs for primary databases.

3   Drain the RSSD transaction log.

4   Disable the secondary truncation point.

5   Upgrade Adaptive Server.

6   Restore Replication after upgrade.

 Warning! Sybase strongly recommends you perform a dump database and dump transaction before executing the steps below.

Suspending replication and transaction activity in the databases

---

Note "Replication" includes creating and dropping both routes and subscriptions.

---

1   Verify that the subscriptions you have created with primary data in the databases being upgraded, have reached a "valid" state at the primary Replication Server.

Do not upgrade while the subscriptions are being created.

Make sure no users create subscriptions for the data in the database you are upgrading until the upgrade procedure is finished.

2   Run rs_helproute in each RSSD being upgraded to determine its status.

The status of all routes should be "Active." See Chapter 6, "Managing Routes" in the *Replication Server Administration Guide Volume 1,* to resolve route problems.

3   Shut down the applications that are using the databases you are upgrading.

4   Use the admin who command in Replication Server to identify the existing Data Server Interface (DSI) connections to the data server being upgraded.

5   Suspend all DSI connections to non-RSSD databases you are upgrading by issuing this command for each database:

```
suspend connection to dataserver.database
```

6   Leave the DSI connections for the RSSDs running.

Draining transaction logs for primary databases

For each primary database you are upgrading, follow these steps to ensure that the Replication Server completely processes the preupgrade log.

1   Wait for all remaining transactions to be replicated.

2   Execute:

```
admin who, sqm
```

Find the entry that corresponds to the inbound queue for this database by looking in the Info field for the *queue_number* and *queue_type* entry. For an inbound queue, the queue type is 1. Note the last segment:block entry for the queue.

3   Open the queue dump file:

```
sysadmin dump_file, "file_name"
```

where *file_name* is the name of the dump file you will dump to

4   Create a dummy table to check that the Replication Server has received the latest log record written in the log. You can drop this table later.

```
create table dummy (c1 int, c2 char(255))
go
sp_setreptable dummy, true
go
begin tran
go
insert dummy values (1,'hello')
go 10
```

```
commit tran
go
```

5   In the primary Replication Server, execute the admin who, sqm command
    until the last segment:block entry for the inbound queue changes.

6   In Replication Server, dump the last block of the inbound queue to the
    dump file you created in step 3:

    ```
    sysadmin dump_queue, queue_number, queue_type,
        last_seg, block, 1
    ```

    Use the *queue_number*, *queue_type*, *last_seg*, and *block* values found in
    the output of the admin who, sqm command in step 5.

7   Use a text editor to examine the dump file to make sure it contains the
    transaction corresponding to the inserts you performed in step 4.

8   Repeat steps 5 through 7 until the transaction corresponding to the update
    is in the dump file. After draining the transaction logs, do not allow any
    other activity in the databases. If activity does occur, you must redrain the
    transaction logs.

Manually draining the RSSD transaction log

If Replication Server has routes to other Replication Servers, make sure that
Replication Server processes all transactions in the RSSD transaction log
before you upgrade the databases.

You can make sure the transaction log is completely processed by creating a
replication definition in the primary Replication Server and then watching for
it to appear in the replicate Replication Server RSSD. When the replication
definition is in the replicate RSSD, the log is fully processed.

❖   **Creating a replication definition for ensuring that the RSSD log is
    processed**

1   Log in to the primary Replication Server.

2   Create a temporary replication definition:

    ```
    create replication definition rep_def_name
        with primary at dataserver.database
        (column_a int)
        primary key (column_a)
    ```

3   Log in to the replicate RSSD.

4　See whether the replication definition has arrived from the primary RSSD:

```
select * from rs_objects
    where objname = "rep_def_name"
```

When the replication definition has arrived in the replicate RSSD, the RSSD transaction log has been drained.

Disabling the secondary truncation point

When you upgrade a primary database, the Replication Agent cannot be running, and the secondary truncation point should be turned off for the duration of the upgrade.

1　Shut down the Replication Agents, or make sure that dbcc logtransfer is not running for the databases that are being upgraded.

2　Shut down Replication Servers for the RSSDs you are upgrading.

3　In each primary database including RSSDs, turn off the secondary truncation point:

```
1> use database
2> go
1> dbcc settrunc ("ltm", "ignore")
2> go
```

Repeat step 3 for each primary database and each primary RSSD.

Upgrading Adaptive Server

For information on upgrading Adaptive Server, see the *Adaptive Server Enterprise Installation Guide* for your platform.

Restoring replication after upgrade

1　Zero out the locator in the RSSD for each replicated primary.

Using isql, connect to the RSSD and execute:

```
1> use RSSD
2> go
1> rs_zeroltm dataserver, RSSD
2> go
```

2   Set the secondary truncation point to "valid" in each primary database. Using isql, connect to the replicated primary database, and execute:

```
1> use database
2> go
1> dump tran database with truncate_only
2> go
1> dbcc settrunc("ltm","valid")
2> go
```

Downgrading Replication Server to an earlier version

"Downgrading" means reverting to an earlier version of the software. You cannot downgrade an RSSD to a version below the site version.

Before you downgrade:

1   Read the *Replication Server Release Bulletin* for information about downgrading your software. In particular, find out if an RSSD downgrade is required to return to the earlier version.When you downgrade to an earlier software version, you must install the earlier software. Read the release bulletin for the earlier version of Replication Server. Then refer to the installation or configuration guide for that version for installation instructions.

> **Note** If an RSSD downgrade is not required, you do not have to perform these steps. Reinstall the earlier software version following the instructions in *Replication Server Installation Guide*.

2   Back up your system.

If you are downgrading to a directory other than the existing Sybase version directory, verify that the appropriate *sql.ini* file is accessible.

3   Back up the RSSD for the Replication Server you plan to downgrade.

❖ **Downgrading to an earlier software version**

1   Stop Replication Agent for all primary databases and system databases by executing the command on Replication Server:

```
suspend log transfer from all
```

2   If you are using Adaptive Server as your RSSD, stop RepAgent for the RSSD:

```
sp_stop_rep_agent emb
```

3   If you are going to downgrade a replicate Replication Server, log in to the primary Replication Server and suspend all the routes to the replicate Replication Server:

```
suspend route to replicate_Replication_Server
```

4   Verify that the Replication Server queues have been drained and that Replication Server has been quiesced:

```
admin quiesce_check
```

Retry using admin quiesce_force_rsi if Replication Server is not quiesced yet.

Warning! You may lose data if you proceed with the downgrade process and Replication Server is not quiesced.

---

5   Log in as a system administrator.

6   Verify that the RSSDs and the Replication Servers you plan to downgrade are running.

7   In the Sybase for Windows group window, double-click the Replication Server Configuration icon. You see the RS_Init window.

8   Select Configure a Server Product, then choose Continue.

9   Select Replication Server, then choose Continue.

10 Select Downgrade RSSD for an Existing Replication Server, then choose Continue.

11 Complete the Downgrade RSSD for Replication Server screen with the information from the "Replication Server installation worksheet" on page 84 for the Replication Server you are downgrading.

   a   Enter the name of the Replication Server for which you are downgrading the RSSD.

   b   Enter the login name for the Replication Server "sa" user. The default value is "sa."

   c   Enter the password for the Replication Server "sa" user.

   d   Enter the path name of the Replication Server configuration file.

12 Select Continue to save your changes. You see:

```
Execute the Replication Server tasks now?
```

13 Select Yes to continue.

Informational messages appear as rs_init loads the downgrade script into the RSSD. When the downgrade is complete, you see these messages:

```
RSSD successfully downgraded to rel_no.
Replication Server 'rs_name' can now be restarted.
Task to downgrade the RSSD succeeded.
Configuration completed successfully.
```

where:

- *rel_no* – is the Replication Server version from which you are downgrading.

- *rs_name* – is the name of your Replication Server.

14 Select OK. You see:

```
Replication Server "rs_name" can now be restarted
```

15 Select OK. You see:

```
Configuration completed successfully.
```

16 Select OK. You see the Setup window.

17 Select Exit.

18 Shut down all Replication Servers and Replication Agents on this machine.

19 Restart the Replication Servers and Replication Agents.

20 If you are using Adaptive Server as the RSSD, restart the RepAgent for the RSSD:

```
sp_start_rep_agent emb
```

Downgrade
restrictions

- Once you set the replication system version to a new level, you cannot downgrade any Replication Servers in the replication system below that version level, or install a Replication Server below that version level.

  For example, if you upgrade to version 15.5, Replication Server may write some 1550 version commands to the inbound queue after the upgrade. Versions of Replication Server earlier than 15.5 cannot recognize the version 15.5 commands.

To return to an earlier software version, reinstall all Replication Servers and re-create your replication applications.

If you do not want to use new features that depend on the site version, do not set the Replication Server site version after the upgrade. You can then downgrade to an earlier version if needed.

- If you plan to downgrade in a directory other than the existing Sybase version directory, verify that the interfaces (*sql.ini*) file is accessible.

- If necessary, downgrade the RSSD for each Replication Server you are downgrading. You must downgrade the RSSD using the predowngrade— that is, the most recent—version of rs_init.

Migrating between 32-bit and 64-bit platforms

Replication Server 15.5 is available only on 64-bit platforms for all supported UNIX operating systems, and is available on 32-bit and 64-bit platforms for Linux and Windows. See the *Replication Server Release Bulletin* for supported 64-bit platforms.

The instructions in this section apply to migration between 32-bit and 64-bit platforms on Windows and Linux.

Note If you have upgraded to Replication Server 15.5 and later on UNIX systems available only on 64-bit platforms, you cannot migrate back to a 32-bit platform.

Before migrating

Back up your replication system. The upgrade process makes changes to the system databases that you cannot roll back if the upgrade fails. Restore the system databases if the upgrade fails.

If you plan to install the Replication Server software in a directory other than an existing Sybase version directory, verify that the interfaces (*sql.ini*) file is accessible.

❖ **Migrating between 32-bit and 64-bit platforms**

1   Stop Replication Agent for all primary databases and system databases by executing this command on Replication Server:

        suspend log transfer from all

2   If you are using Adaptive Server as your RSSD, stop RepAgent for the RSSD:

```
sp_stop_rep_agent emb
```

3   If you are going to migrate a replicate Replication Server, log in to the primary Replication Server and suspend all the routes to the replicate Replication Server:

```
suspend route to replicate_Replication_Server
```

4   Verify that the Replication Server queues have been drained and that Replication Server has been quiesced:

```
admin quiesce_check
```

Retry with admin quiesce_force_rsi if Replication Server is not quiesced yet.

 Warning! You may lose data if you proceed with the downgrade process and Replication Server is not quiesced.

---

5   Stop Replication Server. To stop a Replication Server using isql:

a   Log in to the Replication Server as the system administrator:

```
isql -Usa -Psa_password -Sservername
```

b   Enter:

```
1> shutdown
2> go
```

6   If you are using an ERSSD, manually restart it:

```
C:\sybase\REP-15_5\ASA11\win32\dbspawn.exe -f -q
C:\sybase\REP-15_5\ASA11\win32\dbsrv11.exe -ti 0 -x
"tcpip(PORT=11751;DOBROAD=NO;BLISTENER=NO)" -o
C:\sybase\REP-15_5\errorlog\SAMPLE_RS_ERSSD.out
C:\sybase\REP-15_5\dbfile\SAMPLE_RS_ERSSD.db
```

See your Replication Server log file for the actual commands to start the ERSSD by searching for "ERSSD start command."

7   Load the migration script file into the ERSSD or RSSD. For example:

- ERSSD – load *%SYBASE%\REP-15_5\scripts\rs_migration_asa.sql* into the ERSSD

- RSSD – load *%SYBASE%\REP-15_5\scripts\rs_migration_ase.sql* into the RSSD

8   Start Replication Server from the new Replication Server executable. See Chapter 6, "Starting or Stopping a Replication Server."

CHAPTER 4   **Using Password Encryption**

Overview

When you enable password encryption for a Replication Server, passwords are stored and transmitted in encrypted format. The passwords specified with create user or alter user are encrypted in the rs_users and rs_maintusers system tables in the RSSD.

When you use rs_init to administer passwords in your replication system, you can:

*   Specify during installation that a Replication Server should use encryption.

*   Enable encryption for a Replication Server. See "Enabling password encryption for a Replication Server" on page 62.

*   Change an encrypted password in a Replication Server configuration file. See "Altering an encrypted password for a Replication Server" on page 63.

Note Once you have encrypted passwords using rs_init, they cannot be decrypted.

Enabling password encryption for a Replication Server

In this procedure, rs_init creates a new configuration file that contains encrypted passwords for the Replication Server. rs_init encrypts the passwords in the rs_users and rs_maintusers system tables.

❖ **Enabling password encryption**

1 Go to Start | Programs | Sybase | rs_init.

You see the RS_INIT menu.

2 Select Configure a Server Product, then choose Continue. You see the Configure Server Products window.

3 Select Replication Server and choose Continue. You see the Configure Replication System window.

4 Select Enable Password Encryption for a Replication Server, then choose Continue.

5 Complete the screen as follows.

a Enter the name of the Replication Server for which you want to enable password encryption.

b Enter the login name for the Replication Server with "sa" user.

c Enter the password for the Replication Server "sa" user.

d Enter the full path for the Replication Server configuration file.

6 Choose Continue to save your changes. You see:

```
Execute the Replication Server tasks now?
```

7 Select Yes to enable encryption.

rs_init shuts down the Replication Server and encrypts the passwords in the Replication Server configuration file and in the rs_users and rs_maintusers system tables.

When encryption is complete, rs_init displays:

```
Replication Server 'rs_name' can now be restarted.
```

8 Choose OK. rs_init displays:

```
Configuration tasks completed successfully.
```

9 Choose OK. You see the Configure Replication System dialog box.

10 Choose Exit to quit rs_init.

11   Restart the Replication Server and any connected Replication Agents.

12   Delete the backup of the Replication Server configuration file.

Note The backup file contains unencrypted passwords, so you should remove that file to protect your replication system security. However, you may first want to make a hard copy or offline backup of the file and store it in a safe place.

The backup file has the same name as the Replication Server configuration file, but the extension is changed to a three-digit number such as "001." The file with the highest extension number is the most recent backup file.

Altering an encrypted password for a Replication Server

Follow the steps in this section to change an encrypted password in a Replication Server configuration file.

If password encryption is not enabled, you can use a text editor to change passwords in the configuration file.

Note The steps in this procedure do not apply to the passwords stored in the RSSD. To change the Replication Server password, use the alter user command. To change the maintenance user password, use the alter connection or alter route command.

❖   **Altering an encrypted password**

1   Select Start | Programs | Sybase | rs_init.

    You see the RS_INIT menu.

2   Select Configure a Server Product, then select Continue.

3   Select Replication Server, then select Continue.

4   Select Alter a Replication Server Configuration File Password, then select Continue.

5   Complete the screen as follows.

    a   Enter the name of the Replication Server whose configuration file you want to update.

    b   Enter the login name for the Replication Server "sa" user.

    c   Enter the password for the Replication Server "sa" account.

    d   Enter the full path name for the Replication Server configuration file.

    e   Enter the parameter for the password you want to alter. The parameters for the password that you can be used are:

-     *RSSD_primary_pw_enc* – for the RSSD primary user.
-     *RSSD_maint_pw_enc* – for the RSSD maintenance user.
-     *ID_pw_enc* – for the ID Server user name.

    f   Enter the new password you want to use.

6   Select Continue to save your changes. rs_init displays:

```
Execute the Replication Server tasks now?
```

7   Select Yes.

rs_init shuts down the Replication Server, then records the new password in the Replication Server configuration file. When that process is complete, rs_init displays this message:

```
Configuration completed successfully.
```

8   Choose OK. You see the Configure Replication System window.

9   Choose Exit to quit rs_init.

10   Restart the Replication Server.

Secure Sockets Layer

Topic	Page
Setting up SSL services	65

SSL is an industry standard for sending wire- or socket-level encrypted data over secure network connections. See Chapter 8, "Managing Replication Server Security" in the *Replication Server Administration Guide Volume 1,* for detailed information on the SSL security option.

Setting up SSL services

Before setting up SSL services on Replication Server, review the SSL Plus user documentation and documentation for any third-party SSL security software you are using.

❖ **Setting up SSL services on Replication Server**

The following steps are described in detail in the rest of this chapter.

1   Add the SSL driver to the Open Client/Server™ driver configuration file.

2   Modify the Open Client/Server trusted roots file to include trusted CA certificates.

3   Obtain a certificate from a trusted Certificate Authority (CA) for each Replication Server accepting SSL connections.

4   Create the identity file that concatenates a certificate and its private key.

5   Use rs_init to enable SSL on Replication Server and to add an encrypted SSL password to the Replication Server configuration file.

Note You can enable and disable SSL on Replication Server using configure replication server and the use_ssl option.

6   Create an SSL entry in the Replication Server interfaces (*sql.ini*) file,
     Windows Registry, or directory service.

7   Restart Replication Server.

Adding the SSL driver to the driver configuration file

Replication Server uses the *libtcl.cfg* file to map security mechanism names to
security driver file names. The default location is
%SYBASE%\%SYBASE_OCS%\ini\libtcl.cfg.

SSL driver names are listed in the [FILTERS] section of *libtcl.cfg*:

```
[FILTERS]
filter = driver
```

where:

- *filter* – specifies the local name for the security mechanism.

- *driver* – is the file name for the driver. A sample entry for SSL is:

  ```
  [FILTERS]
  ssl = libsybfssl.so
  ```

For more information about configuring *libtcl.cfg* for security drivers, see
"Configuring libtcl.cfg" in Chapter 8, "Managing Replication Server Security"
in the *Replication Server Administration Guide Volume 1*.

Adding trusted CA certificates to the trusted roots file

The list of known and trusted CAs is maintained in the trusted roots file:

%SYBASE%\ini\trusted.txt

The System Administrator adds and deletes CAs using a standard ASCII-text
editor. The trusted roots file is similar in format to a certificate file.

By default, Replication Server recognizes these third-party CAs:

- Thawte

- Entrust

- Baltimore

- VeriSign

• RSA

Obtaining a certificate for each SSL-enabled Replication Server

The System Administrator installs server certificates and private keys for the Replication Server installation. The System Administrator can get a server certificate using third-party tools provided with an existing public-key infrastructure (PKI) already in use in the customer environment. Each Replication Server acting as a server in an SSL-enabled connection must have a certificate issued by a trusted CA.

Most third-party PKI vendors have utilities to generate certificates and private keys.

If you request a certificate from a third-party vendor, and that certificate is in PKCS#12 format, use the certpk12 utility to convert the certificate into a format understood by Replication Server.

Adaptive Server Enterprise provides the certreq and certauth utilities to test the certificate request tool and to verify that the authentication methods are working on your server. See Chapter 9, "Security Administration" in *Adaptive Server Enterprise System Administration Guide* for more information.

Creating an identity file

The System Administrator must create an identity file that is understood by the SSL Plus software. The identity file contains the concatenation of a certificate and its corresponding encrypted private key.

The name and default location of the identity file is the following, where *servername* is the name of the server as specified at start-up:

%SYBASE%\%SYBASE_REP%\certificates\servername.crt

To place the identity file in a different location, you must specify the alternate location in the RS_ssl_identity entry in the configuration file.

To make a successful connection, the common name in the certificate must match the Replication Server name in the directory service.

Client certificates are not supported.

Adding an encrypted password to the configuration file

Specify an SSL password that decodes the identity file private keys. This password is stored as the RS_ssl_pw entry in the Replication Server configuration file where it will not be sent over the network.

Use rs_init to add or change an encrypted SSL password, which is stored as RS_ssl_pw_enc in the Replication Server configuration file.

Creating SSL entries in the directory service

The Replication Server directory service—such as the interfaces (*sql.ini*) file, the Windows Registry, or an LDAP server—defines the server address and port numbers, and determines security protocols that are enforced for client connections. Replication Server implements the SSL protocol as a filter that is appended to master and query lines in the directory service.

All attempts to connect to a master or query entry in a directory service with an SSL filter must support the SSL protocol. For example, suppose a primary Replication Server (SYBSRV1) and a replicate Replication Server (SYBSRV2) use the Transmission Control Protocol (TCP) and the SSL protocol for communication.

Entries in the interfaces (*sql.ini*) file might look like this:

```
[SYBSRV1]
query=tcp,myserver,sybasehost1,5001,ssl
master=tcp,myserver,sybasehost1,5001,ssl
[SYBSRV2]
query=tcp,myserver,sybasehost2,4001,ssl
master=tcp,myserver,sybasehost2,4001,ssl
```

You can also configure Replication Server to accept SSL connections and, at the same time, have other connections that accept clear text or use security mechanisms such as DCE and Kerberos. To support both SSL and other connection protocols, you must use multiple interfaces (*sql.ini*) files.

For example, a typical interfaces (*sql.ini*) file entry that supports the Transmission Control Protocol (TCP) and both SSL and clear text connections looks like this:

```
[SYBSRV1]
query=tcp,myserver,sybasehost1,5001,ssl
master=tcp,myserver,sybasehost1,5001,ssl
master=tcp,myserver,sybasehost1,5001
```

The interfaces (*sql.ini*) file master line entries allow SYBSRV1 to listen for both SSL and clear text connections. To make sure that SYBSRV1 sends queries to SYBSRV2 using SSL, there must be a single query entry in the interfaces (*sql.ini*) file for SYBSRV1. To allow SYBSRV1 to send queries to other servers using a different protocol, you must use a separate interfaces (*sql.ini*) file.

Enabling SSL on Replication Server

Note Replication Server does not require the REP_SSL license, as SSL comes as a part of the basic REP_SERVER license.

You can enable SSL using rs_init; you can enable or disable SSL using configure replication server with the use_ssl option.

To use configure replication server, enter:

```
configure replication server
   set use_ssl to 'on'
```

Set use_ssl to off to disable SSL. By default, SSL is not enabled on Replication Server. When use_ssl is off, Replication Server does not accept SSL connections.

use_ssl is a static option. You must restart Replication Server after you change its value.

CHAPTER 6   **Starting or Stopping a Replication Server**

Topic	Page
Using the Services Manager	71
Starting a Replication Server	72
Stopping a Replication Server using isql	73

Using the Services Manager

You can use the Services Manager to start and stop Replication Servers and Adaptive Servers. The Services Manager provides a visual indication of the server status.

Note Before you can use the Services Manager, you must shut down the server using isql and restart it using the Services Manager. See "Stopping a Replication Server using isql" on page 73 for instructions.

❖ **Using the Services Manager to start and stop a Replication Server**

1   Select Start | Programs | Services Manager. You see the Services Manager window.

2   From the Services list box, select the type of server you want to view. The available choices depend on the Sybase products you have installed.

3   From the Server list box, select the name of the server you want to view.

4   To start the server, double-click Start/Continue, or the green light.

To shut down the server, double-click Stop, or the red light.

Note Pause, the yellow (center) light, is not currently implemented.

Starting a Replication Server

When you install a new Replication Server to your replication system, rs_init creates a runserver file in the Sybase installation directory. The runserver file is an executable script that contains the complete command line required to start a Replication Server.

The runserver file name is constructed based on the name of the server, truncated to eight characters, if necessary, and a *.bat* extension. For example, for a Replication Server named ROME_RS, the runserver file is named *run_rome.bat*.

Start-up sequence for servers

Start servers in this order:

1   If the Replication Server uses RSSD in Adaptive Server Enterprise, start the Adaptive Server first.

2   Replication Servers.

Starting servers at system boot

In a production system, you must start Adaptive Servers and Replication Servers, whenever your machine reboots. To do this, see your System Administrator.

❖   **Configuring a new server to start at system start-up**

1   Choose Start | Settings | Control Panel.

2   From the Control Panel, double-click the Services icon.

3   From the Server list box, select the server that you want to start at system start-up.

4   Click Startup.

5   In the Server dialog box, select Automatic in the Startup Type box.

6   Choose OK.

The server you selected will start at system start-up.

Stopping a Replication Server using *isql*

To stop a Replication Server using isql:

1   Use isql to log in to the Replication Server as the System Administrator:

```
isql -Usa -Psa_password -Sservername
```

2   Enter:

```
1> shutdown
2> go
```

CHAPTER 7 **Replication Monitoring Services**

Introducing Replication Monitoring Services

The Replication Manager (RM) plug-in for Sybase Central can manage small and simple replication environments with fewer than ten servers. However, to manage large and complex replication environments, the RM can use a management server layer called the Replication Monitoring Services (RMS). RMS monitors the servers and components in a replication environment, provides the ability to control the flow of data in the replication environment, and sets the configuration parameters.

RMS functionality is available through the RM or a command line API. RM provides commands to create, modify, or delete replication objects; RMS provides an API to monitor and troubleshoot the replication environment.

RMS is applicable only for a three-tier management support.

Three-tier management support

In a three-tier management support, the RM connects to the servers in the environment through the RMS. RMS provides the monitoring capabilities for the replication environment.

RMS monitors the status of the servers and other components in the replication environment, and the RM provides the client interface that displays the information provided by the RMS.

Monitoring servers in the replication domain

Using RMS, you can monitor the following servers in your replication domain:

- Adaptive Server Enterprise

- Sybase IQ

- Replication Agent

- Mirror Replication Agent

- DirectConnect™

- Open Server™

- Replication Server

- Other RMS Servers

Installation

You can use the Replication Server installer to install the RMS component at the same time you install Replication Server.

If you select Typical or Full installation when you install Replication Server, the RMS component is automatically installed.

Configuring RMS for three-tier management support

Follow these steps to configure RMS:

1 Go to the %SYBASE% directory and run *SYBASE.bat*.

2 Go to Start | Programs | Sybase | Connectivity | Open Client Directory Service Editor. Using dsedit, add RMServices to the *sql.ini* file.

- Server Name – RMServices.

- Port – 32008.

- Hostname: host name of the machine on which RMS will run.

3 To start RMS, go to the *%SYBASE_UA%\bin* directory and run *agent.bat*.

4 To configure the RMS server, start an isql session by entering:

        isql -Usa -Psa_pwd -SRMServices

5   To change the RMS password, enter:

        configure password=newPassword

        go

6   Set the parameter *sybasehome* to the directory where the *sql.ini* file resides
     by running the following command, where *c:\Sybase* is directory in which
     the *sql.ini* file resides:

        configure sybasehome=*c:\Sybase*

     The *sql.ini* file contains the connection specifications for the servers added
     to an RMS domain.

7   You can now start using the RMS API commands to monitor a replication
     environment. For example:

        add replication server SAMPLE_RS set username to sa

See Chapter 9, "Replication Monitoring Services API" in the *Replication
Server Reference Manual* for API definitions.

Starting and Stopping RMS

RMS is a Java application built using the Sybase Unified Agent Framework
(UAF). To start or stop RMS, you must also start or stop UAF.

❖   **Starting RMS**

1   Navigate to the Replication Server installation directory, *%SYBASE%*.

2   Set the environment variables by executing SYBASE.bat.

3   Change to the *%SYBASE_UA%\bin* directory.

4   Execute agent.bat, or add this command to run Unified Agent (UA) in the
     background.

❖   **Stopping RMS**

1   Navigate to the Replication Server installation directory, *%SYBASE%*.

2   Set the environment variables by executing SYBASE.bat.

3   Stop RMS:

- • If an Adaptive Server UA is running, enter one of the following commands:

  ```
  shutdown [-port rmi-port] [-U username]
  [-P password]
  ```

  Or

  ```
  shutdown [-port rmi-port] [-user username]
  [-password password]
  ```

  where:

  - • *rmi-port* value is 9999

  - • *username* and *password* are the values configured for the Adaptive Server UA.

- • If RMS is the only Unified Agent running, enter shutdown.bat.

Connecting to RMS

Once the RMS has been started, you can connect to it using the RM plug-in. You can use RM plug-in to add the servers that need to be monitored by the RMS.

1 Click the Connect icon from the RM toolbar. The Connect to a Replication Domain window opens.

2 Select RMS Server.

3 Enter the user name and password needed to connect to RMS.

4 Select RMS from the list of servers in the drop-down list, or click the options button to provide the connection information for the RMS.

5 Enter a server name, host, and port number.

6 Click OK. The RMS server is added in your object tree.

For information on RMS API, see Chapter 9, "Replication Monitoring Services API" in the *Replication Server Reference Manual*.

Installing and Implementing Non-ASE Support Features

Topic	Page
Introduction	79
Setting up and configuring non-ASE support	81

Introduction

Replication Server support for replication into a non-ASE replicate database requires:

- Replication Server system tables—rs_lastcommit and rs_info—created in the non-ASE database, and Replication Server support functions such as rs_get_lastcommit and rs_get_charset.

- Function strings that:

   a   Replace certain language command and stored procedure invocations from the replicate Replication Server, then

   b   Produce operations in the replicate database that emulate the behavior of the commands and stored procedures that would exist in a Sybase Adaptive Server Enterprise replicate database.

- Heterogeneous datatype support for non-ASE datatypes that do not map directly to Replication Server datatypes (or Sybase ASE datatypes), which must be translated to the appropriate datatypes for replication into the replicate database.

Components for non-ASE support installed with Replication Server

The default installation of Replication Server includes the following components:

- Connection profiles that contain function-string classes and error classes for each actively supported database

- Datatype classes

- Replication Server native datatype *literal descriptor* rows in the RSSD rs_datatype table

- The Replication Server datatype translation engine

For functions-string classes, see Chapter 2, "Customizing Database Operations" in the *Replication Server Administration Guide Volume 2*, and for datatype classes, see Chapter 2, "Topics" in the *Replication Server Reference Manual*.

Connection profiles

Replication Server includes connection profiles that you use to connect to non-ASE data servers. Connection profiles contain or install these components:

- Datatype definitions

- Replication Server support objects in the replicate database

- Replication Server function strings

- Class-level translations for non-ASE datatypes

Datatype definitions

Datatype definitions assign a unique datatype ID to each datatype, and describe the attributes of each non-ASE datatype, such as delimiters, length, scale, precision, minimum and maximum values, how it is represented using native Replication Server datatypes. Replication Server uses datatype definitions to:

- Identify datatypes

- Convert datatypes into native datatypes for internal handling (if necessary)

- Translate datatypes

Replication Server support objects

Replication Server relies on a replicate database to maintain some of the operational data that Replication Server needs to replicate to that database.

Non-ASE support accommodates the Replication Server replicate database requirements by creating two tables in the replicate database:

- rs_info – stores the character set and sort order used by the database. The Replication Server maintenance user ID must have select permission on this table.

- rs_lastcommit – is used by the replicate Replication Server to record information about the most recent replicated operations committed in the replicate database. Because this table is both read and updated by the replicate Replication Server, the Replication Server maintenance user ID must have both insert and update permission on this table.

Replication Server function strings
Function strings allow users to customize the database operations sent by the replicate Replication Server to the replicate database. Non-ASE support uses function strings to replace invocations of stored procedures and certain database commands that the replicate Replication Server sends to the replicate database.

The function strings required to support connections to non-ASE data servers are installed in the RSSD of the replicate Replication Server.

Class-level translations for non-ASE datatypes
Connection profiles provide default datatype-to-datatype mappings, called class-level translations.

Connection profiles provide a function-string class for each supported database server. The class-level translations are specific to each function-string class that supports a non-Sybase replicate database.

Setting up and configuring non-ASE support

Set up and configure non-ASE support in Replication Server following these steps:

1   Create a replicate database connection – use the using profile clause with the create connection command to create a connection to a non-ASE replicate database. See "create connection with using profile clause," in Chapter 3, "Replication Server Commands" in the *Replication Server Reference Manual*.

2   Create replicate definitions – see "Creating replication definitions," in Chapter 9, "Managing Replicated Tables" in the *Replication Server Administration Guide Volume 1*.

3   Mark tables for replication – see "Marking tables for replication," in Chapter 9, "Managing Replicated Tables" in the *Replication Server Administration Guide Volume 1*.

4   Create subscriptions – see Chapter 11, "Managing Subscriptions" in the *Replication Server Administration Guide Volume 1*.

Once you complete all these steps, you can begin replicating transactions to a non-ASE replicate database.

See the *Replication Server Heterogeneous Replication Guide* for information specific to supported non-ASE databases.

APPENDIX A   **Worksheets**

Replication Server installation worksheet

Make a copy of this worksheet for each Replication Server you install. Complete the worksheet as you read Chapter 1, "Preparing to Install and Configure Replication Server."

Required worksheet items are marked with an asterisk (*). rs_init has default values for items that are *not* marked. To use a default value, leave the unmarked fields blank and fill it in on the worksheet when you run rs_init.

Release directory

Release directory:

Replication Server information

Replication Server name:*		
Is this Replication Server the ID Server?*	Yes	No
Replication Server error log:		
Replication Server configuration file:		
Replication Server password encryption:	Yes	No
Replication Server character set:		
Replication Server language:		
Replication Server sort order:		

Replication Server security information

Enable network security?*	Yes	No
If Yes, security system:	dce	csfkrb5
If Yes, login name:		
If Yes, keytab file name:		
Use Secure Sockets Layer (SSL) security?	Yes	No
If Yes, SSL identity file:		
If Yes, SSL private key password (default is `password`):		

Replication Server interfaces information

Network driver:*   ____ Windows Sockets   ____ Named Pipes   ____ IPX/SPX
Connection information:*

ID Server information

ID Server name:*	
ID Server user:	
ID Server password:	
Starting Replication Server ID:	
Starting database ID:	

Replication Server System Database choice

Will RSSD be embedded? (default is no)	Yes	No

Embedded Replication Server System Database information

Complete if you selected Yes for "Will RSSD be embedded?"

ERSSD name:*
ERSSD database file directory:*
ERSSD transaction log directory:*
ERSSD backup directory:*
ERSSD error log directory:*

Replication Server System Database information

Complete if you selected No for "Will RSSD be embedded?"

RSSD Adaptive Server name:*		
RSSD name:		
Will RSSD be replicated?*	Yes	No
Allow HA failover for RSSD connections?	Yes	No
Create RSSD:*	Yes	No
SA user:		
SA password:*		
Primary user:		
Primary password:		
Maintenance login:		
Maintenance password:		

RSSD device information

Size of the RSSD database:		
RSSD device name:*		
Create the RSSD device:*	Yes	No
RSSD device physical name:		
RSSD device size:		
Size of the RSSD log:		
RSSD log device name:*		
Create the RSSD log device:*	Yes	No
RSSD log device physical name:		
RSSD log device size:		

Disk partition information

Disk partition path:*
Logical identifier for disk partition:*
Size of disk partition:
Start value for partition:

Remote site connections information

Replication Server login name:
Replication Server login name:
Replication Server password:

RSSD RepAgent information

Complete if you selected Yes for "Will RSSD be replicated?"

RS user:
RS password:

Database setup worksheet

Make a copy of this worksheet for each database you add to the replication system. Complete the worksheet as you read Chapter 1, "Preparing to Install and Configure Replication Server." Refer to the information on the worksheet when you use rs_init to add the database to your replication system.

Required worksheet items are marked with an asterisk (*). rs_init has default values for items that are *not* marked. To use the default values, leave the unmarked field blank and fill it on the worksheet when you run rs_init.

Replication Server information

Replication Server name:*	
RS SA user:*	
RS SA password:*	

Replication Server interfaces information

Network driver:* ____ Windows Sockets ____ Named Pipes ____ IPX/SPX		
Connection information:*		

Database information

Adaptive Server name:*		
SA user:		
SA password:		
Database name:		
Will the database be replicated?*	Yes	No
Maintenance user:		
Maintenance password:		
Is this a physical connection for an existing logical connection?	Yes	No

Logical connection information

Complete if you selected Yes for "Is this a physical connection for an existing logical connection?"

Is this an active connection or a standby connection?*	Active	Standby
Logical DS name:*		
Logical DB name:*		

Complete the rest of the items in this section only if you selected "Standby" in response to "Is this an active connection or standby connection?"

Active DS name:*		
Active DB name:*		
Active DB SA user:*		
Active DB SA password:*		
Initialize standby using dump and load?*	Yes	No
Use dump marker to start replicating to standby?*	Yes	No

Complete the following three sections if you selected Yes for "Will the database be replicated?"

Database RepAgent information

RS user:
RS password:

Using *rs_init* with Resource Files

Using resource file templates

Instead of using rs_init interactively, you can use a resource file to install, configure, upgrade, or downgrade a Replication Server. Resource files are text files that you can modify using any text editor that can save ASCII format files. To create a resource file, copy and edit a template file, which is supplied with the Replication Server software. Then execute rs_init with the -r command line option, specifying the resource file that rs_init is to use for input.

Sybase supplies several resource file templates for Replication Server. Each template contains the attributes that are valid for a certain rs_init operation.

Table B-1 lists the Replication Server resource file templates. The templates are located in subdirectories under the *init* subdirectory of the Sybase installation directory.

Table B-1: Resource file templates for Replication Server

Template name	Description
install.rs	Configures a new Replication Server.
setupdb.rs	Adds a database to the replication system.
upgr.rs	Upgrades an RSSD for a Replication Server. Use this template after installing new Replication Server software.
upgrdb.rs	Upgrades a user database that is already part of a replication system.

Template name	Description
downgr.rs	Downgrades an RSSD for a Replication Server. Use this template before reinstalling the previous Replication Server software release.
eers.rs	Enables password encryption for a Replication Server.
updrscf.rs	Alters a password in a Replication Server configuration file.

Using resource files for *rs_init*

This section explains how to prepare a resource file for rs_init.

❖ **Using resource files for *rs_init***

1 Select the resource file template you want to use from Table B-1.

2 Make a copy of the template and rename it to distinguish it from the original. For example:

```
copy install.rs install.rsx
```

Note You must have read and write permissions on the copy of the resource file template that you want to edit. You may need to grant write permission to yourself as the file owner.

3 Use a text editor to edit the new resource file.

For example, enter:

```
edit install.rsx
```

See "Editing a resource file" on page 91 for instructions.

4 When you have finished editing the resource file, start rs_init from the operating system prompt, using the -r flag (see Table B-2 on page 92) to specify your resource file. For example:

```
%SYBASE%\%SYBASE_REP%\install\rs_init -r
install.rsx
```

Warning! If you try to start a resource file session with an input file that is not an edited copy of one of the resource file templates, rs_init fails upon validation of the input file.

Editing a resource file

Resource files list the attributes to be defined during an rs_init session and the values for these attributes. This section describes the syntax and parameters you can use in the resource file and additional information, such as restrictions and usage.

Syntax

Attribute entries are in this format:

```
product_name.attribute:value
```

Parameters

- *product_name* – is either sybinit or rs.

- *attribute* – is an item for which you are supplying information, such as a server name or network protocol.

- *value* – is the value you want to assign to the attribute.

Usage

- Resource file entries can be only one line long (80 characters).

- rs_init does not recognize end-of-line characters, carriage returns, or backslashes.

- rs_init ignores blank lines and lines that begin with a pound sign (#).

- If you do not enter a valid value for every required attribute, rs_init returns an error when you use the resource file.

- If a Sybase-defined default value exists for an attribute, you can specify the default with the special value USE_DEFAULT.

- Certain resource file attributes can take lists of values. Attributes that can accept lists of values end with "_list." Use commas to separate values. For example:

  ```
  rs.rs_rs_network_protocol_list:tcp,ipx
  ```

- If you use a resource file to upgrade or modify a Replication Server, you can use the UNCHANGED value to indicate that a particular attribute should remain unchanged.

- You cannot use the USE_DEFAULT or the UNCHANGED value for required attributes with a null default value, except for attributes that specify passwords. If you enter USE_DEFAULT or UNCHANGED for attributes that specify passwords, rs_init uses a NULL password.

Using *rs_init* command line options

After you have edited your resource file, start rs_init from the operating system prompt:

```
rs_init resource_file_name [-option] [parameter]
```

where:

- *option* – is the letter specifying a command line option.

- *parameter* – is any valid parameter for that option.

You can specify more than one command line option. For a resource file session, you must specify the -r option and the resource file name. Table B-2 lists the available options for a resource file. You can also use some of these options in an interactive rs_init session.

Table B-2: rs_init command line options

Flags	Parameters	Explanation
-a	none	Validates the resource file and exits without performing the configuration task. Without the -a flag, rs_init validates the resource file and continues the product configuration. You must use the -r flag with the -a flag.
-c	See "Replication Server information" on page 6 for a list of character sets.	Specifies the character set used for all messages and prompts. The -c flag forces rs_init to use a particular character set. Otherwise, rs_init uses your system's default character set.
-e	none	Records information about the user's environment and exits. Information is written to the log file. Without the -e flag, rs_init records user environment information and continues the product configuration.
-h	none	Prints out usage message (help) and exits.
-l	French, German, Japanese, Spanish, Chinese, Korean	Specifies the language used for all messages and prompts. The -l flag forces rs_init to use a particular language. Without this option, rs_init uses U.S. English.
-log	Path and file name of log file	Lets the user specify location of the session log file. Without the -log flag, rs_init uses the default log location (*%SYBASE%\init\log*).
-r	Path and file name of resource file	Specifies that rs_init is to take input from the listed resource file. Use this flag in noninteractive sessions to configure new server products, upgrade existing server products, or modify existing server products.

Flags	Parameters	Explanation
-s	Path of Sybase release directory	Specifies the Sybase release directory. If you do not use the -s flag, rs_init assumes that the Sybase release directory is the current directory.
-T IGNORE_WARNINGS	none	Entering certain values for some attributes causes rs_init to exit with a warning. (rs_init exits, for instance, if you specify an operating system file for the location of the master device.) Invoking an rs_init resource file session with the -T IGNORE_WARNINGS flag allows the rs_init session to continue.
-v	none	Prints the rs_init version string and exits.

Sample Replication Server resource file

This section contains a sample resource file for configuring a new Replication Server. Your resource file will have different values for many of the attributes, but will be similar to the sample.

```
#######################################################
#                    RESOURCE TEMPLATE
#
# This file contains a list of configuration attributes
# for Sybase Replication Server. This is the template
# for configuring a new Replication Server. DO NOT EDIT
# THIS FILE.
# Copy the template to another file and edit that.
#
# Syntax of the resource file is:
#
#    product_name.attribute:value
#
# Attributes with a value of USE_DEFAULT will use the
# Sybase defaults for this platform.
#
# NOTES:
#   Generic attributes are prefaced by "sybinit." The
#   only generic attributes are "release_directory" and
#   "product."
#
#######################################################

#######################################################
```

```
#    RELEASE LOCATION
#
sybinit.release_directory: c:\sybase

# The product that you wish to configure.  Possible
values are:
#    rs
#
sybinit.product: rs

#########################################################

# REPLICATION SERVER ATTRIBUTES
#
# This operation installs a new Replication Server.
rs.rs_operation: rs_install

#########################################################

# ID SERVER INFORMATION
#
# Name of the ID Server
rs.rs_idserver_name: IDRS

# Is the ID Server the same as the Replication Server
# that is being installed ? Default is no
rs.rs_id_server_is_rs_server: yes

# Login that other Replication Servers will use to
# connect with the ID Server. Default is
# <rs_idserver_name>_id_user.
rs.rs_idserver_user: USE_DEFAULT

# Password for the ID Server user. Default is
# <rs_idserver_name>_id_passwd
rs.rs_idserver_pass: USE_DEFAULT

# The next two attributes should be set only when
# installing an ID Server and there are multiple ID
# Server domains

# First ID used for Replication Servers in this ID
Server domain
rs.rs_start_rs_id: USE_DEFAULT

# First ID used for databases in this ID Server domain
```

```
rs.rs_start_db_id: USE_DEFAULT

############################################################

# REPLICATION SERVER INFORMATION

#
# Replication Server name
rs.rs_name: NYRS

# Will the Replication Server manage databases with
# primary data,submit asynchronous transactions, or
# serve as an intermediate site in an indirect route ?
# Default is no

rs.rs_requires_ltm: no

# Will the Replication Server(11.0 or higher) manage
# databases with primary data, submit asynchronous
# transactions, or serve as an intermediate site in an
# indirect route ? Default is yes
rs.rs_needs_repagent: yes

# Locations of the errorlog and config file for the
# Replication Server.

# The default names of these files are <rs_name>.log and
# <rs_name>.cfg respectively.
# The default directory in which these files are located
# is the current working directory on Unix platforms,
# and in %SYBASE%\install on PC platforms.
rs.rs_rs_errorlog: USE_DEFAULT
rs.rs_rs_cfg_file: USE_DEFAULT

# Character set to be used by this Replication Server
#(and the RSSD LTM if needed)
rs.rs_charset: USE_DEFAULT

# Language to be used by this Replication Server (and
# the RSSD LTM if needed)
rs.rs_language: USE_DEFAULT

# Sort order to be used by this Replication Server (and
# the RSSD LTM if needed)
rs.rs_sortorder: USE_DEFAULT
```

```
#########################################################

# REPLICATION SERVER SYSTEM DATABASE CHOICE
#

# Is this an embedded rssd
rs.rs_rssd_embedded: no

#########################################################

# EMBEDDED REPLICATION SERVER SYSTEM DATABASE
# INFORMATION

# The following only applies if embedded RSSD is chosen
#
# erssd name
rs.rs_erssd_name: rep_erssd

# embedded rssd database directory
rs.rs_erssd_database_dir: C:\sybase\data\database

# embedded rssd transaction log directory
rs.rs_erssd_translog_dir: C:\sybase\data\translog

# embedded rssd backup directory

rs.rs_erssd_backup_dir: C:\sybase\data\backup

# embedded rssd error log directory
rs.rs_erssd_errorlog_dir: C:\sybase\data\errorlog

#########################################################

# REPLICATION SERVER SYSTEM DATABASE INFORMATION

# The following only applies if embedded RSSD is not
# chosen Name of the Adaptive Server that will manage
# the Replication Server's system database.
rs.rs_rssd_sqlsrvr: NYDS

# Name of the database where the Replication Server
# system tables will be stored. Default is<rs_name>_RSSD
rs.rs_rssd_db: USE_DEFAULT

# Do you want the RSSD connections to allow HA failover?
# Default is no
```

```
rs.rs_rssd_ha_failover: no

# Do you want rs_init to create the system database ?
#Default is no
rs.rs_create_rssd: no

# sa login for the system Adaptive Server - default is sa
rs.rs_rssd_sa_login: USE_DEFAULT

# sa password for the system Adaptive Server - default
# is NULL
rs.rs_rssd_sa_pass:

# Name of the RSSD primary user. Default is
# <rs_rssd_db>_prim
rs.rs_rssd_prim_user: USE_DEFAULT

# Password for the RSSD primary user. Default is
# <rs_rssd_db>_prim_ps
rs.rs_rssd_prim_pass: USE_DEFAULT

# Name of the RSSD maintenance user. Default is
# <rs_rssd_db>_maint
rs.rs_rssd_maint_user: USE_DEFAULT

# Password for the RSSD maintenance user. Default is
# <rs_rssd_db>_maint_ps
rs.rs_rssd_maint_pass: USE_DEFAULT

# The dbo_user and dbo_password attributes are not used
# by default. They should be used only if the RSSD
# requires an LTM and the log should be scanned by
# someone other than rs_rssd_sa_login. This user should
# already exist in the database.

# Name of the Database Owner for the RSSD
rs.rs_rssd_dbo_user: USE_DEFAULT

# Password for the database owner
rs.rs_rssd_dbo_pass: USE_DEFAULT


########################################################

# REPLICATION SERVER SYSTEM DATABASE DEVICE INFORMAITON
```

```
                   # The following only applies if embedded RSSD is not
                   # chosen
                   # (USED ONLY IF RS_INIT IS TO CREATE THE RSSD)

                   # Size of the system database in MB. Default and minimum
                   # is 40
                   rs.rs_rsdddb_size: 40

                   # Size of the log for the system databas in MB. Default
                   # and minimum is 32
                   rs.rs_rssd_log_size:32

                   # Name of the device on which the system database is to
                   # be created Default is master
                   rs.rs_rssd_db_device_name: dbdev

                   # Do you want rs_init to create this device for the
                   # system database ? Default is no
                   rs.rs_create_rssd_database_dev: no

                   # Physical pathname of the device for the system
                   # database
                   rs.rs_rssd_db_device_path: c:\sybase\data\dev1.dat

                   # Size of the device for the system database
                   rs.rs_rssddb_device_size: 40

                   # Name of the device on which the log for the system
                   # database is to be created
                   rs.rs_rssd_log_device_name: logdev

                   # Do you want rs_init to create this device for the log
                   #for the system database ? Default is no
                   rs.rs_create_rssd_log_dev: no

                   # Physical pathname of the device for the log for the
                   # system database
                   rs.rs_rssd_log_device_path: c:\sybase\data\dev2.dat

                   # Size of the device for the log for the system database
                   rs.rs_rssd_log_device_size:32

                   ########################################################

                   # DISK PARTITION INFORMATION
                   #
```

```
# Full path name of a raw disk partition for the
# Replication Server
rs.rs_diskp_name: c:\sybase\data\dev3.dat

# Logical identifier name for the raw disk partition for
# the Replication Server
rs.rs_diskp_lname: part1

# Size, in megabytes, of the raw disk partition.Default
# is 20.
rs.rs_diskp_size: 20

# The offset, in megabytes, at which the Replication
# Server should begin writing in the raw disk partition.
# Default is 0
rs.rs_diskp_vstart: 0

########################################################

# REMOTE SITE CONNECTION INFORMATION
#
# Replication Server login name that other Replication
# Servers will use to connect with this Replication
# Server

# Default is <rs_name>_rsi
rs.rs_rs_user: USE_DEFAULT

# Password for the Replication Server login name
# Default is <rs_name>_rsi_ps
rs.rs_rs_pass: USE_DEFAULT

########################################################

# SYSTEM DATABASE LOG TRANSFER MANAGER INFORMATION
# (IF RSSD NEEDS LTM)

# Name of the RSSD LTM. Default is
# <rs_rssd_sqlsrvr>_<rs_name>_RSSD_ltm.
rs.ltm_name: NY_LTM

# Replication Server login name that the log transfer
# manager will use when connecting to the Replication
# Server
# Default is <rs_name>_ltm
```

```
rs.rs_ltm_rs_user: USE_DEFAULT

# Password for the login name for the log transfer
# manager
# Default is <rs_name>_ltm_ps
rs.rs_ltm_rs_pass: USE_DEFAULT

# Login name for the user who will start and shutdown
# the log transfer manager for the Replication Server
# system database
# Default is sa
rs.rs_ltm_admin_user: USE_DEFAULT

# Password for the admin user - default is NULL
rs.rs_ltm_admin_pass: USE_DEFAULT

##########################################################

# ID SERVER INTERFACES INFORMATION

# These attributes are valid only for Unix platforms.
# On PC platforms,adding interface file entries through
# resource files is not supported.
# rs.do_add_id_server must be no on these platforms.
#
# Add ID Server to interfaces file? Default is no
rs.do_add_id_server: USE_DEFAULT

# Connect retry count; number of times client tries to
# connect to ID Server before giving up
rs.rs_id_server_connect_retry_count: USE_DEFAULT

# Connect retry delay time (in seconds); amount of time
# client waits between each connection attempt
rs.rs_id_server_connect_retry_delay_time: USE_DEFAULT

# Notes associated with ID Server interfaces file entry
rs.rs_id_server_notes: Default Sybase Configuration

# Protocol for ID Server network listener
rs.rs_id_server_network_protocol_list: tcp

# Name of host for ID Server
rs.rs_idserver_hostname: herbie

# Port numbers for network listener
```

```
rs.rs_idserver_port: 5002

##########################################################

# REPLICATION SERVER INTERFACES INFORMATION
# These attributes are valid only for Unix platforms.
# On PC platforms,adding interface file entries through
# resource files is not supported.

# rs.do_add_replication_server must be no on these
platforms.
#
# Add Replication Server to interfaces file?
rs.do_add_replication_server: no

# Connect retry count; number of times client tries to
# connect to Replication Server before giving up
rs.rs_rs_connect_retry_count: USE_DEFAULT

# Connect retry delay time (in seconds); amount of time
# client waits between each connection attempt
rs.rs_rs_connect_retry_delay_time: USE_DEFAULT

# Notes associated with Replication Server interfaces
# file entry
rs.rs_rs_notes: Default Sybase Configuration

# Protocol for Replication Server network listener
rs.rs_rs_network_protocol_list: tcp

# Name of host for Replication Server
rs.rs_rs_hostname:   herbie

# Port numbers for network listener
rs.rs_rs_port: 5005

##########################################################

# LOG TRANSFER MANAGER INTERFACES INFORMATION - IF RSSD
HAS LTM

# These attributes are valid only for Unix platforms.
# On PC platforms,adding interface file entries through
# resource files is not supported.
# rs.do_add_ltm must be no on these platforms.
```

```
# Add Log Transfer Manager to interfaces file?
rs.do_add_ltm: no

# Connect retry count; number of times client tries to
# connect to Log Transfer Manager before giving up
rs.rs_ltm_connect_retry_count: USE_DEFAULT

# Connect retry delay time (in seconds); amount of time
# client waits between each connection attempt
rs.rs_ltm_connect_retry_delay_time: USE_DEFAULT

# Notes associated with Log Transfer Manager interfaces
# file entry
rs.rs_ltm_notes: Default Sybase Configuration

# Protocol for Log Transfer Manager network listener
rs.rs_ltm_network_protocol_list: tcp

# Name of host for Log Transfer Manager
rs.rs_ltm_hostname:  herbie

# Port numbers for network listener
rs.rs_ltm_port: 5000

##########################################################

# REPLICATION SERVER SECURITY INFORMATION

# These attriibutes apply to the security features
# available for the replication server. This option is
# only available on Solaris and NT.
# Enable external network security
rs.rs_network_security_enable: no

# Type of network security for the Replication Server,
# choices are "dce" or "csfkrb5",
rs.rs_network_security_system: USE_DEFAULT

# Login name for the user who will principle user, this
# login name will be used for all secure connections,
# Sybase recommends the name of the Replication Server
# as the principle user name.
rs.rs_principal_user_name: USE_DEFAULT

# Full path to the location of keytab file
rs.rs_keytab_file: USE_DEFAULT
```

```
# Use Secure Socket Layer(ssl) security
rs.rs_use_ssl: no

# Full path to the location of the ssl identity file
rs.rs_ssl_identity_file: USE_DEFAULT

# Password for the ssl private key
rs.rs_ssl_pkey_password: USE_DEFAULT

# end of resource file
```

Sample Replication System

Topic	Page
Description of the sample replication system	105
Setting up the example	106
Testing and troubleshooting the replication system	111

The sample replication system replicates the changes made to two tables in the pubs2 database from one Adaptive Server to another Adaptive Server.

You can set up this example as an introduction to using Replication Server or to test your replication system installation.

Note The application architecture for this example is similar to the decision-support model described in the *Replication Server Design Guide*.

Description of the sample replication system

The goal of this replication system is to replicate all changes made to the authors and titles tables in the pubs2 database in one Adaptive Server to the same tables in the pubs2 database in another Adaptive Server.

The replication system has two Adaptive Servers:

- A primary Adaptive Server, named TOKYO_DS, holds the RSSD for the primary Replication Server and the primary pubs2 database.

- The replicate Adaptive Server, named SYDNEY_DS, holds the RSSD for the replicate Replication Server and the replicate pubs2 database.

The replication system has two Replication Servers:

- A primary Replication Server named TOKYO_RS manages the primary pubs2 database.

- A replicate Replication Server named SYDNEY_RS manages the replicate pubs2 database.

The replication system has two RepAgents, which are the Replication Agents for Adaptive Server:

- A RepAgent for the primary RSSD runs in the ASE TOKYO_RSSD and transfers the RSSD log to the primary Replication Server.

- A RepAgent for the primary pubs2 database runs in the ASE TOKYO_PUBS2 and transfers the pubs2 log to the primary Replication Server.

Setting up the example

This section outlines the tasks for setting up the replication system.

- "General setup tasks" on page 106 explains how to install the servers and databases used in the example.

- "Establishing replication" on page 108 explains how to set up replication between the pubs2 databases in the two Adaptive Servers.

❖ **General setup tasks**

If you already have Adaptive Servers or Replication Servers installed, you can use them for the example. Substitute the names of your servers throughout the instructions.

You must choose the machines where each server will execute. You must also locate disk space for Adaptive Server database devices and Replication Server partitions.

1 Install the primary Adaptive Server, TOKYO_DS.

- The Adaptive Server must have room on its database devices for a 2MB pubs2 database, a 10MB RSSD, and at least 10MB for logs.

2 Install the replicate Adaptive Server, SYDNEY_DS.

- The Adaptive Server must have room on its database devices for a 2MB pubs2 database, a 10MB RSSD, and at least 10MB for logs.

3   Install the pubs2 database in the primary Adaptive Server:

```
isql -Usa -Psa_passwd -STOKYO_DS < \
      %SYBASE%\%SYBASE_ASE%\scripts\installpubs2
```

4   Install the pubs2 database in the replicate Adaptive Server:

```
isql -Usa -Psa_passwd -SSYDNEY_DS < \
      %SYBASE%\%SYBASE_ASE%\scripts\installpubs2
```

5   Complete Appendix A, "Worksheets" for the primary Replication Server (TOKYO_RS).

   •   Create the RSSD for TOKYO_RS in the TOKYO_DS Adaptive Server.

   •   The RSSD requires a RepAgent.

6   Complete Appendix A, "Worksheets" for the replicate Replication Server (SYDNEY_RS).

   •   Create the RSSD for SYDNEY_RS in the SYDNEY_DS Adaptive Server.

   •   The RSSD does not require a RepAgent.

7   Complete "Database setup worksheet" on page 87 for the primary pubs2 database.

   •   The database is in Adaptive Server TOKYO_DS.

   •   The database is managed by the TOKYO_RS Replication Server.

   •   The database requires a RepAgent.

8   Complete "Database setup worksheet" on page 87 for the replicate pubs2 database.

   •   The database is in Adaptive Server SYDNEY_DS.

   •   The database is managed by the SYDNEY_RS Replication Server.

   •   The database does not require a RepAgent.

9   Log in to the machine where the primary Replication Server will execute. Run rs_init and install Replication Server TOKYO_RS using the worksheet you completed in step 5.

10   Log in to the machine where you installed the primary Replication Server. Run rs_init and add the primary pubs2 database to the replication system using the worksheet you completed in step 7.

11   Log in to the machine where the replicate Replication Server will execute.
     Run rs_init and install Replication Server SYDNEY_RS using the
     worksheet you completed in step 6.

12   Log in to the machine where you installed the replicate Replication Server.
     Run rs_init and add the replicate pubs2 database to the replication system
     using the worksheet you completed in step 8.

❖   **Establishing replication**

Create a route from the primary Replication Server to the replicate Replication
Server.

1   Log in to the primary Replication Server as "sa":

```
isql -Usa -STOKYO_RS
```

2   Enter the create route command:

```
create route to SYDNEY_RS
   set username SYDNEY_RS_rsi
   set password SYDNEY_RS_rsi_ps
go
```

Note Find the user name and password for the create route command in
the "Remote site connections" section of the Replication Server
Installation Worksheet for the replicate Replication Server.

3   Create a login account in the primary Adaptive Server for the user who
    will create the replication definitions and subscriptions. In this example,
    the login name is "repsys." Add the user to the pubs2 databases and grant
    the user select permissions for the tables to replicate.

```
isql -Usa -STOKYO_DS
     sp_addlogin repsys, repsys_ps
     go

     use pubs2
     go

     sp_adduser repsys
     go

     grant select on authors to repsys
     grant select on titles to repsys
     go
     quit
```

4   Add the "repsys" user to the two Replication Servers and grant create
     object permission to the user. The "repsys" user must have the same login
     name and password in the two Replication Servers and the primary
     Adaptive Server:

```
isql -Usa -STOKYO_RS
      create user repsys
      set password repsys_ps
      go

      grant create object to repsys
      go
      quit

isql -Usa -SSYDNEY_RS
      create user repsys
      set password repsys_ps
      go

      grant create object to repsys
      go
      quit
```

5   Create replication definitions for the authors and titles tables:

```
isql -Urepsys -Prepsys_ps -STOKYO_RS
      create replication definition authors
      with primary at TOKYO_DS.pubs2
      with all tables named 'authors'
       (
          au_id varchar(11),
          au_lname varchar(40),
          au_fname varchar(20),
          phone char(12),
          address varchar(40),
          city varchar(20),
          state char(2),
          country varchar(12),
          postalcode char(10)
       )
      primary key (au_id)
      searchable columns (state, postalcode)
      go

      create replication definition titles
      with primary at TOKYO_DS.pubs2
      with all tables named 'titles'
```

```
            (
               title_id varchar(6),
               title varchar(80),
               type char(12),
               pub_id char(4),
               price money,
               advance money,
               total_sales int,
               notes varchar(200),
               pubdate datetime,
               contract bit
            )
            primary key (title_id)
            searchable columns (type, pub_id)
            go
```

6 Set replication to on for the authors and titles tables in the primary pubs2
   database:

```
isql -Usa -STOKYO_DS
       use pubs2
       go

       sp_setreptable authors, true
       go

       sp_setreptable titles, true
       go
```

7 In the replicate pubs2 database, grant permissions on the authors and titles
   tables to the maintenance user:

```
       isql -Usa -SSYDNEY_DS

       use pubs2
       go

       grant select, insert, delete, update
       on authors to pubs2_maint
       grant select, insert, delete, update
       on titles to pubs2_maint
       go
```

Note You can find the maintenance user in the "Database information"
section of the Database setup worksheet you completed for the replicate
pubs2 database.

8   In the replicate Replication Server, create subscriptions for the authors and titles tables:

```
isql -Urepsys -Prepsys_ps -SSYDNEY_RS

        create subscription authors_sub
        for authors
        with replicate at SYDNEY_DS.pubs2
        without materialization
        go

        create subscription titles_sub
        for titles
        with replicate at SYDNEY_DS.pubs2
        without materialization
        go
```

Note Since there is already data at the replicate database, this example uses the create subscription without materialization option. For other methods, see Chapter 3, "Replication Server Commands," in the *Replication Server Reference Manual*.

Testing and troubleshooting the replication system

Replication should now be established for the authors and titles tables. To test and troubleshoot the replication system:

- Log in to the replicate pubs2 database and select the data from the titles and authors tables. If the rows exist in the tables, it indicates that the subscriptions were created and materialized successfully.

- If rows are not appearing in the replicate tables, execute the check subscription command in each of the Replication Servers:

```
check subscription authors_sub
   for authors
   with replicate at SYDNEY_DS.pubs2
```

The check subscription command reports the status of the subscription. If the status is not "valid" in both the primary and replicate Replication Servers, then either the subscription has not finished materializing or an error has occurred.

The authors and titles tables are very small. If there are no configuration problems, they should not take more than a few seconds to materialize. If you do not see the results quickly, you can assume that an error has occurred.

- Log in to the primary pubs2 database and execute some insert, update, and delete SQL commands against the authors and titles tables. Then log in to the replicate pubs2 database and verify that your modifications appear in the replicate tables. If rows do not appear in the replicate tables, execute the check subscription command in each of the Replication Servers.

- Check the error logs for the primary and replicate Replication Servers for error messages. The most common problems are:

  - Failure to log in to the primary Adaptive Server. The user who creates the subscription in the replicate Replication Server must have the same login name and password in the primary Adaptive Server and the primary Replication Server.

  - Missing permissions in the primary database. The user who creates the subscription must be a user in the primary database and must have select permission in the primary table.

  - Missing permissions in the replicate database. The maintenance user must have select, insert, update, and delete permissions on the tables in the replicate database.

  - A Replication Server or Adaptive Server has stopped running. Try logging in to each of the servers. Restart any servers that are not running.

Index

Numerics

A

B

C

W