SYBASE®

Installation Guide

Mainframe Connect™ DirectConnect™ for z/OS Option

15.0

[Microsoft Windows, Linux, and UNIX]

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About This Book

This guide describes how to install the Mainframe Connect™ DirectConnect™ for z/OS Option on the following platforms:

- HP 9000/800 HP-UX
- HP Itanium
- IBM RISC System/6000 AIX
- Sun Solaris
- Linux
- Microsoft Windows

Audience

This guide is for System Administrators or other qualified persons familiar with their system environment, resources, and devices. This includes system administrators or communications specialists who are responsible for setting up communications for the DirectConnect for z/OS Option.

How to use this book

This guide provides the following information:

- Chapter 1, “Introduction,” provides an overview of the DirectConnect for z/OS Option, explains the installation program, and describes the installed directory structure.
- Chapter 2, “Preparing to Install,” describes the necessary tasks to perform before installation, which includes filling out installation worksheets and preparing for connectivity.
- Chapter 3, “Installing DirectConnect for z/OS Option,” describes how to install and uninstall DirectConnect for z/OS Option on UNIX and Windows platforms.
- Chapter 4, “Installing and Using DirectConnect Manager,” describes how to install DirectConnect Manager.
- Chapter 5, “Using the Create Server Wizard,” allows you to create a server and complete the connection to the target database.

- Chapter 6, “Using DirectConnect Utilities and DirectConnect Manager,” describes how to create, start, and stop a server, create a service, and start a service.
- Chapter 7, “Performing Post-Installation Tasks,” describes server and client post-installation tasks that you need to complete.
- Chapter 8, “Creating Database Tables,” explains how to run SQL scripts to set up database tables for using DB2 UDB data.
- Appendix A, “Using DirectConnect for z/OS Utilities,” describes Sybase® utilities used to start a server, create and start a new server, and migrate files from one server to another.
- Appendix B, “Validating Connectivity,” describes how to use the cicsping and snaping utilities.
- Appendix C, “Migrating to the ODBC Driver by Sybase,” describes the required changes to the Data Source Name (DSN) to migrate from the Tabular Data Stream™ (TDS) driver to the ASE ODBC Driver by Sybase.

Related documents

To configure and administer Mainframe Connect DirectConnect for z/OS Option, use these documents:

- Enterprise Connect and Mainframe Connect *Server Administration Guide* for DirectConnect
- Mainframe Connect DirectConnect for z/OS Option *Users Guide for Access Services*
- Mainframe Connect DirectConnect for z/OS Option *Users Guide for Transaction Router Services*
- DirectConnect Manager online Help

To install and administer the other Mainframe Connect products, use these documents:

- Mainframe Connect Client Options *Programmers Reference* for Client Services Applications
- Mainframe Connect Client Options *Installation and Administration Guide* for CICS
- Mainframe Connect Client Options *Installation and Administration Guide* for IMS and MVS
- Mainframe Connect Client Options *Programmers Reference for PL/1*
- Mainframe Connect Client Options *Programmers Reference for C*

- Mainframe Connect Client Options *Programmers Reference for COBOL*
- Mainframe Connect Server Options *Installation and Administration Guide* for CICS
- Mainframe Connect Server Options *Installation and Administration Guide* for IMS and MVS
- Mainframe Connect Client Options *Programmers Reference* for Remote Stored Procedures
- Mainframe Connect Server Options *Programmers Reference for PL/1*
- Mainframe Connect Server Options *Programmers Reference for COBOL*
- Mainframe Connect Client Options and Server Options *Messages and Codes*

For additional references, use the following documents:

- Open Client™ *Client-Library Reference Manual*
- Open Server™ *Server-Library Reference Manual*
- Open Client and Open Server *Installation Guides* (by platform)
- Open Client and Open Server *Programmers Supplements* (by platform)

Other sources of information

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

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

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

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

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

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

Sybase certifications on the Web

Technical documentation at the Sybase Web site is updated frequently.

❖ **Finding the latest information on product certifications**

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

2 Click Certification Report.

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

4 Click a Certification Report title to display the report.

❖ **Finding the latest information on component certifications**

1 Point your Web browser to Availability and Certification Reports at http://certification.sybase.com/.

2 Either select the product family and product under Search by Base Product; or select the platform and product under Search by Platform.

3 Select Search to display the availability and certification report for the selection.

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

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

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

2 Click MySybase and create a MySybase profile.

Sybase EBFs and software maintenance

❖ **Finding the latest information on EBFs and software maintenance**

1. Point your Web browser to the Sybase Support Page at http://www.sybase.com/support.
2. Select EBFs/Maintenance. If prompted, enter your MySybase user name and password.
3. Select a product.
4. Specify a time frame and click Go. A list of EBF/Maintenance releases is displayed.

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

Style conventions

Table 1 explains the style conventions used in this guide.

Table 1: Style conventions

This type of information	Looks like this
Gateway-Library function names	TDINIT, TDCANCEL
Client-Library function names	CTBINIT, CTBCANCEL
Other executables (DB-Library™ routines, SQL commands) in text	the dbrpcparam routine, a select statement
Directory names, path names, and file names	*/usr/bin directory, interfaces* file
Variables	*n* bytes
Adaptive Server® Enterprise (ASE) datatypes	datetime, float
Sample code	`01 BUFFER PIC S9(9) COMP SYNC`
User input	*01 BUFFER PIC X(n)*
Client-Library and Gateway-Library function argument names	*BUFFER, RETCODE*
Names of objects stored on the mainframe	SYCTSAA5
Symbolic values used with function arguments, properties, and structure fields	CS_UNUSED, FMT_NAME, CS_SV_FATAL
Client-Library property names	CS_PASSWORD, CS_USERNAME
Client–Library and Gateway-Library datatypes	CS_CHAR_TYPE

Syntax conventions

Syntax statements that display options for a command look like this:

COMMAND [*object_name*, [{TRUE | FALSE}]]

Table 2 explains the syntax conventions used in this guide.

Table 2: Syntax conventions

Symbol	Convention
( )	Include parentheses as part of the command.
{ }	Braces indicate that you must choose at least one of the enclosed options. Do not type the braces when you type the option.
[ ]	Brackets indicate that you can choose one or more of the enclosed options, or none. Do not type the brackets when you type the options.
|	The vertical bar indicates that you can select only one of the options shown. Do not type the bar in your command.
,	The comma indicates that you can choose one or more of the options shown. Separate each choice by using a comma as part of the command.

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.

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

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.

See Section 508 compliance statement for Enterprise Connect Data Access for Voluntary Product Assessment Templates at http://www.sybase.com/detail_list?id=52484.

If you need help

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

CHAPTER 1

Introduction

Topic	Page
Introducing DirectConnect for z/OS Option	1
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Introducing DirectConnect for z/OS Option

The Mainframe Connect DirectConnect for z/OS Option is one of many products that provide the following middleware services:

- Distributed database access services
- Transaction services
- Mainframe integration
- Data delivery
- Object interfaces

DirectConnect servers are LAN-based middleware servers that provide access to non-Sybase data sources. DirectConnect for z/OS is Open Server-based software that supports CT-Library and Open Database Connectivity (ODBC) application program interfaces (APIs).

DirectConnect for z/OS Option provides the following middleware services for decision support and Online Transaction Processing (OLTP) applications:

- Access services that provide access to DB2 UDB systems
- Transaction Router Services (TRSs) that provide access to remote transactions
- Administrative services that provide server-side systems management

Components of DirectConnect for z/OS Option

The following subsections describe the components of the DirectConnect for z/OS Option.

DirectConnect server

The DirectConnect server provides management and support functions for DirectConnect service libraries, such as:

- Routing client connections to the appropriate access service based on user ID, requesting application, and access service name.
- Providing a single log file for access services. TRS has its own Tabular Data Stream ™ (TDS) trace file, LU 6.2 protocol trace file, and TCP/IP protocol trace file.
- Logging server, access service, and client messages.
- Tracing server, access service, and client events.
- Providing configuration management of all installed services.

For detailed information about configuring and starting the server, see the Enterprise Connect Data Access and Mainframe Connect 15.0 *Server Administration Guide*.

DirectConnect service libraries

Residing on the DirectConnect server, a service library is a set of configuration properties that describes how its access services will function. These service libraries reside on the DirectConnect server:

- Transaction Router Service Library
- DB2 Access Service Library
- Administrative Service Library

Transaction Router Service (TRS)

Each TRS library contains a TRS that provides access to DB2 data and supports Mainframe Connect Sever Option mainframe applications, defined to TRS as remote procedure calls (RPCs).

There are two TRS libraries:

- *TRSLU62* service library, which uses the LU 6.2 communications protocol to talk to Mainframe Connect or to any Open Server application running in CICS.
- *TRSTCP* service library, which uses the Transmission Control Protocol/Internet Protocol (TCP/IP) communications protocol to talk to the Mainframe Connect for DB2 Option or any Mainframe Connect Server Option application running in CICS.

Having multiple instances of a TRS library on a server results in different physical copies of the shared library files that constitute the TRS component.

For an explanation of TRS, see the Mainframe Connect DirectConnect for z/OS Option 15.0 *Users Guide for Transaction Router Services*.

DB2 access service library

The DB2 access service library contains DB2 access services that interface with Mainframe Connect for DB2 UDB option to allow clients to access DB2 data in a DB2 UDB database.

Each DB2 access service is a specific set of configuration properties that perform the following:

- Transform SQL
- Convert datatypes
- Support remote stored procedures (RPCs)
- Transfer data between DB2 UDB and other servers accessible through Open Client
- Support catalog stored procedures (CSPs) and system stored procedures
- Support RSPs and host-resident requests

Administrative service library

The Administrative service library provides specific administrative services for all DirectConnect libraries, including logging, tracing, and allowing remote configuration of DirectConnect access services (for example, through DirectConnect Manager).

Using DirectConnect Manager

DirectConnect Manager graphically represents each DirectConnect server object on a tree list or an “icon map,” a customizable workspace where you can add or remove objects. When you add a DirectConnect server to DirectConnect Manager, its server name, access service library, and any access services appear on the tree list or the icon map.

DirectConnect Manager communicates with DirectConnect servers asynchronously, which means you can continue to use DirectConnect Manager while a command is being processed.

You can configure properties using DirectConnect Manager or a text editor. Sybase recommends using DirectConnect Manager for the following reasons:

- Changes that you make with a text editor do not take effect until you restart the server.
- Most changes that you make with DirectConnect Manager can be made to take effect immediately.
- You can use DirectConnect Manager as a guide to the properties that can be changed, as well as the valid values for each property.
- DirectConnect Manager can perform all of its management functions remotely. With DirectConnect Manager, you do not need physical access to the DirectConnect server machine or directory.
- DirectConnect Manager provides management services to multiple servers at the same time, including the ability to copy access service configurations from one server to another.

For more information about DirectConnect Manager features, use the DirectConnect Help available under the online Help menu option, and refer to Chapter 6, “Using DirectConnect Utilities and DirectConnect Manager.”

You can install DirectConnect Manager and its required components from the PC Client CD.

Note When you install DirectConnect for z/OS Option on a Windows or UNIX platform or machine, you may install DirectConnect Manager on a separate platform or machine. This allows you to control any DirectConnect server from any machine.

CHAPTER 2

Preparing to Install

Step	Page
1. Gather your installation team	5
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3. Review the installation process	11
4. Review hardware and software requirements	12
5. Complete the installation worksheets	12
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This chapter outlines the tasks you must complete before you install DirectConnect for z/OS Option on UNIX platforms (HP 9000/800, HP Itanium, RISC/6000 AIX, Linux, and Sun Solaris) and on Windows platforms, in that order.

Note Most processes and information you need for UNIX and Windows platforms are the same. However, information that differs between UNIX and Windows platforms (such as hardware and software requirements) is provided in separate subsections.

1. Gather your installation team

To install the DirectConnect for z/OS Option, you need a team with specific skills and experience, as well as the authority to carry out the variety of tasks in the installation process.

At your site, identify the people who have the skill sets described in Table 2-1 and keep them informed of any changes.

Table 2-1: DirectConnect for z/OS Option team skill requirements

Role	Skill set
Operating system administrator	• Understanding of Sun Solaris, HP 9000, HP Itanium, AIX, Linux, Windows operating systems • Knowledge of standards and conventions at the installation site
Network administrator	• Understanding of connectivity products used at your site, such as TCP/IP and SNA • Ability to design, establish, test, and troubleshoot communications between DirectConnect and the mainframe • Understanding of your network configuration
DirectConnect administrator	• Understanding of the DirectConnect environment • DirectConnect Server administrator privileges
Mainframe administrator	• Knowledge of DB2 UDB database • Knowledge of mainframe environment, including security operations

2. Lay the groundwork

Before you begin, you must build the foundation that will support your DirectConnect for z/OS Option installation and subsequent services that you create. If you complete connectivity and administrative tasks *first*, you can better ensure a successful installation.

Network connectivity

Before you begin installation, you need to have network connections in place and operational. This section provides preliminary information for setting up connectivity. To actually configure connectivity for the z/OS mainframe and LAN server, you need to refer to vendor documentation for the connectivity protocol that your site supports.

Perform these recommended tasks before you set up connectivity.

1. Hold a planning session
2. Check the system requirements
3. Research connectivity parameters

4. Set up server-to-mainframe connectivity

Note This is not a complete list; your team should prepare a list that is pertinent to your site and connectivity setup.

1. Hold a planning session

The primary purpose of conducting a preliminary planning session is to have the following team members meet:

- VTAM/NCP system programmer
- DirectConnect Administrator
- CICS system programmer
- Mainframe security administrator
- z/OS mainframe system programmer
- LAN system administrator or communications administrator

All team members are required, because each person knows a key piece of information for the configuration parameters.

During this planning session, the team members should perform the activities listed in the following sections as appropriate for a TCP/IP environment.

Assign LU 6.2 configuration tasks

For LU 6.2 connectivity only, the machine on which the DirectConnect server will reside requires SNA connectivity. For more information, see “4. Review hardware and software requirements” on page 12.

Use this checklist to plan to configure an LU 6.2 environment. If a step contains a team member in parentheses, this means that this team member should perform the step.

1 Determine the type of connection you want to use, such as:

- Token Ring or Ethernet attachment through a local 3174 or 3172
- Token Ring or Ethernet attachment through a front-end processor (FEP)
- Remote SDLC connection

2 Determine the type of session to run:

- Single session
- Parallel sessions

3 Check the other z/OS mainframe configuration properties, including:

- VTAM and NCP node definitions (VTAM/NCP system programmer)
- CICS terminal definitions (CICS system programmer)

4 Create and fill out a LU 6.2 configuration worksheet for your platform (all team members).

5 Determine the server configuration values (LAN system administrator).

6 Determine who performs the z/OS mainframe configuration.

7 Determine who performs the server configuration.

8 Determine who runs the snaping connectivity test for the SNA environment.

Assign TCP/IP configuration tasks

Use this checklist to plan for a TCP/IP environment.

1 Check the server configuration values (LAN system administrator).

2 Determine who performs the z/OS mainframe configuration.

3 Determine who performs the server configuration.

4 Determine who runs the cicsping connectivity test for the TCP/IP environment.

The following section provides preliminary information about system requirements. Refer to your connectivity protocol documentation for more specific information.

2. Check the system requirements

Verify that you have the platform and mainframe requirements that are listed in the mainframe installation guides for the client or server option.

z/OS mainframe in an LU 6.2 or TCP/IP environment

- Check with your site's contact person for Sybase Technical Support to determine whether any new release levels or bug fixes of Sybase or vendor products are required.

- See the Mainframe Connect DirectConnect for z/OS Option *Release Bulletin* for Windows and UNIX version 15.0 for the most current information.

3. Research connectivity parameters

You need these parameters for each platform when you set up connectivity for DirectConnect for z/OS Option using TCP/IP or LU 6.2:

- ConnectionSpec1, ConnectionSpec2, ConnectionSpec3
- ConnectionProtocol

Be sure to record these values in the section called "5. Complete the installation worksheets" on page 12. Also, tables that describe each of these parameters for UNIX and Windows platforms are located in the section called "Worksheet information and instructions" on page 12.

4. Set up server-to-mainframe connectivity

After you have reviewed the previous sections and prepared your connectivity information, set up connectivity between the machine where the DirectConnect server will reside and the target mainframe. For the steps involved in this process, refer to the documentation for your connectivity protocol or consult the network administrator at your site.

Note Be sure that Mainframe Connect Server Option is already installed in CICS on the z/OS mainframe.

After you have set up your SNA LU 6.2 or TCP/IP configurations to go from the local machine to the mainframe, verify this connectivity by running:

- snaping, if accessing any mainframe component over SNA LU 6.2
- cicsping, if accessing the CICS subsystem over TCP/IP
- imsping, if accessing an IMS subsystem over TCP/IP

See Appendix B, "Validating Connectivity," for information about cicsping and snaping.

If you have problems with your installation *after* you have verified connectivity between the LAN, the DirectConnect server machine, and the target—*and* you have an active session, then notify your site's contact for Sybase Technical Support.

Critical administrative tasks

Perform these administrative tasks:

- Read the Mainframe Connect DirectConnect Option for z/OS Option *Release Bulletin* for 15.0 for Windows and UNIX.
  This document provides product information that may not be included in the DirectConnect for z/OS Option guides.
- Make a backup copy of your current Sybase software, particularly if you plan to keep previously-installed DirectConnect servers or reuse their configurations.
- Make a copy of the installation worksheet for your platform in this chapter for each DirectConnect server that you will install.
- Verify that you have authority to sign in as user sybase.

3. Review the installation process

Table 2-2 lists the major installation steps for the DirectConnect for z/OS Option.

Table 2-2: Installation process steps

Step	Process	Resource
Pre-installation		
1	Identify the mainframe components.	Chapter 2, “Preparing to Install” (this chapter)
2	Complete the pre-installation tasks.	Chapter 2, “Preparing to Install” (this chapter)
3	Set up and test connectivity.	Chapter 2, “Preparing to Install” (this chapter)
Installation		
1	Obtain a SySAM license.	Chapter 3, “Installing DirectConnect for z/OS Option”
2	Install DirectConnect for z/OS Option.	Chapter 3, “Installing DirectConnect for z/OS Option”
3	Install DirectConnect Manager.	Chapter 4, “Installing and Using DirectConnect Manager”
4	Create and start a DirectConnect server.	Chapter 5, “Using the Create Server Wizard”
5	Start, configure, and stop DirectConnect servers and access services.	• Chapter 6, “Using DirectConnect Utilities and DirectConnect Manager” • Appendix A, “Using DirectConnect for z/OS Utilities”
Post-installation		
1	Perform post-installation tasks: • Test client to mainframe connectivity. • Test DirectConnect for z/OS access service connectivity to the mainframe. • Verify TRS connectivity. • Stop the DirectConnect server.	Chapter 7, “Performing Post-Installation Tasks”
2	Set up database tables.	Chapter 8, “Creating Database Tables”

4. Review hardware and software requirements

To use DirectConnect for z/OS Option, you must have the requirements described in the Mainframe Connect DirectConnect for z/OS Option *Release Bulletin.*

5. Complete the installation worksheets

Use the installation worksheet to record information relating to installation and connectivity tasks for DirectConnect for z/OS Option. The worksheet covers the following:

- Information from products that must be installed before and after installing DirectConnect for z/OS Option, both Sybase and non-Sybase
- Information that is requested during installation, connectivity setup, and configuration of DirectConnect for z/OS Option service configuration files

Worksheet information and instructions

The following sections provide specific information for some of the areas on the worksheet. A worksheet for each platform is provided after this section, followed by other pre-installation tasks.

Remember to fill out a worksheet for each DirectConnect for z/OS Option service that you will be installing.

Connection protocol

Specify the protocol that the access service uses to connect to the mainframe, either lu62 or tcpip.

TCP/IP connectivity parameters for Windows

Table 2-3 describes the TCP/IP connectivity parameters.

Table 2-3: TCP/IP connectivity parameters for Windows platforms

Parameter	Description	Syntax	Range	Default
Connection protocol	Specifies protocol the access service uses to connect to target database, either lu62 or tcpip	*ConnectionProtocol= [lu62|tcpip]*	na	none
ConnectionSpec1	Specifies name or IP address of mainframe host for TCP/IP communications	*ConnectionSpec1= char*	1-255 char	none
ConnectionSpec2	Specifies port number for CICS region	*ConnectionSpec2= char*	1-255 char	none
ConnectionSpec3	Specifies CICS region name running Open ServerConnect for TCP/IP communications	*ConnectionSpec3= char*	1-255 char	none

LU 6.2 connectivity parameters for UNIX

Table 2-4 describes the LU 6.2 parameters for each UNIX platform. Be sure to record these values on the installation worksheet.

Table 2-4: LU 6.2 connectivity parameters for UNIX platforms

Platform	ConnectionSpec1	ConnectionSpec2	ConnectionSpec3
RISC/6000 AIX	Specifies the SNA Server/6000 side profile name	Not used, but must not be left blank	Specifies the SNA mode name for LU 6.2 communications
HP 9000 /800	Specifies the local logical unit (LU) alias for LU 6.2 communications	Specifies the name of the partner logical unit (PLU) alias for LU 6.2 communications	Specifies the SNA mode name for LU 6.2 communications
Sun Solaris	Specifies the local logical unit (LU) alias for LU 6.2 communications	Specifies the name of the partner logical unit (PLU) alias for LU 6.2 communications	Specifies the SNA mode name for LU 6.2 communications
HP Itanium	Specifies the local logical unit (LU) alias for LU 6.2 communications	Specifies the name of the partner logical unit (PLU) alias for LU 6.2 communications	Specifies the SNA mode name for LU 6.2 communications

Note Linux does not support LU 6.2.

LU 6.2 connectivity parameters for Windows

Table 2-5 describes the LU 6.2 parameters for the Windows platform.

Table 2-5: LU 6.2 connectivity parameters for Windows

Parameter	Description	Syntax	Range	Default
ConnectionSpec1	Specifies the local logical unit (LU) alias for LU 6.2 communications	*ConnectionSpec1= char*	1-255 char	none
ConnectionSpec2	Specifies the name of the partner logical unit (PLU) alias for LU 6.2 communications	*ConnectionSpec2= char*	1-255 char	none
ConnectionSpec3	Specifies the SNA mode name for LU 6.2 communications	*ConnectionSpec3= char*	1-255 char	none

Sybase home directory name

Record the directory in which you will install DirectConnect for z/OS Option and record it on your worksheet. For DirectConnect for z/OS Option, the directory names specified must not contain any uppercase letters, periods, symbolics, or tildes (~).

DirectConnect server name

Record the name of the DirectConnect server that you would like to use, subject to these restrictions:

- The name must contain 30 or fewer characters and cannot contain spaces or tabs (white space characters).
- All subsequent characters can be letters, numerics (0-9), or the underscore ("_") character.
- It must not be any of the following; *bin*, *codesets*, *drivers*, *install*, *lib*, *locale*, *locales*, *messages*, *sample*, *scripts*, *svclib*, *tables*, or *work*.

DirectConnect service names

Record the name of the DirectConnect services you will be creating, subject to the following restrictions:

- The name must be unique within an installation.
- It must begin with a letter. All subsequent characters must be letters, numerics (0-9), or the underscore ("_") character.
- It must not be the same name as a DirectConnect server.

Port number for DirectConnect server/services

Identify and record the port number for the DirectConnect server and services.

Code set information

Determine the values for the following code sets and enter them on your worksheet:

- DefaultClientCodeset – enter the desired client code set on your worksheet.
- DefaultTargetCodeset – enter the desired target code set on your worksheet.

For additional information regarding code sets, refer to the Mainframe Connect DirectConnect for z/OS Option 15.0 *Users Guide for DB2 Access Services*.

DirectConnect TPName entry (Windows only)

Record the CICS transaction program name (TP) for a specific Mainframe Connect.

For all other items on the worksheets, consult your installation team or systems administrators.

Installation worksheet for HP 9000/800, HP Itanium, RISC/6000 AIX, Linux, and Sun Solaris

Using the descriptions provided on the previous pages, fill out one of these worksheets for each DirectConnect server that you plan to install. Keep it with you for each step of the installation process.

Table 2-6: Worksheet for DirectConnect for HP9000/800, HP Itanium, RISC/6000 AIX, Linux, and Sun Solaris

Description of installation information	Your installation information
Connection Protocol, either TCP/IP or LU 6.2 that the access service uses to connect to the target database.	*TCP/IP:* or *LU 6.2:*
TCP/IP Connectivity:	
ConnectionSpec1—specifies the IP address.	*IP ADDRESS:*
ConnectionSpec2—specifies the port number.	*PORT NUMBER:*
ConnectionSpec3—specifies the CICS region name running Open Server.	*CICS REGION NAME:*
LU 6.2 Connectivity:	
ConnectionSpec1—specifies the local logical unit (LU) alias for LU 6.2 communications.	*LOCAL LU ALIAS:*
ConnectionSpec2—specifies the name of the partner logical unit (PLU) alias.	*PLU ALIAS:*
ConnectionSpec3—specifies the SNA mode name for LU 6.2 communications.	*SNA MODE NAME:*
DirectConnect Directory Name: Record the <*install_dir*>*/DC-15_0* and <*install_dir*>*/OCS-15_0* home directory for DirectConnect for z/OS (sets to *DC-15_0* and *OCS-15_0*).	*DIRECTORY NAMES:* *DC-15_0* *OCS-15_0*
DirectConnect Server Name: Identify the name of the DirectConnect server you want to create or update.	*SERVER NAME:*
DirectConnect Service Name(s): Identify the name of the DirectConnect service you want to create or update.	*SERVICE NAME(S):*
Port number used for DirectConnect Server/Service: Identify the port number for the DirectConnect server and service.	*PORT NUMBER* *(DC SERVER/SERVICE):*

Installation worksheet for Windows platforms

Using the descriptions provided on the previous pages, fill out one of these worksheets for each DirectConnect server that you plan to install. Keep it with you, because you will be prompted for this information one or more times throughout the installation process.

Note Unlike the UNIX platforms, this worksheet includes two code set parameters and a transaction program name.

Table 2-7: Worksheet for Windows platforms

Description of installation information	Your installation information
Connection Protocol: either TCP/IP or LU 6.2, that the access service uses to connect to the target database.	*TCP/IP:* or *LU 6.2:*
TCP/IP Connectivity:	
ConnectionSpec1—specifies the IP address.	*IP ADDRESS:*
ConnectionSpec2—specifies the port number.	*PORT NUMBER:*
ConnectionSpec3—specifies the CICS region name running Open ServerConnect.	*CICS REGION NAME:*
LU 6.2 Connectivity:	
ConnectionSpec1—specifies the local logical unit (LU) alias for LU 6.2 communications.	*LOCAL LU ALIAS:*
ConnectionSpec2—specifies the name of the partner logical unit (PLU) alias.	*PLU ALIAS:*
ConnectionSpec3—specifies the SNA mode name for LU 6.2 communications.	*SNA MODE NAME:*
DirectConnect Directory Name: Record the <*install_dir*>*DC-15_0* and <*install_dir*>*OCS-15_0* home directory for DirectConnect for z/OS (sets to *DC-15_0* and *OCS-15_0*).	*DIRECTORY NAMES:* *DC-15_0* *OCS-15.0*
DirectConnect Server Name: Identify the name of the DirectConnect server you want to create or update.	*SERVER NAME:*
DirectConnect Service Name(s): Identify the name of the DirectConnect service(s) you want to create or update.	*SERVICE NAME:*
Port number used for DirectConnect Server/Service: Identify the port number for the DirectConnect server and service.	*PORT NUMBER (DC SERVER/SERVICE)*:
Default Client Codeset: Enter the desired code set for the configuration property.	*CLIENT CODESET:*

Description of installation information	Your installation information
Default Target Codeset: Enter the desired code set for the configuration property.	*TARGET CODESET:*
DirectConnect TPName Entry: Enter the CICS transaction program name (TP) for a specific Mainframe Connect.	*TPNAME:*

6. Review previously installed Sybase products

When you install DirectConnect for z/OS Option into an existing directory structure, be aware of any previously installed Sybase software. The installation program will install a version of Open Client and Open Server with DirectConnect for z/OS Option.

CHAPTER 3

Installing DirectConnect for z/OS Option

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Pre-installation instructions

Before you install DirectConnect, you must complete pre-installation tasks.

❖ **To perform pre-installation tasks**

1. Read Chapter 2, “Preparing to Install,” to perform the identified critical administrative tasks.
2. (For Windows) Back up the system environment before starting the installation.
3. Complete the installation worksheet. See the worksheet for your platform in Chapter 2, “Preparing to Install.”
4. Consider the following for SNA:
   - If using an SNA target, verify that the SNA libraries are in the library search path.
   - (For AIX only) If using a non-SNA environment, you need to create two soft links using the threaded library names, libappc.o and libsnau.o, to the SNA stub called libappc.o.stub.

5 Set the environment variable %SYBASE% (for Windows) and $SYBASE (for UNIX and Linux) to point to the location where DirectConnect for z/OS Option will be installed.

Note When installing on Windows, Sybase recommends that you exit all programs before running the installation program.

SySAM licensing requirements

ECDA version 15.0 includes a Sybase Software Asset Management System (SySAM) implementation to perform license administration and asset management tasks. Sybase recommends that you get your license files from the Sybase Product Download Center (SPDC) at https://sybase.subscribenet.com before you begin installation. Accessing SPDC requires a separate login and password information through e-mail.

Warning! If a product license cannot be obtained during the grace period (usually 30 days), ECDA will cease to operate.

For information about SySAM 2.0, see the Sybase Software Asset Management *User's Guide*.

Using the installation program

This section describes how to install DirectConnect for z/OS Option using the installation program. These procedures assume that:

- The target computer meets the requirements outlined in Chapter 2, "Preparing to Install."
- You have completed the list of tasks for in "Pre-installation instructions" on page 21.

The installation program creates the target directory (if necessary) and loads all the selected components into that directory.

Installation options

You have three options for installing Sybase components from the distribution media using the installation program:

- GUI (graphical user interface) mode, which allows you to install the components using the installation program interface described in “Installing DirectConnect for z/OS Option in GUI mode” on page 23.
- Console mode, which allows you to install components using a command line interface described in “Installing DirectConnect for z/OS Option in console mode” on page 27.
- Response file mode, which allows you to record or create a response file described in “Installing using a response file” on page 28. The response file mode has two different options:
  - Silent, which lets you install the product without any interaction required on your part. This is convenient if you are performing identical installations on multiple machines.
  - Interactive installation using response file, which lets you install interactively but with all the responses already filled in, so that you can accept or change the default values and install DirectConnect for z/OS Option according to the responses in the response file. This can be convenient if several sites are installing DirectConnect for z/OS Option and must conform to a standard installation.

Each of these options is described in the following sections.

Note Sybase recommends that you use the GUI mode for installing DirectConnect for z/OS Option.

Installing DirectConnect for z/OS Option in GUI mode

This section describes how to install the DirectConnect for z/OS Option in GUI mode.

❖ **To install DirectConnect for z/OS Option**

1 Verify that the drive on which you install the products has enough free disk space for the products being installed, and at least 10MB extra disk space for the installation program. The program frees this space after the installation is complete.

2 Insert the Mainframe Connect DirectConnect for z/OS Option CD-ROM into the CD-ROM drive.

For UNIX, if auto-mount is not available, follow your local mounting procedures.

3 The installation program should start automatically. If it does not start:

- For Windows, select Start | Run, and enter the following, where *x:* is your CD drive:

```
x:\setup.exe
```

- For UNIX and Linux platforms, enter:

```
./setup
```

The Welcome window appears.

4 Click Next. You may see the following error message:

```
Error writing file =  There may not be enough
temporary disk space. Try using -is:tempdir to use a
temporary directory on a partition with more disk
space.
```

If so, set the temporary directory to another directory that has more disk space by entering the following at the command line:

- For Windows:

```
x:\setup.exe -is:tempdir <directory_name>
```

- For UNIX and Linux:

```
./setup -is:tempdir <directory_name>
```

where *directory_name* is the name of the temporary directory to which the installation program will write its temporary files.

5 Read the License and Copyright Agreement. Using the drop-down list at the top of the window, select the geographic location where you are installing DirectConnect to display the agreement appropriate to your region. Select “I agree” and click Next.

You must agree to the license and copyright agreement before you can continue.

6 In the installation directory window, click Next to accept the default directory for the installation, or enter a different directory where you want to install DirectConnect for z/OS Option. One of the following occurs:

- If the installation directory you chose does not exist, the installation program prompts:

```
The directory does not exist. Do you want to
```

```
create it?
```

Click Yes.

- If the installation directory exists and contains files, the software prompts:

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

Note You will not see this message if the directory exists but is empty.

If you are prompted to overwrite any *DLLs*, (Windows) or files (UNIX) select Yes *only* if the version of the new *DLL* or file is later than the one you are attempting to overwrite.

Note In certain cases when DirectConnect for z/OS Option is installed with other Sybase products, you may see warnings about overwriting newer versions of files. In these cases, simply instruct the installer to overwrite these files and proceed with the installation.

7 Select Yes or No to indicate if you have SNA installed on your system. Click Next.

8 Select one of the two installation types:

- Custom, which allows you to select the components for DirectConnect for z/OS Option to install
- Full, which installs all DirectConnect for z/OS Option and components from the CD

Click Next.

9 Select the components that you want to install. Because all the components are already checked (selected), you must un-check (deselect) the components that you do *not* want to install.

Note Be aware that if you deselect a component that is required, it is automatically installed if it is needed to run other selected components.

After you have selected the desired components, click Next.

10 Before proceeding to the next window, the install program verifies the selections, and checks for dependencies and available disk space. The Product Summary window displays every component that is to be installed and the total disk space required for all the selected components.

Note If the target directory does not have enough free space, the space-required and the space-available information is displayed. If you click Next without sufficient hard disk space, an error occurs that stops the installation.

11 Verify that you have selected the correct type of installation, and that you have enough disk space to complete the process. Click Next to continue the installation.

The installation program unloads all the components from the CD and displays a progress indicator. When the installation is complete, a message appears indicating that the installation program has completed installing your product. Click Next.

12 Click Next. The SySAM License Server window opens and displays this prompt:

```
Will licenses be obtained from the License Server?
```

- Select Yes if you have a pre-existing SySAM network license server installed, or install a new license server. Enter the host name and the port number of the license server.
- Select No if you do not have a SySAM license server installed and are going to use a local license file. A message displays telling you to download the license file.

If you select Yes and the license server is not found, or if you select No and the local license file is not installed on your local machine, this message appears:

```
Installer can't check out a license. Do you want to
continue without a license?
```

13 Click Yes to complete the installation. If you select No, this message appears:

```
Please remember to download and install the license
file after this installation.
```

Click OK.

The SySAM Notification window asks you to configure your server for e-mail notification. When configuration is enabled, you will receive information about license management events requiring attention.

14 Enter the following:

- SMTP server host name
- SMTP server port number
- E-mail Return Address
- Recipient e-mail addresses
- Message severity that triggers e-mail messages

Click Next.

15 A window displays a message indicating that the installation was successful and advising you to check for software updates. Click Finish.

Installing DirectConnect for z/OS Option in console mode

If you want to run the installer without the graphical user interface (GUI), you can launch the installation program in console mode. In cases where the installation program launches automatically, click Cancel to cancel the GUI installation and then launch the setup program from a terminal or console.

❖ **To install in console mode**

The steps for installing components in console mode are the same as those described in "Installing DirectConnect for z/OS Option in GUI mode" on page 23, except that you execute the installation program from the command line using the setup -console command, and you enter text to select the installation options, as follows:

1 Enter the following at the command line:

- For Windows platforms:

```
x:\setup -console
```

- For UNIX and Linux platforms:

```
./setup -console
```

Note The setup command will be identified as setup for the remaining UNIX entries in this chapter.

The installation program starts and displays a Welcome message.

2 The flow of the installation is identical to a regular GUI installation, except that the display is written to a terminal window, and responses are entered using the keyboard. Respond to the remaining prompts to install DirectConnect for z/OS Option.

Installing using a response file

A silent installation (sometimes referred to as an unattended install) is done by running the installation program and providing a response file that contains answers to all of the installation program's questions.

Creating a response file

There are two methods of generating a response file for the installation program:

- *Record* mode: In this mode, the installation program performs an installation of the product, and records all of your responses and selections in the specified response file. You must complete the installation to generate a response file. To create a response file, enter the following:
  - For Windows:

```
x:\setup.exe -options-record <responseFileName>
```

  - For UNIX:

```
./setup -options-record <responseFileName>
```

where *responseFileName* is a name you choose for the response file.

Note There should be no space between *-options* and *-record*.

The following are the results:

- An installation of DirectConnect for z/OS Option on your computer
- A response file containing all of your responses from the installation

  If this response file is used for a silent installation, the resulting installation is identical to the one from which the response file was created: the same installation location, same feature selection, and all of the same remaining information. The response file is a text file that you can edit to change any responses prior to using it in any subsequent installations.

- *Template* mode: In this mode, the installation program creates a response file containing commented-out values for all required responses and selections. However, you do not need to install the product, and you can cancel the installation after the response file has been created. To create this template file, enter the following:

  - For Windows:

```
x:\setup.exe -console -options-template <responseFileName>
```

  - For UNIX:

```
./setup -console -options-template <responseFileName>
```

  where *responseFileName* is the absolute file name you chose for the response file, for example:

  - For Windows:

```
C:\DC\OptionsTemplate.txt
```

  - For UNIX:

```
/sybase/DC/OptionsTemplate.txt
```

  If run in console mode, as shown in the previous example, the installation program provides a message indicating that the template creation was successful. If run in GUI mode, no message is provided. However, you can click Cancel immediately and a response file is created.

Then, if you use this response file for a silent installation, the default values for all responses are used. Edit the template with the values you want to use during installation.

Warning! If you created a response file using a Custom installation, you need to edit the response file to allow the custom selections to be chosen correctly during installation. The following is a workaround for an installer issue when using a response file.

Use a text editor and delete the "Custom" setup type in this line:

```
-W setupTypes.selectedSetupTypeId=Custom
```

The resulting line will look similar to this:

```
-W setupTypes.selectedSetupTypeId=
```

Failure to delete the "Custom" setup type results in a Full installation of the product.

Interactive installation using a response file An interactive installation using a response file allows you to accept the default values obtained from the response file that you have set up, or to change any of those values for the specific installation. This is useful when you want multiple similar installations but with some minor differences that you want to change at installation time.

At the command line, execute this command (all on one line):

- For Windows:

  ```
  x.\setup.exe -console -options <responseFileName>
  -W SybaseLicense.agreeToLicense=true
  ```

- For UNIX:

  ```
  ./setup -console -options <responseFileName>
  -W SybaseLicense.agreeToLicense=true
  ```

Installing in silent mode A silent mode installation, sometimes referred to as an unattended installation, allows you to install the product with all responses being taken from the response file that you have set up. There is no user interaction. This is useful when you want multiple identical installations or when you want to automate the installation process.

At the command line, execute this command (all on one line):

- For Windows:

```
x.\setupConsole.exe -silent -options
<responseFileName>
-W SybaseLicense.agreeToLicense=true
```

- For UNIX:

```
./setup -silent -options <responseFileName>
-W SybaseLicense.agreeToLicense=true
```

where *responseFileName* is the name of the file containing the installation options you chose. The -W option specifies that you agree with the Sybase License Agreement text.

Warning! In Windows only, Sybase recommends that you use the *setupConsole.exe* executable, which runs in the foreground, when running a silent installation. The normal *setupwin32.exe* executable runs in the background, giving you the impression that the installation has terminated immediately, without a completion status. This could result in duplicate installation attempts.

Except for the absence of the GUI screens, all actions of the installation program are the same, and the result of an installation in silent mode is exactly the same as one done in GUI mode with the same responses.

Uninstalling DirectConnect for z/OS Option

Note Before uninstalling Sybase software, shut down all Sybase applications and processes.

To uninstall a DirectConnect for z/OS Option installation, use the installation program uninstall feature. This removes all servers, all common files, and all required components. After the uninstall runs, you may need to delete a number of existing files and directories in the directory where DirectConnect for z/OS Option was installed.

You can invoke the uninstall procedure using either the GUI or the console method. Sybase recommends that you use the GUI method.

Before uninstalling Sybase software, log in to your machine using an account with “administrator” privileges, then shut down all other processes for the components you are uninstalling.

❖ **To uninstall in GUI mode**

1 Enter one of the following:

- For Windows:
  - Using Windows Explorer:
    - Go to the directory where your application is installed.
    - Select the *uninstall* directory.
    - Select the application you want to uninstall.
    - Double-click the uninstall icon. The wizard appears.
  - Using the Add/Remove program:
    - Go to Start | Setting | Control panel | Add/Remove Programs.
    - Select the application you want to remove.
    - Click Change/Remove. The wizard appears.
- For UNIX:
  - Go to the directory where your application is installed.
  - Go to the *uninstall* directory.
  - Go to the directory for your application that you want to uninstall.
  - From the command line, enter:

```
Uninstall
```

2 The wizard's Welcome window appears.

3 Click Next to display the list of selected products and components that were installed.

4 All of the products and components that were installed are displayed and already checked (selected) to allow you to remove the total installation. If you do not want to remove a product or component, uncheck (deselect) that product or component. Click Next.

5 A summary of all the products and components is displayed. Click Next.

6 A message indicating that the removal of a z/OS installation is in progress. When this is completed, a message appears, indicating a successful uninstall. Click Next to end the uninstall program.

❖ **To uninstall in console mode**

1 Enter one of the following:

- For Windows, go to the *uninstall* directory, and at the DOS window prompt, enter:

```
<install_dir>\uninstall\ECDASuite\uninstall.exe -console
```

- For UNIX, at the command line, enter:

```
<install_dir>/uninstall/ECDASuite/uninstall -console
```

The uninstall program starts.

2 Choose the DirectConnect for z/OS Option.

The DirectConnect for z/OS Option you chose is uninstalled.

Setting up and verifying your environment

Set up the environment

Sybase provides scripts to set the following variables, which DirectConnect for z/OS Option needs to run:

- SYBASE
- SYBASE_ECON
- SYBASE_OCS
- PATH (Windows), SHLIB_PATH (HP-UX), LIBPATH (AIX), LD_LIBRARY_PATH (HP Itanium, Linux, Sun Solaris)

Set the environment variables from a command line prompt by running one of the following environment scripts, as appropriate for your platform. For Windows, use a DOS command session, *DC_SYBASE.bat* on Windows.

For AIX, HP Itanium, HP-UX, and Sun Solaris using SNA LU 6.2 protocol, you must locate the following line in the environment script that begins as follows (this example is for Sun Solaris):

```
set LD_LIBRARY_PATH.........
```

Add the following to the end of this line:

```
/opt/sna/lib:$LD_LIBRARY__PATH
```

Note Your SNA location may vary.

To verify that the environment script ran successfully on UNIX, execute the following commands:

```
echo $SYBASE
```

The response should match the home directory for your installation.

```
echo $SYBASE_ECON
```

The response should be .. (*parent directory*)

```
echo $SYBASE_OCS
```

The response should be *OCS-15-0*.

```
echo $SHLIB_PATH
```

This variable (shown for HP) should equal the following:

```
$SYBASE/SYBASE_ECON/lib
```

Note *For UNIX:* $SYBASE, $SYBASE_ECON, and $SYBASE_OCS will be expanded to their actual values.

Verify that the environment script ran successfully

To verify that the environment script ran successfully on Windows, execute this in a DOS command window:

```
echo %SYBASE%
```

The response should match the home directory for your installation.

```
echo %SYBASE_ECON%
```

The response should be .. (*parent directory*)

```
echo %SYBASE_OCS%
```

The response should be *OCS-15-0*.

```
echo %PATH%
```

This variable should equal the following:

```
%SYBASE%\SYBASE_ECON\lib
```

For Windows, keep your DOS command line session active to create the DirectConnect server.

CHAPTER 4

Installing and Using DirectConnect Manager

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Installing DirectConnect Manager software

This section describes the DirectConnect Manager installation process.

❖ **To install DirectConnect Manager**

1. Insert the PC Client CD into the CD-ROM drive.
2. Go to the DirectConnect Manager directory.
3. Execute one of the following:
   - For Windows:

     ```
     .\setupwin32.exe
     ```

   - For UNIX and Linux platforms:

     ```
     setupaix.bin
     ```

4. The Welcome window appears. Click Next to proceed with the installation.
5. Read the License and Copyright Agreement. Using the drop-down list at the top of the window, select the geographic location where you are installing to display the agreement appropriate to your region. Select “I agree” and click Next.
6. On the Choose Directory dialog box, enter the directory path for the installation, and click Next.

   You must agree to the license and copyright agreement before you can continue.

7 Select one of the two types of installation:

- Install a new version of Sybase Central™ and click Next.

  This type of installation will install DirectConnect Manager as well as all other necessary components and create a new set of icons and Registry entries.

  Note This option will make your current Sybase Central installation invalid.

- Register with existing Sybase Central™ and click Next.

  This type of installation will install the DirectConnect Manager plug-in and register it with the existing Sybase Central application.

8 A Summary window appears and lists all the features that you are going to install. Click Next.

9 The installation process begins and a Setup window appears.

  The Setup window shows the percentage (%) of installation that is complete, and monitors the decompressing and installing of the DirectConnect Manager files. The installation will register the plug-in with Sybase Central.

10 When installation is completed, a DirectConnect Manager *README* file appears. After reading the file, click Finish to clear the window.

Using DirectConnect Manager

Before you can use DirectConnect Manager to start a server, or create and start an access service, you must identify and establish a connection between the server and DirectConnect Manager.

Creating a new DirectConnect access service

For instructions on how to use DirectConnect Manager to create a service, go to the DirectConnect Manager online Help and select Managing Access Services | Creating a New Service or Copying a Service.

Note If you use service name redirection, the connectivity parameters must match the connectivity parameters or the default, and the access service name must map through the redirection file to the DirectConnect server.

For more information about service name redirection, see Enterprise Connect Data Access and Mainframe Connect *System Administration Guide* for DirectConnect.

Starting a DirectConnect access service

The only way you can start the new access service without stopping and restarting DirectConnect is by using DirectConnect Manager. For instructions on how to use DirectConnect Manager to start a service, go to the DirectConnect Manager online Help and select Managing Access Services | Starting a Service.

Stopping a DirectConnect access service

For instructions on how to use DirectConnect Manager to stop a service, go to the DirectConnect Manager online Help and select Managing Access Services | Stopping a Service.

Adding a new service

To add a new service to a DirectConnect server, use DirectConnect Manager to copy an existing service and modify it as necessary to connect to the desired target database; or, you can use the Create New Service option.

Configuring servers and access services

After you create a DirectConnect server or an access service, you can use DirectConnect Manager to configure them:

- To identify the configuration properties and to configure the DirectConnect server, refer to the Enterprise Connect Data Access and Mainframe Connect *System Administration Guide*.
- To identify the access service properties and to configure a service, refer to the Mainframe Connect DirectConnect z/OS Option *Users Guide for DB2 Access Services.*

CHAPTER 5

Using the Create Server Wizard

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Create Server wizard overview

The Create Server Wizard is a Java program that allows you to create a server and complete the connection to the target database based on the driver and driver manager you want to use.

After you create the server, to complete the configuration you can use DirectConnect Manager to configure a service to connect to a specific target database and to test the configuration. For DirectConnect Manager information, see Chapter 4, “Installing and Using DirectConnect Manager.”

Creating servers using the Create Server wizard

The Create Server wizard, which is installed with ECDA, is located in the *<install_dir>\DC-15_0\DCWizard* (for Windows) and *<install_dir>/DC-15_0/DCWizard* (for UNIX) directories.

Configuring DirectConnect for z/OS Option

This section describes how to create a server for the DirectConnect for z/OS Option..

❖ **To create a DirectConnect server for z/OS**

1 Start the Create Server wizard:

- For Windows:

```
DCWizard.bat
```

- For UNIX:

```
DCWizard.sh
```

2 When the Welcome Create Server Wizard window appears, click Next. The Create DirectConnect Server Options window appears.

3 Select the DirectConnect for z/OS Option and click Next. The Server Name and Port Information window appears.

4 Enter the Server Name for the new DirectConnect server and the Port Number that you want the server to “listen” on and click Next. The DirectConnect for z/OS Service Options window appears.

5 Select DirectConnect DB2 Access Service and click Next. The DirectConnect Service Name window appears.

6 Enter the service name that you want to use for this server and click Next. The DirectConnect for z/OS Server Summary and Build window appears.

7 Verify the DirectConnect for z/OS Server information that appears:

- If correct, select Create Server. The DirectConnect for z/OS Server Summary and Build window appears.
- If incorrect, click Back to change the information.

8 Verify the DirectConnect for z/OS Server information that appears.

- If correct, click Next. The Start DirectConnect Server (Optional) window appears.
- If incorrect, click Back to change the information.

9 Optionally, start the DirectConnect server that you created and click Finish.

CHAPTER 6

Using DirectConnect Utilities and DirectConnect Manager

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Creating a new DirectConnect server

After installing DirectConnect for z/OS Option, the installation program has automatically created the subdirectories, files, and tables needed for the DirectConnect server and for its selected access service components, the DB2 access service, and TRS. Now, you need to create, start, and stop a server, and to create a service and start a service. You can perform these tasks from the command line and with several utilities that are available.

For more information and a detailed description of the DirectConnect utilities, see Appendix A, “Using DirectConnect for z/OS Utilities.”

Running the AddServer utility

Run the AddServer utility, using the syntax in the following example:

- For UNIX:

Note You must be in the *<install_dir>/DC-15_0/bin* directory for this C shell script to work properly.

```
cd <install_dir>/DC-15_0/bin
AddServer srvname 1234
```

- For Windows:

Note You must be in the *<install_dir>\DC-15_0\bin* directory for this batch file to work properly.

```
cd <install_dir>\DC-15_0\bin
AddServer srvname 1234
```

where:

- *srvname* is the name of the new server.
- *1234* is the port that it will listen on.
- AddServer is the utility that will:
  - Set the environment
  - Create the server
  - Start the server
  - Insert the server name in the Sybase *interfaces* file

Creating a new DirectConnect access service

You can use DirectConnect for z/OS Option to create access services by editing the service library configuration file one of two ways:

- Using DirectConnect Manager
- Using a text editor

Using DirectConnect Manager

You can use DirectConnect Manager to configure, start, and stop DirectConnect servers and access services. For instructions, refer to Chapter 4, “Installing and Using DirectConnect Manager.”

Using a text editor

You can use a text editor to configure the service library configuration file (*db2.cfg* or *trslu62.cfg* or *trstcp.cfg).* The service library configuration files reside in the *cfg* subdirectory under the directory with the same name as the DirectConnect server.

❖ **To configure the service using a text editor**

1 Change to the *cfg* subdirectory of the directory with the name of the server you created. If you successfully created and started a new server, this directory contains a basic version of *db2.cfg*, *trslu62.cfg* and *trstcp.cfg*.

2 At the end of the configuration file, enter a name for the service in brackets, for example:

```
[db2_acs]
```

3 Save and close the configuration file.

To make the configuration effective, you must restart the DirectConnect server. This procedure is described in the section called "Starting a DirectConnect access service."

Adding a new service to the interfaces file (UNIX)

This subsection describes how to allow an Open Client application, such as isql, to connect to the Open Client installation that will be used by your client application. Add the new service to the *interfaces* file as a Server Object using the dsedit utility, specifying the same connectivity information for this Server Object as specified in the *sql.ini* file for the DirectConnect server.

To preserve a unique directory structure and environment for Sybase applications, each Sybase product must have a unique user or start-up script for each application. The key file for maintaining this uniqueness is the Open Server network address file. On UNIX-based systems, this is the *interfaces* file, which resides in the *$SYBASE* directory.

The network address file configures the Open Server application listening network address. On UNIX systems, it configures the network type and TCP/IP values, plus the operating system type and network.

❖ **To modify the *interfaces* file using the *dsedit* utility**

1 Right-click the server object.

2 From the menu, click Add to display the Input Server Name window.

3 Enter the server object and modify its attributes.

4 On the Network Address window that appears, enter protocol information for your site.

5 Enter the machine name on which you installed the DirectConnect server and the connectivity parameter.

6 Click OK twice and exit dsedit.

Defaults are provided for the server configuration parameters. For additional information, see the Enterprise Connect Data Access and Mainframe Connect *Server Administration Guide*.

Adding a new service to the sql.ini file (Windows)

To allow an Open Client application, such as isql, to connect to the Open Client installation that will be used by your client application. Add the new service to the *sql.ini* file as a Server Object using the dsedit utility, specifying the same connectivity information for this Server Object as specified in the *sql.ini* file for the DirectConnect server.

Starting a DirectConnect access service

The only way you can start the new access service without stopping and restarting the DirectConnect server is by using DirectConnect Manager. For more information, see Chapter 4, “Installing and Using DirectConnect Manager.”

To start your new service without using DirectConnect Manager, be sure that the EnableAtStartup=Yes property is set in the service configuration (*.cfg*) file, which starts the service automatically when the server is started, and then restart the DirectConnect server.

Verifying a DirectConnect access service

Use one of the SQL utilities to verify that the access service is connecting to its target data source and working properly.

Using isql from a command line

Note If you are using isql on the same machine on which you installed DirectConnect for z/OS Option, you must add a access service entry to the *interfaces* (for UNIX) or *sql.ini* (for Windows) file that points to the access service you are testing.

❖ **To verify the access service configuration using *isql***

1 Do one of the following:

- On the UNIX client machine, use dsedit to create an *interfaces* file entry for the access service.
- On the Windows client machine, use dsedit to create a *sql.ini* file entry for the access service.

Be sure to enter the access service name exactly as you defined it in the configuration file.

2 Set the environment variables from a command line prompt by running one of the following environment scripts, as appropriate for your platform:

- For UNIX:

```
DC_SYBASE.csh or DC_SYBASE.sh
```

- For Windows:

```
DC_SYBASE.bat
```

3 For UNIX and Windows, run isql from the command line by entering:

```
isql -SServiceName -Uuserid -Ppassword
```

where:

- *ServiceName* is the name of the access service exactly as you defined it in the *interfaces* or *sql.ini* file.
- *userid* is a valid user ID for the target database.
- *password* is a valid password for the user ID in the target database.

If the connection is successful, a 1> prompt appears.

Note If you cannot connect, the access service might not be running. Start the access service with DirectConnect Manager, edit the configuration file, and then verify that the Enable at Startup parameter is set to Yes. This starts the access service automatically when the server is started.

4 At the 1> prompt, query a table in the target database by entering a select statement and pressing Return.

5 At the 2> prompt, enter:

```
go
```

Press Return.

The query should run and return a result set, followed by a >1 prompt.

6 To exit isql, enter the following at the 1> prompt:

```
exit
```

Press Return.

A regular operating system command appears.

Note At this point, you can stop the DirectConnect server using the stopsvr utility, which shuts down the server and terminates all client connections. However, if you plan to perform post-installation tasks for the client and server, leave DirectConnect up and running.

CHAPTER 7

Performing Post-Installation Tasks

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Post-installation tasks for UNIX platforms

This section describes the server and client tasks to perform after you install the DirectConnect for z/OS Option on a UNIX platform

Server tasks

Perform these tasks for installations that use TCP/IP only:

- Test client-to-mainframe connectivity
- Test DirectConnect DB2 access service connectivity to the mainframe
- Verify TRS connectivity
- Set up database tables
- Stop the DirectConnect server

The server procedures in this section ensure that the UNIX environment is properly configured for mainframe connectivity.

Test client-to-mainframe connectivity

To test connectivity from your UNIX workstation to the z/OS mainframe, use one of the methods in this section. (Check your worksheet for the information requested.)

For LU 6.2 connectivity to the CICS mainframe, using *snaping*

For testing connectivity to the CICS region, enter the following command using the values defined previously and recorded on your worksheet as *ConnectionSpec1*, *ConnectionSpec2*, and *ConnectionSpec3*:

snaping -C*ConnectionSpec1* **-R***ConnectionSpec2* **-M***ConnectionSpec3* **-U***hostuserid* **-P***hostpassword*

Use the values for these configuration properties found in a service on your worksheet that has *ConnectionProtocol=lu62*.

Note that this is an example of successful snaping output for a Sun Solaris platform:

```
> snaping -C LOCAL -R CICSAMD2 -M MVSMODE -U userid
-P password

Verify LU6.2 connectivity with a host transaction.  A
connection may be specified individually, or an entire
configuration can be verified using the configuration
file created by the DirectConnect Transaction Router
Service.

Usage: snaping [-C Local_LU -R Partner_LU -M Modename]
[-L connection_file][-T Host_Tran_id]  [-P password]
[-U userid]

Defaults are:Connection file - $SYBASE/ngcid.[$DSQUERY]
Host Transaction - SYI1
Userid and passord - Null

Allocating to SYI1 on CICSAMD2 using LOCAL with mode
MVSMODE..Ok

Sending data...Ok
Waiting for response...Received data 187 bytes.

<Open Server Module: SYGWCICS, Version: ZRL/1500GA
/P /z/OS V2R9  /11/19/07 11.03. Open Client Module:
SYGWCICC, Version: ** SYGWZZRL/1500GA  /P       /z/OS
V2R9  /11/19/07 .>
```

```
Normal Deallocate

Done
Test complete
```

If you receive an error or you need additional information on how to use the snaping utility, refer to the Appendix, "Validating Connectivity."

For TCP/IP connectivity to the CICS mainframe, using *cicsping*

For testing TCP/IP connectivity to a CICS region, enter the following command using the values defined previously and recorded on your worksheet as *ConnectionSpec1* and *ConnectionSpec2*. Note that this example is for a Sun Solaris platform:

```
cicsping -HConnectionSpec1 -NConnectionSpec2 -Uhostuserid -Phostpassword
```

Use the values for these configuration properties found in a service defined on your worksheet that has ConnectionProtocol=tcpip.

An example of successful cicsping:

```
Torreys> cicsping -H sungard -N 3020


Sybase CICSPING (cicsping/3.0.1/P/sun_svr4/Solaris 2.5/1/OPT/Mar 25 12:00:00
2007)

Verify TCP/IP connectivity to a CICS region.  A host and port may be specified
individually, or an entire configuration can be verified using the region
definition file created by the Sybase MSG.
Usage:  cicsping [-H hostname -N portnumber ]
                 [-T Host_Tran_id] [-U userid  [-P password]]
Defaults are:   Region file  - $SYBASE/ngreg.[$DSQUERY]
                Host Transaction - SYPG
                Userid and password - Null
Testing host sungard, port 3020
        get host by name ok
        connect to CICS listener ok
        transaction started by listener ok
        test message sent ok
        Reply from host transaction:
DWMCI410 : *** MODULE SYGWTCPS LOADED SUCCESSFULLY ***
VERSION STRING = SYGWTCPS/310 EBF /P       /z/OS R1.2  /05/19/07 10.55
ECHO DATA = abcdefghijklmnopqrstuvwxyz
        test completed in 1228ms
```

If you receive an error or you need additional information on how to use the cicsping utility, refer to Appendix B, "Validating Connectivity.'

Test DirectConnect DB2 access service connectivity to the mainframe

❖ **To test DB2 access service connectivity to the mainframe**

1 To test DirectConnect for z/OS Option DB2 access service connectivity to the mainframe without DirectConnect for z/OS Option, you can use one of two methods:

- Start the DirectConnect server that you created using the following syntax from the command line:

```
DCStart -Ssrvname
```

  where *srvname* is your DirectConnect server name.

- Start up DirectConnect Manager and click on the server icon.

2 Test the connectivity between the access service and DB2 by using the isql utility and entering:

```
isql -Sservice_name -Umainframe userid -Pmainframe password
```

where:

- service_name is the name of your service.
- *userid* and *password* are your mainframe user ID and mainframe password.

The connection is successful when you see the prompt.

Verify TRS connectivity

Test the connectivity between TRS and the mainframe.

Note This section assumes that you have already installed the *SYM2* RPC.

❖ **To define the test region**

1 Log in to TRS as “sa”:

```
isql -Strstcpservice -Usa -P
```

2 At the isql prompt, enter:

```
exec sgw_addregion region, "ipaddress"|hostname, "portnumber"
```

```
go
```

Note Any entry beginning with a number must be entered with double quotes.

where:

- *region* is the name of the destination CICS region, or you can use *ConnectionSpec3* from a service definition worksheet.
- *ipaddress*|*hostname* is the IP address or the host name, the name that corresponds to the TCP/IP network host name, or you can use *ConnectionSpec1* from a service definition worksheet.
- *portnumber* is the port number, or you can use *ConnectionSpec2* from a service definition worksheet.

❖ **To define the test connection**

1 Log in to TRS as "sa":

```
isql -Strslu62service -Usa -P
```

2 At the isql prompt, enter:

```
exec sgw_addconn locallu, remotelu, snamode, "max_sessions"
go
```

Note Any entry beginning with a number must be entered with double quotes.

where:

- *locallu* is the local logical unit (LU), or you can use *ConnectionSpec1* from your worksheet.
- *remotelu* is the name of the partner logical unit (PLU), or it can be the *ConnectionSpec2* on your worksheet.
- *snamode* is the mode name, or it can be *ConnectionSpec3* from your worksheet.
- *max_sessions* is the maximum number of sessions that can run concurrently over this connection.

Define the test RPC

This section describes how to define an RPC to execute in the defined region. The SYM2 transaction is a simple CICS transaction that simulates data and requires no external resources such as DB2 or VTAM.

- At the isql prompt, enter:

  ```
  exec sgw_addrpc SYM2, SYM2, CICSregion, security
  go
  ```

  where:

  - *sgw_addrpc* is the RPC name.
  - SYM2 (1st occurrence) is the RPC name of the remote procedure.
  - SYM2 (2nd occurrence) is the transaction ID at the mainframe.
  - *CICSregion* is the CICS region name:
    - For TCP/IP, it must match the region name given in the sgw_addregion procedure.
    - For LU 6.2, it must match the remote lu parameter in the sgw_addcon procedure.
  - security is the type of login information TRS passes to the transaction processing region. Enter one of the following:
    - none – to indicate that no user IDs are passed to the mainframe for this test.
    - both – to send both user ID and password to the mainframe for this test.
    - userid – to send user ID to the mainframe for this test.

Run the SYM2 sample

Enter the following at the isql prompt to run the SYM2 sample:

```
exec SYM2 a, 4
```

The output should be similar to the following:

```
TESTDATA
-----------------------------------------------
       U6T42P01
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
       U6T42P01
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
       U6T42P01
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
       U6T42P01
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
(4 rows affected, return status = 0)
```

CSP scripts

Sybase provides three scripts for you to use with CSPs:

- *15_0_addcat* - adds the CSPs to TRS.
- *15_0_dropcat* - drops the CSPs from TRS.
- *15_0_testcat* - tests the CSPs (requires that the AMD2 transaction be installed at the mainframe).

Installing CSPs

The *15_0_addcat* script executes the sgw_addrpc procedure automatically for each CSP. Before you run *15_0_addcat*, modify the script to suit your installation.

Use your text editor to specify the value of these parameters:

- *region* parameter – name of the region you want the CSPs to execute against.
- *security* parameter – value you can change to meet the security requirements at your installation. If you do not change it, the value is none.
- *rpc_name* parameter – name or value must be coordinated with any change to the RPC names with the mainframe system programmer. If you are using ODBC applications, do not change the RPC names.
- *tran_id* parameter – value or name of this parameter must be coordinated with any change to the transaction ID with the mainframe system programmer.

After you edit the script to suit your installation, run the *15_0_addcat* script as input to your TRS. The following isql example shows how to run the *15_0_addcat* script with a TRS named “new_TRS”:

```
isql -Snew_TRS -Usa -P < 15_0_addcat
go
```

This script automatically executes the sgw_addrpc procedure for each CSP.

Testing CSPs

The *15_0_testcat* script uses the AMD2 transaction to create temporary tables and execute each CSP. At least one row is returned for each CSP and the *15_0_testcat* script then drops the temporary tables.

Run the *15_0_testcat* script as input to your TRS. The following isql example shows how to run the *15_0_testcat* script with a TRS named “new_TRS”:

```
isql -Snew_TRS -Usa -P < 15_0_testcat
go
```

This script automatically tests each of the CSPs.

Dropping CSPs

The *15_0_dropcat* script drops the CSPs from TRS. Run the *15_0_dropcat* script as input to your TRS.

The following isql example shows how to run the *15_0_dropcat* script with a TRS named “new_TRS”:

```
isql -Snew_TRS -Usa -P < 15_0_dropcat
go
```

This script automatically drops the CSPs.

Set up database tables

You can use the isql scripts in the *$SYBASE/scripts* subdirectory to set up PUBS and CSP tables for DB2. For instructions and guidelines, see Chapter 8, “Creating Database Tables.”

Stop the DirectConnect server

Stop the DirectConnect server using the stopsrvr utility that shuts down the server and terminates all client connections:

```
stopsrvr [-v|-?|-h] -Sserver_name -ddelay
go
```

where:

- -v displays the program version only.
- -? or -h displays the stop server parameters you entered.
- -S shows the name of the server to be shut down.
- -d is the delay, in seconds, before client connections are terminated. The default is 3.

Client tasks

The following sequential steps ensure that the UNIX client environment is properly connected to the LAN and to the DirectConnect server.

1. Configure your clients to connect to DirectConnect access services
2. Set up the ODBC Driver by Sybase
3. Install your application

1. Configure your clients to connect to DirectConnect access services

Use sqledit or DirectConnect Manager to add, edit, or delete entries in the client *interfaces* file:

- Configure your client *interfaces* file. The access service name and port number must match the entry for the DirectConnect Service on your worksheet. For more information, refer to the Enterprise Connect Data Access and Mainframe Connect *Server Administration Guide*.
- Add a server Query entry for each service you want to connect to.

2. Set up the ODBC Driver by Sybase

ODBC clients must use the ODBC Driver by Sybase to connect with DirectConnect access services. For instructions on setting up the driver, refer to Appendix C, “Migrating to the ODBC Driver by Sybase.’

3. Install your application

If you have connectivity between your server, your workstation, and the mainframe (target database), you are ready to install your applications.

See the appropriate documentation to install your client applications.

Troubleshooting for UNIX platforms

This section describes the errors that can occur during and after installation on UNIX platforms. It includes suggested steps to locate and correct the errors.

System does not work correctly following installation

If your system does not work properly after you install DirectConnect for z/OS products, and if you already performed the connection steps listed previously, try the following:

- Confirm the version number of Open Server software. DirectConnect is compatible with Open Server and Adaptive Server version numbers identified in Chapter 1.
- Check the log and trace files in the server subdirectory *$SYBASE/$SYBASE_ECON/servername/log* subdirectory for more information. This is an example of an error message that can occur:

  ```
  Error : 16029 Severity : 20 State: 0 OS Error: -
  1 : Failed to start any network listeners OS Error
  Text : <srv-lib>
  ```

  Following are the possible causes:

  - One of the specified port numbers is in use. Change the port number to one that is not in use and try again, or
  - The wrong machine name or IP address was specified. Enter the machine name or the IP address running the DirectConnect server.

If the server fails before the log files initialize, error messages are written to the console. If this occurs, see the Enterprise Connect Data Access and Mainframe Connect *Server Administration Guide* for DirectConnect for an explanation of these “pre-log” messages.

DirectConnect server fails to start after installation

If the DirectConnect server fails to start after installation and the SNA library files are listed in error in the DirectConnect log, one of these messages appears, depending on the platform.

Messages for Sun Solaris

```
LoadLibrary failed : .../dc150ss/
DC-15_0/svclib/db2.so : ld.so.1: direct: fatal:
libappc.so: open failed: No such file or directory

LoadLibrary failed : .../dc150ss/
DC-15_0/svclib/db2.so : ld.so.1: direct: fatal:
libcsv.so: open failed: No such file or directory

LoadLibrary failed : .../dc150ss/
```

```
DC-15_0/svclib/db2.so : ld.so.1: direct: fatal:
libmgr.so: open failed: No such file or directory
```

```
LoadLibrary failed : .../dc150ss/
DC-15_0/svclib/db2.so : ld.so.1: direct: fatal:
libsna_r.so: open failed: No such file or directory
```

Messages for HP Itanium

```
LoadLibrary failed : .../dc150ss/
DC-15_0/svclib/db2.so : ld.so.1: direct: fatal:
libappc.so: open failed: No such file or directory
```

```
LoadLibrary failed : .../dc150ss/
DC-15_0/svclib/db2.so : ld.so.1: direct: fatal:
libcsv.so: open failed: No such file or directory
```

```
LoadLibrary failed : .../dc150ss/
DC-15_0/svclib/db2.so : ld.so.1: direct: fatal:
libmgr.so: open failed: No such file or directory
```

```
LoadLibrary failed : .../dc150ss/
DC-15_0/svclib/db2.so : ld.so.1: direct: fatal:
libsna_r.so: open failed: No such file or directory
```

Messages for HP-UX

```
usr/lib/dld.sl: Can't find path for shared library:
libmgr.sl
```

```
/usr/lib/dld.sl: Can't find path for shared library:
libappc.1
```

```
/usr/lib/dld.sl: Can't find path for shared library:
libcsv.1
```

Messages for RISC/6000 AIX

```
LoadLibrary failed : /.../dc150aix/
DC-15_0/svclib/db2.so : No such file or directory
```

```
Could not load service library: /.../dc150aix/
DC-15_0/svclib/db2.so
```

```
LoadLibrary failed : /.../dc150aix/
DC-15_0/svclib/trslu62.so : No such file or directory
```

```
Could not load service library: /.../dc150aix/
DC-15_0/svclib/trslu62.so
```

Error conditions and their fixes

Error condition #1

SNA software does not exist on the UNIX machine, and during installation the response to the question about SNA software existing on the machine was "yes."

Fix for error #1

❖ **To correct error condition #1**

1 Go to this directory:

```
cd $SYBASE/$SYBASE_ECON/bin
```

2 Execute this script:

```
DCConfig
```

3 Respond *NO* to the question, "Is SNA installed on your system?"

This creates the soft links to the SNA stub libraries as a substitute for the actual libraries.

Note For AIX, you must manually create the soft links to the stub libraries.

Error #2

SNA software does exist on the UNIX machine. However, the LD_LIBRARY_PATH (for Sun Solaris, HP-UX, and HP Itanium) or LIBPATH (for RISC/6000 AIX) environment variable is missing in the directory where the *SNA* libraries reside.

Fix for error #2

To fix error #2, change your LD_LIBRARY_PATH or LIBPATH to include the */opt/sna/...* (for Sun Solaris, HP-UX, and HP Itanium), or */usr/lib/sna/...* (for AIX) directory, or the custom directory where your SNA software is installed on your UNIX machine. The SNA libraries are now in the DirectConnect server library path.

Post-installation tasks for Windows platforms

This section describes the server and client tasks to perform after you install the DirectConnect for z/OS Option on a Windows platform

Server tasks

The following server procedures ensure that the Windows environment is properly configured for mainframe connectivity.

Note These tasks apply to installations using TCP/IP only:

- Test Windows-to-mainframe connectivity
- Test DirectConnect for z/OS Option DB2 access service connectivity to the mainframe
- Set up database tables
- Verify TRS connectivity
- Stop the DirectConnect server

Each of these tasks is described in the following subsections.

Test Windows-to-mainframe connectivity

To test connectivity from the Windows workstation to the z/OS mainframe, use one of the following (the information requested is located on your worksheet).

For LU 6.2 connectivity to the CICS mainframe, using *snaping*

For testing connectivity to the CICS region, use the snaping utility. Enter this command using the values defined previously and recorded on your worksheet as *ConnectionSpec1*, *ConnectionSpec2*, and *ConnectionSpec3*:

snaping -C*ConnectionSpec1* **-R***ConnectionSpec2* **-M***ConnectionSpec3* **-U***hostuserid* **-P***hostpassword*

Use the values for these configuration properties found in a service that has ConnectionProtocol=lu62 in this subdirectory:
$SYBASE/$SYBASE_ECON/server_name/cfg/db2.cfg

An example of successful snaping output:

```
C:\sql10\bin>snaping -C LOCAL -R DWMCI410 -M MVSMODE -U DWMD33 -P GOODHART
Sybase SNAPING (snaping/3.0.1/P/PC Intel/Windows 3.51/1/OPT/Mar 17 10:00:00
2007)
Verify LU 6.2 connectivity with a host transaction. A connection may be
specified individually, or an entire configuration can be verified using the
configuration file created by the Sybase Net Gateway.
This program is intended to be run against the CICS transaction SYI1.
Usage:  snaping [-C Local_LU -R Partner_LU -M Modename]
                [-T Host_Tran_id] [-U userid [-P password]]
                [-L Connection_file]
Defaults are:   Connection file  - %SYBASE%\[%DSQUERY%].cid
                Host Transaction - SYI1
                Userid and Password - Null
Allocating to SYI1 on DWMCI410 using LOCAL with mode MVSMODE...Ok
       Sending data...Ok
```

```
       Waiting for response...Received data 194 bytes.
       <Received 000000000000026 bytes total from userid: DWMD33  . Version
SYGWCICC//310GA BU/P       /MVS
/ESA 4.2  /09/12/96   14.44   SYGWCICS/310 EBF /P     /z/OS R1.2  /05/19/9
>
       Normal Deallocate
Done
Test complete
```

If you receive an error or you need additional information about how to use the snaping utility, refer to Appendix B, "Validating Connectivity.'

For TCP/IP connectivity to the CICS mainframe, using cicsping

For testing TCP/IP connectivity to a CICS region, enter the following command using the values defined previously and recorded on your worksheet as *ConnectionSpec1* and *ConnectionSpec2* (items 2a and 2b):

cicsping -H*ConnectionSpec1* **-N***ConnectionSpec2* **-U***hostuserid* **-P***hostpassword*

Use the values for these configuration properties found in a service that has ConnectionProtocol=tcpip in this subdirectory:
$SYBASE/$SYBASE_ECON/server_name/cfg/db2.cfg

An example of successful cicsping output:

```
C:\sql10\bin>cicsping -H sungard -N 3020
Sybase (CICSPING/3.0.1/P/PC Intel/Windows 3.51/1/OPT/Mar 17 10:00:00 PST 1997)
Verify TCP/IP connectivity to a CICS region. A host and port may be specified
individually, or an entire configuration can be verified using the region
definition file created by the Sybase MSG.
Usage:  cicsping [-H hostname -N portnumber ]
                 [-T Host_Tran_id] [-U userid  [-P password]]
Defaults are:   Region file  - %SYBASE%\[%DSQUERY%].reg
                Host Transaction - SYPG
                Userid and password - Null
Testing host sungard, port 3020
        gethostbyname ok
        connect to CICS listener ok
        transaction started by listener ok
        test message sent ok
        Reply from host transaction:
DWMCI410 : *** MODULE SYGWTCPS LOADED SUCCESSFULLY ***
VERSION STRING = SYGWTCPS/310 EBF /P       /z/OS R1.2  /05/19/97    10.55
ECHO DATA = abcdefghijklmnopqrstuvwxyz
        test completed in 1071ms
```

If you receive an error, or you need additional information on how to use the cicsping utility, refer to Appendix B, "Validating Connectivity," or to vendor documentation for your connectivity protocol.

Test DirectConnect for z/OS Option DB2 access service connectivity to the mainframe

❖ **To test connectivity to the mainframe**

1 From the command line, start the DirectConnect server using the following syntax:

```
DCStart -Ssrvname
```

where *srvname* is your DirectConnect server name.

2 Test the connectivity between the access service and DB2 by using isql and entering:

```
isql -Sservice_name -Umainframe userid -Pmainframe password
```

where:

- service_name is the name of your service.
- *userid* and *password* are your mainframe userID and mainframe password.

Your connection is successful if you see the prompt.

Set up database tables

You can use the isql scripts in the *%SYBASE%\%SYBASE_ECON%\scripts* subdirectory to set up PUBS and CSP tables for DB2. For guidelines, see Chapter 8, "Creating Database Tables."

Verify TRS connectivity

The following procedure tests the connectivity between TRS and the mainframe.

Define the test region (TCP/IP only)

❖ **To define the test region**

1 Log in to TRS as "sa":

```
isql -Sservice_name -Usa -P
```

2 At the isql prompt, enter:

```
exec sgw_addregion region, "ipaddress"|hostname, "portnumber"
go
```

Note Any entry beginning with a number must be entered with double quotes.

where:

- *region* is the name of the destination CICS region, or you can use *ConnectionSpec3* from a service definition worksheet.
- *ipaddress*|*hostname* is the IP address or the hostname, the name that corresponds to the TCP/IP network hostname, or you can use *ConnectionSpec1* from a service definition worksheet.
- *portnumber* is the port number, or you can use *ConnectionSpec2* from a service definition worksheet.

Define the test region (LU 6.2 only)

❖ **To define the test connection**

1 Log in to TRS as "sa":

```
isql -Strslu62service -Usa -P
```

2 At the isql prompt, enter:

```
exec sgw_addconn lualias, plualias, snamode, "max_sessions"
go
```

where:

- *lualias* is the local logical unit (LU) from your worksheet.
- *plualias* is the name of the partner logical unit (PLU) on your worksheet.
- *snamode* is the SNA mode name from your worksheet.
- *max_sessions* is the maximum number of sessions that can run concurrently over this connection.

Define the test RPC

Define an RPC to execute in the defined region. The SYM2 transaction is a simple CICS transaction that fabricates data and requires no external resources such as DB2 or VTAM.

❖ **To define the test RPC**

- At the isql prompt, enter:

```
exec sgw_addrpc SYM2, SYM2, CICSregion, security
go
```

  where:

  - *sgw_addrpc* is the RPC name.
  - SYM2 (1st occurrence) is the RPC name of the remote procedure.
  - SYM2 (2nd occurrence) is the transaction ID at the mainframe.
  - *CICSregion* is the CICS region name:
    - For TCP/IP, it must match the region name given in the sgw_addregion procedure.
    - For LU 6.2, it must match the region parameter in the sgw_addcon procedure.
  - *security* is the type of user login information TRS passes to the transaction processing region. Enter one of the following:
    - none – indicates that no user IDs are passed to the mainframe for this test.
    - both – sends both user ID and password to the mainframe for this test.
    - userid – sends the user ID to the mainframe for this test.

Run the sample

❖ **To run the sample**

- Enter this at the isql prompt to run the “SYM2” sample:

```
exec SYM2 a, 4
```

  The output should be similar to this:

```
TESTDATA
-------------------------------------------
   U6T42P01
```

```
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
   U6T42P01
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
   U6T42P01
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
   U6T42P01
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
(4 rows affected, return status = 0)
```

Check for error messages

The MSG request can return any of several types of error messages. Some mainframe access products messages are written to the error log at MSG; others are returned to the client.

CSP scripts

Sybase provides three scripts for you to use with CSPs:

- *15_0_addcat* – adds the CSPs to TRS..
- *15_0_dropcat* – drops the CSPs from TRS. .
- *15_0_testcat* – tests the CSPs (requires that the AMD2 transaction be installed at the mainframe).

Installing CSPs

The *15_0_addcat* script executes the sgw_addrpc procedure automatically for each CSP. Before you run *15_0_addcat*, modify the script to suit your installation.

Use your text editor to specify the value of these parameters:

- *region* parameter – name of the region you want the CSPs to execute against.
- *security* parameter – value you can change to meet the security requirements at your installation. If you do not change it, the value is none.
- *rpc_name* parameter – name or value must be coordinated with any change to the RPC names with the mainframe system programmer. If you are using ODBC applications, do not change the RPC names.
- *tran_id* parameter – value or name of this parameter must be coordinated with any change to the transaction ID with the mainframe system programmer.

After you edit the script to suit your installation, run the *15_0_addcat* script as input to your TRS. The following isql example shows how to run the *15_0_addcat* script with a TRS named “new_TRS”:

```
isql -Snew_TRS -Usa -P < 15_0_addcat
go
```

This script automatically executes the sgw_addrpc procedure for each CSP.

Testing CSPs

The *15_0_testcat* script uses the AMD2 transaction to create temporary tables and execute each CSP. At least one row is returned for each CSP and the *15_0_testcat* script then drops the temporary tables.

Run the *15_0_testcat* script as input to your TRS. The following isql example shows how to run the *15_0_testcat* script with a TRS named "new_TRS":

```
isql -Snew_TRS -Usa -P < 15_0_testcat
go
```

This script automatically tests each of the CSPs.

Dropping CSPs

The *15_0_dropcat* script drops the CSPs from TRS. Run the *15_0_addcat* script as input to your TRS.

This isql example shows how to run the *15_0_dropcat* script with a TRS named "new_TRS":

```
isql -Snew_TRS -Usa -P < 15_0_dropcat
go
```

This script automatically drops the CSPs.

Stop the DirectConnect server

Stop the DirectConnect server using the stopsrvr utility that shuts down the server and terminates all client connections.

The stopsrvr format is:

```
stopsrvr [-v|-?|-h] -Sserver_name [-ddelay]
```

- -v displays the program version only.
- -? or -h displays the stop server parameters you entered.
- server_name is the name of the server to be shut down.
- delay is the delay, in seconds, before client connections are terminated. The default is 3.

Client tasks

The procedures in this section ensure that the Windows client environment is properly connected to the LAN and to the DirectConnect servers:

- Install a DirectConnect server as a Windows service
- Configure your client connectivity
- Install your application

Install a DirectConnect server as a Windows service

Using the installation program, DirectConnect for z/OS Option no longer automatically creates the server as a Windows service. However, you can run a DirectConnect server as a Windows service. For instructions, see the Enterprise Connect Data Access and Mainframe Connect *Server Administration Guide*.

Configure your client connectivity

Use the dsedit Windows program to add, edit, or delete entries in the *sql.ini* and *libtcl.cfg* files:

- Configure your client *sql.ini* file. The service name and port number must match the entry for the DirectConnect for z/OS Option service.

  For additional information, see the Enterprise Connect Data Access and Mainframe Connect *Server Administration Guide*.

- Use Add Query for each service to which you want to connect.

Install your application

If you have connectivity between your server, your workstation, and the mainframe (target database), you are ready to install your applications.

See the appropriate documentation for the client application you plan to install.

Troubleshooting for Windows platforms

This section describes the errors that can occur on WIndows platforms during and after installation and suggests steps to locate and correct the errors.

System does not work correctly following installation

If your system does not work properly after you install DirectConnect for z/OS Option, and if you already performed the connection steps listed previously, try the following:

- Confirm the version number of Open Server software. DirectConnect for z/OS Option is compatible with Open Server and Adaptive Server version numbers identified in the Mainframe Connect DirectConnect for z/OS Option *Release Bulletin.*
- Check the log and trace files in the server subdirectory *<install_dir>\DC-15_0\ServerName\log* subdirectory for more information. Following are examples of error messages that can occur:

```
Error : 16029 Severity : 20 State: 0 OS Error: -
1 : Failed to start any network listeners OS Error
Text : <srv-lib>
```

  Possible causes are:

  - One of the specified port numbers is in use. Change the port number to one that is not in use and try again, or
  - The wrong machine name or IP address was specified. Enter the machine name or the IP address running the DirectConnect server.

If the server fails before the log files initialize, error messages are written to the console. If this occurs, see the Enterprise Connect Data Access and Mainframe Connect *Server Administration Guide* for an explanations of these “pre-log” messages.

DirectConnect for z/OS Option fails to start after installation

If the DirectConnect server fails to start after installation and the SNA library files are listed in error in the DirectConnect log, this message appears:

```
The application has failed to start because WAPPC32.dll
was not found. Re-installing the application may fix
this problem.
```

Fix for error condition

Verify that you have SNA Host Integration Server (HIS) installed on the Windows machine where DirectConnect for z/OS Option is installed:

- If it is installed:

- Verify that %SNARoot% is one of the system environment variables in start, settings, control_panel, system, advanced_tab, environment_variables_button, and system_variables:

  ```
  %SNARoot = c:\HIS\system
  ```

- Edit the <*install_dir**DC-15_0**DC_SYBASE.bat* file and add this line at the top of the file:

  ```
  set SNARoot=c:\HIS\system
  ```

- If it is *not* installed:
  - Install the stub libraries for DirectConnect for z/OS Option 15.0 on Windows:

    ```
    <install_dir>\DC-15_0\bin\DCConfig.bat
    ```

CHAPTER 8

Creating Database Tables

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Creating CSP tables	71

Using SQL scripts

This chapter explains how to run SQL scripts to set up database tables, which are necessary for using DB2 with DirectConnect for z/OS Option.

Sybase provides SQL scripts that allow you to create a sample database and system tables on DB2. The installation program installs the scripts in the *scripts* subdirectory.

The *scripts* subdirectory is at *<install_dir>/DC-15_0/scripts* (UNIX) and *<install_dir\DC-15_0\scripts* (Windows).

The scripts are:

- The *pubsdb2.sql* script creates sample PUBS tables that simulate the PUBS database provided with ASE. By installing PUBS tables on DB2, you can more easily test the transfer process between ASE and DB2. These tables are not required for DirectConnect for z/OS Option setup, but Sybase recommends installing them to assist Sybase Technical Support.
- The *cspdb2.sql* script creates tables for catalog stored procedures (CSPs). These tables are required for DirectConnect for z/OS Option setup with DB2.

Use the isql utility to run the scripts. Sybase recommends that you complete all of these tasks from the platform server before you attempt to install Open Client/DB-Library files on any client machines.

Creating PUBS tables

PUBS is a sample database that contains tables that you can use to test the transfer process between DB2 and SQL Server. Use the *pubsdb2.sql* script to create the tables by performing the following steps.

❖ **To create PUBS tables**

1 Start the DirectConnect server.

2 If you are using Windows, display the Windows command line.

3 Edit *pubsdb2.sql* to create the tables in the desired DB2 database and tablespace. For example, you can modify the script to say *one* of the following:

- IN *databasename.tablespacename*
- IN DATABASE *dataspacename*

Note The user ID must have CREATE TABLE privileges in the specified *databasename.tablespacename*.

4 Run pubsdb2.sql:

```
isql -Uuserid -Ppassword -Sservice_name -ipubsdb2.sql
```

where:

- isql starts the utility of the same name.
- *userid* is a valid DB2 user ID with CREATE TABLE privileges.
- *password* is a valid password for the DB2 user ID you enter.
- *service_name* is the DirectConnect service name.

The script drops any tables with the same names as the tables it creates. If the table does not exist, the DropTable command returns an error message. This does not prevent successful execution of the rest of the script. The script creates indexes for the remaining tables.

5 To verify that you successfully created the PUBS database in DB2, log in to DirectConnect for z/OS Option:

```
isql -Uuserid -Ppassword -Sservice_name
```

6 Issue this select statement against PUBS:

```
select * from authors
```

If you successfully created the PUBS database, DB2 returns data from the authors table.

If you receive an error, run the *pubsdb2.sql* script again or review the log files.

For information about the transfer function, see the Mainframe Connect DirectConnect for z/OS Option *Users Guide for DB2 Access Services*.

Creating CSP tables

The system tables described in Table 8-1 are required if you are using CSPs in DB2.

Table 8-1: CSP tables

CSP	System table	Table description
sp_stored_procedure	SYSPROCEDURES	This table contains specific information about stored procedures created at your site.
sp_sproc_columns	SYSPROCCOLUMNS	These tables contain specific information about the arguments in the stored procedures created at your site.

The system administrator maintains the information in each table.

❖ **To use the *cspdb2.sql* script to create the tables**

1 Start the DirectConnect server by issuing the direct -S command.

2 If you are using Windows, display the Windows command line.

3 Run *cspdb2.sql* by entering the following:

```
isql -Uuserid -Ppassword -Sservice_name -icspdb2.sql
```

where:

- isql starts the utility of the same name.
- *userid* is a valid DB2 user ID with create table privileges.
- *password* is a valid password for DB2 for the user ID you entered.
- *service_name* is the desired DB2 service name.

The script drops any tables with the same names as the tables created. If the table does not exist, the DropTable command returns an error message. This does not prevent successful execution of the rest of the script.

4 Log in to DirectConnect for z/OS Option and issue a SELECT statement against each table to verify that you successfully created each one.

5 Grant SELECT authorization to the following DB2 system tables for all CSP users:

- SYSIBM.SYSCOLAUTH
- SYSIBM.SYSCOLUMNS
- SYSIBM.SYSDATABASE
- SYSIBM.SYSFOREIGNKEYS
- SYSIBM.SYSINDEXES
- SYSIBM.SYSKEYS
- SYSIBM.SYSRELS
- SYSIBM.SYSSYNONYMS
- SYSIBM.SYSTABAUTH
- SYSIBM.SYSTABLES

Although *cspdb2.sql* automatically grants select authorization to PUBLIC for the tables it creates, you must grant authorization to these DB2 system tables.

APPENDIX A

Using DirectConnect for z/OS Utilities

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Creating and starting a new server using AddServer	74
Starting a server using DCStart	75

Overview

To simplify the execution of DirectConnect for z/OS Option on multiple platforms, Sybase provides utilities to start a server, create and start a new server, and migrate files from one server to another.

These utilities are c shell scripts (on UNIX) and batch files (on Windows) that can be found and kept in the *<install_dir>/DC-15_0/bin* (UNIX) or *<install_dir>\DC-15_0 \bin* (Window) directory. To run properly, the scripts must be kept in their original directory. It is from this directory that the utilities can find the paths to the other files they need to perform their tasks.

Creating and starting a DCDirector server

DirectConnect for z/OS Option version 15.0 allows DirectConnect Manager to connect to a "directing" server, called a "DCDirector," that is capable of creating, starting, and stopping DirectConnect servers. To create a new DCDirector for an installation, use the *DCDirector* script (on UNIX) or batch file (on Windows).

Using the DCDirector utility

This utility creates a default DCDirector server in the installation area. This script or batch file does not accept any parameters and uses the server name "DCDirector" and the port 7711 by default.

If you need to use different values to identify the directors, you can use a text editor to modify the *DCDirector* batch file by assigning different values.

Usage DCDirector

Example

```
DCDirector
```

Creating and starting a new server using AddServer

Creating a new DirectConnect server is not particularly difficult, but often one will forget to add the necessary entries in the *interfaces* (UNIX) or *sql.ini* (Windows) file. However, the AddServer utility will create the necessary entries in the *interfaces* or *sql.ini* file before starting the DirectConnect server. AddServer requires two parameters:

- The name of the new server
- The port number for the server to listen on

AddServer utility

This utility is a simple way to create a server entry in the *interfaces* (UNIX) or *sql.ini* (Windows) files, and then run the "direct" executable using the -N option. This utility makes changes to the *interfaces* or *sql.ini* file but it does not check to see if the *servername* or the *port number* are already being used.

Usage AddServer <*servername*> <*port number*>

Example

```
AddServer srvrname 1133
```

Starting a server using DCStart

In the past, you started a DirectConnect server using a command that used the direct executable itself. For example, the command, direct –S*srvname*, was the standard way to start an existing DirectConnect server. Currently, this method is not recommended because it has some limitations:

- For this command to work properly, all of the appropriate environment variables need to be set properly before attempting to execute the command.
- If multiple installations of DirectConnect for z/OS Option exist on a single machine, each installation will need its own environment.

To relieve these limitations, Sybase provides a shell script or a batch file with DirectConnect for z/OS Option version 15.0 that sets the installation-specific variables *before* executing the direct –Ssrvname command. This script, called DCStart, requires that all the non-Sybase variables be set properly, and ensures that the environment variables that are specific to a DirectConnect for z/OS Option installation are all correctly set.

To stop a server, see "Stopping the DirectConnect server" section in Chapter 4, "Installing and Using DirectConnect Manager."

DCStart utility

This utility is similar to using the direct executable. DCStart will automatically "source" the appropriate *DC_SYBASE.csh* (UNIX) file or run the appropriate *DC_SYBASE.bat* (Windows) file to ensure that all the appropriate Sybase-specific environment variables are set properly. This is the required method to start a DirectConnect server, for one or multiple versions, because the DirectConnect for z/OS Option no longer sets the system environment.

Usage

DCStart <*parameters*>

Example

```
DCStart -Ssrvname
```

APPENDIX B

Validating Connectivity

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Using snaping to validate connectivity	83

Using cicsping to validate connectivity

The following sections cover these topics:

- Description of cicsping
- When to use cicsping
- How cicsping works
- Installing the cicsping utility
- Defining SYPG to CICS
- Syntax for cicsping
- Examples of using cicsping
- If you receive errors

Description of cicsping

The cicsping utility verifies that the TCP/IP connection between the z/OS mainframe and the server is configured and operating correctly. Sybase recommends running cicsping before you install Transaction Router Service (TRS) or DirectConnect Access Service Library (ACSLIB).

DirectConnect for z/OS Option does not need to be active when you run cicsping. The mainframe component of cicsping, SYPG, does not use the Mainframe Connect Server Option or Mainframe Connect for DB2 UDB Option; the cicsping utility only tests the network connection between the machine where you are running the DirectConnect for z/OS Option on the LAN and CICS at the z/OS mainframe.

You can use cicsping to collectively test all CICS regions defined to TRS or to test connectivity to one region at a time.

When to use cicsping

To check connectivity between various parts of your network, use the cicsping utility at each of the following times:

- After you configure the TCP/IP connection between the DirectConnect server and the mainframe
- After Mainframe Connect Server Option is installed (it loads SYPG)
- Before you start or configure any DirectConnect services

How cicsping works

The cicsping utility opens a TCP/IP connection to a CICS region. Then, it starts the SYPG transaction on the mainframe and sends a message to SYPG. Finally, cicsping receives an "echo" response from SYPG when it executes successfully.

If your network is configured correctly, cicsping returns a short message. The last two lines should read:

```
ECHO DATA = abcdefghijklmnopqrstuvwxyz
        test completed in 1081ms
```

Installing the cicsping utility

The cicsping utility ships with Open Server. Instructions for defining these programs to the mainframe are listed in these guides:

- Mainframe Connect Server Option for CICS *Installation and Administration Guide*

- Mainframe Connect for DB2 UDB Option *Installation and Administration Guide*

Defining SYPG to CICS

For you to run cicsping at the server, the z/OS mainframe system programmer must define the cicsping transaction and program to the CICS region. Verify that this is done before you use the cicsping utility.

The cicsping transaction ID is SYPG, and the cicsping program name is SYGWCAI2.

Syntax for cicsping

Following is the syntax for the cicsping utility and details about each cicsping parameter. Parameters enclosed in square brackets are optional. The default is the *-Rregion_file* for the specific platform.

```
cicsping [-Hhostname -Nportnumber]
         [-Thost_tramsaction_id]
         [-Rregion_file
         [-Uuser_name [-Ppassword]]][-v]
```

Table B-1 lists each parameter, the operating system for which it is valid, and a description of the parameter.

Table B-1: cicsping parameters

Parameter	Valid operating system	Description
-Hhostname	HP-UX HP Itanium IBM RISC System/6000 Sun Solaris	The name of the mainframe as defined in your NIS map or your /etc/hosts file. This is the same name you use in the *hostname* property of the exec sgw_addregion command of the Transaction Router Service or the ConnectionSpec1 value of a DB2 access service (see the Mainframe Connect DirectConnect for z/OS Option *Users Guide for Transaction Router Services* for more information). When you use the -H parameter, you must also use the -N parameter.
	Windows	The name of the mainframe as defined in your Domain Name Server (DNS) or your *%windr%\system32\drivers\etc\hosts* file. This is the same name you use in the *hostname* property of the exec sgw_addregion command of the Transaction Router Service or the ConnectionSpec1 value of a DB2 access service (see the Mainframe Connect DirectConnect for z/OS Option *Users Guide for Transaction Router Services* for more information). When you use the -H parameter, you must also use the -N parameter.
-Nportnumber	All	The number of the mainframe port where the CSKL (TCP/IP Listener) transaction listens. This is the same number you use in the *portnumber* property of the exec sgw_addregion command of the Transaction Router Service, or the ConnectionSpec2 value of a DB2 access service (see the DirectConnect for z/OS Option *Transaction Router Service Users Guide* for more information). When you use the -N parameter, you must also use the -H parameter.
-Rregion_file (This parameter has no application to the DB2 Access Service Library.)	HP-UX HP Itanium RISC/6000 Sun Solaris	The name of the TRS connection file. The default is *$SYBASE/$DSQUERY.reg*. You can use this parameter if you are running cicsping after you configure TRS. TRS example files: *$SYBASE/$SYBASE_ECON/server_name/cfg/ngreg.trstcp*. When you run cicsping before you configure TRS, omit this parameter and use the *-H* and *-N* parameters.
	Windows	The name of the TRS connection file. The default is *%SYBASE%\%DSQUERY%.reg*. You can use this parameter if you are running cicsping after you configure TRS. TRS example files: *%SYBASE%\$%SYBASE_ECON%\server_name\cfg\trstcp.ngreg*. When you run cicsping before you configure TRS, omit this parameter and use the -H and -N parameters.
-Uuser_name	All	The mainframe user ID of the client issuing the command. It must be in uppercase.
-Ppassword	All	The mainframe password of the client issuing the command. You must use the -U parameter to use the -P parameter. It must be in uppercase.

Parameter	Valid operating system	Description
-Thost_transaction_id	All	The name of the z/OS mainframe (host) transaction called by cicsping that runs the cicsping program SYGWCAI2. This program is required for cicsping to execute successfully. The default transaction, SYPG, is called if you run cicsping without the -T parameter and value. Use the -T parameter if the cicsping transaction has a name other than SYPG. The value of this parameter must be in uppercase.
-v	All	Use this parameter to display information about the current version of cicsping. When it executes with the -v parameter, cicsping does not run.

Examples of using cicsping

This section provides the following examples of how to use cicsping:

- Testing the connectivity between the z/OS mainframe and the server
- Testing all defined connections
- Using a new transaction ID

Note Since you set up only the TCP/IP communication environment in this guide, you test only the server-to-mainframe connectivity.

Testing the connectivity

Use cicsping after you configure the z/OS mainframe and the server and before you configure DirectConnect for z/OS Option TRS or DB2 access services. You need to use the -H and -N parameters to test each region, one at a time, that you use when you configure TRS or ACSLIB.

The following example tests a single region located at the host, listening on "BIGSYB" port number "3003." Replace these example parameter values with the correct host name and port number values for your site in this example:

```
cicsping -HBIGSYB -N3003
```

Testing all regions defined to TRS

If you configured TRS and you must run cicsping again, execute the command without the parameters. This tests all regions defined to TRS:

- For HP-UX, HP Itanium, IBM RISC System/6000, and Sun Solaris:

```
cicsping -R $SYBASE/SYBASE_ECON/server_name/cfg/ngreg.trstcp
```

- For Windows:

```
cicsping -R %SYBASE%\%SYBASE_ECON%\server_name\cfg\trstcp.ngreg
```

where *server_name* is the name of your DirectConnect server.

Using a new transaction ID

The cicsping utility requires the SYGWCAI2 program, which is accessed through the default SYPG transaction.

Note The cicsping utility requires the SYPG transaction. You can rename the transaction.

If your system programmer changes the name of the cicsping mainframe transaction, run cicsping using the -T parameter to specify the new transaction ID.

In the following example, cicsping runs against a mainframe transaction that was renamed “SYP2”:

```
cicsping -TSYP2
```

Replace SYP2 in the example with your own transaction ID.

If you receive errors

Execute cicsping successfully and without errors before you configure TRS. An example of successful cicsping output is as follows:

```
Testing host bugguy, port 3011
        gethostbyname ok
        connect to CICS listener ok
        transaction started by listener ok
        test message sent ok
        Reply from host transaction:
 CICSTEST        : *** MODULE SYGWTCPS LOADED
SUCCESSFULLY ***
 VERSION STRING = 02/24/9411.45 SYGWCICx/3.0/370/CICS/1
 ECHO DATA = abcdefghijklmnopqrstuvwxyz
```

```
test completed in 1081ms
```

If cicsping stops prematurely or fails to operate correctly, check for one or more of the following conditions:

- A mainframe configuration error. For example,

  ```
  "CICS TRANID - SYPG IS INVALID"
  ```

  This message means that the SYPG transaction is not installed in the CICS region.
- A TCP/IP network configuration error.
- A network outage problem.

You can determine where the configuration error or network outage occurred based on the type of error message cicsping returns or by the point at which it stops prematurely.

- If the error occurred at the mainframe, the system programmer or operator must make the necessary changes in the network configuration.
- If the error occurred at the server, the operating system administrator must make the necessary changes to the network.

Using snaping to validate connectivity

The following sections cover these topics:

- Description of snaping
- When to use snaping
- How snaping works
- Installing the SYI1 utility
- Defining SYI1 to the z/OS mainframe
- Syntax for snaping
- Examples of using snaping
- If you receive errors

Description of snaping

The snaping utility verifies that the LU 6.2 connections between the z/OS mainframe and the server are configured and operating correctly. Sybase recommends running snaping before you install Transaction Router Service (TRS) or DirectConnect for z/OS Option for DB2 Access Service Library.

DirectConnect for z/OS Option TRS or ACSLIB programs do not need to be active when you run snaping. The z/OS mainframe component of snaping, SYI1, does not use Open ServerConnect™ or Mainframe Connect Server Option for DB2 UDB. The snaping utility only tests the SNA support between the machine where you are running DirectConnect for z/OS Option on the LAN and the transaction processing region at the z/OS mainframe.

You can use snaping to collectively test all LU 6.2 connections defined to TRS or to test a single LU 6.2 connection.

When to use snaping

To check connectivity between various parts of your network, use the snaping utility at the following times:

- After you set up LU 6.2 communications between the DirectConnect Server and the mainframe
- After Mainframe Connect Server Option is installed (it loads SYI1)
- Before you start or configure DirectConnect for z/OS Option TRS or ACSLIB

How snaping works

The snaping utility opens an LU 6.2 conversation to a mainframe transaction processing region. Then, it starts the SYI1 transaction on the z/OS mainframe and sends a message to SYI1. Finally, snaping receives an “echo” response from SYI1 when it executes successfully.

If your network is configured correctly, snaping returns a short message. The last line should read:

```
Done.
Test complete.
```

Installing the SYI1 utility

The SYI1 utility is included in Mainframe Connect Server Option for CICS, which, when installed correctly, automatically makes SYI1 available and needs no further configuration.

Defining SYI1 to the z/OS mainframe

For you to run snaping at the server, the z/OS mainframe system programmer defines the snaping transaction and program to the transaction processing region. Verify that this is done before you use the snaping utility.

The snaping transaction ID is SYI1, and the snaping program name is one of the following:

- SYGWCAI1 for CICS
- SYGWIAI1 for IMS

Syntax for snaping

This section shows the syntax for the snaping utility and provides details about each snaping parameter. Parameters enclosed in square brackets [ ] are optional. The default parameter is *-LConnection _file* for the specific platform.

For HP 9000/8xx, HP Itanium, Sun Solaris 2.x, and Windows:

```
snaping [-Cconnection -Mmodename -Rremote_lu]
 [-Uuser_name [-Ppassword]]
 [-Lconnection_file]
 [-Hhost_transaction_id] [-v]
```

For RS/6000 AIX:

```
snaping [-Cconnection -MModename]
 [-Uuser_name [-Ppassword]]
 [-Lconnection_file]
 [-Thost_transaction_id] [-v]
```

Examples of using snaping

This section provides the following examples of how to use snaping:

- Testing the connectivity between the z/OS mainframe and the server
- Testing all defined connections

- Using a new transaction ID

Note Since you are setting up only the LU 6.2 communication environment, you test only the server to mainframe connectivity using this section.

Testing the connectivity

Use snaping after you configure the z/OS mainframe and the local SNA subsystem, and before you configure TRS or the ACSLIB. Use the -C, -M, and -R parameters to test each connection—one at a time—that you will use when you do configure TRS or the ACSLIB. The connections are defined in the server configuration and at the z/OS mainframe.

The following command tests the connection called "SYBLU01." The mode is "SYBMODE," and the remote LU is called "TESTCICS."

Replace the italicized example parameter values with the correct connection, mode and remote_LU values for your site, in this example:

- For HP-UX, HP Itanium, Sun Solaris, Windows:

```
snaping -CSYBLU01 -MSYBMODE -RTESTCICS
```

- For IBM RISC System/6000:

```
snaping -CSYBLU01 -MSYBMODE
```

Testing all connections defined to TRS

If you configured TRS and you need to run snaping again, execute the command without the parameters. This tests all connections defined to TRS.

To test all defined connections, enter:

- For HP-UX, HP Itanium, AIX, and Sun Solaris:

```
snaping -L $SYBASE/$SYBASE_ECON/server_name/cfg/ngcid.trslu62
```

- For Windows:

```
snaping -L %SYBASE%\$SYBASE_ECON\%server_name\cfg\trslu62.cid
```

where *server_name* is the name of your DirectConnect server.

Using a new transaction ID

The snaping utility requires the SYGWCAI1 program for CICS or the SYGWIAI1 program for IMS, which is accessed through the default SYI1 transaction.

Note The snaping utility requires the *SYI1* transaction. You can rename the transaction; however, this transaction must be used.

If your systems programmer changes the name of the snaping mainframe transaction, run snaping using the -T parameter to specify the new transaction ID.

In the following example for HP-UX, HP Itanium, AIX, Sun Solaris, and Windows, snaping runs against an z/OS mainframe transaction that has been renamed "SYT2." Replace "SYT2" in this example with your own transaction ID:

```
snaping -TSYT2
load snaping -TSYT2
```

If you receive errors

Execute snaping successfully and without errors before you configure TRS or ACSLIB. An example of successful snaping output is:

```
Done.
Test complete.
```

If snaping stops prematurely or fails to operate correctly, check for one or more of these conditions:

- A mainframe configuration error
- An SNA network support configuration error
- A line outage problem

You can determine where the configuration error or line outage occurred based on the type of error message snaping returns or by the point at which it stops prematurely.

- If the error occurred at the z/OS mainframe, the system programmer or operator must make the necessary changes in network configuration.

- If the error occurred at the server, the communications specialist administrator must make the necessary changes to the SNA network support configuration.

APPENDIX C

Migrating to the ODBC Driver by Sybase

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Migration overview

This appendix describes the required changes to the data source name (DSN) to migrate from the Tabular Data Stream™ (TDS) driver to the ASE ODBC Driver by Sybase.

Note The DataDirect TDS driver is no longer provided by Sybase.

To migrate from the TDS driver to the ASE driver, the data source name (DSN) setup must be modified.

The original Sybase TDS driver and the Sybase ASE ODBC driver provide similar DSN setup GUIs under the Windows ODBC Administrator.

The following sections describe the steps for migrating a TDS driver DSN to a Sybase ASE DSN.

Basic connectivity

Similar to the TDS driver, the ASE driver has a General dialog box for specifying the basic parameters for connectivity.

❖ **To migrate a TDS driver DSN to the ASE driver DSN**

1 Copy the TDS driver DSN and Description into the same-named fields for the ASE Driver.

2 Use the first part of the TDS driver Network Address as the ASE driver Server Name. Use the second part of the TDS driver Network Address as the ASE driver Server Port.

3 Copy the TDS driver Service Name into the same-named field for the ASE driver.

4 Optionally, enter the Database Name for your service.

5 From the BackEnd Type pull-down list, choose the gateway type that matches your DSN:

- DC DB2 Access Service
- DC TRS
- MFC Gatewayless

6 Click Test Connection to verify connectivity.

Advanced options

The options found under the TDS driver Advanced dialog box will map to the options found in the ASE driver dialog boxes.

❖ **To map the TDS driver Advanced options to the ASE driver options**

1 Copy TDS driver Initialization String to the same named field for the ASE driver in the Advanced dialog box.

2 Copy TDS driver Default Buffer Size for Long Columns to the TextSize field for ASE driver in the Advanced dialog box.

3 For TDS driver Enable Quoted Identifiers, copy the value to the ASE Use Quoted Indentifiers field in the Connection dialog box.

Connection options

The options found under the TDS driver Connection dialog box will map to the options found under the ASE driver Advanced and General dialog boxes.

❖ **To map the TDS driver Connection options to the ASE driver options**

1 Copy the TDS driver Default Login Id to the ASE driver Login Id found in the General dialog box.

2 Copy the TDS driver Workstation Id to the ASE driver Client Host Name found in the Advanced dialog box.

3 Copy the TDS driver Application Name to the same named field found in the Advanced dialog box.

4 Copy the TDS driver Charset to the ASE driver User Specified Character Set found in the Advanced dialog box.

5 Copy the TDS driver Language to the same named field found in the Advanced dialog box.

6 Copy the TDS driver Workstation Id to the ASE driver Client Host Name found in the Advanced dialog box.

7 Copy the TDS driver Application Name to the same named field found in the Advanced dialog box.

8 Copy the TDS driver Charset to the ASE driver User Specified Character Set found in the Advanced dialog box.

9 Copy the TDS driver Language to the same named field found in the Advanced dialog box.

Performance options

The options found under the TDS driver Performance Options dialog box will map to the options found in the ASE driver dialog boxes.

❖ **To map the TDS driver performance options to the ASE driver options**

1 For Select Method = Cursor, enable Use Cursors in the General dialog box.

2 For Prepare Method = None, disable Dynamic Prepare in the Connection dialog box. Otherwise, enable Dynamic Prepare.

3 Copy Fetch Array Size value into the same-named field in the Advanced dialog box.

4 Copy Packet Size value into the same named field in the Advanced dialog box.

For a complete description of ASE driver options, see the ASE ODBC Driver by Sybase *Users Guide*.

Glossary

accept
Establishment of a SNA or TCP/IP connection between Mainframe Connect Server Option and Mainframe Connect DirectConnect for z/OS Option.

access service
The named set of properties, used with an access service library, to which clients connect. Each DirectConnect server can have multiple services.

access code
A number or binary code assigned to programs, documents, or folders that allows authorized users to access them.

access service library
A service library that provides access to non-Sybase data contained in a database management system or other type of repository. Each such repository is called a “target.” Each access service library interacts with exactly one target and is named accordingly. See also **service library**.

ACSLIB
See **access service library**.

Adaptive Server Enterprise
The server in the Sybase client/server architecture. It manages multiple databases and multiple users, tracks the actual location of data on disks, maintains mapping of logical data description to physical data storage, and maintains data and procedure caches in memory.

Adaptive Server Enterprise/Component Integration Services
Includes a variation of ASE that provides a Transact-SQL interface to various sources of external data. Component Integration Services allows ASE to present a uniform view of enterprise data to client applications.

administrative service library
A service library that provides remote management capabilities and server-side support. It supports a number of remote procedures, invoked as RPC requests, that enable remote DirectConnect server management. See also **remote procedure call**, **service library**.

ADMLIB
See **administrative service library**.

Advanced Interactive Executive
The IBM implementation of the UNIX operating system. The RISC System/6000, among other workstations, runs the AIX operating system.

advanced program-to-program communication
Hardware and software that characterize the LU 6.2 architecture and its implementations in products. See also **logical unit 6.2**.

AIX
See **Advanced Interactive Executive.**

AMD2

The component of the Mainframe Connect DB2 UDB Option that allows clients to submit SQL statements to DB2 UDB. It is a CICS transaction that receives SQL statements sent from Mainframe Connect DirectConnect for z/OS Option and submits them to DB2 UDB, using the DB2 UDB dynamic SQL facility. It also receives the results and messages from DB2 UDB and returns them to Mainframe Connect DirectConnect for z/OS Option.

American Standard Code for Information Interchange

The standard code used for information interchange among data processing systems, data communication systems, and associated equipment. The code uses a coded character set consisting of 7-bit coded characters (including a parity check, 8 bits).

API

See **application program interface**.

APPC

See **advanced program-to-program communication**.

application program interface

The programming language interface between the user and Mainframe Connect Client Option or Mainframe Connect Server Option. The API for Mainframe Connect Client Option is Client-Library. The API for Mainframe Connect Server Option is Gateway-Library.

ASCII

See **American Standard Code for Information Interchange**.

ASE

See **Adaptive Server Enterprise**.

ASE/CIS

See **Adaptive Server Enterprise/Component Integration Services**.

batch

A group of records or data processing jobs brought together for processing or transmission.

bind

In the Sybase environment, this term has different meanings depending on the context:

- In CICS, it is an SNA command used to establish a connection between LUs, or a TCP/IP call that connects an application to a port on its system.
- In DB2 UDB, it compiles the Database Request Module, the precompiler product that contains SQL statements in the incoming request, and produces an access plan, a machine code version of the SQL statements that specifies the optimal access strategy for each statement.
- In the mainframe access product set, it establishes a connection between a TRS port and a CICS or IMS region.

bulk copy transfer

A transfer method in which multiple rows of data are inserted into a table in the target database. Compare with **destination-template transfer** and **express transfer**.

call level interface — A programming style that calls database functions directly from the top level of the code. Contrast with **embedded SQL.**

catalog — A system table that contains information about objects in a database, such as tables, views, columns, and authorizations.

catalog RPC — A component of the Mainframe Connect DB2 UDB Option that allows clients to access DB2 UDB system catalogs. It uses an interface compatible with the catalog interface for the ODBC API.

catalog stored procedure — A procedure used in SQL generation and application development that provides information about tables, columns, and authorizations.

character set — A set of specific (usually standardized) characters with an encoding scheme that uniquely defines each character. ASCII is a common character set.

CICS — See **Customer Information Control System**.

CICS region — The instance of CICS.

client — In client/server systems, the part of the system that sends requests to servers and processes the results of those requests. See also **client/server**. Compare with **server**.

client application — Software responsible for the user interface that sends requests to applications acting as servers. See also **client/server**.

Client-Library — A library of routines that is part of Mainframe Connect Client Option.

client request — An RPC or language request sent by a client to a server.

client/server — An architecture in which the client is an application that handles the user interface and local data manipulation functions, and the server is an application providing data processing access and management. See also **client application**.

Client Services Application — A customer-written CICS program initiated on the host that uses the API to invoke the Mainframe Connect Client Option as a client to the DirectConnect server or to ASE. See also **application program interface**, **Client Services for CICS**.

Client Services for CICS — A Sybase host API that invokes the Mainframe Connect Server Option as a client to an access service for DB2 UDB or ASE. See also **application program interface**, **Customer Information Control System**, **Client Services Application**, **Mainframe Connect Server Option**.

clustered index An index in which the physical order and the logical (indexed) order is the same. Compare with **nonclustered index**.

code page An assignment of graphic characters and control function meanings to all code points.

commit A process that makes permanent all changes made to one or more database files since the initiation of the application program, the start of an interactive session, or the last commit or rollback operation. Compare with **rollback**.

Common Programming Interface Specifies the languages and services used to develop applications across SAA environments. The elements of the CPI specification are divided into two parts: processing logic and services.

configuration file A file that specifies the characteristics of a system or subsystem.

configuration set A section into which service library configuration files are divided.

conversion The transformation between values that represent the same data item but which belong to different datatypes. Information can be lost due to conversion, because accuracy of data representation varies among different datatypes.

connection A network path between two systems. For SNA, the path connects a logical unit (LU) on one machine to an LU on a separate machine. For TCP/IP, the path connects TCP modules on separate machines.

connection router A program provided with Mainframe Connect Client Option that directs requests to particular remote servers. Mainframe system programmers use the connection router to define remote servers and server connections to Mainframe Connect Client Option.

Connection Router Table A memory-resident table maintained by a Mainframe Connect Client Option system programmer that lists servers and the connections that a Client-Library transaction can use to access them.

control section The part of a program specified by the programmer to be a relocatable unit, all elements of which are to be loaded into adjoining main storage locations.

control statement In programming languages, a statement that is used to alter the continuous sequential execution of statements. A control statement can be a conditional statement or an imperative statement.

conversation-level security The passing of client login information to the mainframe by TRS when it allocates a conversation.

CSA See **Client Services Application**.

CSP — See **catalog stored procedure**.

cursor — In SQL, a named control structure used by an application program to point to a row of data.

Customer Information Control System — An IBM licensed program that enables transactions entered at remote terminals to be processed concurrently by user-written application programs.

DASD — See **direct access storage device**.

data definition statement — An IBM mainframe statement used to relate a name with a file.

data definition language — A language for describing data and data relationships in a database.

data set name — The term or phrase used to identify a data set.

database management system — The term or phrase to identify a data set.A computer-based system for defining, creating, manipulating, controlling, managing, and using databases.

database operation — A single action against the database. For Mainframe Connect DirectConnect for z/OS Option, a database operation is usually a single SQL statement. One or more database actions can be grouped together to form a request. See also **request**.

Database 2 — An IBM relational database management system.

datatype — A keyword that identifies the characteristics of stored information on a computer.

DB-Library — A Sybase and Microsoft API that allows client applications to interact with ODS applications. See also **application program interface**.

DBMS — See **database management system**.

DB2 UDB — See **Database 2**.

DDL — See **data definition language**.

DD statement — See **data definition statement**.

default language — The language that displays a user's prompts and messages.

destination-template transfer — A transfer method in which source data is briefly put into a template where the user can specify that some action be performed on it before execution against a target database. See also **transfer**. Compare with **bulk copy transfer** and **express transfer**.

direct access storage device A device in which access time is effectively independent of the location of the data.

direct request A request sent directly from a client workstation through Transaction Router Service to the DirectConnect server without going through ASE. Contract with **indirect request**.

direct resolution A type of service name resolution that relies upon a client application specifying the exact name of the service to be used. See also **service name resolution**. Compare with **service name redirection**.

DirectConnect Manager A Java application from Sybase that can be used in Windows and UNIX environments. It provides remote management capabilities for DirectConnect products, including starting, stopping, creating, and copying services.

DirectConnect server The component of Mainframe Connect DirectConnect for z/OS Option that provides general management and support functions to service libraries.

dll See **dynamic link library**.

DSN See **data set name**.

dynamic link library A file containing executable code and data bound to a program at load time or runtime, rather than during linking.

dynamic SQL The preparation and processing of SQL source statements within a program while the program runs. The SQL source statements are contained in host-language variables rather than being coded directly into the application program. Contrast with **static SQL**.

ECDA See **Enterprise Connect Data Access**.

ECDA Option for ODBC A Sybase solution that allows client applications to access ODBC data. It combines the functionality of the ECDA Option for ODBC architecture with ODBC to provide dynamic SQL access to target data, as well as the ability to support stored procedures and text and image pointers.

ECDA Option for Oracle A Sybase solution that provides Open Client access to Oracle databases. When used in combination with ASE, it provides many of the features of a distributed database system, such as location transparency, copy transparency, and distributed joins.

embedded SQL SQL statements that are embedded within a program and are prepared in the process before the program runs. After it is prepared, the statement itself does not change, although values of host variables specified within the statement might change.

end user — A person who connects to a DirectConnect server using an application to access databases and perform transfers. See also **transfer**.

Enterprise Connect Data Access — An integrated set of software applications and connectivity tools that allow access to data within a heterogeneous database environment, such as a variety of LAN-based, non-Sybase data sources, as well as mainframe data sources.

environment variable — A variable that describes how an operating system runs and the devices it recognizes.

exit routine — A user-written routine that receives control at predefined user exit points.

express transfer — A form of bulk copy transfer that uses ODBC bulk APIs to improve performance when transferring bulk data between data sources. Because it uses the same syntax as bulk copy transfer, no modification of applications is required.

external call interface — A CICS client facility that allows a program to call a CICS application as if the calling program had been linked synchronously from a previous program instead of started from a terminal.

External Security Manager — An add-on security package for the z/OS mainframe, licensed by Computer Associates.

FCT — See **forms control table**.

forms control table — An object that contains the special processing requirements for output data streams received from a host system by a remote session.

gateway — Connectivity software that allows two or more computer systems with different network architectures to communicate.

Gateway-Library — A library of communication, conversion, tracing, and accounting functions supplied with Mainframe Connect Server Option.

globalization — The combination of internationalization and localization. See **internationalization**, **localization**.

global variable — A variable defined in one portion of a computer program and used in at least one other portion of the computer program. Contrast with **local variable**.

handler — A routine that controls a program's reaction to specific external events, for example, an interrupt handler.

host The mainframe or other machine on which a database, an application, or a program resides. In TCP/IP, this is any system that is associated with at least one Internet address. See also **Transmission Control Protocol/Internet Protocol**.

host ID In Mainframe Connect Server Option, the ID that the TRS passes to the mainframe with a client request. The host ID is part of the client login definition at the TRS.

host password In Mainframe Connect Server Option, the password that the client passes to the mainframe with a client request.

host request library A DB2 UDB table that contains host-resident SQL statements that can be executed dynamically. See also **host-resident request**.

host-resident request A SQL request that resides in a DB2 UDB table called the host request library. See also **host request library**.

IMS See **Information Management System**.

indirect request A client request that is routed through a stored procedure on a SQL Server, which forwards the request to TRS as an RPC. Compare with **direct request**.

Information Management System A database/data communication system that can manage complex databases and networks.

interfaces file An operating system file that determines how the host client software connects to a Sybase product. An *interfaces* file entry contains the name of any DirectConnect server and a list of services provided by that server.

internationalization The process of extracting locale-specific components from the source code and moving them into one or more separate modules, making the code culturally neutral so it can be localized for a specific culture. See also **globalization**. Compare with **localization**.

keyword A word or phrase reserved for exclusive use by Transact-SQL.

language RPC The name TRS uses to represent a client's language request. TRS treats a language request as a remote procedure call (RPC) and maps it to a language transaction at the remote server.

language transaction The server transaction that processes client language requests. The Mainframe Connect DB2 UDB Option language transaction for CICS is AMD2, which uses the DB2 UDB dynamic SQL facilities to process incoming SQL strings. The Mainframe Connect DB2 UDB Option for IMS uses SYRT by default.

linkage — In computer security, combining data or information from one information system with data or information from another system with the intention to derive additional information; for example, the combination of computer files from two or more sources.

linkage editor — A computer program that creates load modules from one or more object modules or creates load modules by resolving cross references among the modules, and if necessary, adjusts those addresses.

link-edit — To create a loadable computer program by using a linkage editor. See also **linkage editor**.

localization — The process of preparing an extracted module for a target environment, in which messages are displayed and logged in the user's language. Numbers, money, dates, and time are represented using the user's cultural convention, and documents are displayed in the user's language. See also **globalization**.

local variable — A variable that is defined and used only in one specified portion of a computer program. Contrast with **global variable**.

logical unit — A type of network addressable unit that enables a network user to gain access to network facilities and communicate remotely. A connection between a TRS and a CICS region is a connection between logical units.

logical unit 6.2 — A type of logical unit that supports general communication between programs in a distributed processing environment. See also **advanced program-to-program communication**.

login ID — In Mainframe Connect Server Option, the ID that a client user uses to log in to the system.

login packet — Client information made available to Mainframe Connect Server Option. The client program sets this information in a login packet and sends it to TRS, which forwards it to the mainframe.

long-running transaction — A transaction that accepts more than one client request. Whereas short transactions end the communication after returning results to a client, a long-running transaction can await and process another request. Compare with **short transaction**.

LU 6.2 — See **logical unit 6.2**.

mainframe access products — Sybase products that enable client applications to communicate with mainframes in a client/server environment. See **client/server**.

Mainframe Connect — The Sybase product set that provides access to mainframe data.

Mainframe Connect Client Option
A Sybase product that, using Client-Library, allows mainframe clients to send requests to SQL Server, Open Server, the Mainframe Connect DB2 UDB Option and Mainframe Connect Server Option. Mainframe Connect Client Option provides capability for the mainframe to act as a client to LAN-based resources in the CICS or the IMS and MVS environment.

Mainframe Connect DB2 UDB Option
A Sybase mainframe solution that provides dynamic access to DB2 UDB data. It is available in the CICS or IMS environment. See also **Customer Information Control System**, **Database 2**, **Multiple Virtual Storage**.

Mainframe Connect DirectConnect for z/OS Option
A Sybase Open Server application that provides access management for non-Sybase databases, copy management (transfer), and remote systems management.

Mainframe Connect Server Option
A Sybase product that provides capability for programmatic access to mainframe data. It allows workstation-based clients to execute customer-written mainframe transactions remotely. It is available for the CICS and the IMS and MVS environments

Multiple Virtual Storage
An IBM operating system that runs on most System/370 and System/390 mainframes. It supports 24-bit addressing up to 16 megabytes.

network protocol
A set of rules governing the way computers communicate on a network.

nonclustered index
An index that stores key values and pointers to data. Compare with **clustered index**.

null
Having no explicitly assigned value. NULL is not equivalent to 0 or to blank.

ODBC
See **Open Database Connectivity**.

ODS
See **Open Data Services**.

Open Client
A Sybase product that provides customer applications, third-party products, and other Sybase products with the interfaces required to communicate with Open Client and Open Server applications.

Open Data Services
A product that provides a framework for creating server applications that respond to DB-Library clients.

Open Database Connectivity
A Microsoft API that allows access to both relational and non-relational databases. See also **application program interface**.

Open Server
A Sybase product that provides the tools and interfaces required to create a custom server. Clients can route requests to the DirectConnect server through an Open Server configured to meet specific needs, such as the preprocessing of SQL statements.

parameter — A variable that is given a constant value for a specified application and can denote the application. Compare with **property**.

Partner Certification Reports — Sybase publications that certify third-party or Sybase products to work with other Sybase products.

Password Expiration Management — An IBM password management program with CICS Version 3.3 through an optional program temporary fix, and as an integral part of CICS with version 4.1 and higher.

PEM — See **Password Expiration Management**.

PL/1 — See **Programming Language /1**.

primary database — The database management system that the DirectConnect server is always connected to. It is implied in the transfer statement.

Programming Language/1 — A programming language designed for use in a wide range of commercial and scientific computer applications.

property — A setting for a server or service that defines the characteristics of the service, such as how events are logged. Compare with **parameter**.

protocol — The rules for requests and responses used to manage a network, transfer data, and synchronize the states of network components.

query — A request for data from a database, based upon specified conditions.

Registry — The part of the Windows operating system that holds configuration information for a particular machine.

relational database — A database in which data is viewed as being stored in tables consisting of columns (data items) and rows (units of information).

relational operators — Operators supported in search conditions.

relops — See **relational operators**.

remote procedure call — A call to execute a stored procedure on a remote server. For Mainframe Connect Server Option, an RPC is a direct request from a client to TRS. For Mainframe Connect Client Option, a Client-Library transaction that calls a procedure on a remote server acts like an RPC.

remote stored procedure — A customer-written CICS program using an API that resides on the mainframe and communicates with Mainframe Connect DB2 UDB Option. See also **Customer Information Control System**, **stored procedure**. Compare with **Client Services Application**.

remote systems management — A feature that allows a system administrator to manage multiple DirectConnect servers and multiple services from a client.

Replication Server — A Sybase SQL Server application that maintains replicated data and processes data transactions received from a data source.

request — One or more database operations an application sends as a unit to the database. Depending upon the response, the application commits or rolls back the request. See also **commit**, **rollback**, **unit of work**.

resource table — A main storage table that associates each resource identifier with an external logical unit (LU) or application program.

rollback — An instruction to a database to back out of changes requested in a unit of work. Compare with **commit**.

router — An attaching device that connects two LAN segments, which use similar or different architectures, at the Open System Interconnection (OSI) reference model network layer. Contrast with **gateway**.

RPC — See **remote procedure call.**

RSP — See **remote stored procedure**.

SAA — See **System Application Architecture**.

secondary connection — The connection specified in the transfer statement. It represents anything that can be accessed using Mainframe Connect Client Option, such as ASE or another access service.

secondary database — In transfer processing, the supported database that is specified in the transfer statement. Compare with **primary database**.

server — A functional unit that provides shared services to workstations over a network. See also **client/server**. Compare with **client**.

server process ID — A positive integer that uniquely identifies a client connection to the server.

service — A functionality available in Mainframe Connect DirectConnect for z/OS Option. It is the pairing of a service library and a set of specific configuration properties.

service library — In Mainframe Connect DirectConnect for z/OS Option, a set of configuration properties that determine service functionality. See also **access service library**, **administrative service library**, **Transaction Router Service library**, **transfer service library**.

service name redirection — A type of service name resolution that allows a system administrator to create an alternative mechanism to map connections with services. See also **service name resolution**. Compare with **direct resolution**.

service name redirection file — The default name of the file used for the service name redirection feature. See **service name redirection**.

service name resolution — The DirectConnect server mapping of an incoming service name to an actual service. See also **direct resolution**, **service name redirection**.

session — A connection between two programs or processes. In APPC communications, sessions allow transaction programs to have conversations between the partner LUs. See also **advanced program-to-program communication**.

short transaction — A mainframe transaction that ends the communication when it finishes returning results to the client. Compare with **long-running transaction**.

SNA — See **Systems Network Architecture**.

SNRF — See **service name redirection file**.

SPID — See **server process ID**.

SQL — See **structured query language**.

SQLDA — See **SQL descriptor area**.

sqledit — A utility for creating and editing *sql.ini* files and file entries.

sql.ini — The interfaces file containing definitions for each DirectConnect server to which a workstation can connect. The file must reside on every client machine that connects to ASE.

SQL descriptor area — A set of variables used in the processing of SQL statements.

SQL stored procedure — A single SQL statement that is statically bound to the database. See also **stored procedure**.

static SQL — SQL statements that are embedded within a program and prepared during the program preparation process before the program runs. Compare with **dynamic SQL**.

stored procedure — A collection of SQL statements and optional control-of-flow statements stored under a particular name. Adaptive Server stored procedures are called “system procedures.” See also **remote stored procedure**, **system procedures**.

structured query language — An IBM industry-standard language for processing data in a relational database.

stub A program module that transfers remote procedure calls (RPCs) and responses between a client and a server.

SYRT The component of Mainframe Connect DB2 UDB for IMS that allows clients to submit SQL language requests to DB2 through IMS.

System Administrator The person in charge of server system administration, including installing and maintaining DirectConnect servers and service libraries.

System Application Architecture An IBM proprietary plan for the logical structure, formats, protocols, and operational sequences for transmitting information units through networks and controlling network configuration and operation. See also **advanced program-to-program communication**.

system procedures A stored procedure that ASE supplies for use in system administration. System procedures serve as shortcuts for retrieving information from system tables, or a mechanism for accomplishing database administration. See also **stored procedure**.

Systems Network Architecture An IBM proprietary plan for the structure, formats, protocols, and operational sequences for transmitting information units through networks. See also **advanced program-to-program communication**.

table An array of data or a named data object that contains a specific number of unordered rows. Each item in a row can be unambiguously identified by means of one or more arguments.

Tabular Data Stream A Sybase application-level protocol that defines the form and content of relational database requests and replies.

target A system, program, or device that interprets, rejects, satisfies, or replies to requests received from a source.

target database The database to which the DirectConnect server transfers data or performs operations on specific data.

TCP/IP See **Transmission Control Protocol/Internet Protocol**.

TDS See **Tabular Data Stream**.

transaction A unit of processing initiated by a single request. A transaction consists of one or more application programs that, when executed, accomplish a particular action. In Mainframe Connect Server Option, a client request (RPC or language request) invokes a mainframe transaction. In Mainframe Connect Client Option, a mainframe transaction executes a stored procedure on a remote server.

transaction processing	A sequence of operations on a database that is viewed by the user as a single, individual operation.
Transaction Router Service	A Mainframe Connect DirectConnect for z/OS Option program used when the mainframe acts as a transaction server to route requests from remote clients to the Mainframe Connect Server Option and return results to the clients.
Transaction Router Service library	A service library that facilitates access to remote transactions, allowing customers to execute transactions from virtually any mainframe data source. See also **service library**.
Transact-SQL	A Sybase-enhanced version of the SQL database language used to communicate with ASE.
transfer	A Mainframe Connect DirectConnect for z/OS Option feature that allows users to move data or copies of data from one database to another.
transfer service library	A service library that provides copy management functionality. See also **service library**.
Transmission Control Protocol/Internet Protocol	A set of communication protocols that supports peer-to-peer connectivity functions for both local and wide area networks.
trigger	A form of stored procedure that automatically executes when a user issues a change statement to a specified table.
TRS	See **Transaction Router Service**.
TRS library	See **Transaction Router Service library**.
T-SQL	See **Transact-SQL**.
unit of work	One or more database operations grouped under a commit or rollback. A unit of work ends when the application commits or rolls back a series of requests, or when the application terminates. See also **commit**, **rollback**, **transaction**.
user ID	User identification. The ID number by which a user is known in a specific database or system.
variable	An entity that is assigned a value. Mainframe Connect DirectConnect for z/OS Option has two kinds of variables: *local* and *global*.
view	An alternate representation of data from one or more tables. A view can include all or some of the columns contained the table or tables on which it is defined.

Virtual Storage Access Method	An IBM-licensed program that controls communication and the flow of data in an SNA network.
Virtual Telecommunications Access Method	IBM mainframe software that allows communication on an SNA network between mainframes and allows the mainframe to have multiple sessions per connection.
VSAM	See **Virtual Storage Access Method.**
VTAM	See **Virtual Telecommunications Access Method**.
wildcard	A special character that represents a range of characters in a search pattern.

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