Connect:Direct® OS/400

Installation and Administration Guide

Connect:Direct®
OS/400

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Version 3.5

Connect:Direct OS/400 Installation and Administration Guide
Version 3.5
First Edition

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Preface

The *Connect:Direct OS/400 Installation and Administration Guide* is for programmers and network operations staff who install and maintain the Connect:Direct OS/400 product.

Read the first three chapters in the book to gain the general knowledge required to install the Connect:Direct product. These chapters introduce you to the basic components and general concepts, and they summarize the preinstallation and installation procedures.

This guide assumes knowledge of the OS/400 operating system, its applications, network, and environment. If you are not familiar with the OS/400 operating system, refer to the OS/400 library of manuals.

Chapter Overview

The organization of the *Connect:Direct OS/400 Installation and Administration Guide* follows:

❖ Part I, *Installation,*, introduces the Connect:Direct product and details the preinstallation and installation procedures.

- ◆ Chapter 1, *About Connect:Direct OS/400,*, provides general information about the Connect:Direct product and describes how Connect:Direct OS/400 works.

- ◆ Chapter 2, *Preparing to Install Connect:Direct,*, describes system requirements and provides a worksheet to assist you in gathering values for the parameter definitions required for installation.

- ◆ Chapter 3, *Installing Connect:Direct,*, explains how to install the Connect:Direct OS/400 software, set up the start and stop procedures, and test the installation.

❖ Part II, *Administration,*, provides information you need to perform Connect:Direct OS/400 system administration functions.

- ◆ Chapter 4, *Starting and Stopping Connect:Direct,*, describes how to start and stop the Connect:Direct OS/400 system.

- ◆ Chapter 5, *Modifying Initialization Parameters,*, details how to change your initialization parameter settings.

- ◆ Chapter 6, *Maintaining Security,*, explains how to establish and maintain local and remote user authorizations.

- ◆ Chapter 7, *Maintaining the Network Map,*, describes the network map and its maintenance procedures.

- ◆ Chapter 8, *Managing Connect:Direct Execution,*, details how to monitor and control a Connect:Direct OS/400 node.

- Chapter 9, *Performing Administrative Duties,*, describes administration functions, such as changing communication devices or changing the average number of prestarted sessions allowed.
- Chapter 10, *Maintaining Spool Support,*, describes configuration and use of the Spool Support program.
- Chapter 11, *Maintaining Extended Translation,*, explains how to set up your system to use extended translation. This information includes how to create your own translation table and how to update tables.
- Chapter 12, *Administering Statistics,*, discusses the statistics facility, procedures for determining the outcome of Connect:Direct Processes, and procedures for using the results.
- Chapter 13, *Analyzing Connect:Direct Problems,*, describes isolating and solving problems by using both Connect:Direct and communication traces.
- Appendix A, *Defining the LU0 Environment,*, details how to define the LU0 environment and provides sample definitions for connectivity between the OS/400 node and remote nodes.
- Appendix B, *Defining the LU6.2 Environment,* describes how to define the LU6.2 environment and provides sample definitions for connectivity between the OS/400 node and remote nodes.
- Appendix C, *Defining the TCP/IP Environment,* explains how to define the TCP/IP environment.
- Appendix D, *Configuring an APPN Network,* describes how to set up a sample APPN network with an OS/400 node and includes definitions for the nodes in the network.
- *Glossary* defines Connect:Direct terms used in this manual.

Notational Conventions

The *Connect:Direct OS/400 Installation and Administration Guide* uses certain notational conventions. This section describes the conventions used in this guide.

Uppercase Letters

Uppercase letters in the command format indicate that you type in information as shown. For example, SNODENVIRN(OS400) indicates that environment must be typed as OS400.

Lowercase Letters

Lowercase letters or words in commands or syntax boxes require substitution by the user. For example, PNODE(primary-node-name) indicates that you must provide the name of the primary node.

Bold Letters

Bold print in syntax boxes indicates Connect:Direct commands and required parameters. For example, **DSN(filename)** indicates that the parameter DSN is required.

Bold print in text indicates values and commands that you enter through the keyboard.

Underlined Letters

Underlining indicates default values for parameters and subparameters. For example, RETAIN(*YES|*NO|*INITIAL) specifies that the default for RETAIN is *NO.

Vertical Bars

Vertical bars indicate that you can supply one of a series of values separated by the vertical bars. For example HOLD(*YES|*NO|*CALL) specifies that *YES or *NO or *CALL is a valid value.

Brackets

Brackets indicate that information is optional. For example, STARTT=([date|day][,hh:mm:ssXM]) indicates that you can specify either a date or a day, a date or a day plus a time, or just a time.

Additional Notations

Process, as shown with a capital P, refers to a Connect:Direct Process.

`Monospaced characters` (characters of equal width) represent information for screens, commands, Processes, and reports.

Italics indicate book, chapter, and section titles or show emphasis in the text.

Connect:Direct OS/400 Documentation

The following manuals make up the Connect:Direct OS/400 library:

❖ *Connect:Direct OS/400 Release Notes* is a document shipped with Connect:Direct OS/400 that lists system requirements, ESD instructions, and last-minute product information. This document is provided in hard copy only.

❖ *Connect:Direct OS/400 Installation and Administration Guide* provides information for system administrators about installing and maintaining Connect:Direct OS/400.

❖ *Upgrading Connect:Direct OS/400* provides information and instructions on migrating from an earlier version of Connect:Direct OS/400 to Connect:Direct OS/400, version 3.5.

❖ *Connect:Direct OS/400 Version 3.5 Maintenance* provides a complete list of issues resolved for Connect:Direct OS/400 version 3.5.

❖ *Connect:Direct OS/400 User's Guide* explains how to use Connect:Direct OS/400.

❖ *Connect:Direct Compatibility and Connectivity Chart* provides definitions for several supported Connect:Direct platforms and the mapping of the definitions that must match between two communicating platforms.

❖ Connect:Direct Process documentation provides you with the information needed to write a Connect:Direct Process. This documentation consists of two books:

   ◆ *Connect:Direct Process Concepts and Examples Guide* provides an overview of Connect:Direct, describes the general structure and syntax rules for the Process language, and includes numerous examples.

   ◆ *Connect:Direct Process Statements Guide* describes the Process statements for various platforms including Connect:Direct OS/400.

If you install Connect:Direct Secure+ Option, the following documentation is also included:

❖ *Connect:Direct Secure+ Option OS/400 Implementation Guide* explains how to install and use the Connect:Direct Secure+ Option OS/400.

❖ *Connect:Direct Secure+ Option OS/400 Release Notes,* which is shipped with Connect:Direct OS/400, describes hardware and software requirements, known restrictions, and last-minute product information for Connect:Direct Secure+ Option OS/400.

Getting Support for Sterling Commerce Products

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The Sterling Commerce Customer Support Web site at www.sterlingcommerce.com is the doorway to Web support, information, and tools. This Web site contains several informative links, including a solutions database, an issue tracking system, fix information, documentation, workshop information, contact information, sunset and retirement schedules, and ordering information. Refer to the Customer Support Reference Guide at www.sterlingcommerce.com/customer/tech_support.html for specific information on getting support for Sterling Commerce products.

Part I

Installation

Chapter 1

About Connect:Direct OS/400

Connect:Direct links technologies and moves all types of information between networked systems/computers. It manages high-performance transfers by providing such features as: automation, reliability, efficient use of resources, application integration, and ease of use. Connect:Direct software offers choices in communications protocols, hardware platforms, and operating systems. It provides the flexibility to move information among mainframes, midrange systems, desktop systems, and LAN-based workstations.

Connect:Direct OS/400 can initiate connections to other Connect:Direct remote nodes through LU6.2 independent or dependent sessions and TCP/IP sessions. The Connect:Direct OS/400 node is the secondary or receiving node for LU0, LU6.2, or TCP/IP sessions.

Refer to the *Connect:Direct OS/400 Release Notes* for a list of remote node platforms, their connectivity, and their session initiation capabilities.

Connect:Direct OS/400 Interface

Connect:Direct OS/400 includes Control Language (CL) commands that enable you to send or receive data from other nodes running Connect:Direct and to administer the Connect:Direct subsystem.

You can issue Connect:Direct CL commands interactively from the command line or use the commands in a CL program. Results of CL commands that interact with a remote node are recorded in the Connect:Direct log, in the user message queue of the local and remote OS/400 nodes, and in the Connect:Direct statistics facilities of the local and remote Connect:Direct nodes.

Connect:Direct OS/400 commands are case sensitive if the information passed to the remote node is enclosed in single quotation marks.

Detailed information and examples for CL commands and programming are included in the *Connect:Direct OS/400 User's Guide*.

Connect:Direct Administrative CL Commands

The following table lists the Connect:Direct administrative command names and functions.

Command	Parameter
†ADDCDNTMP	Add remote node records to the network map.
†ADDCDUSR	Define new user records.
†ADDSPLMONE	Add a destination configuration file entry to the Spool Support for Connect:Direct OS/400.
CDARCSTATM	Compress and archive a statistics file member other than the active one.
CDCRTSTATM	Create a new statistics file member and log statistics to that new member.
CDDEVACT	Connect:Direct Device Activate SNA devices
CDDLTARCST	Connect:Direct Delete Archived members
CDDLTSTATM	Delete a specified statistics file member other than the active one.
CDDSPSTATI	Display Connect:Direct statistics information.
CDSELSTAT	Retrieve Connect:Direct statistics.
CDVER	Display Connect:Direct version and maintenance.
†CHGCDPARM	Change Connect:Direct initialization parameters. (WRKCDPARM)
†CHGCDNTMP	Change Connect:Direct netmap entry.
†CHGCDUSR	Change Connect:Direct user entry.
†CHGSPLMONE	Change a destination configuration file entry of the Spool Support for Connect:Direct OS/400.
CNVNTMPF	Convert Connect:Direct netmap file.
CNVUSRF	Convert Connect:Direct user file.
†CPYCDNTMP	Copy Connect:Direct netmap entry.
†CPYCDUSR	Copy Connect:Direct user entry.
†CPYSPLMONE	Copy a destination configuration file entry of the Spool Support for Connect:Direct OS/400.
CRTCDOBJ	Create Connect:Direct objects.
CRTCDXTTBL	Create and update the translation table.
†DLTCDNTMP	Delete Connect:Direct netmap entry.
†DLTCDUSR	Delete Connect:Direct user entry.
ENDCD	Stop Connect:Direct OS/400.
HLDCDPROC	Place Connect:Direct Processes on hold.
†HLDSPLMONE	Hold a destination configuration file entry to the Spool Support for Connect:Direct OS/400.

†These commands are for reference only and should not be used directly.

††Connect:Direct Secure+ Option commands.

Command	Parameter
RLSCDPROC	Release held Connect:Direct Processes.
†RLSSPLMONE	Release a destination configuration file entry to the Spool Support for Connect:Direct OS/400.
†RMVSPLMONE	Delete a destination configuration file entry to the Spool Support for Connect:Direct OS/400.
††SPADMIN	Secure+ Option administrative utility to generate keys and update node information.
STRCD	Start Connect:Direct OS/400.
STRCDTCPL	Start Connect:Direct TCP/IP Listener.
UNINSTALLM	Back out Connect:Direct maintenance.
UPDATECD	Apply Connect:Direct maintenance.
WRKCDNTMP	Select remote node records and displays attributes. Options from this screen allow you to copy or change attributes of the remote nodes.
WRKCDPARM	View and change Connect:Direct initialization parameter values. (CHGCDPARM)
WRKCDPROC	Monitor and control Connect:Direct Processes.
WRKCDSTS	View and control Connect:Direct job status.
WRKCDUSR	Browse existing user records and invoke other user maintenance commands.
WRKSPLMONE	View, change, or delete destination configuration file entries of the Spool Support for Connect:Direct OS/400.

†These commands are for reference only and should not be used directly.

††Connect:Direct Secure+ Option commands.

For information on the user commands, refer to the *Connect:Direct OS/400 User's Guide*.

Connect:Direct Secure+ Option

If you install Connect:Direct Secure+ Option, you have access to SPADMIN utility. The SPADMIN utility allows you to generate and maintain Secure+ Option keys, and update Local and Remote Secure+ Option node information. This utility also updates local and remote node entry. For additional information on the SPADMIN utility, refer to the *Connect:Direct Secure+ Option OS400 Implementation Guide*.

Using Connect:Direct Screens

Connect:Direct OS/400 screens in this manual show parameter keywords instead of all available choices. The following function keys provide access to information you need to complete the screens:

❖ Press **F11** to display keywords.

❖ Press **F1** to access help screens for the command and parameters.

❖ Press **F4** to display a list of valid parameters with a brief description of each parameter.

For details on a parameter and a list of valid values, place the cursor on the parameter and press **F1**.

Screen examples throughout this document show the first screen in a series. If a screen shows Bottom in the lower right corner, your response to the current screen can display new screens. If the screen shows More... in the lower right, you access subsequent screens by using the page down key.

Preparing to Install Connect:Direct

Connect:Direct OS/400 installation is a two-part procedure that consists of defining the communications environment for network connectivity and installing the Connect:Direct OS/400 product. This chapter describes the steps you should take prior to installing the Connect:Direct OS/400 product:

❖ Creating the administrator profile

❖ Preparing for remote nodes

❖ Checking options in the license key file

❖ Preparing the installation worksheet

Chapter 3, *Installing Connect:Direct*, describes the actual product installation. For information on how to move a test system into production, refer to Chapter 9, *Performing Administrative Duties*.

Creating the Administrator Profile

Create a Connect:Direct administrator profile on each OS/400 system on which Connect:Direct is to be installed. The Connect:Direct administrator profile requires:

❖ All object authority

❖ Save system authority

❖ Security administration authority

❖ Service authority

❖ Job control authority

❖ Spool control authority

❖ I/O system configuration authority

Use this profile to define and create the lines, controllers, and devices to be used by Connect:Direct OS/400. This profile is also used as the ongoing administrator ID. The terminal from which you install the product must be authorized for this user profile.

If the Connect:Direct Administrator profile is something other than CDADMIN, you can expect to see warning messages related to object ownership during installation. This situation could occur if you are installing a test Connect:Direct on a system that already uses CDADMIN as the administrator for another Connect:Direct release.

> **Note:** If security is a concern, do not use this user ID for normal work such as sending a file. See Chapter 6, *Maintaining Security*, for more information on security.

Create the Administrator User ID on OS/400

Use the following steps to create a user profile for the Connect:Direct administrator on the OS/400 system:

1. Sign on to the OS/400 system with the security officer user profile QSECOFR or the profile used to create user profiles on your system.

2. Enter the following OS/400 command and press **Enter**.

```
CRTUSRPRF        USRPRF(cdadmin) SPCAUT(*ALLOBJ *SAVSYS
                 *SPLCTL *SECADM *JOBCTL *SERVICE *IOSYSCFG)
                 PWDEXPITV(*NOMAX) LMTDEVSSN(*NO)
```

Enter the user profile for **cdadmin**. The password will also be cdadmin because no password was specified in this example. Use normal password procedures for your organization.

3. Sign off the OS/400 system.

4. Sign on again, this time using the CDADMIN profile to guarantee that the correct authorization is connected to the objects created during the installation procedure.

Refer to Chapter 6, *Maintaining Security* for information about the authority that the nonadministrative Connect:Direct user requires.

Preparing for Remote Nodes

Connect:Direct OS/400 supports three types of connectivity to other Connect:Direct nodes: LU0, LU6.2, and TCP/IP.

See your *Connect:Direct OS/400 Release Notes* to determine which connectivity types are supported on other Connect:Direct platforms. Refer to the *Connect:Direct Compatibility and Connectivity Chart* for information that will help you define your connections.

LU0 Connectivity

Connect:Direct OS/400 cannot initiate Processes from the LU0 node. The remote node must initiate all Processes. To initiate Processes from Connect:Direct OS/400, you must use an LU6.2 or a TCP/IP connection.

Appendix A, *Defining the LU0 Environment*, provides sample LU0 environment definitions for connectivity between Connect:Direct OS/400 nodes and other Connect:Direct nodes using an LU0 session.

LU6.2 Connectivity

You can use any line supported by APPC/APPN to enable communications between Connect:Direct OS/400 and remote Connect:Direct nodes using LU6.2.

Refer to Appendix B, *Defining the LU6.2 Environment*, for samples of connectivity definitions for some of the supported platforms. Examples shown in this appendix are for APPN and non-APPN controllers and devices on a nonswitched (leased) SDLC line and Token Ring line. Appendix D, *Configuring an APPN Network*, has a sample APPN configuration.

TCP/IP Connectivity

You must configure your OS/400 node for TCP/IP and prepare the Connect:Direct OS/400 software for TCP/IP. Appendix C, *Defining the TCP/IP Environment*, provides details.

Checking Options in the License Management Key File

Use the following steps to check options in the license management key file. You need this information when you are filling in the Change C:D Parms (CHGCDPARM) screens during installation.

1. Using a text viewer, open the license management key file. This file is named *99999*.txt, where *99999* is the key number.

2. If you have a Usage license, your license management key file contains a value for the number of available sessions. Look for the value of *N CONCURRENT-SESSIONS* and use it in the Maximum primary sessions, Maximum secondary sessions, and Maximum synchronous sessions fields on the Change C:D Parms (CHGCDPARM) screen. Make a note of this value on the *Installation Worksheet*.

   If you have a Tier license, your license management key file does not include this value. You may use the default values or change them.

   The license management key also indicates if you have Secure+ Option.

   See Chapter 5, *Modifying Initialization Parameters*, for more information on these parameters related to the different kinds of sessions.

Preparing the Installation Worksheet

Before you begin the installation procedure, complete the installation worksheet that follows. This worksheet provides a list of the values you will be asked to provide during installation.

Installation Worksheet

This worksheet matches the panels you will complete during the installation of Connect:Direct OS/400.

Connect:Direct administrator profile name: <u>cdadmin</u>

Production Library where you will install Connect:Direct: _____ (8 characters)

CD Reader for the installation:_____

Name for the Connect:Direct subsystem:_____

    (10 characters - This name can match the production library name.)

Do you want the install process to create translation tables: *YES or *NO

Type of printer device file to be created: _____

    Type: *SCS or *IPDS

Define necessary initialization parameters.

> **Note:** See Chapter 5, *Modifying Initialization Parameters*, for a list of the initialization parameters.

You can accept the defaults for most fields, but you must provide the following:

    Name for your local Connect:Direct node: _____

      (This name can match the library name or subsystem name.)

Enable TCP/IP up to four Listeners: *YES or *NO.

If *YES, this node's TCP/IP address: _____ Port Number _____

       TCP/IP address: _____ Port Number _____

       TCP/IP address: _____ Port Number _____

       TCP/IP address: _____ Port Number _____

License Management Key File Information

    N-Concurrent-Sessions: _____

    License Management Key File Name and Location: _____ (Both temporary and permanent license key files are sent in e-mails. See *Connect:Direct OS/400 Release Notes* for more information on the License Management Key File.)

Chapter 3

Installing Connect:Direct

Note:	This chapter focuses on brand-new, first-time installations. If you are upgrading, refer to *Upgrading Connect:Direct OS/400,* which provides information and instructions on migrating from an earlier version of Connect:Direct OS/400 to Connect:Direct OS/400, version 3.5.

After you complete the worksheet provided in the *Preparing to Install Connect:Direct* chapter, proceed with the installation procedures for the Connect:Direct OS/400 product. This chapter details the installation procedure and includes instructions for testing your installation.

If you plan to distribute Connect:Direct OS/400 to other OS/400 systems, refer to the *Distributing Connect:Direct OS/400 to Other OS/400 Systems* section beginning on page 3-11 before you begin your installation.

Installation Procedure Overview

Complete the following steps to configure Connect:Direct objects:

1. Mount the Connect:Direct OS/400 distribution media.

2. Sign on to the OS/400 system as cdadmin.

3. Use the DSPLIBL command to ensure the following:

   ❖ QTEMP and QGPL are in your library list.

   ❖ CURLIB is set to *CRTDFT. (No current library)

   ❖ Your list does not include any previously installed Connect:Direct libraries.

Note:	You must use a new library for installation.

4. Enter the following command to load the installation objects from the CD and to start the installation procedure.

   ```
   LODRUN DEV(device id)
   ```

   where device id is the name of your optical drive, for example, OPT01.

The LODRUN command goes through the following steps:

1.   Execute the Connect:Direct install command

2.   Build Connect:Direct objects

3.   Create the printer device file

4.   Add installing USER as a default administrator

5.   Define initialization parameters

6.   Build extended translation tables (Optional)

7.   Add a loopback TCP/IP entry with values specified on TCP_HOST1 and TCP_PORT1 in Initparms file

8.   Make installing user profile an owner of INITPARMS, CDUSER and CDNTMP files

9.   Change installing user profile to point to the production library as the current library, CDJOBD as the job description, and CDOUT as the output queue.

The following is an example of the **Load and Run** screen:

```
                      Load and Run (LODRUN)

 Type choices, press Enter.

 Device  . . . . . . . . . . . . .  _____       Name, *TAP, *OKT, *OPT








                                                              Bottom
   F3=Exit    F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
   F24=More keys
```

Step 1 – Execute the Connect:Direct Install Command

Enter the Connect:Direct Install (CDINSTALL) command to start the actual installation.

```
                  Connect:Direct Install (CDINSTALL)

 Type choices, press Enter.

 Install from Device  . . . . . .   _____       NAME
 Install to library . . . . . . .   _____       NAME
 Character set  . . . . . . . . .   *MIXED         *UPPER, *MIXED














                                                             Bottom
  F3=Exit    F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  F24=More keys
```

Descriptions for each entry field for this screen follow.

Install from Device specifies the name of the device to be used for installation. The installation procedure extracts the value for this field automatically from the **Load and Run** screen.

Install to library specifies the name of the library where you want to install the product**.**

> **Note:** The library name must not exceed eight characters if one of your remote nodes is OS/390, VM, or VSE.

The installation procedure provides a suggested value for this field automatically.

Character Set specifies to install either a mixed case or all upper-case version of Connect:Direct OS/400 for systems that use DBCS character sets. The values are:

- MIXED–Install the mixed-case version of Connect:Direct OS/400.
- UPPER–Install the upper-case version of Connect:Direct OS/400.

After completing the fields, press **Enter**.

Step 2 – Build Connect:Direct Objects

The **Create Connect:Direct Objects (CRTCDOBJ)** screen displays automatically when you perform a complete product installation. Complete this screen to build the rest of the components required by Connect:Direct. The Create Connect:Direct Objects screen follows.

Enter the required information as it applies to your system. A definition for each field pertinent to first-time installations follows.

```
                   Create Connect:Direct Objects (CRTCDOBJ)

   Type choices, press Enter.

   Local Library Name . . . . . . .   _____        Character value
   Subsystem Name . . . . . . . . .   _____        Name
   Local Node Name  . . . . . . . .   _____
   Convert Old C:D Netmap file  . .   *NO             *YES, *NO
   Convert Old C:D User File  . . .   *NO             *YES, *NO
   Copy Secure+ Files . . . . .       *NO             *YES, *NO
   Build XTRAN tables . . . . . . .   *NO             *YES, *NO




                                                                     Bottom
    F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
    F24=More keys
```

Local Library Name specifies the name of the Connect:Direct production library (the **Install to library** from page 3-3.)

Subsystem Name specifies the name of the Connect:Direct subsystem. The subsystem cannot be named CDJOBD. SBSD can be 10 characters long. By default this name should be the same as the production library name. You can change the subsystem name.

> **Note:** A test version of Connect:Direct OS/400 cannot run concurrently from the same subsystem as the production Connect:Direct OS/400.

Local Node Name specifies the name of the local Connect:Direct node used for communicating with remote nodes. The Local Node Name (PNODE) cannot exceed 16 characters in length and is case-sensitive.

Build XTRAN tables specifies whether CRTCDOBJ should build the Connect:Direct OS/400 version 3.5 extended translation tables. This option is primarily for those systems requiring Double-byte Character Set (DBCS) support. Type ***YES** or ***NO**.   (If you choose to build your tables after installation, use the CRTCDXTTBL command as explained in Chapter 11, *Maintaining Extended Translation*.)

> **Note:** If BLDXTRAN(*NO) is specified, you can delete the cdlib/CDXTSOURCE file after the installation is complete.

You may receive the message *Object already exists* in the following circumstances:

❖ If you tried to install Connect:Direct previously but aborted the installation.

❖ If you received an abnormal termination and then attempted to install again.

This message gives you the opportunity to either cancel, ignore, or proceed.

Step 3 – Create the Printer Device File

During the CRTCDOBJ job, the OS/400 **Create Printer File (CRTPRTF)** screen displays.

```
                        Create Printer File (CRTPRTF)

  Type choices, press Enter.

  File . . . . . . . . . . . . . .    _____        Name
    Library  . . . . . . . . . . .     *CURLIB        Name, *CURLIB
  Source file  . . . . . . . . . .    *NONE           Name, *NONE
    Library  . . . . . . . . . . .     _____         Name, *LIBL, *CURLIB
  Source member  . . . . . . . . .    *FILE           Name, *FILE
  Generation severity level  . . .    20              0-30
  Flagging severity level  . . . .    0               0-30
  Device:
    Printer  . . . . . . . . . . .    *JOB            Name, *JOB, *SYSVAL
  Printer device type  . . . . . .    *SCS            *SCS, *IPDS, *LINE...
  Text 'description' . . . . . . .    *SRCMBRTXT_____
   _____



                                                                       Bottom
  F3=Exit    F4=Prompt   F5=Refresh   F10=Additional parameters   F12=Cancel
  F13=How to use this display        F24=More keys
```

The values specified for the command parameters are used to build the printer device file. Connect:Direct uses this file when it creates its statistics log files and when data received as a result of a Connect:Direct COPY is sent to a spool file.

Press **F10** for additional parameters. Complete these parameters in compliance with your printer device. Refer to the *OS/400 Control Language Reference* manual for more information on the parameter values that you can specify.

Note: Define your printer device file for the widest audience; specialized needs can be specified on an operation-by-operation level, overriding the values set at installation.

In most cases, accepting the default is sufficient.

To abort the build at this time, press **F12**. You will receive a message indicating that the Connect:Direct build has ended and the install procedure is aborted.

Press **Enter** to execute.

Step 4 – Add a Default Administrator

The installation program automatically defines the default administrator as the user who is installing the product. This guarantees that the correct authorization is connected to the objects created during the installation.

Step 5 – Define Initialization Parameters

During installation, you must define your initialization parameters. The Change C:D parms (CHGCDPARM) screen is displayed automatically as shown in the following example:

```
                        Change C:D parms (CHGCDPARM)

   Type choices, press Enter.

   Production Library Name  . . . . > CDDV3500      Character value
   Connect:Direct subsystem name  .   CDDV3500      Character value
   Local Node Name  . . . . . . . .   'FRAN.CDDV3500'
   Default local location . . . . .   *NETATR       Character value
   User to receive Messages . . . .   CDDV3500      Character value
   Process queue startup option . .   *COLD         *WARM, *COLD
   Enable TCP/IP listener . . . . .   *YES          *NO, *YES
   TCP CRC  . . . . . . . . . . . .   *ON           *ON, *OFF
   TCP CRC Override . . . . . . . .   *YES          *YES, *NO
   TCP/IP host address  . . . . . .   'FRAN'

   TCP/IP host port . . . . . . . .   '01364'       00001-65535, '',
    Alternate TCP/IP Host Address

    Alternate TCP/IP Host Port  . .                 00001-65535, '',

                                                                    More...
   F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
   F24=More keys
```

Note: To run the TCP/IP listener job when you start up Connect:Direct OS/400, be sure that ***YES** is specified for the **Enable TCP/IP listener** field and then enter the information for your system in the **TCP/IP host address** and **TCP/IP host port** fields. Optionally you may enter the **Alternate TCP/IP Host Address** and **Alternate TCP/IP Host Port** fields. You may specify up to four TCPHOST/TCP PORT combinations for the server to listen on for incoming remote node connections. To listen on all interfaces, enter **0.0.0.0** in **TCP/IP host address**.

Press **Page Down** to access the second screen and display additional parameters. An example follows.

```
                        Change C:D parms (CHGCDPARM)

  Type choices, press Enter.

   Alternate TCP/IP Host Address

   Alternate TCP/IP Host Port  . .              00001-65535, '',
   Alternate TCP/IP Host Address

   Alternate TCP/IP Host Port  . .              00001-65535, '',
  TCP SRC Ports . . . . . . . . .

  TCP SRC Port Listen Iterations   03           01-255
  Netmap Check . . . . . . . . . .  *YES        *NO, *YES
  Node Check . . . . . . . . . . .  *NAME       *NAME, *ADDRESS, *BOTH
  Enable spool monitor . . . . . .  *NO         *NO, *YES
  Permanent session managers . . .  00          00-20, *NOMAX
  Maximum primary sessions . . . .  2           00-99, *NOMAX
  Maximum secondary sessions . . .  2           00-99, *NOMAX
  Maximum synchronous sessions . .  2           00-99, *NOMAX
                                                                   More...
  F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  F24=More keys
```

> **Note:** If you have a usage license, use the value of *N CONCURRENT-SESSIONS* in the license key file for the fields, **Maximum primary sessions**, **Maximum secondary sessions**, and **Maximum synchronous sessions**. See the *Checking Options in the License Management Key File* section beginning on page 2-3 for more information.

Press **Page Down** to access the third screen and display additional parameters. An example follows.

```
                        Change C:D parms (CHGCDPARM)

  Type choices, press Enter.

  Trace Instructions . . . . . . .    *NONE
  Job Default Priority . . . . . .    07            00-15
  Checkpoint Interval  . . . . . .    0             0..2000M
  Checkpoint Days  . . . . . . . .    03            01-99
  Wait between Retries . . . . . .    000300        Time
  Maximum Retry Attempts . . . . .    002           000-512
  Maximum records in stat member      0000010000    *NOMAX 1000..2147483643
  Maximum members in stat file . .    00010         *NOMAX 2..32767
  Full stat file action  . . . . .    *ARCHIVE      *ARCHIVE, *DELETE
  Extended compression level . . .    1             01-09
  Extended compression window  . .    13            08-15
  Extended compression memory  . .    4             01-9
  Print CDLOG spool files  . . . .    *YES          *NO, *YES
  TCP Max Time to Wait . . . . . .    00180         *NOMAX 0..03600
  RUNTASK Max Time to Wait . . . .    21600         *NOMAX 0..21600


                                                                   More...
  F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  F24=More keys
```

Press **Page Down** to access the fourth screen and display the remaining parameters. An example follows.

```
                          Change C:D parms (CHGCDPARM)

  Type choices, press Enter.

  Asset protection key file  . . . > 'cdlib/APKEYF(APKEYF)'












                                                                    Bottom
   F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel   F13=How to use this display
   F24=More keys
```

Note: Enter the license management key file name in single quotes.

Use these initialization parameters to specify the components required by Connect:Direct. Each parameter is defined in Chapter 5, *Modifying Initialization Parameters*. You can use the defaults where provided, but you must supply LCLNODE, TOUSR, and TCP/IP information as appropriate.

When you have specified all parameters, press **Enter**.

Step 6 – Complete the Installation Procedure

Connect:Direct OS/400 creates a local node record and displays the Secure+ Admin Main Screen.

```
                      SECURE+ ADMIN MAIN SCREEN                   FRAN
                                                         06/03/04  11:13:22
    Position to node . . .

    Type option and press Enter.
      2=Change    4=Delete    5=Display    6=Add Alias Node

      Node-Name        Typ  S+  STS  SSL  TLS  Ovr  Encryption  Sig  Lmt  Upd
      *LCLNODE          L   N   Y    N    N    Y   IDEACBC128   N         N
      FRAN.CDTS3500     R   *   Y    N    N    *   *            *         *


                                                                     Bottom

    F1=Help    F3=Exit    F5=Refresh    F6=Add NEW entry    F7=Sync-Add    F8=Sync-Del
    F12=Previous         F13=ReKey Secure
```

Regardless of whether you are installing Secure+ Option or not, press **F3** to complete the installation procedure. When the build process is complete, you receive a message that the process was successful.

Note: To configure Secure+ Option, refer to the *Connect:Direct Secure+ Option OS/400 Implementation Guide* for more information.

Step 7 – Review the Installation Procedure Results

Verify the successful completion of the steps by viewing the job log. Type **DSPJOBLOG** at the command line, and press **F10** for detailed messages.

Note: You can rerun CRTCDOBJ if necessary. Reply carefully to any error messages regarding duplicate objects.

Test the Installation

Use the following sample Processes and Connect:Direct CL command strings to test your installation. Refer to your *Connect:Direct OS/400 User's Guide* for an explanation of the CL command strings. See the *Connect:Direct Process Statements Guide* for an explanation of Process parameters.

OS/390, VSE, VM, or Tandem to OS/400 Using LU0 Connectivity

The Process to test the OS/390, VSE, VM, or Tandem to OS/400 connectivity using LU0 can be created and submitted through Connect:Direct OS/390, VM, VSE, or Tandem nodes. For more information on creating

and submitting Processes on Connect:Direct OS/390, VSE, VM, or Tandem nodes, refer to the *Connect:Direct Process Statements Guide.* Substitute information specific to your environment for fields shown in lowercase.

```
INSTEST    PROCESS      SNODE=OS400node                            -
                        NOTIFY=userid                              -
                        SNODEID=(userid,password)                  -
STEP01     RUN TASK     (PGM=OS400)  SNODE                         -
                        SYSOPTS=\" \                               -
                        \ CMD ( \                                  -
                        \ SNDBRKMSG \                              -
                        \ MSG( 'PROCESS INSTEST HAS \              -
                        \ COMPLETED SUCCESSFULLY.')\               -
                        \ TOMSGQ( dsp0x ) \                        -
                        \ ) \                                      -
                        \ " \
```

OS/400 to OS/400 Nodes

To test OS/400 to OS/400 connectivity, enter the following command on the command line. Substitute information specific to your environment where lowercase letters are shown. Press **Enter** after typing all necessary information.

```
CDRUNTASK       SNODE(localnodename) SNODENVIRN(OS400)
                CMD('SNDBRKMSG MSG(''400 to 400 process has succeeded.'')
                TOMSGQ(DSP0x)')
                SNODEID(remoteid remotepw)
```

Note: DSP0x represents appropriate display device name/message queue name.

OS/400 to OS/390

To test OS/400 to OS/390 connectivity, type the following command on the command line. Substitute information specific to your environment where lowercase letters are shown. Press **Enter** after typing all necessary information.

```
CDSND           SNODE(OS390node) SNODENVIRN(OS390)
                FDSN('cdlib/INITPARMS') TDSN('hlq.filename')
                FMSYSOPTS('TYPE(MBR)')  SNODEID(remoteid remotepw)
```

OS/400 to UNIX

To test OS/400 to UNIX connectivity, type the following command on the command line. Substitute information specific to your environment where lowercase letters are shown. Press **Enter** after typing all necessary information.

```
CDSND           SNODE(unixnode) SNODENVIRN(UNIX)
                FDSN('cdlib/INITPARMS') TDSN('/cd/user/filename')
                FMSYSOPTS('TYPE(MBR)')  SNODEID(remoteid remotepw)
```

OS/400 to Windows

To test OS/400 to Windows connectivity, type the following command on the command line. Substitute information specific to your environment where lowercase letters are shown. Press **Enter** after typing all necessary information.

```
CDSND           SNODE(W95NODE) SNODENVIRN(WINDOWS_NT) +
                FDSN('cdlib/INITPARMS') +
                TDSN('C:\test.dat') +
                FMSYSOPTS('TYPE(MBR)') +
                TOSYSOPTS('datatype(binary)')
```

OS/400 to Tandem

To test OS/400 to Tandem connectivity, type the following command on the command line. Substitute information specific to your environment where lowercase letters are shown. Press **Enter** after typing all necessary information.

```
CDSND           SNODE(tdmnode) SNODENVIRN(TANDEM)
                FDSN('cdlib/INITPARMS') TDSN('filename')
                FMSYSOPTS('TYPE(MBR)')  SNODEID(remoteid remotepw)
```

Distributing Connect:Direct OS/400 to Other OS/400 Systems

Use these instructions if you are distributing Connect:Direct OS/400 to other OS/400 systems.

Software Installed on OS/400 without CD-ROM Drives

Follow these steps to install Connect:Direct OS/400 without CD-ROM drives.

1. Sign on as a Connect:Direct administrator (cdadmin).

2. Create a temporary library (CDTEMP).

3. Follow the installation procedure specifying the install library as CDTEMP.

4. Suspend the installation procedure at the screen for item number 2 (CRTCDOBJ) by pressing **F3**. You will receive the *Install terminated by user* message.

5. Issue a SAVLIB command to save the CDTEMP library to a save file.

6. On the target system, create a user profile for the Connect:Direct administrator.

7. Sign on to the target system as the Connect:Direct administrator (cdadmin).

8. Issue the RSTLIB command to restore the saved library CDTEMP to the target system from the save file.

9. Issue the CHGCURLIB CURLIB(CDTEMP) command to change a current library of the session to CDTEMP.

10. Issue the CRTCDOBJ command from the screen at item number 2 (CRTCDOBJ) to resume the suspended installation procedure.

> **Note:** If the installation procedure was not suspended on the source system at a correction location, you may receive *Object already exists* messages while resuming on the target system. If this occurs, use option G (GO) to replace the existing objects and recreate them.

Post Installation Considerations

After the installation is complete, complete the following:

1. Ensure that your non-administrative Connect:Direct users have the proper OS/400 authority and that they are entered into the Connect:Direct OS/400 user authorization file. Refer to Chapter 6, *Maintaining Security*, for information about the authorization required and how to update the Connect:Direct user authorization file.

2. Ensure that all remote nodes with which you connect are in your network map and that your node and Connect:Direct library name are in the network map. Refer to Chapter 7, *Maintaining the Network Map*, for information on how to maintain your network map. The appendices in this document and the *Connect:Direct and Compatibility Connectivity Chart* contain information about setting up connectivity to the various Connect:Direct platforms and protocols.

3. Notify all remote nodes on your network map of your library name and local node name.

Part II

Administration

Starting and Stopping Connect:Direct

All jobs necessary for Process execution start automatically when you start Connect:Direct OS/400. You can also specify in your initialization parameters that the TCP/IP listener and the spool monitor start automatically at system startup.

This chapter details the procedures for starting and stopping Connect:Direct OS/400 and describes the commands and parameters for these tasks.

Starting Connect:Direct OS/400

Start the Connect:Direct OS/400 system by using the STRCD command if the Connect:Direct subsystem is active.

If the subsystem is not active you can start Connect:Direct OS/400 by issuing the STRSBS cdlib/cdsbsd command, as shown in the following example:

```
STRSBS SBSD(Prodlibname/cdsubsys)
```

Note: Connect:Direct OS/400 should be started by a user with Connect:Direct administrative authority.

Before the start command is successfully executed, a license management file must be present at the location specified in INITPARMS.

Connect:Direct OS/400 verifies the file contents before enabling any of the product features. To verify file integrity, Connect:Direct reads the file contents upon startup, as well as every 24 hours thereafter. You can also use the **F9** key from the WRKCDSTS screens to read the file contents on demand.

Command Format

Use the following format for the STRCD command.

Command	Parameter
STRCD	LIBRARY(*PRDLIB)
	PROCESSQ(*WARM|*COLD|*INITPARMS)
	STRPROC(*YES|*NO)

Parameters

The following parameters are used with the STRCD command.

LIBRARY(*PRDLIB)|library-name
specifies to search the first library in the library list to find the first occurrence of Connect:Direct. You can indicate a specific library name for the Connect:Direct OS/400 node.

PROCESSQ(*WARM|*COLD|*INITPARMS)
specifies whether Process queue information is retained when Connect:Direct initializes.

*COLD specifies that the Process queue is reinitialized when the Connect:Direct OS/400 node starts. Any entries from prior executions are purged. If you specify this parameter, it overrides the initialization parameters setting.

*WARM specifies that the contents of the Process queue are preserved when the Connect:Direct OS/400 node starts. If you specify this parameter, it overrides the initialization parameters setting.

*INITPARMS specifies that Connect:Direct honor the PROCESSQ value in the initialization parameters.

STRPROC(*YES|*NO)
specifies whether Processes starts after Connect:Direct OS/400 starts.

*YES allows normal Process execution after Connect:Direct OS/400 begins.

*NO does not allow Process execution after Connect:Direct OS/400 begins.

You can reset this value later without stopping and restarting Connect:Direct. Use the Work with Connect:Direct Status (WRKCDSTS) command described in the *Understanding the Process Management Queue* section beginning on page 8-1.

Varying on the Line, Controller, and Devices

You must verify that the lines, controllers, and communication device(s) for Connect:Direct OS/400 are allocated to the Connect:Direct subsystem and varied on. Issue the WRKCFGSTS command to determine the status of the lines, controllers, and devices. If the lines, controllers, and devices are inactive, you need only vary on the lines. When you vary on the lines, all controllers and devices defined to the lines vary on also. Only the device gets allocated to the subsystem, not the Controller or the Line.

You can vary on the lines from the **Work with Configuration Status (WRKCFGSTS)** screen or from the command line with the following OS/400 Vary Configuration (VRYCFG) command.

```
VRYCFG    CFGOBJ(line.name) CFGTYPE(*LIN) STATUS(*ON)
          RANGE(*NET)
```

The Connect:Direct subsystem includes an auto start entry for the CDDEVACT command. The CDDEVACT command reads the Netmap file. Any devices in the Netmap definitions are varied off and on after the Connect:Direct subsystem starts, allowing the devices to be allocated to the Connect:Direct subsystem.

Restarting After a System Failure

You can restart Connect:Direct OS/400 after a system failure by using the STRCD command. If you use this command with *WARM specified, Connect:Direct attempts to restart any local Processes that were running when the system terminated.

Stopping Connect:Direct OS/400

Use the ENDCD command to stop the Connect:Direct OS/400 system. The next figure is an example of the ENDCD command.

```
ENDCD  LIBRARY(*PRDLIB) OPTION(*IMMED)
```

Command Format

The format detailed in the following table is required for the ENDCD command.

Command	Parameters
ENDCD	LIBRARY(*PRDLIB)
	OPTION(*IMMED|*STEP|*CNTRLD)

Parameters

The ENDCD command uses the following parameters.

LIBRARY(*PRDLIB)| library-name)
specifies to search the first library in the library list for the first occurrence of Connect:Direct. You can indicate a specific library name for the Connect:Direct OS/400 node.

OPTION(*IMMED|*STEP|*CNTRLD)
specifies how the Connect:Direct OS/400 product stops.

*IMMED indicates an immediate shutdown of the Connect:Direct OS/400 node. This option terminates all active Processes as follows:

❖   Remote Processes terminate their sessions and end.

❖   Synchronous local Processes are flushed from the Process queue.

❖   Asynchronous local Processes are interrupted and moved to the WAIT queue so they are available for restart when you restart the node.

❖   Ends the Connect:Direct subsystem.

*STEP specifies a controlled shutdown of the Connect:Direct OS/400 node. This option prevents any new Processes from starting and allows all currently active Processes to terminate following the current step.

This option allows local Processes to complete because they are single-step Processes. *STEP allows remote Processes to complete only the current step. You can use the WRKCDPROC screen to end selected processes during a *STEP shutdown.

Note: This option does not end the Connect:Direct subsystem.

*CNTRLD causes a controlled shutdown of the Connect:Direct OS/400 node. This option prevents any new Processes from starting and allows both local and remote Processes to run to completion.

You can use the WRKCDPROC screen to end selected processes during a *CNTRLD shutdown. This option does not end the Connect:Direct subsystem.

Note: This option does not end the Connect:Direct subsystem.

Modifying Initialization Parameters

During startup, Connect:Direct processes the initialization parameters you defined during installation. These parameters define the local Connect:Direct OS/400 and provide operational information to Connect:Direct OS/400.

This chapter details how to modify initialization parameters. Use the Change Connect:Direct Parameters (CHGCDPARM) command to complete your changes. Use the Work with Connect:Direct Status (WRKCDSTS) command to modify certain initialization parameters while Connect:Direct OS/400 is running.

Note: If you want to control access to your Connect:Direct system running behind a packet-filtering firewall, you can assign a specific TCP/IP source port number or a range of port numbers with a particular TCP/IP address (or addresses) for outgoing Connect:Direct sessions. The TCPSRCPORT parameter provides this capability while the TCPLSTITR parameter lets you specify the number of times you want Connect:Direct to attempt a connection by scanning the eligible ports before going into a retry state.

Also, for more information, see Appendix C, *Defining the TCP/IP Environment*.

Following the order presented in this chapter is critical to your system's operation:

1. Understanding the CHGCDPARM command format

2. Changing initialization parameter values (CHGCDPARM)

3. Applying new parameter values

Note: You may elect to use the WRKCDPARM instead of CHGDPARM. The WRK command has a default value of *PRDLIB which is passed to the CHGCDPARM command. You do not need to specify any library name while using the WRKCDPARM command, because the default value of *PRDLIB means search for the current library list for the first occurrence of a product and use that library name. Only users with administrative authority can change the initialization parameters. Other users can only view the parameters specified.

Understanding the Connect:Direct Parameters (CHGCDPARM) Command

The Connect:Direct Parameters (CHGCDPARM) command allows you to modify your initialization parameters. This section provides an example of the command and describes the command format.

CHGCDPARM Command Example

The following figure shows an example of the CHGCDPARM command.

```
CHGCDPARM LCLLIB(CDLIB) SUBSYS(CDSBSD) LCLNODE(CONNECT.NODE)
          LCLLOCNAME(*NETATR) TOUSR(CDADMIN) PROCESSQ(*COLD) RUNTCPL(*YES)
          GCRC(*ON) OCRC(*YES) TCPHOST1('0.0.0.0') TCPPORT1(1364)
          TCPSRCPORT('(199.1.*,5000-5010)') TCPLSTITR(03) NETMCHK(*YES)
          NODECHK(*NAME) RUNSPLM(*NO) PERMSMGR(00) MAXPRIMARY(02) MAXSECNDRY(02)
          MAXCMD(02) TRCINST(*NONE) PRTY(07) CKPTINV(0) CKPTDAY(03) WTRETRY(000300)
          MAXRETRY(03) STATMAXSIZ(0000010000) STATMAXMBR(00010) STATFULACT(*ARCHIVE)
          ECCLEVEL(01) ECWINSIZE(13) ECMLEVEL(04) CDLOGPRT(*YES) TCPTIMEOUT(00180)
          RUNTASKTIM(00600) APKEYF('cdlib/APKEYF')
```

CHGCDPARM Command Format

The CHGCDPARM command has the following format. Required parameters are shown in bold print.

Command	Parameters
CHGCDPARM	LCLLIB(local-library-name|*PRDLIB)
	APKEYF('library/file')
	CKPTDAY(n)
	CKPTINV(n)
	CDLOGPRT(*YES|*NO)
	[ECCLEVEL (n), ECWINSIZE(n), ECMLEVEL(n)]
	GCRC(*ON|OFF)
	LCLLOCNAME(local-location-name|*NETATR)
	LCLNODE(local-node-name)
	MAXCMD(n|*NOMAX)
	MAXPRIMARY(n|*NOMAX)
	MAXRETRY(n)
	MAXSECNDRY(n|*NOMAX)
	NETMCHK(*YES|*NO)
	NODECHK(*NAME|*BOTH)
	OCRC(*YES|*NO)
	PERMSMGR(n)
	PROCESSQ(*COLD|*WARM)
	PRTY(n)
	RUNSPLM(*YES|*NO)
	RUNTASKTIM(21600)
	RUNTCPL(*YES|*NO)

Command	Parameters
	STATFULACT(*DELETE|*ARCHIVE)
	STATMAXMBR(n|*NOMAX)
	STATMAXSIZ(n|*NOMAX)
	SUBSYS(subsystem-name)
	TCPHOST(host address)
	TCPLSTITR(n)
	TCPSRCPORT (address pattern1/subnet mask, port#|min-max[,]...), (address pattern2/0xfffffff0, cccc,dddd,min-max), address patternN/255.255.255.0, eeee,ffff,min-max)
	TCPPORT(n)
	TCPTIMEOUT(00180|*NOMAX)
	TOUSR(userid)
	TRCINST(L,S,F,C,X,K,D,H,V,W,P|*NONE|*ALL|*EXT| *COMMON|*INITPARMS|*CURRENT)
	WTRETRY(n)

Parameters

LCLLIB(local-library-name|*PRDLIB)

specifies the name of the library from which the INITPARMS file is to be changed. This field is 10 characters in length.   The default value is *PRDLIB which searches the library list for the first occurrence of a product and uses that library name.

> **Note:**   The library name must not exceed eight characters if one of your remote nodes is OS/390, VM, or VSE.

APKEYF('library/file')

specifies the location of a license management key file name and its library that was on the Connect:Direct OS/400 distribution media. This field is 120 characters in length.

You must install the license management key file shipped with Connect:Direct OS/400 to start the Connect:Direct OS/400 server. The key file may be a temporary key. View the key file and check the EXPIRATION-DATE line to find the expiration date of the key. If it is a temporary key, you must replace it with a permanent key. See *Permanent License Key File* in the *Connect:Direct OS/400 Release Notes* for more information.

CDLOGPRT (*YES|*NO)

specifies if a CDLOG spool file is created for each Connect:Direct inbound and outbound Process. Valid values are:

❖ ***YES** –A CDLOG spool file is created for each Process.

❖ ***NO**–A CDLOG spool file is only created when an error occurs in a Process, to assist in problem determination.

CKPTDAY(n)
specifies the number of days that checkpoint records stay in the system before they are deleted. The value specified becomes the system-wide value. Valid entries range from 1–99. The default value is **3**. This field is 2 characters in length.

Process file entries and Process storage areas that are older than the value in this field are also deleted.

CKPTINV(n)
specifies the number of bytes, from 0–2 gigabytes, to send or receive before taking a checkpoint. The format is *nnnnnnn*, *nnnnnn*K, or *nnnnnn*M, where **K** specifies thousands of bytes and **M** specifies millions of bytes. A value of **0** specifies no checkpoint restart.

Connect:Direct OS/400 uses the value you specify, rounded up to the nearest record boundary, to determine when to take a checkpoint.

A checkpoint interval specified here overrides the system-wide default value in the initialization parameters.

ECCLEVEL(n)
specifies the extended compression level, which affects how much CPU the extended compression routines use. Higher compression levels use more CPU but achieve greater compression. The valid values for this subparameter are 1–9, inclusive. The default value is **1**.

ECWINSIZE(n)
specifies the extended compression window size, which is specifically for the history buffer that is filled from the user's input buffer (both compressing and decompressing). The window specifies the amount of storage designated to maintain data previously read.

This data can be scanned for string matches. The extended compression window size affects how much virtual memory the extended compression routines use. Higher window size values use more memory but achieve greater compression. The valid values for this subparameter are 8–15, inclusive. The default value is 13.

ECMLEVEL(n)
specifies the extended compression memory level parameter, which determines how much memory should be allocated for other internal data structures like the hash table and the previous table (pointers to previous strings starting with the same 3 characters). The extended memory level affects how much memory the extended compression routines use. Higher memory levels use more virtual memory but achieve greater compression. The valid values for this subparameter are 1–9, inclusive. The default value is **4**.

GCRC(*ON|*OFF)
indicates if the CRC function for TCP/IP process is turned on globally. The default is *ON.

LCLLOCNAME(local-location-name|*NETATR)
specifies the default APPN local location name to be associated with Connect:Direct. The field is 10 characters in length.

local-location-name is the name of the local Connect:Direct location.

*NETATR is the default value. This parameter uses the default local location name for the system as it is defined in the network attributes.

LCLNODE(local-node-name)
specifies the local node name by which this Connect:Direct node is known and referenced by other Connect:Direct nodes in your network. This field is 16 characters in length.

MAXCMD(n|*NOMAX)

specifies the maximum number of command sessions that can be active simultaneously for Processes initiated by the local node. This parameter applies to synchronous (CMD) requests initiated on this node. This field is 2 characters in length. The default value is **2**.

n specifies the maximum number of sessions.

*NOMAX indicates that the value of 99 is used.

Note: If you have a usage license, use the value of *N CONCURRENT-SESSIONS* in the license key file for the MAXCMD value. See the *Checking Options in the License Management Key File* section beginning on page 2-3 for more information.

MAXPRIMARY(n|*NOMAX)

specifies the maximum number of asynchronous PNODE sessions used with the CDSUBPROC command. The value can range 0–99. This field is 2 characters in length. The default value is **2**.

n indicates the number of PNODE sessions. Values range 0–99.

*NOMAX indicates that the value of 99 is used.

Note: If you have a usage license, use the value of *N CONCURRENT-SESSIONS* in the license key file for the MAXPRIMARY value. See the *Checking Options in the License Management Key File* section beginning on page 2-3 for more information.

MAXRETRY(n|*NOMAX)

specifies the number of times to retry session connection. This value becomes the system-wide value. This field is 3 characters in length. The default is **7**.

n indicates the number of times Connect:Direct retries the connection. Values can range 0–512.

*NOMAX indicates no restriction on the number of retries.

MAXSECNDRY(n|*NOMAX)

specifies the maximum number of remote (SNODE) sessions used for Processes initiated by the remote node. The value can range 0–99. This field is 2 characters in length. The default value is **2**.

n indicates the number of SNODE sessions. Values range 0–99.

*NOMAX indicates that the value of 99 is used.

Note: If you have a usage license, use the value of *N CONCURRENT-SESSIONS* in the license key file for the MAXSECMDRY value. See the *Checking Options in the License Management Key File* section beginning on page 2-3 for more information.

NETMCHK(*YES | *NO)

indicates if netmap checking is to be performed.

Note: Netmap checking pertains only to inbound connections – not outbound. You must have a network map accurately defined for a remote node that sends to Connect:Direct if netmap checking is active. If you use a DNS name in the network map, you must convert it to an IP address to compare it against the IP address received.

---

*YES checks the network map for all nodes that Connect:Direct communicates with.

*NO does not validate any session establishment requests in the network map.

NODECHK(*NAME | *BOTH)

specifies the level of network map checking that occurs for each node that Connect:Direct communicates with.

*NAME checks only the node name.

Note: SNA can only check the node name. The remote node name must be in the network map.

---

*BOTH checks both the node IP address and the node name.

OCRC(*YES|*NO)

indicates if node and command statement overrides for CRC checking are allowed. The default is *YES.

PERMSMGR(n)

specifies the number of permanent session managers. The valid value range is 0–20, but it cannot exceed the total of the MAXPRIMARY and MAXSECNDRY. This field is 2 characters in length.

PROCESSQ(*COLD|*WARM)

specifies whether Process queue information is retained when Connect:Direct initializes. This field is 5 characters in length. You can override this parameter when you start Connect:Direct.

*COLD specifies that the Process queue reinitialize when the Connect:Direct OS/400 node starts. Any entries from prior executions are purged.

*WARM specifies that the contents of the Process queue are preserved when the Connect:Direct OS/400 node starts.

PRTY(n)

specifies the default job priority. Valid values are 0–15. The default is **7**. This field is 2 characters in length.

RUNSPLM(*YES|*NO)

specifies whether to run the spool monitor when you start up Connect:Direct OS/400. This field is 4 characters in length. You can also start the spool monitor listener job with the WRKCDSTS command while Connect:Direct is running.

*YES indicates that the spool monitor starts up when Connect:Direct OS/400 starts.

*NO indicates that the spool monitor will not start up when Connect:Direct OS/400 starts.

RUNTASKTIM(21600|*NOMAX)

specifies the amount of time, in seconds, to wait for remote run steps to complete. Remote run steps include RUN TASK steps. When set to *NOMAX, the maximum value is used unless limited by the operating system.

This wait time is different from the wait time specified by the TCPTIMEOUT parameter. Using RUNTASKTIM prevents a Process from failing when a remote step takes longer to complete than specified in the TCPTIMEOUT parameter.

RUNTCPL(*YES|*NO)

specifies whether to run the TCP/IP listener job when you start up Connect:Direct OS/400. This field is 4 characters in length.

*YES indicates that the TCP/IP listener job starts up when Connect:Direct OS/400 starts.

*NO indicates that the TCP/IP listener job will not start up when Connect:Direct OS/400 starts.

You can also start the TCP/IP listener job with the Work with Connect:Direct Status (WRKCDSTS) command while Connect:Direct is running.

STATFULACT(*DELETE|*ARCHIVE)

specifies what happens to the oldest statistics file member when Connect:Direct OS/400 exceeds the maximum number of members specified by the STATMAXMBR parameter. This field is 9 characters in length.

*DELETE indicates that the oldest member is deleted.

*ARCHIVE indicates that the oldest member is compressed into a statistics archive file before deletion.

STATMAXMBR(n|*NOMAX)

indicates the number of members to maintain in the statistics file. This field is 5 characters in length. The default value is 1010.

n specifies the number of members to keep in the statistics file. Valid values are 1–32767.

*NOMAX indicates no restriction on the number of members to maintain in the statistics file.

STATMAXSIZ(n|*NOMAX)

determines how large (in number of records) a statistics file member can be. When a file reaches this maximum size, Connect:Direct closes the member and continues logging to a newly created member. This field is 10 characters in length. The default value is 10000.

n specifies the maximum size of the statistics file member. Valid values are 1–2147483643.

*NOMAX indicates a value of 2147483643.

SUBSYS(subsystem-name)

specifies the name of the Connect:Direct subsystem to be used for the Connect:Direct Process. This subsystem resides in the library specified by the LCLLIB parameter. This field is 10 characters in length.

TCPHOST1|2|3|4(address)

specifies the address of the local Connect:Direct node. This field is 64 characters in length. The value represents either an IP address or a DNS name on which Connect:Direct listens.

> **Note:** If the name resolution server is not available, DNS name resolution will not occur and system will not be able to listen on that host/port combination.
> Up to four TCPHOST/TCP PORT combinations may be specified for the server to listen on for incoming remote node connections.

TCPLSTITR(n)

specifies the number of times that Connect:Direct scans the available ports list to attempt a connection before going into a retry state. Use any value between 1 and 255.

TCPPORT1|2|3|4(n)

identifies the communications port for Connect:Direct to listen on. This field is 5 characters in length and the value range is 1–65536. TCPPORT1 corresponds to TCPHOST1, TCPPORT2 corresponds to TCPHOST2 and so on.

TCPSRCPORT (address pattern1/subnet mask, port#|min-max[,]...), (address pattern2/0xfffffff0, cccc,dddd,min-max),address patternN/255.255.255.0, eeee,ffff,min-max)
> is a list of address patterns and associated ports or port ranges from which ports are chosen for connection attempts to the nodes matching the address pattern. No restrictions are enforced if this parameter is not defined.

> **Note:** Connect:Direct OS/400 initialization parameters are limited to 189 characters.

> Use a wildcard character [* or 0 (zero)] to define an IP address pattern. The wildcards must be in the least significant positions.
> If you specify an address pattern, you must also define ports or port ranges. You can add an optional subnet mask for the IP address by delimiting it from the address pattern by using a forward slash (/), followed by the port number and/or range of port numbers for the IP address. Valid subnet mask values are are:

> ❖ Dotted quad notation, such as 255.255.0.0

> ❖ Hexadecimal notation, such as 0xffffff00

> **Note:** You cannot use a subnet mask if you use wildcards in the IP address pattern.

> Specify the range of ports from lowest port number to highest port number order. For example, 1025–2000 is valid, whereas 2000–1025 is not. Ranges are inclusive and can overlap. The port number must be greater than 1024.

> **Note:** The number of ports defined must be sufficient to handle the number of concurrent Connect:Direct sessions and frequency of sessions intended to be run by the installation. If not, performance can be severely affected. An appropriate number depends on the TCP/IP stack and the latency or timeouts associated with complete TCP port closure. Upon closure, ports can be in a unusable state for as long as twice the Maximum Segment Lifetime (MSL) as defined by RFC793.

> The following example demonstrates some valid patterns. Only the most specific pattern should match properly – not the first encountered.

```
  TCPSRCPORT(199.1.*, 5000-5010), 5050, 9000-9002),
           (199.1.4.2,6010),(200.200.0,7000,7010-7020),
            (*,1024-5000)
```

TCPTIMEOUT(00180|*NOMAX)
> specifies the maximum amount of time, in seconds, that the local node waits for a message from the remote node when using TCP/IP. When the time expires an error message is generated. The default value is 180 seconds. When set to ***NOMAX** the maximum value is used unless limited by the operating system.

TOUSR(userid)
> specifies the user ID to receive all Connect:Direct messages. This field is 10 characters in length.

TRCINST(L, S, F, C, X, K, D, H, V, W, P,|*NONE|*ALL|*EXT| *COMMON|*INITPARMS|*CUR-RENT)
> specifies the trace bits that define functions to be traced by Connect:Direct OS/400. The following are valid options for the TRACE parameter:

> ❖ **L** enables the main line logic trace for all components.

❖ **S** enables the Process step logic trace.

❖ **F** enables the file handler trace.

❖ **C** enables the communications logic trace.

❖ **X** enables the XDR trace.

❖ **K** enables the KQV logic trace.

❖ **D** enables the all-purpose data dump.

❖ **H** enables the FMH dump.

❖ **V** enables the XDR dump.

❖ **W** enables the communications dump.

❖ **P** enables the CIPC dump.

❖ ***NONE** turns off all traces.

❖ ***ALL** enables all product traces.(L, S, F, C, X, K, D, H, V, W, and P)

❖ ***EXT** enables all product traces plus two system traces. (TRCICF and TRCJOB)

❖ ***COMMON** enables the communications traces.(L, S, F, C, and H)

❖ ***INITPARMS** indicates the traces specified in the initialization parameters.

❖ ***CURRENT** selects the trace bits that the session manager is currently using.

You can also start tracing with the WRKCDSTS command while Connect:Direct is running. For additional information about running traces, refer to Chapter 13, *Analyzing Connect:Direct Problems*.

WTRETRY(n)
specifies how long to wait before retrying after a session failure occurs. The value specified becomes the system-wide value. This time value defaults to 000300, which is 3 minutes.

Using the CHGCDPARM Screens

Use the **Change Connect:Direct Parameters (CHGCDPARM)** screens to modify initialization parameters.

Note: Only users with administrative authority can change the initialization parameters. Other users can only view the parameters specified.

Changing Connect:Direct Initialization Parameters

Complete the following steps to change Connect:Direct initialization parameters:

1. Access the CHGCDPARM screen through the Connect:Direct Main Menu. To display the Main Menu, type **STRCDMNU** at the command line and press **Enter.**

2. From the main menu, select Option 20 to access the Administration Menu.

3. Select the WRKCDPARM option by typing **1** and pressing **Enter**.

    Press **Enter** to use the default Production Library Name, *PRDLIB, or enter the name of the library you are using as the production library.

The first **Change C:D Parms (CHGCDPARM)** screen is displayed.

```
                       Change C:D parms (CHGCDPARM)

 Type choices, press Enter.

 Production Library Name  . . . . > CDDV3500     Character value
 Connect:Direct subsystem name  .  CDDV3500     Character value
 Local Node Name  . . . . . . . .  'FRAN.CDDV3500'
 Default local location . . . . .  *NETATR      Character value
 User to receive Messages . . . .  CDDV3500     Character value
 Process queue startup option . .  *COLD        *WARM, *COLD
 Enable TCP/IP listener . . . . .  *YES         *NO, *YES
 TCP CRC  . . . . . . . . . . . .  *ON          *ON, *OFF
 TCP CRC Override . . . . . . . .  *YES         *YES, *NO
 TCP/IP host address  . . . . . .  'FRAN'

 TCP/IP host port . . . . . . . .  '01364'      00001-65535, '',
  Alternate TCP/IP Host Address

  Alternate TCP/IP Host Port  . .               00001-65535, '',

                                                                  More...
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

4.   Enter any new values.   Press **Enter** to continue.

5.   The second Change C:D parms screen is displayed. An example follows:

```
                       Change C:D parms (CHGCDPARM)

 Type choices, press Enter.

  Alternate TCP/IP Host Address

  Alternate TCP/IP Host Port  . .               00001-65535, '',
  Alternate TCP/IP Host Address

  Alternate TCP/IP Host Port  . .               00001-65535, '',
 TCP SRC Ports  . . . . . . . . .

 TCP SRC Port Listen Iterations    03           01-255
 Netmap Check . . . . . . . . . .  *YES         *NO, *YES
 Node Check . . . . . . . . . . .  *NAME        *NAME, *ADDRESS, *BOTH
 Enable spool monitor . . . . . .  *NO          *NO, *YES
 Permanent session managers . . .  00           00-20, *NOMAX
 Maximum primary sessions . . . .  2            00-99, *NOMAX
 Maximum secondary sessions . . .  2            00-99, *NOMAX
 Maximum synchronous sessions . .  2            00-99, *NOMAX
                                                                  More...
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

6.   Enter any new values.

7.   Press **Page Down** to access the third screen. An example follows:

```
                        Change C:D parms (CHGCDPARM)

 Type choices, press Enter.

 Trace Instructions . . . . . . .    *NONE
 Job Default Priority . . . . . .    07              00-15
 Checkpoint Interval  . . . . . .    0               0..2000M
 Checkpoint Days  . . . . . . . .    03              01-99
 Wait between Retries . . . . . .    000300          Time
 Maximum Retry Attempts . . . . .    002             000-512
 Maximum records in stat member      0000010000      *NOMAX 1000..2147483643
 Maximum members in stat file . .    00010           *NOMAX 2..32767
 Full stat file action  . . . . .    *ARCHIVE        *ARCHIVE, *DELETE
 Extended compression level . . .    1               01-09
 Extended compression window  . .    13              08-15
 Extended compression memory  . .    4               01-9
 Print CDLOG spool files  . . . .    *YES            *NO, *YES
 TCP Max Time to Wait . . . . . .    00180           *NOMAX 0..03600
 RUNTASK Max Time to Wait . . . .    21600           *NOMAX 0..21600

                                                                     More...
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

8.   Enter any new values.

9.   Press **Page Down** to access the fourth screen. An example follows:

```
                        Change C:D parms (CHGCDPARM)

 Type choices, press Enter.

 Asset protection key file  . . . > 'cdlib/APKEYF(APKEYF)'








                                                                     Bottom
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

10.   After you complete your changes, press **Enter** to accept the changes.

Applying Parameter Changes

When you change Connect:Direct initialization parameters with the CHGCDPARM command or screens, press **Enter** to accept the changes. The changes will not affect Connect:Direct execution until you restart Connect:Direct OS/400.

Changing Initialization Parameters While Connect:Direct OS/400 is Running

Certain initialization parameters for the current Connect:Direct OS/400 can be changed while Connect:Direct is running. Use the **Work with Connect:Direct Status** screen (WRKCDSTS) to change the following parameters while Connect:Direct OS/400 is running:

❖ MAXCMD

❖ MAXPRIMARY

❖ MAXSECNDRY

❖ PERMSMGR

❖ TRCINST

❖ RUNTCPL

❖ RUNSPLM

For additional information about using the WRKCDSTS command, refer to the *Managing the Connect:Direct Node* section beginning on page 8-2.

Chapter 6

Maintaining Security

This chapter explains the security features of the Connect:Direct OS/400 product:

❖ Establishing the user's OS/400 profile

❖ Creating the user's Connect:Direct user authorization record

❖ Overview of Connect:Direct Process security

❖ Determining the security profile under which Connect:Direct Processes run

Establishing the User's OS/400 Profile

Use the CRTUSRPRF or the CHGUSRPRF command to set up the Connect:Direct user's OS/400 profile. This profile controls the user's authority to access or create files, objects, libraries, and directories.

Ensuring Minimum Authority

The Connect:Direct installation procedure grants the necessary authority to the product library and objects. The product is delivered with:

❖ Object owner QPGMR and a public authority *CHANGE

❖ Public authority *USE for CDUSER, CDNTMP and INITPARMS files.

After installation you will have:

❖ Default object owner QPGMR and a default public authority *CHANGE

❖ Public authority *USE for CDUSER, CDNTMP and INITPARMS files. Installer becomes owner of these objects and has full authority.

If your security environment requires a change to this default authority, ensure that the typical nonadministrative Connect:Direct user has the following authority::

❖ *CHANGE authority to the Connect:Direct library and all items in the Connect:Direct library except for files CDUSER, CDNTMP and INITPARMS. These three files can have *USE authority.

❖ *USE or *EXCLUDE authority to the CDADMIN *MENU depending on whether you want the user to see the Connect:Direct administrative menu

> **Note:** Do not use CDADMIN as the local user mapped from a remote user or system on Secure Point of Entry (SPOE) as you will be compromising your security.

Establishing the User's Connect:Direct OS/400 Authority

You can also identify each Connect:Direct user by an entry in the Connect:Direct user authorization file, CDUSER. This entry establishes the user's Connect:Direct privileges, but the entry is not required for normal use of Connect:Direct. Use the WRKCDUSR command to create and maintain records in the CDUSER file.

This file defines the local user's authorization to Connect:Direct commands, statistics selection privileges, and remote node ID override rights.

The secure point-of-entry facility uses the user authorization file to map remote user IDs to the appropriate local user. Explanation of this capability is in the *Secure Point-of-Entry* section beginning on page 6-3.

A list of the parameters and their valid values used by the commands that maintain the CDUSER file are provided at the end of this chapter.

Overview of Connect:Direct Process Security

All Connect:Direct OS/400 Processes regardless of how they are initiated, execute using a security profile. This security profile authorizes file creation, deletion, and data access. The profile also controls command execution in a RUNTASK or RUNJOB Process step.

For local and remote-initiated processes, the security profile authorizes access to the file system. For example, the security profile verifies:

❖ the user's authority to access a file to be sent in a CDSND command

❖ the user's authority to create a new file for output in a specified library in a CDRCV command

For example, your security profile verifies your authority to send a file using the CDSND command. Process Security also verifies your authority to create a new file for output in a specified library using a CDRCV command

Under the authority of your security profile, you can also execute the RUNTASK and RUNJOB process commands..

Note: The security profile owns files created during the Process execution, except for spooled files used as the destination on a transfer. The Connect:Direct administrator owns these spooled files.

Two factors determine the security profile used by a Process submitted from a remote node::

❖ Connect:Direct OS/400 allows users to specify a user profile and password to be used as the security profile on both locally and remotely initiated Processes.

❖ The secure point-of-entry allows remotely initiated Processes to execute without knowing a local user profile.

Determining the Connect:Direct Security Profile

Connect:Direct Processes execute under the authority of a security profile. Connect:Direct uses the security profile authority to access or create OS/400 files or perform commands in a RUNTASK or RUNJOB Process step. This section describes how Connect:Direct determines the security profile.

Controlling Local Node Security

For locally initiated Processes, the OS/400 user profile submitting the Process becomes the security profile for the local node. However, the user can also supply an alternate user profile and password in the PNODEID parameter of the Connect:Direct command to be used as the local security profile.

The security profile does not require a matching entry in the Connect:Direct OS/400 user authorization file.

Controlling Remote Node Security

All remotely initiated Processes must provide information to be used on the local node for user authorization. Connect:Direct OS/400 determines remote user authority by SNODEID override secure point-of-entry.

SNODEID Override

This override is the simplest form of security authorization used by Connect:Direct. To use the SNODEID override, you specify a user profile and password in the remote Process definition (SNODEID) which is then used as the security profile on the local node. This user profile must be a valid OS/400 user profile on the local node.

You can prevent an SNODEID override for a selected user profile. To block this override, you add a local user entry for that profile in the user authorization file and specify SNIDOVRD(*NO).

Secure Point-of-Entry

The secure-point-of-entry feature does not require a password when you initiate a Connect:Direct Process to another node because you have already been verified by system security at login. All Connect:Direct Processes provide the name of the user profile submitting the Process (submitterid). The other node then uses the submitterid to determine the security profile.

Connect:Direct OS/400 supports secure point-of-entry through remote user entries in the user authorization file. Each remote user entry designates a local user profile to be used as the security profile by Processes submitted by a given user at a remote node. The local user profile specified in a remote user entry must be a valid OS/400 user profile and must have a local user entry in the authorization file.

Your user authorization file also supports generic remote user entries which allow you to map the following to a local user profile:

❖   Any user at a specific node

❖   A given user at any node

❖   Any user at any node.

This method provides a simple way to manage authority for a large number of remote users.

Understanding How Secure Point-of-Entry Works

During security negotiation, if a user profile and password are not provided (SNODEID), Connect:Direct compares the submitting user ID and node name to the USER and NODE fields of the *RMT records of the local Connect:Direct user authorization file. If the field matches a record, the *RMT record indicates in the LCLUSRID field which local user profile to use as the security profile. In effect, it *maps* the remote user ID and node name to a local user profile.

Connect:Direct matches USER and NODE in the following order:

USER	at	NODE	Maps to LCLUSRID
submitter profile	at	submitter node	local user ID

USER	at	NODE	Maps to LCLUSRID
submitter profile	at	*(any node)	local user ID
*(any user)	at	submitter node	local user ID
*(any user)	at	*(any node)	local user ID

The value in the LCLUSRID field of the *RMT record is used as the security profile. If no *RMT match is found, the Process generates a security error.

The following table illustrates the user authorization file for CD.HOUSTON, when USERDAL at the remote node CD.DALLAS submits a Process to the CD.HOUSTON node. USERDAL does not require a valid user ID on the CD.HOUSTON node nor does USERDAL need to be a valid OS/400 user on the CD.HOUSTON node.

The CD.HOUSTON administrator set up a *RMT authorization record for USERDAL with NODE=CD.DALLAS as a valid remote node and LCLUSRID=USERHOU for its associated local user ID.

During security establishment, the CD.HOUSTON node completes the following activities:

❖   Locates the USERDAL *RMT record in the user authorization file

❖   Verifies that CD.DALLAS is a valid node for this user

❖   Locates its associated local user ID, USERHOU

❖   Uses USERHOU as its security profile

USER	NODE	USRTYPE	LCLUSRID	AUTH	SNIDOVRD
USERHOU		*LCL		U	*YES
NOAUTH		*LCL		U	*NO
USERDAL	CD.DALLAS	*RMT	USERHOU		
*	CD.DALLAS	*RMT	NOAUTH		

In the CD.HOUSTON user authorization file, only the USERDAL/CD.DALLAS combination matches the USERHOU local user. Other users from CD.DALLAS map to the local user NOAUTH, which does not allow the SNIDOVRD parameter and has been configured with no authorization rights to OS/400 files.

The local administrator has several options available to grant access of the Connect:Direct OS/400 system:

❖   Specifying each remote user at each remote Connect:Direct node and mapping them to a valid local user authorizes those users to the system.

❖   Entering a remote entry of '*' for a certain node allows all users from that node to access the local system. All users from the remote system map to the same local user, unless they have a remote entry specifying their particular remote user and node.

❖   Entering a remote entry for a specific user name with a node name of '*' allows the same user from any node to access the local system.

❖   Specifying an '*' for both the user name and node name allows all users to access the local system.

Using the WRKCDUSR Command

> **Note:** You must have administrative authority in order to use the WRKCDUSR command.

If you have the proper authority, use the WRKCDUSR command to browse user records and add, copy, change, or delete selected user records. This section provides a command example, the command format, and the parameters associated with the WRKCDUSR command.

> **Note:** Use the ENDCD command to stop Connect:Direct OS/400 before making any changes. After completing your changes, use the STRCD command to restart Connect:Direct OS/400.

WRKCDUSR Command Example

The following figure is an example of how to use the WRKCDUSR command. In this example, the resulting list includes all remote users with a node identity of CD3300.

```
WRKCDUSR  USER(*ALL) NODE(DIRECT) USRTYPE(*RMT)
```

WRKCDUSR Command Format

The following table provides the format for the WRKCDUSR command. The parameter definitions follow the table.

Command	Parameters
WRKCDUSR	USER('userid'|*ALL|generic)
	NODE('nodename')
	USRTYPE(*LCL|L|*RMT|R|*ALL)

WRKCDUSR Parameters

The following parameters are valid for the WRKCDUSR command.

USER('local-userid'|*ALL|generic)
is the key to the local user record. It must be unique and must be a valid user ID on the local system.

'local-userid' identifies a specific record or records to be accessed.

*ALL lists all users of type local.

generic selects one or more user records. If you use generic selection, Connect:Direct selects all user record IDs that match the selection string (xxx*).

NODE('nodename')|*ALL)
identifies the name of the Connect:Direct node associated with the user. ***ALL** lists all users in the file.

USRTYPE(*LCL|L|*RMT|R|*ALL)
specifies the type of user as a local or remote user.

*LCL and **L** identify the user as a local user.

*RMT and **R** identify the user as a remote user.

*ALL specifies all users in the file.

> **Note:** The USER and the NODE are case-sensitive. You can specify case sensitivity by enclosing the value in single quotation marks.

Local and Remote User Parameters

The following Connect:Direct user authorization file parameters are valid for defining both local and remote user records.

USER(userid| *)
specifies the key to the file. For local user records this should match a valid OS/400 user ID. For remote user records, this parameter can be *, indicating that all remote users from NODE are valid.

USRTYPE(*LCL|L|*RMT|R)
specifies whether this is a local user record or a remote user record type.

*LCL and **L** designate the record as a local OS/400 user.

*RMT or **R** designates that the record describes a remote Connect:Direct user that is associated with a local user for security authorization purposes.

DESCRIP(description)
is a description of the record.

Local User Parameters

The following parameters are valid for defining local user records only.

AUTH(*ADM|A|*USR|U)
determines whether the user has Connect:Direct administrative authority or Connect:Direct user authority.

*ADM or **A** specifies that the local user has administrative authority and can execute all Connect:Direct commands.

*USR or **U** indicates that the user can execute only nonadministrative Connect:Direct commands.

NAME('local-user-name')
indicates the local user's name.

PHONE('local-user-phone-number')
contains the local user's phone number.

SELSTATS(*OWN|O|*ALL|A)
specifies the local user's access to statistics data. Access relates to the authority specified in the AUTH parameter.

*OWN or **O** specifies that statistics selection is restricted to the local user's own statistics.

*ALL or **A** specifies that the local user can select all statistics.

SNIDOVRD(*YES|Y|*NO|N)
specifies that Connect:Direct Processes running under the authority of this user (whether initiated locally or remotely) can contain the remote node override parameter, SNODEID. This parameter

protects both local and remote nodes from users who attempt to avoid the secure point-of-entry feature.

*YES or **Y** indicates that Connect:Direct Processes running under the authority of this user can contain the SNODEID parameter.

*<u>NO</u> or **N** indicates that Connect:Direct Processes running under the authority of this user cannot contain the SNODEID parameter.

Remote User Parameters

The following parameters are only valid for defining remote user records.

NODE(remote-node|*)
identifies the remote node that is associated with the remote user defined in this record. The node name must be valid in the local node Network Map. Only this user ID and node combination is considered valid.

If the user ID is valid for all remote nodes, enter * in this field. Partial generic specifications such as ABCD* are not valid. This parameter is required for the remote user record.

LCLUSRID(local-userid)
specifies the local user record that is to be used for security checking for this remote user. This value must match a Connect:Direct local user record. This parameter is required for a remote user record.

Using the WRKCDUSR Screen

Use the **Work with C:D User (WRKCDUSR)** screen to view, add, modify, or delete user authorization file records.

Working with User Records

Complete the following steps to work with user records.

1. Access the **WRKCDUSR** screen by typing the WRKCDUSR command and pressing **F4**. The following screen displays.

   The **Work with Connect:Direct User** screen displays the list of user record IDs you selected.

```
                          Work with C:D User (WRKCDUSR)

 Type choices, press Enter.

 User name  . . . . . . . . . . .    *ALL

 Node Name  . . . . . . . . . . .    *ALL
 User type  . . . . . . . . . . .    *ALL          *LCL, *RMT, *ALL, L, R, B












                                                                    Bottom
  F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  F24=More keys
```

2. Enter your selection criteria. The list of matching users displays as shown in the next sample screen.

3. From this list, select the user authorization file records you want to view, add, modify, or delete.

Modifying User Authorization File

The **Work with Connect:Direct User command** (**WRKCDUSR**) has three views: basic, local user, and remote user. The following screen shows the basic view. Press **F11** to change views.

```
                         Work with C:D User

  Position to User . . .

  Type option and press Enter.
    2=Change   3=Copy   4=Delete   5=Display

  Opt  User                Typ  Adm  Stt  Ovr  Description
       *@ath3500jw          R                  SPOE Jim Ward C:D UN
       *@CD.DEV.STA         R                  SPOE Jim Ward C:D 39
       *@CD.DEVA            R                  OS390 SSL Node
       *@CD.DEVB            R                  OS390 STS Node
       *@CD.WINWARD         R                  SPOE for Jim Ward C:
       *@CDUNX35            R                  Remote ID
       *@KVMWARE            R                  KVMWARE C:D 41 Windo
       *@W2S.4101.Cdwops7   R                  SPOE Denise SV C:D W
       kmoor1               R                  Remote UNIX Node ID
       CDDV3500             L    A    A    Y    The Administrator
                                                               More...
  Parameters or command
  ===>
  F1=Help   F3=Exit   F4=Prompt   F5=Refresh   F6=Add new entry   F9=Retrieve
  F11=Remote View     F12=Cancel
```

From these views of the **Work with Connect:Direct User** screen you can complete the following tasks.

Changing a User Record

To change a user record, enter **2** in the option column to the left of the user name and press **Enter**. The **Change Connect:Direct User (CHGCDUSR)** screen displays. From this screen, you can change parameter definitions for the user.

```
                      Change Connect:Direct User (CHGCDUSR)

   Type choices, press Enter.

   User name  . . . . . . . . . . . > 'CDUSER'

   User type  . . . . . . . . . . . > L  '          *LCL, *RMT, L, R
   Node Name  . . . . . . . . . .
   Local user profile . . . . . . .              Character value
   Administrative authority . . . .   U          *USR, *ADM, U, A, ' '
   Select statistics authority  . .   O          *OWN, *ALL, O, A, ' '
   SNODE ID override authority  . .   N          *YES, *NO, Y, N, ' '
   User description . . . . . . . .   'Connect:Direct User'

   User name  . . . . . . . . . . .   'Local User'

   User phone number  . . . . . . .   '555-1212'



                                                                  Bottom
   F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
   F24=More keys
```

You cannot change the NODE parameter of the *RMT entry. You must delete the entry and then add an entry to make this change.

Copying a User Record

To copy a user record, select option **3**, **Copy**, and press **Enter**. The **Copy Connect:Direct User** screen displays.

```
                       Copy Connect:Direct user (CPYCDUSR)

  Type choices, press Enter.

  User name  . . . . . . . . . . . > 'CDUSER'

  User type  . . . . . . . . . . . > L              *LCL, *RMT, L, R
  Administrative authority . . . .   U              *USR, *ADM, U, A, ' '
  Select statistics authority  . .   O              *OWN, *ALL, O, A, ' '
  SNODE ID override authority  . .   N              *YES, *NO, Y, N, ' '
  User description . . . . . . . .   'Connect:Direct User'

  User name  . . . . . . . . . . .   'Local User'

  User phone number  . . . . . . .   '555-1212'




                                                                      Bottom
  F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  F24=More keys
```

Deleting a User Record

To delete a user record, select option **4**, **Delete**, and press **Enter**. The **Delete Connect:Direct User** screen displays.

```
                       Delete Connect:Direct user (DLTCDUSR)

  Type choices, press Enter.

  User name  . . . . . . . . . . .   'CDUSER'

  Node name  . . . . . . . . . . .   *ALL
  User type  . . . . . . . . . . .   L              *LCL, *RMT, *ALL, L, R, B








                                                                      Bottom
  F3=Exit    F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  F24=More keys
```

Adding a User Record

To add a new Connect:Direct user press **F6**. The **Add Connect:Direct User (ADDCDUSR)** screen displays.

Note: The ADDCDUSR, CHGCDUSR, DELCDUSR, and CPYCDUSR commands should not be used alone. These commands are for reference only. The WRKCDUSR command uses these commands internally.

The following screen is an example of the primary ADDCDUSR screen.

```
                         Add C:D User (ADDCDUSR)

   Type choices, press Enter.

   User name  . . . . . . . . . . .   'CDUSER'

   User type  . . . . . . . . . . .   L              *LCL, *RMT, L, R




















                                                                 Bottom
    F3=Exit    F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
    F24=More keys
```

Note: If Connect:Direct Secure+ Option is installed and you have authority to read or write to the Secure+ Option information, you can see additional parameters on the User screens after you press the **Enter** key.

Once you have entered the new user name and pressed **Enter**, you are taken to the **Add C:D User** second
screen where you update user information.

```
                         Add C:D User (ADDCDUSR)

  Type choices, press Enter.

  User name  . . . . . . . . . . . > 'CDUSER'

  User type  . . . . . . . . . . . > L             *LCL, *RMT, L, R
  Administrative authority . . . .   *USR          *USR, *ADM, U, A, ' '
  Select statistics authority  . .   *OWN          *OWN, *ALL, O, A, ' '
  SNODE ID override authority  . .   *NO           *YES, *NO, Y, N, ' '
  User description . . . . . . . .

  User name  . . . . . . . . . .

  User phone number  . . . . . . .




                                                                  Bottom
  F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  F24=More keys
```

Maintaining the Network Map

In order for Connect:Direct OS/400 to start a session with a remote node, the remote node must have a corresponding entry in the Connect:Direct OS/400 network map. The node name is used to retrieve the necessary information for session start up. The network map record contains the remote node name and information that describes the remote location. (Other Connect:Direct operating environments may refer to a remote node entry as an adjacent node entry.)

The Work with Connect:Direct Netmap (WRKCDNTMP) command allows you to create and change network map entries. This chapter details how to use, copy, or change the network map for Connect:Direct OS/400. The network map information includes a description of the commands you use to modify the network map, samples of the screen, and descriptions of the command parameters.

Note: Be sure that the information entered for network maps does not conflict with the initialization parameters related to firewall navigation and netmap checking, including:

   ❖   TCPSRCPORT

   ❖   TCPLSTITR

   ❖   NETMCHK

   ❖   NODECHK

Using the WRKCDNTMP Command

Note: You must have administrative authority in order to use the WRKCDNTMP command.

After installation, use the Work with Connect:Direct Netmap (WRKCDNTMP) command to maintain the network map file.

WRKCDNTMP Command Example

The following figure presents a working example of the WRKCDNTMP command.

```
WRKCDNTMP   NODNM(OS390.V20100 OS390.V20200)
```

WRKCDNTMP Command Format

The WRKCDNTMP command has the following format.

Command	Parameters
WRKCDNTMP	NODNM(node-name|*ALL)

Required Parameter

The WRKCDNTMP command has one required parameter.

NODNM(node-name|*ALL)
   specifies a 1–16 character alphanumeric node name. You can specify a series of node names by inserting a space and between the names.

   ***ALL** lists all nodes in the Connect:Direct network map.

Network Map Entry Parameters

When you add, change, copy, and delete a network map entry, the WRKCDNTMP command uses the following network map entry parameters.

BUFSIZE(n)
   specifies the transmission buffer size. Enter a value between **0** and **65000**.

CMNTYPE(communications-type)
   describes the communication type. This field is 10 characters in length. Enter LU62, SNUF, or TCPIP.

Cyclic Redundancy Check=*ON|O*OFF|F*INITPARMS|I*NETMAP|N
   determines if CRC checking is to be performed for any TCP/IP Process sending to this node. If this this value is set to *OFF (or *F), setting overrides for CRC checking will be ignored. If overrides are allowed, that is, the initialization parameter OCRC (TCP CRC Override), is set to *YES, this parameter enables you to override the GCRC (TCP CRC) setting in the initialization parameters for this node.

   Note: See the Chapter 5, *Modifying Initialization Parameters*, for additional parameters related to CRC checking.

DEVICE(device-description-name)
   specifies the device description name of the LU6.2 (APPC) device(s). Devices must be APPC devices if work is to be initiated from this node.

ENVIRON(remote-node-environment)
   specifies the remote node environment. This parameter is only required when you are adding a new network map entry.

LCLLOCNAME(local-location-name|*INITPARMS|*NETATR)
   specifies the APPN local location name to use for the connection. This field is 10 characters in length.

   Note: For LU6.2 devices, you can enter either the device name or the LCLLOCNAME, RMTLOCNAME, RMTNETID, and MODE. You cannot specify both of these entries.

local-location-name is the name of the local Connect:Direct location.

*INITPARMS indicates that the local location name specified in the initialization parameters is used.

*NETATR specifies that Connect:Direct use the default local location name in the session network attributes.

LIBNAME(remote-library-name)
> specifies the Connect:Direct library name at the remote node. You must specify the node library only if the environment is OS400.

MODE(mode-description)
> specifies the APPN mode description to use for the connection. This field is 10 characters in length.

NODE(node-name)
> identifies the name of the remote node you are adding or changing.

RMTLOCNAME(remote-location-name)
> specifies the APPN remote location name to use for the connection. This field is 10 characters in length.

RMTNETID(remote-network-id)
> specifies the APPN remote network ID to use for the connection. This field is 10 characters in length.

IPADR(IP-address)
> specifies the TCP/IP address to use for the connection. This field is 64 characters in length. It may be specified in "dotted node form" or domain name form.

PORT(port-address)
> specifies the TCP/IP port address to use for the connection. This field is 5 characters in length.

SNDCOUNT(n)
> is the pacing count for TCP/IP. Specify a number between **0** and 999999.

SNDDELAY(n)
> is the pacing delay for TCP/IP. Specify a number between **0** and 999999.

Note: Pacing is not currently supported on Connect:Direct OS/400.

TEXT(node-description)
> describes this Connect:Direct network map record.

Using the WRKCDNTMP Screen

Use the **Work with Connect:Direct Netmap** screen to view, add, change, copy, or delete records in the Connect:Direct network map.

Note: You must have administrative authority in order to use the WRKCDNTMP command.

Working with Network Map Records

Complete the following steps to work with network map records:

1. Type WRKCDNTMP on the command line and press F4 to access the **Work with CD Netmap** screen.

2. Enter your changes and press **Enter**.

The following screen is a sample of the basic view:

```
                         Work with CD Netmap

   Position to node . . .

   Type option and press Enter.
     2=Change    3=Copy    4=Delete    5=Display


        Node              Remote     Comm
   Opt  Name              Envirn     Type        Description
        ANCHORAGE         OS400      TCPIP       test
        ARLINGTON         UNIX       TCPIP
        ATLANTA           WINDOWS    TCPIP
        BARCELONA         UNIX       TCPIP
        BATON ROUGE       OS400      TCPIP
        CD.DEV.STDA       OS390      TCPIP
        CD.DEVA           OS390      TCPIP
        CDUNX35           UNIX       TCPIP       C:D UNIX 3.5
        CDDV3500          OS400      TCPIP       LOOP BACK TEST
                                                            More...
   Parameters or command
   ===>
   F1=Help   F3=Exit   F4=Prompt    F5=Refresh   F6=Add new entry   F9=Retrieve
   F11=APPN view        F12=Cancel   F16=Work with CD parms
```

The WRKCDNTMP command uses the CHGCDNTMP, CPYCDNTMP, ADDCDNTMP, and DLTCDNTMP commands to complete your changes.

Note: These commands should not be used alone. They are for reference only. The WRKCDNTMP command uses these commands internally.

Viewing the Network Map

You can view the network map in four ways, depending on the communication type. Each time you press **F11**, the view changes. The four views are as follows:

❖   Basic view, showing the node name, remote environment, communication type, and description

❖   APPN view, showing the node name, APPN local location name, APPN remote location name, APPN remote network ID, and APPN mode description

❖   TCP/IP view, showing the node name, IP address, IP port address, buffer size, pacing count, and pacing delay

❖   Device view, showing the node name, remote environment, remote library, and device name

From the four views of the **Work with Connect:Direct Netmap** screen, you perform the following tasks.

Positioning to a Particular Node

To position to a particular node, type the node name or a portion of the node name in the *Position to node* field. This field is case-sensitive.

Changing a Network Map

To change a network map, select option 2, Change, on the Work with CD Netmap screen next to the nodename whose netmap you want to change and press **Enter**. The **Change Connect:Direct Netmap (CHGCDNTMP)** screen displays. From this screen, you can change parameter definitions for your network map, as needed.

```
                      Change Connect:Direct Netmap (CHGCDNTMP)

   Type choices, press Enter.

   Node name  . . . . . . . . . . . > DALLAS
   Node Environment . . . . . . . . > OS400          AS400, OS400, UNIX...
   Communication Protocol . . . . . > TCPIP          Character value, LU62...
   IP Host Name/Address . . . . . .

   IP Port Number . . . . . . . . .   01364          00001-65535
   Transmission Buffer Size . . . .   04096          00001-65535
   Cyclic Redundancy Check  . . . .   *OFF           *ON *OFF *INITPARMS
   Pacing Count . . . . . . . . . .   000000         000000-999999
   Pacing Delay . . . . . . . . . .   000000         000000-999999
   Remote Library Name  . . . . . . > DALLAS
   Node Description . . . . . . . . > 'DALLAS'




                                                                       Bottom
   F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
   F24=More keys
```

Copying a Network Map and Adding Records

To copy a network map, select option **3**, Copy, on the Work with CD Netmap screen next to the nodename whose netmap you want to copy and press **Enter**. The **Copy Connect:Direct Netmap (CPYCDNTMP)** screen displays.

```
                      Copy Connect:Direct Netmap (CPYCDNTMP)

   Type choices, press Enter.

   From Node name . . . . . . . . . > 'DALLAS'
   To Node name . . . . . . . . . . > 'DALLAS2'
   Node Environment . . . . . . . . > OS400          AS400, OS400, UNIX...
   Communication Protocol . . . . . > TCPIP          Character value, LU62...
   IP Host Name/Address . . . . . .   'DALLAS.STERCOMM.COM'

   IP Port Number . . . . . . . . .   01364          00001-65535
   Transmission Buffer Size . . . .   04096          00001-65535
   Cyclic Redundancy Check  . . . .   *OFF           *ON *OFF *INITPARMS
   Pacing Count . . . . . . . . . .   000000         000000-999999
   Pacing Delay . . . . . . . . . .   000000         000000-999999
   Remote Library Name  . . . . . .   DALLAS         Name
   Node Description . . . . . . . .   'DALLAS'



                                                                       Bottom
   F3=Exit    F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
   F24=More keys
```

Use the **Copy Connect:Direct Netmap (CPYCDNTMP)** screen to add records in the network map.

Deleting a Network Map

To delete a network map record, select option **4**, **Delete**, on the Work with CD Netmap screen next to the nodename whose netmap you want to delete and press **Enter**. The **Delete Connect:Direct Netmap (DLTCDNTMP)** screen displays.

```
                    Delete Connect:Direct Netmap (DLTCDNTMP)

   Type choices, press Enter.

   Node name  . . . . . . . . . . .    'DALLAS'
                 + for more values















                                                                       Bottom
     F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel    F13=How to use this display
     F24=More keys
```

Adding a Network Map

To add a new network map, press **F6** on the Work with CD Netmap screen. The **Add Connect:Direct Netmap (ADDCDNTMP)** screen displays.

```
                         Add C:D Netmap (ADDCDNTMP)

   Type choices, press Enter.

   Node name  . . . . . . . . . . . > 'DALLAS'
   Node Environment . . . . . . . . > OS400         OS400, AS400, UNIX...
   Communication Protocol . . . . . > TCPIP         LU62, TCPIP, SNUF
   IP Host Name/Address . . . . . .

   IP Port Number . . . . . . . . .   01364         00001-65535
   Transmission Buffer Size . . . .   04096         00001-65535
   Cyclic Redundancy Check  . . . .   *OFF          *ON *OFF *INITPARMS
   Pacing Count . . . . . . . . . .   000000        000000-999999
   Pacing Delay . . . . . . . . . .   000000        000000-999999
   Remote Library Name  . . . . . .   DALLAS        Name
   Node Description . . . . . . . .   'DALLAS'




                                                                       Bottom
     F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel    F13=How to use this display
     F24=More keys
```

Managing Connect:Direct Execution

Connect:Direct OS/400 uses a Process queue to schedule, manage and monitor Processes. All Connect:Direct OS/400 local Processes are single-step Processes. The Process Management Queue handles all Processes:

❖ Local synchronous (Examples: CDSND, CDRCV, CDRUNTASK)

❖ Local asynchronous (CDSUBPROC)

❖ Remote

This chapter describes the Processes and the Process queue and explains how to manage and monitor the Connect:Direct node. For detailed information on command format and parameters, refer to the *Controlling Processes* chapter in the *Connect:Direct OS/400 User's Guide*.

Understanding the Process Management Queue

The Process Management Queue is a repository for Processes currently in the Connect:Direct OS/400 system. Five logical queues are associated with the Process Management Queue:

❖ ACTIVQ - Processes active, executing

❖ WAITQ   - Processes waiting to run

❖ HOLDQ - Processes currently held

❖ TIMERQ - Processes waiting for a timer event

❖ STARTQ - Processes being activated

Types of Processes

The Process Management Queue contains synchronous and asynchronous Processes. Asynchronous Processes are those submitted using the CDSUBPROC command. These Processes can be scheduled and managed according to instructions provided in the CDSUBPROC command.

Synchronous Processes are those Connect:Direct commands issued through CL programs and CL commands other than CDSUBPROC. They cannot be scheduled once they are in the Process Management Queue.

Queue Access

The WRKCDPROC command allows you to access the Process queue and manage your Processes. This command provides options to specify:

❖ Range of Processes to present

❖ Level of detail to present

❖ Control options for local asynchronous Processes

❖ Control access authority

The control options for the asynchronous Processes allow you to hold, release, delete, or change nonexecuting Processes and to end an executing Process.

Access Authority

The control access authority allows you to determine who can control Processes. You can define this authority in the Connect:Direct user authorization file. Users with administrative (*ADM) authority can view and change all Processes. Users with user (*USR) authority can view all Processes but can only change the Processes they initiated.

The *Connect:Direct OS/400 User's Guide* provides detailed information on the use of the WRKCDPROC and CDSUBPROC commands.

Managing the Connect:Direct Node

The WRKCDSTS command allows you to monitor and control a Connect:Direct OS/400 node. This command retrieves and displays status information from the Process manager. You can monitor and modify information such as Process manager activity and Session manager activity. A permanent session manager is one which can execute more than one process in sequence. You can also work with Processes and initialization parameters. This command is only available to users with administrative authority.

Using the WRKCDSTS Screens

The following screen is an example of the **Work with Connect:Direct Status (WRKCDSTS)** screen. From the **Work with Connect:Direct Status** screen, you can access different screens to accomplish the tasks described in the following sections:

```
                        Work with C:D Status

  Node Name:   FRAN.CDDV3500              Version  :   3.5.00 PTF 000A
  Library  :   CDDV3500
  Started  :   Mon Mar 15 16:52:45 2004


  Permanent SMGRs Active  . . :   0000    Permanent SMGRs Configured    0000
  Maximum primary sessions  . .   0002    Maximum secondary sessions    0002
  Maximum synchronous sessions    0002
  Global trace options  . . . .   *NONE
  Allow process execution . . .   YES










     F3=Exit   F5=Refresh   F7=PMGR Components    F8=SMGR Components
     F9=Reload key file    F10=Display key file   F12=Cancel   F24=More keys

```

Viewing and Controlling Process Manager Components

To view and control Process manager (PMGR) components, select **F7**. When you select **F7** from this screen, the following PMGR components screen is displayed.

```
                      WRKCDSTS - PMGR Components

  Type option and press Enter.
    1=Start    2=Change trace bits   4=End   5=Display details

  Opt  Compnt   Sts  Jobname    Jobnum  Trace           Information
       PMGR     FXD  CDPMGR     186562  *NONE
       TIMER    FXD  CDTIMER    186564  *NONE
       STATMGR  FXD  CDSTATMGR  186565  *NONE           S104031500
       QMGR     FXD  CDQMGR     186566  *NONE
       TCPLIST  ACT  CDTCPL     186567  *NONE                   ***
       SPLMON   INA                     *NONE








                                                                Bottom
     F3=Exit   F5=Refresh      F12=Cancel   F14=Work with Process
     F15=Work with Initparms   F21=Command line

```

This **WRKSDSTS PMGR Components** screen shows the component name, the component's current status, the job name and number, the current trace settings, and additional information such as a member name for STATMGR and the IP address for TCPLIST. This screen allows you to work with the following Process manager components:

❖ TIMER - controls timer events

❖ STATMGR - controls statistics

❖ QMGR - controls queue events

❖ TCPLIST - controls incoming TCP/IP sessions

❖ SPLMON - controls spool monitor events

This screen accesses four options you can use with these components. To use these options, you type the number of the option in the Options column to the left of the component name. Use these four options to work with your Process manager components:

❖ Option 1 allows you to start the component while Connect:Direct OS/400 is running. To select this option, type the number **1** in the Options column to the left of the component name and press **Enter**. The component then starts in the subsystem, and its status changes to ACT on the screen.

> **Note:** You can only start the TCPList or SPLMON components.

❖ Option 2 allows you to change the trace options for a component while Connect:Direct OS/400 is running. To change the trace option, type the number **2** in the Options column and press **Enter**. Changing the trace options here overrides the global and initialization parameter trace values for this execution of Connect:Direct only.

❖ Option 4 allows you to end the component while Connect:Direct OS/400 is running. To use this option, type the number **4** in the Options column and press **Enter**.

> **Note:** You cannot start or stop fixed components (TIMER, STATMGR, QMGR).

❖ Option 5 allows you to display the active TCPLIST Host and Ports.

Viewing and Controlling Session Managers

To view and control session managers, use **F8**. When you select **F8** from the first Work with Connect:Direct Status screen, the session manager screen displays.

```
                         WRKCDSTS - SMGR Components

    Type option and press Enter.
      2=Change trace bits    5=Display details

   Opt    Process    Type    Prm    Trace              Job
          CDSND      SYNC    NO     *ALL_____ CDSMGR/CDADMIN/101315
          CDSND      TCIP    NO     *ALL_____ CDSMGR/CDADMIN/101316












                                                                   Bottom
    F3=Exit    F5=Refresh        F12=Cancel    F14=Work with Process
    F15=Work with Initparms    F21=Command line
```

The **WRKCDSTS - SMGR Components** screen displays the name and type of the Process, whether the Process is permanent, the trace bits setting, and associated job information. From the session manager screen, you have two options for each Process listed:

❖   You can change the trace options by entering the number **2** in the Option column to the left of the Process name and pressing **Enter**. Changing the trace option here overrides the global and initialization parameter trace values for this execution of Connect:Direct only.

❖   You can also view details about a Process by entering the number **5** in the Option column to the left of the Process name and pressing **Enter**. This option is especially useful when you need to correlate the OS/400 job number from the previous panel with the Connect:Direct Process number. .

Note: If Connect:Direct Secure+ Option is installed, an additional screen displays after pressing **Enter**. For additional information, refer to the *Connect:Direct Secure+ Option OS/400 Implementation Guide*.

Reloading the Key File

When you select **F9** the system reads the license management key file, as specified by APKEYF, and updates the system table. Using **F9** allows you to update the key without stopping and restarting Connect:Direct OS/400.

Displaying the Key File

When you select **F10** the system reads the license management key file, as specified by APKEYF, and displays the contents of the file.

Working with Processes and Initialization Parameters

To work with Processes, select **F14**. When you select **F14**, Connect:Direct OS/400 displays the **Work with Connect:Direct Processes (WRKCDPROC)** screen. You can then schedule, control, or monitor your Processes as detailed in the *Connect:Direct OS/400 User's Guide*.

Changing Connect:Direct Parameters

You can select **F15** to access the **Change C:D Parameters (CHGCDPARM)** screens to work with your initialization parameters. If you change initialization parameters by using **F15**, you must end and restart Connect:Direct OS/400 before your changes are applied. The first **Change C:D Parameters (CHGCDPARM** screen is shown below.

```
                      Change C:D parms (CHGCDPARM)

 Type choices, press Enter.

 Production Library Name  . . . . > CDDV3500      Character value
 Connect:Direct subsystem name  .   CDDV3500      Character value
 Local Node Name  . . . . . . . .   'FRAN.CDDV3500'
 Default local location . . . . .   *NETATR       Character value
 User to receive Messages . . . .   CDDV3500      Character value
 Process queue startup option . .   *COLD         *WARM, *COLD
 Enable TCP/IP listener . . . . .   *YES          *NO, *YES
 TCP CRC  . . . . . . . . . . . .   *ON           *ON, *OFF
 TCP CRC Override . . . . . . . .   *YES          *YES, *NO
 TCP/IP host address  . . . . . .   'FRAN'

 TCP/IP host port . . . . . . . .   '01364'       00001-65535, '',
  Alternate TCP/IP Host Address


  Alternate TCP/IP Host Port  . .                 00001-65535, '',

                                                                More...
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

You can override some initialization parameters while Connect:Direct is running by using the **Work with Connect:Direct Status** screen. The following table lists the keyword and valid values for each of the fields on this screen.

> **Note:** The **Allow process execution** field is not an initialization parameter. It is a parameter of the Start Connect:Direct (STRCD) command. For a complete description of these parameters, see Chapter 4, *Starting and Stopping Connect:Direct*.

Field Name	Keyword	Valid Values	Related Initialization Parameter
Permanent SMGRs active	PERMSMGRA	This field reflects the number of active session managers. You cannot manually change this field. The value cannot exceed the number of session managers configured.	none
Permanent SMGRs Configured	PERMSMGRC	0-20 Changing this field programatically changes the Permanent SMGRs active field.	PERMSMGR

Field Name	Keyword	Valid Values	Related Initialization Parameter
Maximum primary sessions	MAXPRIM	0-99	MAXPRIMARY
Maximum secondary sessions	MAXSEC	0-99	MAXSECNDRY
Maximum synchronous sessions	MAXCMD	0-99	MAXCMD
Global trace options	TRACES	L,S,F,C,X,K,D,H,V,W,P|*NONE|*ALL|*EXT|*COMMON| *INITPARMS|*CURRENT	TRCINST
Allow process execution†	ALWPROC	YES, NO	STRPROC

For a complete description of the initialization parameter keywords, refer to Chapter 5, *Modifying Initialization Parameters*.

Performing Administrative Duties

This chapter covers the following topics:

❖ Changing communication entries

❖ Moving a test system into production

❖ Deleting an installation from your system

Changing Communication Entries

The following sections describe procedures for changing communications entries for communication device descriptions allocated to Connect:Direct.

Because you can add communications entries using either a device name or a remote location name, two examples of each command are included in this section.

Ending Connect:Direct

To change, remove, or add communications entries for communication device descriptions allocated to Connect:Direct, you must first end Connect:Direct OS/400 and the OS/400 subsystem. See the *Stopping Connect:Direct OS/400* section beginning on page 4-3 for instructions on ending Connect:Direct OS/400.

Use the ENDSBS command to end the OS/400 Connect:Direct subsystem.

```
ENDSBS      SBS(cdsubsys) OPTION(*IMMED)
```

Note: The ENDSBS command only ends the subsystem. To end the Connect:Direct OS/400, use the ENDCD command.

Removing a Communications Entry

Use one of the following OS/400 Remove Communications Entry (RMVCMNE) commands to remove a communications entry from the Connect:Direct subsystem.

```
RMVCMNE        SBSD(prodlibname/prodsubsys) DEV(commdevd)
    OR
RMVCMNE        SBSD(prodlibname/prodsubsys) RMTLOCNAME(rmtlocname)
```

> **SBSD(prodlibname/prodsubsys)**
> specifies the name of the Connect:Direct library and the name of the Connect:Direct subsystem.

> **DEV(commdevd)**
> specifies the communication device entry to be deleted.

> **RMTLOCNAME(rmtlocname)**
> specifies the remote location entry to be deleted.

Adding a Communications Entry

To add a communications entry to the Connect:Direct subsystem use one of the OS/400 Add Communications Entry (ADDCMNE) commands.

```
ADDCMNE       SBSD(prodlibname/prodsubsys) DEV(commdevd)
              JOBD(*USRPRF) DFTUSR(cdeadmin) MODE(*ANY)
              MAXACT(*NOMAX)
              OR
ADDCMNE       SBSD(prodlibname/prodsubsys) RMTLOCNAME(commrloc)
              JOBD(*USRPRF) DFTUSR(cdadmin) MODE(*ANY)
              MAXACT(*NOMAX)
```

> **SBSD(prodlibname/prodsubsys)**
> specifies the name of the Connect:Direct library and the name of the Connect:Direct subsystem.

> **DEV(commdevd)**
> specifies the new communication device entry.

> **RMTLOCNAME(commrloc)**
> specifies the remote location name. This field should match the RMTLOCNAME in the DEVD or the RMTCFGL.

> **DFTUSR (CDADMIN)**
> specifies the Connect:Direct administrator's user profile, cdadmin.

After you have added a communication entry for the local node to start and accept sessions to a remote node, use the Work with Connect:Direct Netmap (WRKCDNTMP) command to add a node entry for this remote node in the Connect:Direct network map.

Changing a Communications Entry

To change a communications entry to the Connect:Direct subsystem, use the Change Communications Entry (CHGCMNE) CL command. You can also first remove the communications entry and then add a new communications entry, instead of changing an entry. Refer to the *Removing a Communications Entry* section beginning on page 9-1 and the *Adding a Communications Entry* section beginning on page 9-2.

After you have changed a new device or remote location for the local node to start and accept sessions to a remote node, use the WRKCDNTMP command to change the device or remote location name for this remote node in the Connect:Direct network map.

Activating SNA Devices

Complete the following steps to activate SNA devices defined in the Connect:Direct remote node.

1. Access the CDDEVACT screen by typing the CDDEVACT command and pressing **F4**. The following screen is displayed.

```
                    Connect:Direct Device Activate (CDDEVACT)

  Type choices, press Enter.

  Connect:Direct library name  . .   *PRDLIB       Character value, *PRDLIB
  Connect:Direct subsystem name  .   *PROD         Character value, *PROD














                                                                        Bottom
   F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
   F24=More keys
```

2. Type the name of the Connect:Direct library.

3. Type the name of the Connect:Direct subsystem.

4. Press **Enter**.

Restarting the Connect:Direct Subsystem

Issue the Connect:Direct OS/400 STRCD command to restart the Connect:Direct subsystem. See the *Starting Connect:Direct OS/400* section beginning on page 4-1 for instructions on starting the subsystem and its components.

Vary the communications device off and back on with the VRYCFG command.

Moving a Test System into Production

Once you have verified the test Connect:Direct version, you are ready to move it into the production environment.

By moving the test version into the production library, all the work is done on the OS/400 node. Alternatively, you have the option of updating all remote node network maps to reflect the test library name as the production library name.

The Connect:Direct production user profile must be used for the move, not the test Connect:Direct user profile.

The following sections detail the necessary steps to move a test Connect:Direct version into the production environment.

Ending Test and Production Subsystems

The first step is to end the two subsystems. Use the ENDCD command followed by ENDSBS to end both subsystems. Refer to the *Ending Connect:Direct* section beginning on page 9-1 for instructions on how to end a subsystem.

Renaming the Production Library

As an additional safety consideration, you might want to rename your current production library so it can still be recalled. Use the following Rename Object (RNMOBJ) command to rename your library.

```
RNMOBJ    OBJ(prodlibname) OBJTYPE(*LIBL) NEWOBJ(prodlibkup)
```

NEWOBJ(prodlibkup)
    specifies the new library name (the backup of the old production library).

WARNING: You should limit the name of the Connect:Direct library on the OS/400 to eight characters if you are working with OS/390 systems. This is due to a definition name size limit of eight characters on OS/390.

Renaming the Test Library

The next step in this procedure is to rename your test library to the production library name. Use the following Rename Object (RNMOBJ) command to rename your test library.

```
RNMOBJ    OBJ(testlibname) OBJTYPE(*LIB) NEWOBJ(prodlibname)
```

OBJ(testlibname)
    indicates the test library that is to be renamed. The library name cannot exceed eight characters.

NEWOBJ(prodlibname)
    specifies the new library name. The name cannot exceed eight characters.

Use the CHGCURLIB (Change Current Library) command to change the current library to the production library name, if necessary.

WARNING: You should limit then name of the Connect:Direct library on the OS/400 to eight characters if you are working with OS/390 systems. This is due to a name size limit of eight on the OS/390 systems.

Completing the Move

The remaining steps for moving a test version on Connect:Direct into production are the same as for an installation and are detailed in *Step 2 – Build Connect:Direct Objects* on page 3-3. Complete the steps in the order listed.

1. Execute the CRTCDOBJ command. Refer to Chapter 3, *Installing Connect:Direct* on page 3-3 for information about using this command.

2. Enter **G** to indicate that you want Connect:Direct OS/400 to replace existing objects.

3. Start the new Connect:Direct production version.

Deleting an Installation

This section details the steps necessary to remove a version of Connect:Direct. These steps include deleting all objects associated with the subsystem, removing the library, and deleting the user profile, lines, controllers, and devices created for use with Connect:Direct.

Note the following before continuing with this section:

❖ The Connect:Direct output queue must be emptied in order to delete it.

❖ Stop the Connect:Direct OS/400 system with the ENDCD command.

❖ Ensure that the Connect:Direct subsystem is not active before beginning and that the line, controller, and devices are varied offline.

❖ Do not use the Connect:Direct administrator's user profile to remove Connect:Direct from the system, use the Security Officer or another user profile.

❖ Verify that the Connect:Direct library is not used in the library list.

❖ Verify that the Connect:Direct library is not currently in any user's library list.

Deleting the Connect:Direct Library

Note: Do not delete the Connect:Direct library without first deleting or clearing the objects contained within the library. Deleting a library may not cause all objects in the library to be deleted.

Delete the Connect:Direct library with the following Delete Library (DLTLIB) command.

```
DLTLIB    LIB(libname)
```

Deleting the User Profile and Associated Objects

Delete the Connect:Direct administrator's user profile with the following Delete User Profile (DLTUSRPRF) command.

```
DLTUSRPRF    USRPRF(CDADMIN) OWNOBJOPT(*DLT)
```

USRPRF(CDADMIN)
   specifies the administrator's user profile associated with the version of Connect:Direct that you are deleting.

Note: All communication devices, controllers, and lines owned by the Connect:Direct user profile must be deleted or have their ownership changed to another user profile prior to issuing the DLTUSRPRF command.

The user profile and all objects owned by it are deleted.

Removing Lines, Controllers, and Devices

Use the following DLT commands to remove lines, controllers, and devices created for Connect:Direct.

To remove each device, type the DLTDEVD command and press **Enter**.

```
DLTDEVD DEVD(devd)
```

DEVD(devd)
    specifies the name of the device to be deleted.

To remove each controller, type the DLTCTLD command and press **Enter**:

```
DLTCTLD CTLD(ctld)
```

CTLD(ctld)
    specifies the name of the controller to be deleted.

To remove each line, type the DLTLIND command and press **Enter**.

```
DLTLIND LIND(lind)
```

LIND(lind)
    specifies the name of the line to be deleted.

Maintaining Spool Support

The spool support for Connect:Direct OS/400 monitors one or more OS/400 output queues (OUTQ) for spooled files to be transferred to a Connect:Direct node. The spool support includes the following transfers:

❖ Direct transfers to an OS/400 output queue on another Connect:Direct OS/400 node

❖ Transfers to the JES spool queue

❖ Transfers of spooled files to a file on a remote Connect:Direct node

You can associate output queues with Connect:Direct nodes selected from the Connect:Direct network map. These transfers do not require user intervention on the OS/400 system, and print control information is preserved.

You can also send a spooled file by issuing the CDSNDSPL command. Refer to the *Sending a Spool File* chapter in the *Connect:Direct OS/400 User's Guide* for more information on CDSNDSPL.

This chapter describes the commands, parameters, and screens that you will use to configure and use the spool monitor for Connect:Direct OS/400.

Understanding the Spool Monitor

The Connect:Direct Spool Monitor (CDSPLMON) is a long-running, variable component of Connect:Direct OS/400. The component initiates transfers to send spooled files to remote Connect:Direct nodes with minimum user intervention.

Spool monitor entries (SPLMONE) define the output queues that the spool monitor will watch. These entries also contain information required to select and process the spooled files created in the output queues.

You can maintain these entries by using the WRKSPLMONE command. This command allows the administrator to add, change, or remove entries and to hold or release an entry, effectively starting and stopping spool monitor transfers to the designated node.

Starting and Stopping

You can configure the spool monitor to start when Connect:Direct OS/400 starts. To start the spool monitor automatically, you specify the RUNSPLM initialization parameter. You can also start the spool monitor separately through the WRKCDSTS screen

You can stop the spool monitor through the WRKCDSTS command.

Work Flow

The spool monitor observes the designated queues for files that meet the selection criteria in the spool monitor entry. When the spool monitor finds a file in a ready status, the spool monitor initiates the transfer to the node defined in the associated SPLMONE.

If your system reaches the maximum number of concurrent transfers (MAXACT) specified in that entry, the spool monitor queues the transfer until it can be made.

If a transmission error occurs, the values in the initialization parameters are used for checkpointing, maximum number of retries, and the retry wait period. Only after the maximum number of retries has been exhausted is an error returned to the spool monitor.

Upon successful completion, the normal end action (NRMACT) specified in the SPLMONE is made. If an error occurs, the spool monitor sends a message to the designated user (ERRUSR) and takes the action (ABNRMACT) specified for an abnormal end condition.

Results

You can examine the detailed results of transfers initiated by the spool monitor. You can access the detailed information through the CDSELSTAT command or through the CDLOG output files.

Spool Monitor Control

Connect:Direct spool monitor jobs are submitted through the CDSPOOLQ job queue, which is defined to the Connect:Direct subsystem at installation.

The installation default for the number of active jobs is *NOMAX, which does not set a limit on the number of active jobs. You can use the MAXACT parameter of the CHGJOBQE command to limit the number of active jobs to the number of sessions that Connect:Direct and the system can handle.

Options

To use the spool monitor, you must enable secure-point-of-entry security on each remote node specified in the spool monitor entries. You must also have a remote user entry on each remote node for the local Connect:Direct administrator profile.

When you send to a file on a remote node and use a fixed destination file name, you must configure the maximum number of concurrent transfers to one to avoid file contention.

To prevent a subsequent transfer from overwriting the data in the destination file, allow the spool monitor to generate a destination file name by specifying DSTFILE(*GEN) on the SPLMONE.

Working with Spool Monitor Entries

Use the Work with Spool Monitor Entries (WRKSPLMONE) command to display the list of destination configuration file entries. This command provides access to the WRKSPLMONE screen.

From this screen you can access screens to add a new entry, change the attributes of an entry, copy an entry, place or release a hold status on an entry, or remove an entry from the list.

WRKSPLMONE Command Example

The following figure provides a working example of the WRKSPLMONE command.

```
WRKSPLMONE
```

To access the **WRKSPLMONE** screen, type WRKSPLMONE on the command line, and press **Enter**.

WRKSPLMONE Command Format

The WRKSPLMONE command has no parameters. The command uses the ADDSPLMONE, CHGSPLMONE, CPYSPLMONE, HLDSPLMONE, RLSSPLMONE, and RMVSPLMONE commands to complete your changes.

> **Note:**   These commands should not be used alone. They are for reference only. The WRKSPLMONE command uses these commands internally.

The following table and parameter descriptions provide the command format for the WRKSPLMONE command.

Command	Parameter
WRKSPLMONE	

Required Parameters

The following parameters are required when you are making changes to the spool monitor entries. These parameters apply to all screens unless otherwise specified.

OUTQ(lib/queue)
specifies the name and library of the output queue to be monitored. This parameter must be a valid output queue that exists when the command executes.

FROMQ(lib/queue)
indicates the name and library of the output queue that identifies the entry to be copied. This parameter is only valid for CPYSPLMONE.

TOQ(lib/queue)
designates the name and library of the output queue to be used in the newly created entry. This parameter is only valid for CPYSPLMONE.

FILE(*ALL|generic*|name)
specifies the criteria used to select files from the specified queue for transfer.

*ALL indicates that all spooled files in the output queue will be transferred.

generic* transfers all spooled files with names which satisfy the generic request.

name selects all spooled files with the specified name for transfer.

SNODE(remote node-name)
defines the name of the remote node.

SNODENVIRN(remote-node-environment)
    specifies the operating system environment of the remote node.

DSTTYPE(*SPOOL|*FILE)
    indicates the type of output destination on the remote node.

    *SPOOL specifies that the destination is a spool queue (OS/400 OUTQ or JES)

    *FILE indicates that the destination is a file.

Optional Parameters

You can also use the following parameters when you are making changes to the spool monitor entries. These optional parameters apply to all screens unless otherwise specified.

CTLCHAR(*NONE|*FCFC|*PRTCTL)
    determines the type of forms control characters to be used on the transfer.

    *NONE specifies that no forms control characters will be transferred.

    *FCFC indicates that the first character forms control will be used.

    *PRTCTL specifies that the first four characters of each record will contain skip- and space-before values.

DSTFILE(name|*FILE|*GEN)
    identifies the file name to be used on the remote node.

    name indicates the name to be used. If you specify a fully-qualified name, you must leave the DSTQUAL parameter blank.

    *FILE specifies that the current name of the file be used.

    *GEN instructs the spool monitor to generate a unique name from the job information associated with the spooled file.

DSTQUAL(path)
    specifies the path qualifier used on the remote node. This parameter specifies which directory or high-level qualifier to use when creating the output file. If you specify a fully-qualified name in the DSTFILE parameter, this parameter must be blank.

    path identifies a path or high-level qualifier used on the remote node.

DSTOPTS(options)
    identifies the system options (SYSOPTS) required to transfer to the remote node. Refer to the *Connect:Direct Process Guide* for platform-specific information.

    options defines the appropriate SYSOPTS statements.

MAXACT(n)
    specifies the maximum number of concurrent transfers using the current SPLMONE. The default is **3**.

NRMACT(*HLD|*DEL)
    identifies the action to take upon successful completion of a transfer.

    *HLD specifies that the spool monitor place the spooled file in a HOLD status in the output queue upon successful completion of the transfer.

    *DEL instructs the spool monitor to delete the spooled file upon successful completion of the transfer.

ABNRMACT(*HLD|*DEL)
> The action to take when a transfer fails due to error(s).
>
> ***HLD** instructs the spool monitor to place the spooled file in a HELD status in the output queue upon abnormal completion.
>
> ***DEL** specifies that the spool monitor delete the spooled file upon abnormal completion.

ERRUSR(userid)
> specifies the user to receive error notification messages.

Using the Spool Monitor Screens

Use the **Work with Spool Monitor Entries (WRKSPLMONE)** screen to change, delete, add, hold and release spool monitor entries. To access the WRKSPLMONE screen, type **WRKSPLMONE** on the command line and press **F4**.

This command uses the ADDSPLMONE, CHGSPLMONE, CPYSPLMONE, HLDSPLMONE, RLSSPLMONE, and RMVSPLMONE commands to complete your changes.

Note: These commands should not be used alone. They are for reference only. The WRKSPLMONE command uses these commands internally.

The following is a sample of the **Work with Spool Monitor Entries** screen.

```
                     Work with Spool Monitor Entries

   Position to Node . . .

   Type option and press Enter.
     2=Change   3=Copy   4=Delete

       Outq        Outq        Remote          Remote      Max    Cur
   Opt Name        Library     Node            Environ     Active Active  Sts
    _  CDOUT       CD3.5.00    A               UNIX           3









                                                                   Bottom
   Parameters or command
   ===>
   F3=Exit   F4=Prompt   F5=Refresh   F6=Add new entry   F12=Cancel
```

You can perform the following actions from the **Work with Spool Monitor Configuratio**n Entries screen.

Adding an Entry

Select **F6** to add a new entry. The **Add Spool Monitor Entry (ADDSPLMONE)** screen displays. From this screen, you can specify a new spool monitor entry .A sample spool monitor screen, the **Add Spool Monitor Entry (ADDSPLMONE)** screen, follows. Screens for the other options are similar in appearance.

```
                    Add Spool Monitor Entry (ADDSPLMONE)

 Type choices, press Enter.

 Output queue to monitor  . . . .                 Name
   Library . . . . . . . . . . .                  Name
 Spooled file selection . . . . .                 *ALL, generic*, Name
 Remote node name . . . . . . . .
 Destination node environment . .                 OS400, AS400, MVS, OS390...
 Destination type . . . . . . . .                 *SPOOL, *FILE
 Control character  . . . . . . .    *FCFC        *NONE, *FCFC, *PRTCTL
 Destination file name  . . . . .    *SPLF








                                                                    Bottom
   F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
   F24=More keys
```

You can perform the following actions from the **Work with Spool Monitor Configuration Entries** screen.

Changing an Entry

To select an entry to change, type **2** in the Option column next to the entry and press **Enter**. The **Change Spool Monitor Entry (CHGSPLMONE)** screen displays. You can then change the attributes of an entry.

```
                     Change spool monitor entry (CHGSPLMONE)

 Type choices, press Enter.

 Output queue to monitor  . . . . > CDOUT        Name
   Library . . . . . . . . . . . >   CD3.5.00    Name
 Spooled file selection . . . . .   QPRINT       *ALL, generic*, Name
 Remote node name . . . . . . . .   A
 Destination node environment . .   UNIX         AS400, MVS, OS390, OS400...
 Destination type . . . . . . . .   *FILE        *SPOOL, *FILE
 Control character  . . . . . . .   *FCFC        *NONE, *FCFC, *PRTCTL
 Destination file name  . . . . .   '*SPLF'







                                                                    Bottom
   F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
```

Copying an Entry

To select an entry to copy, type **3** in the Option column next to the entry and press **Enter**. The **Copy Spool Monitor Entry (CPYSPLMONE)** screen displays information about the entry.

```
                     Copy spool monitor entry (CPYSPLMONE)

  Type choices, press Enter.

  From queue entry . . . . . . . .    CDOUT         Name
    Library  . . . . . . . . . . .     CD3.5.00     Name
  To queue entry . . . . . . . . .    CDOUT2        Name
    Library  . . . . . . . . . . .     CD23.5.00    Name
  Spooled file selection . . . . .    QPRINT        *ALL, generic*, Name
  Remote node name . . . . . . . .    A
  Destination node environment . .    UNIX          AS400, MVS, OS390, OS400...
  Destination type . . . . . . . .    *FILE         *SPOOL, *FILE
  Control character  . . . . . . .    *FCFC         *NONE, *FCFC, *PRTCTL
  Destination file name  . . . . .    '*SPLF'




                                                                      Bottom
  F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  F24=More keys
```

Removing an Entry

To select an entry to delete, type **4** next to the entry and press **Enter**. The **Remove Spool Monitor Entry (RMVSPLMONE)** screen displays. From this screen you can remove an entry from the list.

```
                     Remove spool monitor entry (RMVSPLMONE)

  Type choices, press Enter.

  Output queue to monitor  . . . .                  Name
    Library  . . . . . . . . . . .                  Name








                                                                      Botto
  F3=Exit    F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
  F24=More keys
```

Releasing an Entry

Type **6** in the Option column next to the entry to release and press **Enter**. The **Release Spool Monitor Entry (RLSSPLMONE)** screen displays. Complete the appropriate fields and press Enter to release an entry from HOLD status.

```
                    Release spool monitor entry (RLSSPLMONE)

  Type choices, press Enter.

  Output queue to monitor  . . . .              Name
    Library  . . . . . . . . . . .              Name




                                                                         Bo
    F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel   F13=How to use this displa
    F24=More keys
```

Holding an Entry

To select an entry to place in HOLD status, type **8** in the Option column next to the entry and press **Enter**. The **Hold Spool Monitor Entry (HLDSPLMONE)** screen displays.

```
                     Hold spool monitor entry (HLDSPLMONE)

  Type choices, press Enter.

  Output queue to monitor  . . . .              Name
    Library  . . . . . . . . . . .              Name




                                                                     Bottom
    F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel   F13=How to use this display
    F24=More keys
```

Note: Spool monitor must be inactive to see options 2, 3, 4 and F6 on the Work with Spool Monitor Entries screen. Similarly, it must be active in order to see options 6 and 8.

Maintaining Extended Translation

Some languages have too many symbols to represent all characters using single-byte character sets (SBCS). For example, the English language can be defined within a single-byte range from 0 through 256, or x00 through xFF. Hanqeul, the language of Korea, and other ideographic languages contain several thousand characters. Coding these character sets requires two bytes for each character or double-byte character set (DBCS).

Feature Definition

The representation for DBCS characters is different across operating system platforms. Mainframes and the OS/400 represent data in 8-bit EBCDIC code. ASCII platforms represent data in 7-bit ASCII code. For the mainframe and OS/400 environments, DBCS can be exclusive within a file or mixed with SBCS characters. Thus knowing the difference between SBCS and DBCS characters is important. Special character indicators make this possible:

- ❖ Shift-out (SO) denotes shifting from SBCS to DBCS mode
- ❖ Shift-in (SI) denotes shifting from DBCS to SBCS mode
- ❖ x'0E' and x'0F' are the EBCDIC SO/SI characters

The SO/SI combinations are not necessary if a file uses only DBCS.

ASCII platforms do not recognize the SO/SI characters. In this environment, DBCS is represented by setting on the high order bit of the ASCII code.

Connect:Direct OS/400 supports controlled translation of both single-byte and double-byte data being transferred between Connect:Direct OS/400 and another Connect:Direct node.

Feature Specification

Extended translation support for Connect:Direct OS/400 provides the transfer of data from OS/400 to ASCII platforms and ASCII platforms to OS/400 that translates SBCS and DBCS data into the form supported on the target platform as follows:

- ❖ For OS/400 to ASCII platforms transfers, Connect:Direct OS/400 checks for SO/SI combinations (unless the host data is pure DBCS). When SO/SI combinations are found, Connect:Direct strips the SO/SI combination from the transfer and translates the DBCS characters to the ASCII equivalent.

- ❖ For ASCII platforms to OS/400 transfers Connect:Direct OS/400 uses the rules for the DBCS code page to identify the character received. If the character is DBCS, Connect:Direct inserts the SO character and starts translating character combinations until an SBCS character is received. When the SBCS character is received, Connect:Direct OS/400 inserts the SI character and continues with SBCS translation.

❖ For ASCII platforms to OS/400 transfers, Connect:Direct OS/400 translates this DBCS data to EBCDIC. The record length of the file on the OS/400 side of the transfer is generally larger than the ASCII equivalent.

Translation to EBCDIC involves the insertion of SO/SI characters which lengthens the record. The amount of record size increase varies with the actual data content since two characters (one SO/SI pair) are inserted for each DBCS field in the record. Ensure that the record length of the file on the OS/400 side of the transfer is large enough to contain the translated record.

This translation is affected by translation tables. A single translation table can specify DBCS and/or SBCS translation details, as well as language rules for the particular ASCII platform/workstation DBCS code page.

Several translation tables are supplied with the product in ready-to-use form. You can also create your own tables, using supplied examples and sample table source. Connect:Direct OS/400 can use the same format table source as Connect:Direct OS/390.

Connect:Direct OS/400 supplies the following tables in source form (CDXTSOURCE):

Table	Description
EBCXJIS	Japanese EBCDIC to Japanese ASCII SBCS
JISXEBC	Japanese ASCII SBCS to Japanese EBCDIC
EBCXKSC	EBCDIC to ASCII KS5601 DBCS
KSCXEBC	DBCS ASCII KS5601 to EBCDIC
EBCXKPC	EBCDIC to DBCS Korean ASCII
KPCXEBC	DBCS ASCII Korean to EBCDIC
NHCXBG5	Chinese new host to Chinese Big5 DBCS
BG5XNHC	Chinese Big5 to Chinese new host
NHCXC55	Chinese new host to Chinese 5550
C55XNHC	Chinese 5550 to Chinese new host
GBKXNHC	Chinese GBK to Chinese new host
NHCXGBK	Chinese new host to Chinese GBK

Creating and Updating Translation Tables

To create your own translation tables and update translation tables use the CRTCDXTTBL command. The command accepts the table source input file and compiles it to create the translation table object. The resulting translation table is stored as an OS/400 user space (*USRSPC).

Three additional keywords allow you to override the default values for the host SO/SI characters and to specify the format of the data on the host side.

You must specify whether the extended translation facility should be used for a given transfer operation. If you specify extended translation, you must also indicate which table should be used. You specify which table to use through the SYSOPTS keyword XTRAN for a send or receive.

CRTCDXTTBL Command Format

The following format is for the translate table creation command (CRTCDXTTBL).

Command	Parameters
CRTCDXTTBL	TABLE([library-name|*CURLIB]|table-name)
	SRCFILE([library-name|*LIBL]|file-name)
	SRCMBR(member-name|*TABLE)
	TEXT('description'|*SRCMBRTXT)
	REPLACE(*NO|*YES)

Required Parameters

Required parameter descriptions for the CRTCDXTTBL command follow.

TABLE([library-name|*CURLIB]|table-name)
specifies the library and table name for the resulting translation table. If you do not specify
library-name, Connect:Direct uses the default of *CURLIB.

SRCFILE([library-name|*LIBL]|file-name)
specifies the location of the file containing the table source. If you omit library-name, Connect:Direct
uses the default *LIBL and searches the library list for the file.

Optional Parameters

The following parameters are optional for the CRTCDXTTBL command.

SRCMBR(member-name|*TABLE)
specifies the name of the member that contains the table source. If you omit the member-name,
Connect:Direct defaults to *TABLE.

*TABLE means that the member will be the same name specified in the *TABLE parameter.

TEXT(description|*SRCMBRTXT)
specifies the text to be associated with the table. If you omit this parameter, Connect:Direct OS/400
defaults to *SRCMBRTXT.

*SRCMBRTXT indicates that the text should be the same as that of the table source file member.

REPLACE(*NO|*YES)
indicates whether an existing table object (*USRSPC) should be replaced with new table object. The
default value is *NO.

Table Translation Source

The translation table source resides in a source physical file member, and has a format that is upward compatible with extended translation on OS/390. The input records are of a fixed format, and all input must begin in column one of each record. The source can include the following sections or parameters:

Parameter	Required	Default	Format	Purpose
NAME	No	Table-name from command	8 Characters	Table Name informational
TITLE	No	Text from command	60 Characters	Table name informational
DEFAULT	No	0000	4-byte hex representation or NOTRAN	Default value for unspecified SBCS characters
SDEFAULT	No	STANDARD	2-byte hex representation or NOTRAN or STANDARD	Default value for unspecified SBCS character
RULES	No	80 - FF	2-byte hex representation	Language rules
END	Yes	None	None	
SBCS	No	None	2-byte hex representation	Single-byte character set translation table
DBCS	No	None	4-byte hex representation	Double-byte character set translation table
comment	No	None	* in column one	Allows any text

Parameter Definitions

The following definitions explain the parameters you can use in your table translation source.

NAME
is an optional parameter used for information only.

TITLE
is an optional parameter used for information only.

DEFAULT
specifies a default value for any unspecified single-byte character set characters.

SDEFAULT
specifies a STANDARD default value for any unspecified single-byte character set characters.

RULES
are used only when you receive and translate a file from ASCII platforms to OS/400. The OS/400 cannot determine valid DBCS characters without language rules. The RULES parameter defines what constitutes a double-byte character for the defined language. The default is any character from 80 through xFF, meaning any character with its high order bit on. If you specify the RULES parameter,

you terminate it with the END statement. The following table presents the valid options for this parameter.

Option	Description	Range	
JAPANESE	Japanese Industry Standard	x81–x9F	xE0–xFC
CHINESE	Traditional, Simplified, and 5550	x81–xFC	
BIG5	New Chinese	xA4–xC6	xC9–xF9
KS5601	Korean Standard	xA1–xAC	xB0–xFD
KOREAN	Old Korean	x81–xBF	
x01-xFF	User definable	Individual selections	

END
is the statement required to terminate each of the RULES, SBCS, and DBCS parameters.

SBCS
specifies that the single-byte character set will be used in the translation.

DBCS
specifies that the double-byte character set will be used in the translation.

comments
is free-form text used to describe the contents of the translation table.

Examples for Extended Translation

The following examples show various ways to specify RULES and SBCS for use with extended translation.

RULES Examples

The following examples show how to specify RULES for extended translation.

Input Example 1

In this example, all characters that adhere to KS5601 standard (start with xA1 through xA4 and xB0 through xC8) will be translated as double-byte character set (DBCS).

```
RULES
KS5601
END
```

Input Example 2

This example will translate all characters that adhere to the Japanese standard (all characters that start with a x81 through x9F and xEC through xFC) as double-byte characters (DBCS).

```
RULES
JAPANESE
END
```

Input Example 3

This example means translate all characters that adhere to the customized table as DBCS. All characters that start with x90 through x94 and xB0 through xB4 are treated as double-byte characters.

```
RULES
90
91
92
93
94
B0
B1
B2
B3
B4
END
```

SBCS Example

The SBCS parameter creates the single-byte character set translation table. This table will be used to translate all single-byte data during a file transfer. The default translation table is provided when SDEFAULT is given as or defaulted to STANDARD. The default translation table translates all EBCDIC characters in the range of x00 through xFF to their ASCII equivalent, within the range of x00 through x7F. The data will be translated from ASCII to EBCDIC if receiving the file.

If you define the SBCS parameter, all data must begin in column one, with only one hexadecimal character pair per line. The data is in the format: ff,tt, where ff denotes translate from and tt denotes translate to. Terminate the SBCS parameter with the END statement.

The following example translates xC1 to x41, xC2 to x42, xC3 to x43, xC4 to x44, xC5 to x45, and xC6 to x46.

```
SBCS
C1,41
C2,42
C3,43
C4,44
C5,45
C6,46
END
```

DBCS Example

The DBCS parameter creates the double-byte character set translation table. This table translates all double-byte data during a file transfer. This parameter has no default value. The DBCS parameter data begins in column one and terminates with the END statement. The data is in the format: f1f2,t1t2, where f1 denotes the first byte of the from DBCS character, f2 is the second byte of the from DBCS character, t1 is the first byte of the to DBCS character, and t2 is the second byte of the to DBCS character.

The following example translates x89A1 to xB0ED, x89A2 to xB0EE, x89A5 to xB0EF, x89A8 to xB0F0, x89A9 to xB0F1, x89AA to xB0F2, x89AB to xB0F3, xD375 to xC8EE, xD377 to xC8EF, and xD37B to xC8F0.

```
DBCS
89A1,B0ED
89A2,B0EE
89A5,B0EF
89A8,B0F0
89A9,B0F1
89AA,B0F2
89AB,B0F3
D375,C8EE
D377,C8EF
D37B,C8F0
END
```

Translation Table Source

Since a DBCS table can be extremely large and complex, Connect:Direct provides sample table sources for each of the eight supplied tables. These table source files can be copied and modified to produce customized tables.

The DEFAULT keyword specifies the default translated value of any DBCS characters not specified in the DBCS section. This keyword, given as 4 hex characters, defaults to 0000. This parameter can also be specified as NOTRAN meaning that such characters are not translated.

The SDEFAULT keyword specifies the default translated value of any SBCS characters not specified in the SBCS section. This keyword, given as 2 hex characters, STANDARD, or NOTRAN, defaults to STANDARD. NOTRAN indicates that any unspecified characters are not translated. STANDARD indicates that standard ASCII-EBCDIC (if receiving) or EBCDIC-ASCII (if sending) translation will be done for unspecified characters.

The comment keyword allows any informational text to be included in the table source. Any input card having an asterisk (*) in column one is a comment card.

The following translation table source example presents a sample preprocessor input data stream. This example is abbreviated so that it can be included in this document. Actual SBCS and DBCS tables are several pages in length.

```
NAME=MYTABLE
TITLE=SAMPLE TRANSLATION TABLE
DEFAULT=0000
SDEFAULT=STANDARD
RULES
80
81
82
83
84
END
SBCS
C1,41
C2,42
C3,43
C4,44
C5,45
C6,46
END
DBCS
89A1,B0ED
89A2,B0EE
89A5,B0EF
89A8,B0F0
89A9,B0F1
89AA,B0F2
89AB,B0F3
D375,C8EE
D377,C8EF
D37B,C8F0
END
```

The translation table object which results from the execution of the CRTCDXTTBL command is saved as an object type *USRSPC with the name given for the table-name specification of the CRTCDXTTBL parameter.

Process Definition

In order to invoke the extended translation facility using the supplied tables or a site customized one, the copy request must include the XTRAN keyword in the SYSOPTS string on the OS/400 side of the COPY.

The XTRAN keyword format is included in the *Connect:Direct OS/400 User's Guide* and the *Connect:Direct Process Statements Guide*.

Administering Statistics

This chapter describes the Connect:Direct OS/400 statistics facility you can use to determine the results of your Connect:Direct Processes and other Connect:Direct activities. Through five administrative commands, you can manage your statistics files, determining when the statistics file members are to be created, archived, and deleted. The following sections detail how you can use the statistics facility:

❖ Understanding the Statistics Facility

❖ Using the Administrative Statistics Commands

❖ Understanding Statistics Records and Types

Understanding the Statistics Facility

Each component of Connect:Direct OS/400 generates statistics information. The Connect:Direct OS/400 statistics facility logs information on activities in the Connect:Direct OS/400 system to a long-running statistics manager job (STATMGR) through a user queue. The STATMGR formats the statistics information and writes it to the statistics file.

The Connect:Direct OS/400 statistics facility logs statistics to a series of file members in the statistics file. The statistics file is a DB2/400 database, and index information is maintained by DB2.

Configuration

You specify the maximum number of records per member in the STATMAXSIZ initialization parameter. The minimum number of records per member is 1000.

The minimum configuration is two file members. You can configure more file members than the minimum of two. Specify the maximum number of members in the initialization parameter STATMAXMBR.

How Records are Written

Connect:Direct writes the statistics records to the members in chronological order, starting at the beginning of the member and proceeding until the member is full. The oldest record is always at the beginning of the member and the newest record is last.

Switching Members

When a file member reaches the number of records specified in the STATMAXSIZ initialization parameter, the system creates a new member in the file, and begins writing to it. When the creation of new member exceeds

the maximum member count that you specified for your statistics, Connect:Direct either archives or deletes the member as you specified in the STATFULACT initialization parameter.

If you indicated that the member should be archived, Connect:Direct archives the oldest member to the archive file (CDSTARCFIL). Archiving consists of compressing the member into a new member in the archive file and deleting the member from the statistics file. The archived file member has the same name as the statistics file member. Connect:Direct archives members asynchronously through a batch job.

If you specified that the member be deleted, Connect:Direct deletes the member synchronously through the STATMGR job.

Accessing Statistics Information

You can access the statistics files through the CDSELSTAT command or by selecting the Statistics Option (**23**) from the Main Menu. This command displays the records specified in the selection criteria. You then have the option of examining further detail. Connect:Direct OS/400 formats this detailed information and writes it to a spool file. According to your selection, the information either displays or is held in the queue for printing.

Managing Statistics

Five CL commands manage the statistics facility. These commands allow you to create, archive, restore, display and delete statistics file members. You can manage statistics with OS/400 job schedule entries, the SBMJOB command, and these commands at any time from the command line.

The following table describes the statistics commands.

Command	Function
CDCRTSTATM	Creates a new statistics file member and starts logging statistics to the new member.
CDDLTSTATM	Deletes specified statistics file members other than the active member.
CDARCSTATM	Archives a specified statistics file member other than the active member.
CDRSTSTATM	Restores a specified statistics file member from the statistics archive file.
CDDSPSTATI	Displays information about where the statistics are being logged.

Retrieving Statistics with the CDSELSTAT Command

When you issue CDSELSTAT command, the system locates the requested records by using the specified selection criteria. All the file members are available to CDSELSTAT command processing. Connect:Direct searches any file member that can contain records that satisfy the CDSELSTAT command, not just the member currently being written. The CDSELSTAT command also allows selection from a file other than the Connect:Direct statistics file. For example, you could select a file that was the object of the CDRSTSTATM command.

Creating Statistics File Members

The CDCRTSTATM command directs the statistics manager job to create a new statistics file member and start logging statistics records to the new member. The Connect:Direct statistics manager creates the new member and generates the member name (Scyymmdd##). If the command fails, logging continues as before.

Naming Conventions

The statistics manager generates the member names according to specific conventions. The following table presents a summary of the naming conventions for statistics members (Scyymmdd##).

Convention	Description
S	Appears as is
c	0 indicates 1928–1999 1 indicates 2000–2053
yy	Specifies the year
mm	Specifies the month
dd	Identifies the day of the month
xx	Designates the member number. Valid values are 00–99. Allows up to 100 members per day.

For example, a member named 'S098090400' is the first member created on 9/4/1998.

CDCRTSTATM Command Format

The following format is for the CDCRTSTATM command.

Command	Parameters
CDCRTSTATM	

Parameters

The CDCRTSTATM command has no parameters.

Deleting Statistics File Members

The CDDLTSTATM command deletes any specified statistics file member other than the active member. You receive an error if you attempt to delete the active member.

CDDLTSTATM Command Format

The following format is for the CDDLTSTATM command.

Command	Parameters
CDDLTSTATM	MBR(mbrname|*ALL|*OLDEST)

Required Parameter

The following parameter specifies which statistics file members to delete. There is no default parameter.

MBR(membername|*ALL|*OLDEST)
indicates the name of the member to be deleted.

membername specifies the name of the statistics file member to be deleted.

***ALL** indicates that all statistics file members except the currently active member are to be deleted.

***OLDEST** indicates that the oldest member are to be deleted.

Optional Parameters

There are no optional parameters for the CDDLTSTATM command.

Archiving Statistics File Members

The CDARCSTATM command archives and deletes any specified statistics file member other than the active member in the file. An error occurs if you attempt to archive the active member.

CDARCSTATM Command Format

This format is for the CDARCSTATM command.

Command	Parameters
CDARCSTATM	MBR(mbrname|*OLDEST)

Required Parameter

The following parameter is required for the CDARCSTATM command. There is no default value.

MBR(mbrname|*OLDEST)
specifies which file members to be archived.

mbrname indicates the name of the member to be archived.

***OLDEST** indicates that the oldest member should be archived.

Optional Parameters

There are no required parameters for the CDARCSTATM command.

Restoring Statistics File Members

The CDRSTSTATM command restores statistics file members from the statistics archive file. The members you request are decompressed from the archive file (CDSTARCFIL) to the specified location. You can then issue CDSELSTAT command against the output file.

CDRSTSTATM Command Format

The command format for the CDRSTSTATM command is shown in the following table.

Command	Parameters
CDRSTSTATM	MBR(mbrname)
	OUTFILE(library/file)

Required Parameters

The following parameters are required for the CDRSTSTATM command.

MBR(mbrname)
indicates the name of the member(s) to be decompressed from the statistics archive file.

mbrname specifies the name of the file(s) to be decompressed.

OUTFILE(library/file)
indicates the name of the library and file where the decompressed member(s) are placed.

Optional Parameters

There are no optional parameters for the CDRSTSTATM command.

Deleting Archived Statistics Members

The CDDLTARCST command deletes archived statistisc members.

CDDLTARCST Command Format

This table provides the command format used with the CDDSPSTATI command.

Command	Parameters
CDDLTARCST	MBR(mbrname|*ALL|*OLDEST)

Required Parameters

MBR(membername|*ALL|*OLDEST)
indicates the members to delete.

membername indicates to delete the specified archived statistics member.

*ALL indicates to delete all archived statistics members.

*OLDEST indicates to delete the oldest archived statistics member.

Optional Parameters

There are no optional parameters for the CDDLTARCST command.

Displaying Statistics File Information

The CDDSPSTATI command displays information about where the statistics are currently being logged. The command formats and displays the following information about the current file:

❖ Library name

❖ File name

❖ Member name

CDDSPSTATI Command Format

This table provides the command format used with the CDDSPSTATI command.

Command	Parameters
CDDSPSTATI	

Parameters

The CDDSPSTATI command has no parameters.

Retrieving Statistics Information

Use the CDSELSTAT command to select statistics information for viewing or printing. You can specify several selection criteria to limit the records selected. The command selects records from either the currently active statistics file or a named statistics database file. Within the file, all members are available to CDSELSTAT and are viewed together as a single logical file.

CDSELSTAT Command Format

The command format shown in the following table is for the CDSELSTAT command.

Command	Parameters
CDSELSTAT	FILE(filename|*ACTIVE)
	FORMAT(*SUMMARY|*DETAIL)
	OUTPUT(*|*PRINT)
	PERIOD(starttime, startdate, endtime, enddate)
	PNUM(process-number|*ALL)
	PNAME(process-name|*ALL)
	PUSER(local-user-name|*ALL)
	RCDTPYE(record-type|*ALL)
	RMTNODE(remote-node-name|*ALL)
	TRACE(L,S,F,C,X,K,D,H,V,W,P|*NONE|*ALL|*EXT|*COMMON|*INITPARMS|*CURRENT)

Required Parameters

The CDSELSTAT command has no required parameters.

Optional Parameters

The following parameters are optional for the CDSELSTAT command.

FILE(filename|*ACTIVE)
allows you to specify the statistics database file to search.

filename indicates the name of a specific file to search.

*ACTIVE directs the command to search the file to which Connect:Direct is currently logging.

FORMAT(*SUMMARY|*DETAIL)
controls how the selection results are presented. Connect:Direct OS/400 presents the selected records in timestamp sequence regardless of the output format chosen. FORMAT allows you to select two formats:

*SUMMARY specifies that the summary information for the selected record are presented as a single row in a scrollable list.

*DETAIL specifies that the entire contents of information for the selected record be formatted into a spooled file. You can view this file at a display station, or you can queue the file to be printed.

Each format is displayed or printed. If you specify FORMAT(*SUMMARY) and OUTPUT(*), you can toggle between the two views by pressing **F11**.

OUTPUT(*|*PRINT)
controls how the selection results are output. OUTPUT allows you to select two options:

* specifies that the statistics information are displayed.

*PRINT specifies that the statistics information are printed.

PERIOD(starttime, startdate, endtime, enddate)
allows you to limit the search to a specific period of time rather than including the entire range available in the statistics file. The parameters for the PERIOD keyword are positional.

starttime and **endtime** specify statistics selection starting and ending at specific times of the day in the format: hhmmssXM.

If you use a 24-hour clock, valid times range from 00:00:00 to 24:00:00. If you do not specify AM or PM, Connect:Direct OS/400 assumes that the 24-hour clock is used.

If you use the 12-hour clock, 01:00:00 would be expressed as 1:00 AM, and 13:00:00 would be expressed as 1:00PM.

*AVAIL specifies the earliest date available in the file.

*TODAY specifies the current date.

*NOON specifies 12:00:00 as a time value.

*MIDNIGHT specifies 00:00:00 as a time value.

startdate and **enddate** indicate start and end dates for statistics selection as a specific date (month, day, and year) in one of three formats: mmddyy, mm/dd/yy, or mm.dd.yy.

The interpretation of dates is subject to the QDATFMT and QDATSEP system values. Input dates are interpreted according to the date format of the current job (OS/400 job date format).

*AVAIL specifies the earliest date available in the file.

*TODAY specifies the current date.

PNUM(process-number|*ALL)
specifies the number of the Process to be searched.

process-number specifies the number of a particular Process.

*ALL specifies that all Processes be searched.

PNAME(process-name|*ALL)
specifies the name of the Process to be searched. This parameter allows generic selections.

process-name specifies the name of the Process to be searched.

*ALL specifies that all Processes be searched.

PUSER(local-user-name|*ALL)
specifies the local user name of the Process to be searched. This parameter allows generic selections.

local-user-name specifies the local user's name to be searched.

*ALL specifies that all local users be searched.

RMTNODE(remote-node-name|*ALL)
specifies the remote node name of the Process to be searched. This parameter allows generic selections.

remote-node-name specifies the remote node name for the Process to be searched.

*ALL specifies that all remote nodes be searched.

RCDTYPE(record-type|*ALL)
specifies the record type of the Process to be searched.

record-type specifies the type of records to be searched. Refer to the *Statistics Records by Category and Event* section beginning on page 12-14 for valid record types.

*ALL specifies that all records be searched.

TRACE

Trace Instructions
(L, S, F, C, X, K, D, H, V, W, P,|*NONE|*ALL|*EXT| *COMMON|*INITPARMS|*CURRENT)

specifies the trace bits that define functions to be traced by Connect:Direct OS/400. The following are valid options:

❖   **L** enables the main line logic trace for all components.

❖   **S** enables the Process step logic trace.

❖   **F** enables the file handler trace.

❖   **C** enables the communications logic trace.

❖   **X** enables the XDR trace.

❖   **K** enables the KQV logic trace.

❖   **D** enables the all-purpose data dump.

❖   **H** enables the FMH dump.

❖ **V** enables the XDR dump.

❖ **W** enables the communications dump.

❖ **P** enables the CIPC dump.

❖ ***NONE** turns off all traces.

❖ ***ALL** enables all product traces.(L, S, F, C, X, K, D, H, V, W and P)

❖ ***EXT** enables all product traces plus two system traces (TRCICF and TRCJOB).

❖ ***COMMON** enables the communications traces. (L, S, F, C, and H)

Using Statistics Screens

Complete the following steps to access the statistics screens and select statistics:

1. Issue the CDSELSTAT command from the command line and press **F4**. Connect:Direct displays the following screen.

```
                    Select C:D Statistics (CDSELSTAT)

 Type choices, press Enter.

 Input file name  . . . . . . . .    *ACTIVE       Name, *ACTIVE
   Library  . . . . . . . . . . .                  Name, *LIBL
 Time period for selection.:
   Period starting time . . . . .    *AVAIL        Time, *AVAIL
   Period starting date . . . . .    *TODAY        Date, *TODAY, *AVAIL
   Period ending time . . . . . .    *AVAIL        Time, *AVAIL
   Period ending date . . . . . .    *TODAY        Date, *TODAY, *AVAIL
 Process number . . . . . . . . .    *ALL          Number, *ALL
 Process name . . . . . . . . . .    *ALL          Name, *ALL
 User ID  . . . . . . . . . . . .    *ALL          Name, *ALL
 Remote node name . . . . . . . .    *ALL
 Statistics record type . . . . .    *ALL          Record type, *ALL
               + for more values
 Output destination . . . . . . .    *             *, *PRINT
 Output format  . . . . . . . . .    *SUMMARY      *SUMMARY, *DETAIL
 Trace bits string  . . . . . . .    *NONE         *NONE, trace string
                                                                  Bottom
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

2. From this screen, review your parameters before issuing the command or make changes to your parameters before running the command.

3. After typing your changes, press **Enter** to apply the values and submit the command. The following screens display the statistics information you requested.

4. From this screen, you can display detailed information on a specific Process or print the information.

The following screens show how the *SUMMARY format selection displays on the screen. The first figure shows View 1.

```
                         Select C:D Statistics

 Process number . .   *ALL               Statistics file  :   CDSTATFILE
 Process name . . .   *ALL               Library  . . . . :   CDDV3500
                                         Position to date

 Type options, press Enter.
   5=Display details   6=Print details

      Process   Process         Record  Step       Event     Event    Message
 Opt  number    name            type    name       time      date     ID
      00014858  CDSNDCRC        SMSES              11:03:49  03/15/04
      00014858  CDSNDCRC        SMPST              11:03:50  03/15/04
      00014858  CDSNDCRC        SMSTST             11:03:50  03/15/04
      00014858  CDSNDCRC        SMCOMP  STEP001    11:03:51  03/15/04  SCPA000I
      00014858  CDSNDCRC        SMSTTM             11:03:51  03/15/04
      00014858  CDSNDCRC        SMSTM              11:03:52  03/15/04
      00014859  CDSNDCRC        SMSES              11:06:20  03/15/04
      00014859  CDSNDCRC        SMPST              11:06:20  03/15/04
                                                                    More...
 Parameters or command
 ===>
 F3=Exit   F4=Prompt   F9=Retrieve   F11=View 2   F12=Cancel
```

The following screen is View 2 of the CDSELSTAT screen.

```
                         Select C:D Statistics

 Process number . .   *ALL               Statistics file  :   CDSTATFILE
 Process name . . .   *ALL               Library  . . . . :   CDDV3500
                                         Position to date

 Type options, press Enter.
   5=Display details   6=Print details

      Process   Record  Local       Local            Remote
 Opt  number    type    user        node             node
      00014858  SMSES   LCLUSER     CDDV3500         ATLANTA
      00014858  SMPST   LCLUSER     CDDV3500         ATLANTA
      00014858  SMSTST  LCLUSER     CDDV3500         ATLANTA
      00014858  SMCOMP  LCLUSER     CDDV3500         ATLANTA
      00014858  SMSTTM  LCLUSER     CDDV3500         ATLANTA
      00014858  SMSTM   LCLUSER     CDDV3500         ATLANTA
      00014859  SMSES   LCLUSER     CDDV3500         PHILADELPHIA
      00014859  SMPST   LCLUSER     CDDV3500         PHILADELPHIA
                                                                    More...
 Parameters or command
 ===>
 F3=Exit   F4=Prompt   F9=Retrieve   F11=View 1   F12=Cancel
```

The following screen is an example of Option 5, Display Details.

```
                                    Display Spooled File
 File  . . . . . :   CDSELSTAT                                   Page/Line   1/6
 Control . . . . .                                               Columns    1 - 130
 Find  . . . . . .

 *...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8....
 C:D/400         Select Statistics (CDSELSTAT) Detail  03/22/04  09:49:44   Page 0001

 --------------------------------------------------------------------------------
 Event:         Communications Session Started (SMSES)
 Process Name:  CDSNDCRC                              Process Number:  00014859
 Date/Time:     03/15/04     11:06:20
 Local Node:    CDDV3500                              Local User:  LCLUSER
 Remote Node:   ATLANTA
 Protocol:      TCPIP                                 Type:  INIT
 Message Id:    ASMT292I


 --------------------------------------------------------------------------------
 PROTOCOL:
 CIPHER: :
                    Encryption  Digital-Signature  Algorithm List
                    =========   ==================================================
 PNODE              N                      NO
 SNODE              N
 MERGE              N                      NO


 --------------------------------------------------------------------------------
                                                                        Bottom
 F3=Exit   F12=Cancel   F19=Left   F20=Right   F24=More keys
```

Deleting Archived Statistics Members

The CDDLTARCST command enables you to delete archived statistics members. To use this command:

1. Issue the CDDLTARCST command from the command line and press **F4**. Connect:Direct displays the following screen.

```
                    Delete Connect:Direct Statisti (CDDLTARCST)

 Type choices, press Enter.

 The member to delete.  . . . . .                    Name, *ALL, *OLDEST

















                                                                       Bottom
   F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel   F13=How to use this display
   F24=More keys
```

2. Type the name of the archived statistics member to delete.

3. Press **Enter**.

Retrieving Statistics Using an API

An Application Program Interface (API) makes certain statistics functions available programatically. The API is packaged as an OS/400 service program (*SRVPGM) object named CDSTATAPI, which must be bound with any applications utilizing API services.

Select Statistics

The select statistics API selects statistics records based on selection criteria specified in the CDSTSELCB structure and places those records in the area pointed to by *buf.

The API returns only complete records up to a maximum of max_return_size bytes. The CDSTSELST function returns the number of bytes actually placed in the output area. The more_bytes field in the CDSTSELCB structure indicates whether more bytes are available.

```
   Include file:  cdstatapi.h

   int  CDSTSELST(void *buf, CDSTSELCB *sel_cb, int  max_return_size,
   int  sel_type )
```

Field Descriptions

The following fields are used with this API. The function of each field follows.

*buf
 pointer to area to place selected records

*sel_cb
 pointer to Connect:Direct selection description control block

max_return_size
 integer value specifying maximum number of bytes to be returned

sel_type
 integer specifying type of selection (initial or continuation). Possible values of sel_type are:

 SEL_INIT, initial selection, discards any pending selection information and records that have yet to be presented to the calling application.

 SEL_CONT, continuation of a previous selection, returns next set of records satisfying selection criteria.

 SEL_QUIT, finished with selection, discards pending selection information and frees associated storage.

Understanding Statistics Records and Types

Connect:Direct OS/400 logs statistics to a physical file, CDSTATFILE, in the product library. The statistics manager creates members named Scyymmdd##. Each component of this name gives you information about the member:

❖ c indicates the year: **0** indicates years 1928–1999; **1** indicates years 2000–2053

❖ yymmdd identifies the creation date

❖ ## is a sequence number (up to 100 members on a given date)

Defining Statistics Records with Initialization Parameters

You can define your statistics records with specific initialization parameters. The following initialization parameters relate to statistics records:

❖ STATMAXSIZE determines how large a statistics file member are. This parameter also controls the frequency with which new members are created. When a file reaches this maximum size, Connect:Direct closes the member and continues logging to a newly created member.

❖ STATMAXMBR determines the number of members to maintain in the statistics file and when statistics file members are removed from the file. When these members are removed, you can copy them to the archival file, or you can simply delete the members.

❖ STATFULACT specifies what happens to the oldest statistics file member when Connect:Direct OS/400 exceeds the maximum number of members. The file members are archived or selected when the maximum number of members is reached.

For a complete description of initialization parameters and list of subparameters, refer to Chapter 5, *Modifying Initialization Parameters*.

Physical Layout of Statistics Records

The file has a single, generic physical record format. Each of the various statistics event records is written to the physical file using this generic record format. The following table describes the physical layout of the statistics records. The structure name for this format is CD_STAT_PF. The data type of all field names is character.

Field Name	Length	Start Position	Special Value	Description
PROCNAME	14	1	May be blank	Process name
PROCNUM	8	15	May be blank	Process number
TIMESTAMP	14	23	yyyymmddhhmmss	Date/time item was generated
RCDTYPE	6	37		Type of statistics event
COMPNAME	6	43	SESMGR, STATS, SPOOLR, ADMIN, CMPRES, PROCTL, LISTEN	Generating component ID
LCLUSER	10	49		Generating component user ID
LCLNODE	16	59	May be blank	Local node name
RMTNODE	16	75	May be blank	Remote node name
STDATA	300	91	May be blank	Variable (event dependent) statistics record data

Statistics Records by Category and Event

The statistics facility generates 42 different statistics record types. Some of the record types share a common set of information. In these cases they also share a common data structure.

The following tables describe each event record, showing the information contained, and the structure by which its STDATA field is mapped.

Note: The common header fields described in the previous table are not repeated. All fields described here represent the data which is placed in the STDATA field of the common physical record format.

The following table presents the statistics record by category. The information identifies the structure associated with the different events and shows which events are in a specific category.

Category	Event	Structure
General	GNMSG	CD_ST_GNMSG
Session Manager	SMSES	CD_ST_SMSES
	SMSTM	CD_ST_SMSES
	SMPST	CD_ST_SMP
	SMPTM	CD_ST_SMP
	SMMBR	CD_ST_SMMBR

Category	Event	Structure
	SMSTST	CD_ST_SMST
	SMSTTM	CD_ST_SMST
	SMCOMP	CD_ST_SMCOMP
	SMMSG	CD_ST_SMMSG
Spooler File Selected	SPFSL	CD_ST_SPFSL
Spooler Monitor	SPEADD	CD_ST_SP
	SPECHG	CD_ST_SP
	SPEDLT	CD_ST_SP
	SPHLD	CD_ST_SP
	SPREL	CD_ST_SP
Statistics Manager	STMCRT	CD_ST_STM
	STMDLT	CD_ST_STM
	STMARC	CD_ST_STM
Precompression	MCMP	CD_ST_M_CMP
	MDCMP	CD_ST_M_CMP
TCP/IP Listener Job	TLSES	CD_ST_TL
	TLGIVE	CD_ST_TL
User Administration	ADUADD	CD_ST_ADU
	ADUCHG	CD_ST_ADU
	ADUDLT	CD_ST_ADU
Network Map Administration	ADNADD	CD_ST_ADN
	ADNDLT	CD_ST_ADN
	ADNCHG	CD_ST_ADN
Initialization Parameters Administration	ADPARM	CD_ST_IPARM
Process Control Commands	PCSUB	CD_ST_PC
	PCDEL	CD_ST_PC
	PCFLU	CD_ST_PC
	PCSUS	CD_ST_PC
	PCHOLD	CD_ST_PC
	PCREL	CD_ST_PC
Component (Job) Control	JOBSUB	CD_ST_JOB
	JOBSTR	CD_ST_JOB
	JOBEND	CD_ST_JOB

Category	Event	Structure
Connect:Direct OS/400 System	CDSTRT	None
	CDSTOP	None

The following series of tables present the statistics records by events. The information identifies the field name, length, and start position associated with the different events and includes any special values and a description of the event.

General Events

The following table details the statistics record types generated by general message events. The structure is CD_ST_GNMSG. All field types are character.

Event	Field Name	Length	Start Position	Special Value	Description
GNMSG	MSGTEXT	120	1		General message text

Session Manager Events

The following table details the statistics record types generated by session manager events.

Event	Field Name	Length	Start Position	Special Value	Description
SMCOMP					Completion code
	STEPNAME	10	1	May be blank	Process step name
	RTCODE	8	11		C:D return code
	FBCODE	8	19		C:D feedback code
	MSGID	8	27		C:D message id
SMMBR					Member copy
	STEPNAME	10	1		Process step name
	OMBRNAME	10	11		Original member name
	NMBRNAME	10	21		New member name
	NUMRCDS	11	31		Number of records transferred
SMMSG					Message to user
	STEPNAME	10	1	May be blank	Process step name
	DSTUSER	10	11		Destination user
	MSGTEXT	120	21		Message text

Event	Field Name	Length	Start Position	Special Value	Description
SMPST					Process start record
	PNODE	1	1	Y, N	Is local node primary?
	SBMUSER	10	11		Submitting user ID
SMPTM					Process termination
	PNODE	1	1	Y, N	Is local node primary?
	SBMUSER	10	11		Submitting user ID
	ELAPSED	6	21		Elapsed seconds
	CCODE	8	29		Completion code
SMSES					Session establishment
	PROTOCOL	6	1	LU6.2, TCP/IP, LU0	Communication protocol used
	STYPE	4	7	INIT, EVK	Session start type
	P_SECDTA	1	11	Y,N	PNODE Encode Data FLAG
	P_SECDIG	1	12	Y,N	PNODE Digest FLAG
	P_SECSIG	1	13	Y,N	PNODE Digital Signature FLAG
	S_SECDTA	1	14	Y,N	SNODE Encode Data FLAG
	S_SECDIG	1	15	Y,N	SNODE Digest FLAG
	S_SECSIG	1	16	Y,N	SNODE Digital Signature FLAG
	M_SECDTA	1	17	Y,N	MERGE Encode Data FLAG
	M_SECDIG	1	18	Y,N	MERGE Digest FLAG
	M_SECSIG	1	19	Y,N	MERGE Digital Signature FLAG
	SES_MSGID	8	20		Session Message ID
SMSTM					Session termination
	PROTOCOL	6	1	LU6.2, TCP/IP, LU0	Communication protocol used
	STYPE	4	7	INIT, EVK	Session start type
	ELAPSED	6	11		Elapsed seconds
SMSTOP					Session manager ended
SMSTRT					Session manager started
SMSTST					Step started
	STEPNAME	10	1		Process step name
	TYPE	3	11	CPY, TSK, JOB, SBM	Process step type

Event	Field Name	Length	Start Position	Special Value	Description
	DIRECTION	3	14	SND, RCV	Copy data direction
	SRCFNAME	50	17		Source file name (copy only)
	DSTFNAME	50	67		Destination file name (copy only)
	NUMBYTES	11	117		Number bytes transferred (copy only) (SMSTTM)
	P_SECDTA	1	128	Y,N	PNODE Encode Data FLAG
	P_SECDIG	1	129	Y,N	PNODE Digest FLAG
	P_SECSIG	1	130	Y,N	PNODE Digital Signature FLAG
	S_SECDTA	1	131	Y,N	SNODE Encode Data FLAG
	S_SECDIG	1	132	Y,N	SNODE Digest FLAG
	S_SECSIG	1	133	Y,N	SNODE Digital Signature FLAG
	M_SECDTA	1	134	Y,N	MERGE Encode Data FLAG
	M_SECDIG	1	135	Y,N	MERGE Digest FLAG
	M_SECSIG	1	136	Y,N	MERGE Digital Signature FLAG
	SES_MSGID	8	137		Session Message ID
SMSTTM					Step termination
	STEPNAME	10	1		Process step name
	TYPE	3	11	CPY, TSK, JOB, SBM	Process step type
	DIRECTION	3	14	SND, RCV	Copy data direction
	SRCFNAME	50	17		Source file name (copy only)
	DSTFNAME	50	67		Destination file name (copy only)
	NUMBYTES	11	117		Number bytes transferred (copy only) (SMSTTM)
	ECMETHOD	4	128		Extended Compression method
	ECLEVEL	1	132		Ext. Comp. Level
	ECWINDOW	2	133		Ext. Comp. window
	ECMEMORY	1	135		Ext. Comp. Memory
	CMPR_PERCENT	4	136		Comp. Percent
	ELAPSED	6	140		Elapsed seconds (SMSTTM only)
	CCODE	8	146		Completion Code (SMSTTM only)
	P_SECDTA	1	152	Y,N	PNODE Encode Data FLAG
	P_SECDIG	1	153	Y,N	PNODE Digest FLAG
	P_SECSIG	1	154	Y,N	PNODE Digital Signature FLAG

Event	Field Name	Length	Start Position	Special Value	Description
	S_SECDTA	1	155	Y,N	SNODE Encode Data FLAG
	S_SECDIG	1	156	Y,N	SNODE Digest FLAG
	S_SECSIG	1	157	Y,N	SNODE Digital Signature FLAG
	M_SECDTA	1	158	Y,N	MERGE Encode Data FLAG
	M_SECDIG	1	159	Y,N	MERGE Digest FLAG
	M_SECSIG	1	160	Y,N	MERGE Digital Signature FLAG
	SES_MSGID	8	161		Session Message ID

Spooler File Selected Events

The following table details the statistics record types generated by spooler file selected events. The structure is CD_ST_SPFSL.

Event	Field Name	Length	Start Position	Special Value	Description
SPFSL					Spooler file selected
	SPLFNAME	10	1		Spooled file name
	SPJBNAME	10	11		Spooled file job name
	SPUSER	10	21		Spooled file user ID
	SPJBNUM	6	31		Spooled file job number
	SPLFNUM	4	37		Spooled file number
	OUTQNAME	10	41		Output queue name
	OUTQLIB	10	51		Output queue library name

Spooler Monitor Events

The following table details the statistics record types generated by spooler monitor events. The structure is CD_ST_SP.

Event	Field Name	Length	Start Position	Special Value	Description
SPEADD					SPLMON entry added
	OUTQNAME	10	1		Output queue name
	OUTQLIB	10	21		Output queue library name
	ENVIRON	5	31		Remote node environment
	DSTTYPE	6	36	*SPOOL, *FILE	Data destination type

Event	Field Name	Length	Start Position	Special Value	Description
SPECHG					SPLMON entry changed
	OUTQNAME	10	1		Output queue name
	OUTQLIB	10	11		Output queue library name
SPEDLT					SPLMON entry deleted
	OUTQNAME	10	1		Output queue name
	OUTQLIB	10	11		Output queue library name
SPHLD					Spooler location held
	OUTQNAME	10	1		Output queue name
	OUTQLIB	10	11		Output queue library name
SPREL					Spooler location released
	OUTQNAME	10	1		Output queue name
	OUTQLIB	10	11		Output queue library name

User Administration Events

The following table details the statistics record types generated by user administration events. The structure is CD_ST_ADU.

Event	Field Name	Length	Start Position	Special Value	Description
ADUADD					User added
	USER	76	1		User name
	TYPE	4	77	*LCL, *RMT	Type of user definition (ADUADD)
	AUTH	6	81	*USR, *ADMIN	Type of authorization (ADUADD)
	LCLUSER	10	87		Local user profile (ADUADD)
ADUCHG					User changed
	USER	76	1		User name
ADUDLT					User deleted
	USER	76	1		User name

Network Map Administration Events

The following table details the statistics record types generated by network map administration events. The structure is CD_ST_ADN.

Event	Field Name	Length	Start Position	Special Value	Description
ADNADD					Network map entry added
	NODE	16	1		Network Node
	ENVIRON	6	17		Adjacent node environment (ADNADD)
	PROTOCOL	6	23	LU6.2, TCP/IP	Communication protocol used (ADNADD)
ADNCHG					Network map entry changed
	NODE	16	1		Network Node
ADNDLT					Network map entry deleted
	NODE	16	1		Network Node

Initialization Parameters Maintenance Events

The following table details the statistics record types generated by initialization parameters maintenance events. The structure is CD_ST_IPARM.

Event	Field Name	Length	Start Position	Special Value	Description
ADPARM					Initialization parameter changed
	PARAMETER	11	1		Name of parameter changed

Statistics Manager Events

The following table details the statistics record3 types generated by statistics manager events. The structure is CD_ST_STM.

Event	Field Name	Length	Start Position	Special Value	Description
STMARC					Statistics file member archived
	MBR	10	1		Statistics file member name
	FILE	10	11		Statistics file name
	LIB	10	21		Statistics file library name
STMCRT					Statistics file member created
	MBR	10	1		Statistics file member name
	FILE	10	11		Statistics file name

Event	Field Name	Length	Start Position	Special Value	Description
	LIB	10	21		Statistics file library name
STMDLT					Statistics file member deleted
	MBR	10	1		Statistics file member name
	FILE	10	11		Statistics file name
	LIB	10	21		Statistics file library name

Precompression Events

The following table details the statistics record types generated by precompression events. The structure is CD_ST_M_CMP.

Event	Field Name	Length	Start Position	Special Value	Description
MCMP					CDCOMP results
	INFILE	10	1		Input file name
	INLIB	10	11		Input library name
	INMBR	10	21		Input member name
	OUTFILE	10	31		Output file name
	OUTLIB	10	41		Output library name
	OUTMBR	10	51		Output member name
	RATIO	6	61		Compression ratio
MDCMP					CDDECOMP results
	INFILE	10	1		Input file name
	INLIB	10	11		Input library name
	INMBR	10	21		Input member name
	OUTFILE	10	31		Output file name
	OUTLIB	10	41		Output library name
	OUTMBR	10	51		Output member name
	RATIO	6	61		Compression ratio

TCP/IP Listener Job Events

The following table details the statistics record types generated by TCP/IP listener job events. The structure is CD_ST_TL.

Event	Field Name	Length	Start Position	Special Value	Description
TLGIVE					Socket descriptor passed to session manager
	IPADDR	15	1		Remote IP address
	IPPORT	5	16		Remote IP PORT
TLSES					Connection request received on listen socket
	IPADDR	15	1		Remote IP address
	IPPORT	5	16		Remote IP PORT

Process Control Commands Events

The following table details the statistics record types generated by process control command events. The structure is CD_ST_PC.

Event	Field Name	Length	Start Position	Special Value	Description
PCDEL					Process deleted
	CMDUSER	10	1		Command issuing user (except PCSUB)
PCFLU					Process flushed
	CMDUSER	10	1		Cmd issuing user (except PCSUB)
PCHOLD					Process held
	CMDUSER	10	1		Cmd issuing user (except PCSUB)
PCREL					Process released
	CMDUSER	10	1		Cmd issuing user (except PCSUB)
PCSUB					Process submitted
PCSUS					Process suspended
	CMDUSER	10	1		Cmd issuing user (except PCSUB)

Component (Job) Control Events

The following table details the statistics record types generated by component (job) control events. The structure is CD_ST_JOB.

Event	Field Name	Length	Start Position	Special Value	Description
JOBSUB					Job submitted for execution
	JOBNAME	10	1		Component job name
	JOBNUMBER	6	11		Component job number
	JOBPGM	10	17		Component job program
JOBSTR					Job started
	JOBNAME	10	1		Component job name
	JOBNUMBER	6	11		Component job number
	JOBPGM	10	17		Component job program
JOBEND					Job ended
	JOBNAME	10	1		Component job name
	JOBNUMBER	6	11		Component job number
	JOBTYPE	10	23		Component job type
	JOBCODE	1	27	A, N	Component job end code (JOBEND)

Connect:Direct OS/400 System Events

The following table details the statistics record types generated by Connect:Direct OS/400 system events.

Event	Field Name	Length	Start Position	Special Value	Description
CDSTRT					Connect:Direct OS/400 system initialized
	No extended fields associated with this type				
CDSTOP					Connect:Direct OS/400 system shut down
	No extended fields associated with this type				

Connect:Direct Secure+ Option System Events

If Connect:Direct Secure+ Option is installed, the following records include Secure+ Option information:

Event	Function
SMSES	Process start
SMSTST	Copy step start

Event	Function
SMSTTM	Copy step end/termination

For additional information, refer to the *Connect:Direct Secure+ Option OS/400 Implementation Guide*.

Analyzing Connect:Direct Problems

This chapter details strategies to use to isolate and resolve Connect:Direct OS/400 operational problems. These strategies include:

❖ Obtaining Connect:Direct traces

❖ Accessing the OS/400 job log

❖ Using an OS/400 communications trace

❖ Obtaining current Connect:Direct OS/400 version and PTF level

This chapter also includes some typical problems and their solutions.

Obtaining Traces

When problems occur with Connect:Direct operations, run a Connect:Direct trace to isolate the problems for possible resolution. You can initiate Connect:Direct traces in three ways:

❖ Specify the trace settings in the TRCINST initialization parameter by using the WRKCDPARM command. If you use this method, you must restart Connect:Direct to apply the changes. Tracing occurs on all Connect:Direct components and all Processes.

❖ Specify trace options with the WRKCDSTS command. If you use this method, you override the current trace settings. You can use this command to change global trace settings or individual component trace settings while Connect:Direct is active. You are not required to restart Connect:Direct to apply these changes.

❖ Specify trace options with the CL commands (Examples: CDSND, CDRCV). This method overrides the WRKCDPARM and WRKCDSTS trace settings for the current Process only.

Note: Running Connect:Direct traces will significantly degrade Connect:Direct performance.

TRACEOPT

Trace Instructions
(L, S, F, C, X, K, D, H, V, W, P,|*NONE|*ALL|*EXT| *COMMON|*INITPARMS|*CURRENT)

specifies the trace bits that define functions to be traced by Connect:Direct OS/400. The following are valid options:

❖ **L** enables the main line logic trace for all components.

❖ **S** enables the Process step logic trace.

❖ **F** enables the file handler trace.

❖ **C** enables the communications logic trace.

❖ **X** enables the XDR trace.

❖ **K** enables the KQV logic trace.

❖ **D** enables the all-purpose data dump.

❖ **H** enables the FMH dump.

❖ **V** enables the XDR dump.

❖ **W** enables the communications dump.

❖ **P** enables the CIPC dump.

❖ ***NONE** turns off all traces.

❖ ***ALL** enables all product traces.(L, S, F, C, X, K, D, H, V, W and P)

❖ ***EXT** enables all product traces plus two system traces (TRCICF and TRCJOB).

❖ ***COMMON** enables the communications traces. (L, S, F, C, and H)

❖ ***INITPARMS** indicates the traces specified in the initialization parameters.

❖ <u>***CURRENT**</u> selects the trace bits that the session manager is currently using.

Command Trace Options
 (L,S,F,C,X,K,D,H,V,P|*ALL|*EXT|*COMMON| <u>*NONE</u>

specifies the trace bits that define functions to be traced for this command but not for the Process it runs. The following are valid options:

❖ **L** enables the main line logic trace for all components.

❖ **S** enables the Process step logic trace.

❖ **F** enables the file handler trace.

❖ **C** enables the common logic trace.

❖ **X** enables the XDR trace.

❖ **K** enables the KQV logic trace.

❖ **D** enables the all-purpose data dump.

❖ **H** enables the FMH dump.

❖ **V** enables the XDR dump.

❖ **P** enables the CIPC dump.

❖ ***ALL** enables all product traces.(L, S, F, C, X, K, D, H, V, and P)

❖ ***EXT** enables all product traces plus two other traces. (TRCICF and TRCJOB)

❖ ***COMMON** enables the most commonly used traces. (L, S, F, C, and H)

❖ <u>***NONE**</u> turns off all traces.

Turning on Traces

To turn a trace on, specify the appropriate trace bits in the TRACE parameter, and press **Enter**. The following two figures illustrate two examples of trace bit specification.

```
TRACEOPT(LSFCHD)
```

```
TRACEOPT(*COMMON)
```

Viewing Traces

You can view traces by using the OS/400 commands WRKSPLF or WRKOUTQ. Traces are placed in the output queue under the name CDTRACE.

Accessing the OS/400 Job Log

An OS/400 job log is a record of requests, such as commands, submitted to the system by a job, the messages related to the requests, and the actions performed by the system on the job.

If a Connect:Direct session manager or any other Connect:Direct OS/400 component terminates abnormally, a spooled output file (QPJOBLOG) is generated. The QPJOBLOG file contains information for determining the cause of the abnormal end.

Note: The QPJOBLOG spooled output file created should not be deleted until the cause of the abnormal
         termination has been determined.

The QPJOBLOG spooled output file is accessed using the WRKSPLF command as shown in the following example.

```
   WRKSPLF CDADMIN
```

Creating a Spooled Output File

Problems can occur with the Connect:Direct session manager or other component that do not cause it to terminate abnormally. If trace files generated to determine the source of the session manager problem do not help, a QPJOBLOG spooled output file might. Because the Connect:Direct session manager is not terminating abnormally, the OS/400 system will not normally create a QPJOBLOG spooled output file for the job. To force the system to create a QPJOBLOG file, you must modify the Connect:Direct job description.

A job description is a set of characteristics that define how the system handles a job. The Message logging (LOG) parameter is the job description characteristic that determines the amount and type of information logged by the system in a job log. The LOG parameter is made up of a list of three values: the message (or logging) level, the message severity, and the level of the message text.

Defaults for the Connect:Direct job description (CDJOBD) are a message level of **4**, a message severity of **0**, and a level of message text of ***NOLIST**. To tell the system to always create a job log for a Connect:Direct session manager, change the value for the level of message text to *MSG or *SECLVL. Specify *SECLVL for the level of message text so that both the message and help text of error messages are logged in the Connect:Direct session manager's job log.

Modifying the Connect:Direct Job Description

To specify that a job log is always created, modify the Connect:Direct job description using the CHGJOBD command, that follows.

```
   CHGJOBD    JOBD(cdlib/CDJOBD) LOG(4 0 *SECLVL) LOGCLPGM(*YES)
```

To specify that a job log is only created if the Connect:Direct session manager terminates abnormally (the normal case), modify the Connect:Direct job description using the CHGJOBD command, that follows.

```
CHGJOBD    JOBD(cdlib/CDJOBD) LOG(4 0 *NOLIST) LOGCLPGM(*NO)
```

Using an OS/400 Communications Trace

Use a communications trace to isolate communications protocol violations including SNA BIND problems. Initiate the OS/400 communications trace from a display connected to the system with a user profile that has the special authority (SPCAUT) of *SERVICE.

Note: Running a communications trace degrades system response time. The system uses a significant amount of auxiliary storage to hold the trace data collected.

Use the following steps to perform an SNA communications trace:

1. Type in the following command and press **Enter**.

```
STRCMNTRC CFGOBJ(linename) CFTTYPE(*LIN)
```

2. Run the failing Process for which you want a communications trace.

3. Type in the following command and press **Enter**.

```
ENDCMNTRC CFGOBJ(linename) CFTTYPE(*LIN)
```

4. Type in the following command and press **Enter**.

```
PRTCMNTRC CFGOBJ(linename) CFTTYPE(*LIN) CTLD(ctldesc) FMTSNA(*YES)
```

5. After the trace successfully prints, type in the following command and press **Enter**.

```
DLTCMNTRC CFGOBJ(linename) CFTTYPE(*LIN)
```

To browse, print, or save the spooled trace data, use system functions provided, such as the WRKSPLF (Work with Spooled Files) CL command. The trace will be in the output queue under the name CMNTRC.

Detailed information concerning OS/400 communications traces is contained in the *OS/400 System Support: Diagnostic Aids* manual.

Common Problems and Their Solutions

The following subsections contain some common OS/400 system error messages and their associated descriptions and examples of problems that can occur when using Connect:Direct OS/400. Following each example problem is a description of the action you can take to recognize and correct these problems.

OS/400 System Error Messages

Error Number	Definition
3001	domain error in math function
3002	range error in math function
3003	truncation on I/O operation
3004	file has not been opened
3005	file not opened to read
3006	input/output error
3007	no such device
3008	file opened for record I/O
3009	file not opened for write
3010	stdin cannot be opened
3011	stdout cannot be opened
3012	stderr cannot be opened
3013	bad offset to seek to
3014	invalid file name specified
3015	invalid file mode specified
3017	invalid position specifier
3018	no record at specified position
3019	no ftell if more than 1 member
3020	no ftell if too many records
3021	invalid argument
3022	invalid function pointer
3025	/* no such file or library
3026	record not found
3027	/* operation not permitted
3028	message data invalid
3029	/* resource busy
3040	bad option on I/O function
3041	file not opened for update
3042	file not opened for delete
3043	padding occurred on write operation
3044	bad key length option
3080	illegal write after read

Error Number	Definition
3081	illegal read after write
3101	I/O exception non-recoverable error
3102	I/O exception recoverable error

Connect:Direct OS/390 Node Could Not Establish Session with Connect:Direct OS/400 Node

If the Connect:Direct OS/390 node cannot establish a session with the Connect:Direct OS/400 node, the communication devices on one or both of the OS/390 and OS/400 nodes are inactive. Possible Connect:Direct OS/390 error messages that may appear are SVTM425I and SVTM026I.

Action to Take

Controllers and LUs on both the OS/390 and the OS/400 nodes must be active before a session is established. Check both systems and vary on the inactive device. (For OS/400 nodes, refer to Chapter 9, *Performing Administrative Duties*, for information on varying on the device.)

Note: If you did not receive any error messages, issue a SELECT PROCESS command on Connect:Direct OS/390 (described in the *Connect:Direct OS/390 User's Guide*.) If the Process appears to be executing but is not in the Process control state, the controller or line on the OS/400 node is probably inactive. Vary on the inactive device. You can also end the session by varying off the OS/390 controller.

After Successful Session Establishment, the Session Abnormally Terminates

If the session abnormally terminates after successful establishment, the OS/400 Connect:Direct library name in the network map of the remote Connect:Direct node may be incorrect. Possible Connect:Direct OS/390 messages that may appear are SVTM018I and SVTM041I.

On the OS/400 node, issue a DSPMSG QSYSOPR command from your terminal running OS/400. The following message may display:

```
   Program start request received on communication line
   [device name] was rejected with reason code 1507,0.
```

Action to Take

Update the network map of the remote Connect:Direct to indicate the production library name.

Unable to Establish Session

If you cannot establish a session, the following message can display.

```
   An error occurred during checking of the key
```

This message is generated if the license management key is incorrectly defined on the OS/400 node. Possible Connect:Direct OS/390 error messages that you may see are SVTM018I and SVTM041I. A possible OS/400 error message that you may see is AAPR519I.

Action to Take

Verify that the key file assigned by Sterling Commerce is correctly defined in the initial parameters file and that it has not expired.

Session Is Established and Immediately Terminated with No Apparent Error

This problem can occur if the wrong remote node user ID or password was defined in the Process. Possible Connect:Direct OS/390 error messages that may appear are SVTM055I and SVTM056I. A possible OS/400 error message that may appear is ASMT015I.

Action to Take

Correct the remote node user ID or password and submit the Process again.

Session Cannot Be Established with OS/400 Node

The following message is generated in the remote system and Connect:Direct logs:

```
alloc immed failure snode=cd400.dallas rcpr:0058. rcsc:0000.
```

A session cannot be established with an OS/400 node when the OS/400 system communication line, controller, or one of the devices is varied off (not active), or the device is not defined with LCLCTLSSN=*NO. A possible Connect:Direct OS/390 error message that may appear is SVTM256I.

Action to Take

On the OS/400 system, display the status of the communication line, controllers, and devices. If they are inactive, vary these devices on to enable sessions between the remote node (SNODE) and Connect:Direct OS/400 to be established.

If they are active, display the line description and check the LCLCTLSSN parameter. If the value in the LCLCTLSSN parameter is not *NO, change the value to *NO and vary the devices off and back on. Changing the parameter enables Connect:Direct OS/390 to establish a local node session with the Connect:Direct OS/400 node.

Session Never Established; No Error Message

A session can fail to establish yet generate no error message. This can occur when the USS table your NCP points to contains a message 10.

Action to Take

Display the LU status on the OS/390 system and see if the condition is PDLUIO, indicating the USS table does contain a message 10. You can correct this problem by taking one of the two following actions:

❖ Remove the message 10 from your USS table and try the transfer again.

❖ Modify the NCP definitions, pointing to a USS table that does not contain a message 10.

Not Able to Allocate Object Device Description

This problem occurs when Connect:Direct OS/400 tries to acquire the communication file and fails. A possible error message that may appear is CPF5355.

Action to Take

Take action to correct this error depending on the conditions described below.

❖ Device is not varied on. Vary on device for the Connect:Direct subsystem.

❖ Session not available for the current job. You exceeded the communications MODE maximum sessions allowed.

Session Not Established

A session may not establish if the request to start a new session failed when the program issued an acquire operation. This problem is a configuration problem. A possible error message that may appear is CPF5538.

Action to Take

Verify that the Advanced Program-to-Program Communications (APPC) device description is properly configured using the WRKDEVD (Work with Device Description) command. The condition is corrected by taking one of the actions described below.

❖ Verify that the remote location name (RMTLOCNAME) parameter, the local node location name (LCLLOCNAME) parameter, and the remote network identifier (RMTNETID) parameter are correct.

❖ Verify that the name of the mode description is the same as a mode name at the remote location by using the WRKMODD (Work with Mode Description) command.

Obtaining Current Version and PTF Level

Use the CDVER command to obtain the Connect:Direct OS/400 version and PTF level that you are currently running. This provides valuable information assists Sterling Commerce support personnel in resolving any system problems.

After entering the CDVER command, the version and PTF information will display at the bottom of your screen.

Appendix A

Defining the LU0 Environment

This appendix provides sample LU0 environment definitions for connectivity between Connect:Direct OS/400 nodes and other Connect:Direct nodes using an LU0 session.

The OS/400 node is a noninitiating node (SNODE) to LU0 nodes only. Connect:Direct OS/400 cannot initiate LU0 sessions. The remote node must initiate all Processes. To initiate Processes from Connect:Direct OS/400, you must use an LU6.2 or TCP/IP connection.

Refer to the *Connect:Direct Compatibility and Connectivity Chart* for assistance in defining your connectivity.

Sample OS/390 or VSE Definitions

Connect:Direct OS/400 LU0 protocol uses SNA Upline Facility (SNUF). Examples shown in this appendix are for a host controller and devices on an SDLC multipoint nonswitched (leased) line. If you are using one of the other SNUF-supported communication lines, refer to the *AS/400 Communication Definitions Examples Guide*, reference number GG24-3449-00. This guide also includes examples using the OS/400 interactive capabilities to generate these commands.

Each description on the OS/400 node has been named to correspond directly with its counterpart on the remote node. For example, the PU on OS/390 is called L1P1, and the corresponding controller on the OS/400 node is called L1P1.

While the examples in this appendix are for an SDLC multipoint nonswitched (leased) line, the following communication lines are supported by SNUF:

❖ SDLC multipoint

❖ SDLC point-to-point nonswitched

❖ IBM Token Ring network

❖ SDLC point-to-point switched (manual answer, automatic answer, manual call, automatic call)

❖ X.25 packet-switched data network supporting both permanent virtual circuit and switched virtual circuit connections

The devices described in this appendix is created only with a user profile of sufficient authority. The Connect:Direct administrator user profile has the necessary authority and should be used to create the devices.

The following subsections contain sample OS/390 environment definitions. VSE definitions should be similar to the OS/390 definitions. Refer to the installation guide for the OS/390 or VSE Connect:Direct product for detailed information. Much of the OS/390 or VSE information must correspond to information in the OS/400 environment.

These examples are not to be used as directions for defining your remote environment. The Connect:Direct System Administrator of the remote node must consult the appropriate installation and administration guide for instructions on defining the remote Connect:Direct environment, as well as defining the OS/400 node to the remote Connect:Direct node.

Refer to the *Connect:Direct Connectivity Guide* for additional information on defining your connectivity.

Define OS/390 or VSE VTAM Connections

Connect:Direct OS/400 uses a LOGMODE entry when establishing a session with the host node.

The following example illustrates a MODETAB with an LU0 LOGMODE entry. This example is referred to throughout this appendix.

```
CDLUTAB  MODETAB
CD04K MODEENT LOGMODE=CD04K,                                          *
              COS=NJE,                                               *
              FMPROF=X'04',                                          *
              TSPROF=X'04',                                          *
              PSNDPAC=X'07',                                         *
              SRCVPAC=X'07',                                         *
              SSNDPAC=X'07',                                         *
              PRIPROT=X'B1',                                         *
              SECPROT=X'B1',                                         *
              COMPROT=X'7080',                                       *
              RUSIZES=X'8989',                                       *
              PSERVIC=X'000000000000000000000000'
   *                    0 1 2 3 4 5 6 7 8 9 1011
          MODEEND
```

Only the pacing values (PSNDPAC and SSNDPAC) and RUSIZES parameter in the LOGMODE is changed. The minimum allowed RU size is 256 (RUSIZES=x'8585').

Unformatted Systems Services (USS) Table

Connect:Direct OS/400 does not use the USS table. However, if you define a USS table for the LUs to be used with OS/400 communication devices, you cannot include an MSG10 definition.

Sample VTAM Start-up List

The following example illustrates part of a VTAM start-up list.

SSCPID must be converted to hexadecimal format for the OS/400 node.

```
   NETID=NETNAME,                          *00010008
   SSCPNAME=HOSTCDRM,                      *00010106
   SSCPID=30200,                           *00010206
   TNSTAT,CNSL,TIME=60,                    *00010306
   NOPROMPT,                               *00010406
   GWSSCP=NO,                              *00010506
   CONFIG=00,                              *00010606
   .
   .
   .
```

Define OS/390 or VSE NCP Definitions

The following example is part of NCP source code with sample definitions for a Connect:Direct OS/400 node with an SDLC leased line. You need a portion of the information to define the OS/400 environment.

```
G11L1     GROUP       LNCTL=SDLC,
                      DUPLEX=FULL,
                      NPACOLL=YES,
                      NRZI=YES,
                      REPLYTO=1,
                      RETRIES=(7,4,5),
                      TYPE=NCP
LIN1      LINE        ADDRESS=(1,FULL),
                      ATTACH=DIRECT,
                      ANS=CONTINUE,
                      CLOCKNG=DIRECT,
                      DUPLEX=FULL,
                      ISTATUS=ACTIVE,
                      ETRATIO=30,
                      MAXPU=1,
                      SERVLIM=10,
                      SRT=(,64),
                      SPEED=19200
                      STATOPT='OS/400 LINE'
L1P1      PU          ADDR=C1,
                      PUTYPE=2,
                      ANS=CONTINUE,
                      ISTATUS=ACTIVE,
                      PASSLIM=8,
                      DISCNT=(NO),
                      DLOGMOD=EM3277,
                      MODETAB=MTGS3X,
                      SSCPFM=USSSCS,
                      RETRIES=(,1,4),
                      USSTAB=RSUSSTAB,
                      PACING=0,
                      VPACING=0,
                      MAXDATA=265,
                      MAXOUT=7,
                      XID=YES
LU02  LU  LOCADDR=02,ISTATUS=ACTIVE
LU03  LU  LOCADDR=03,ISTATUS=ACTIVE
LU04  LU  LOCADDR=04,ISTATUS=ACTIVE,
                      DLOGMOD=CD04K,
                      MODETAB=CDLUTAB,
                      USSTAB=OS400TAB
LU05  LU  LOCADDR=05,ISTATUS=ACTIVE,
                      DLOGMOD=CD04K,
                      MODETAB=CDLUTAB,
                      USSTAB=OS400TAB
LU06  LU  LOCADDR=06,ISTATUS=ACTIVE,
                      DLOGMOD=CD04K,
                      MODETAB=CDLUTAB,
                      USSTAB=OS400TAB
LU07  LU  LOCADDR=07,ISTATUS=ACTIVE,
                      DLOGMOD=CD04K,
                      MODETAB=CDLUTAB,
                      USSTAB=OS400TAB
```

Each line defined to VTAM for use with OS/400 has to have a corresponding OS/400 line definition. Each PU on that line corresponds to a controller on the OS/400 node, and each LU corresponds to a SNUF device description or 3270 emulation device description on the OS/400 node.

In the previous example, LU02 and LU03 are used for 3270 emulation. You use the mode table entry indicated in the PU macro because you didn't identify specific MODETAB and DLOGMOD in the LU macro. Corresponding 3270 emulation device descriptions are defined for these LUs.

LU04, LU05, LU06, and LU07 are dependent logical units which have a specific OS/400 LOGMODE specified and are therefore meant for Connect:Direct OS/400 use. Corresponding communication device descriptions are defined for this LU.

Define Connect:Direct OS/390 Remote Node Parameters

The Connect:Direct OS/390 administrator must define the Connect:Direct OS/400 node in the network map of the Connect:Direct OS/390 node. The *Connect:Direct OS/390 Administration Guide* contains instructions and examples.

```
  REMOTE.NODE=      (PARSESS=(4 2)  (OS400.dallas,,cdtest,SNUF)        -
                    SNODE.LUS=(LU04,LU05,LU06,LU07))
```

Sample Tandem Definitions

The following figure provides examples of lines, PUs, and LUs as defined at the Tandem node.

```
Object:  LINE\LINE1.$D7P4PS
AUTOLOAD ON     Characterset ASCII  Debug OFF        Dsrtimeout 4.00
Duplex FULL     Flagfill OFF        Interface RS232  Iopages 2
Luopmsg OFF     Maxlus 32           Maxpus 8         Noacq OFF
Pollint 0.50    Program $SYSTEM.CSS16.C9312P00       Recsize 268
Retries 3       Speed 19200         Station PRIMARY  Switched OFF
Threshold 0     Timeout 5.00        Type (58,1)         Tws OFF
Window 7        Xmttimeout 0.55     Xpages 54

Object:  PU\LINE740.$D7P4PS.#P1
Address 1       L3retry 65535       L3timeout 10.00  Maxlus 5
Maxpts 5        Noacq OFF           Puidblk 4095 %7777 %HFFF
Puidnum 1048575 %3777777 %HFFFFF    Puswtype OFF     Type (13,2)
Reqms OFF       Actpu COLD          Servicecount 1
Window 7        Names #L02    #L03

Object:  PU\LINE740.$D7P4PS.#L02
Address 2       Characterset EBCDIC Allowedmix 0     Dbcs NONE
Cryptotype OFF Devtype 3278-2       Esstable ESS1    Luswtype OFF
Noacq OFF       Passthru OFF        Actlu COLD       Protocol ITI
Puname #P1      Recsize 80          Static OFF       Type (14,2)

Object:  PU\LINE740.$D7P4PS.#L03
Address 3       Characterset ASCII  Allowedmix 0     Dbcs NONE
Cryptotype OFF Luswtype OFF         Noacq OFF        Passthru OFF
Actlu COLD      Protocol SNALU      Puname #P1       Recsize 265
Static OFF      Type (14,2)
```

Additional Considerations

In the previous example, #L02 is the LU used for emulation, and #L03 is the LU used for Connect:Direct.

If you plan to submit work from an attached Connect:Direct OS/400 node, at least one LU must be defined for 3270 emulation to submit any Processes from the Connect:Direct OS/400 node. Because Connect:Direct OS/400 to a Tandem node is SNODE only, Processes can only be submitted from a Connect:Direct OS/400 node through a 3270 LU, which requires logging on to a Connect:Direct Tandem node to submit the Process. If you only submit Processes from the Tandem node, the 3270 emulation LU is omitted.

Sample OS/400 Definitions

The following sections provide examples of defining the communications environment at the OS/400 node.

Note: The remote system in the network is the system connected by hardware to the OS/400 system. For example, the remote system is the OS/390 or VSE system that owns the LUs to which the OS/400 is attached, or the remote system is the system on which Connect:Direct resides.

The remote node is the system on which the remote Connect:Direct is installed. The remote node is the remote system in the network

Create a User Profile

You must create a user profile for the Connect:Direct program. See the *Creating the Administrator Profile* section beginning on page 2-1 for instructions on how to create a user profile.

The Connect:Direct user profile requires all object authority, save system authority, security administration authority, service authority, job control authority, and spool control authority. Use this profile to define and create the lines, controllers, and devices to be used by Connect:Direct OS/400. The terminal you install from must be authorized for this user profile.

Note: For security reasons, do not use this profile for file transfers. See Chapter 6, *Maintaining Security*, for further details.

Define Lines

The following example shows a line creation command for Connect:Direct OS/400 through an SDLC multipoint nonswitched line. Use the CRTLINSDLC command to define the line. If the line definition already exists, verify that the parameters are defined correctly and continue with the next step.

```
CRTLINSDLC      LIND(lin1) RSRCNAME(physicalport) NRZI(*YES)
                ROLE(*SEC) LINESPEED(19200) MAXCTL(1)
                DUPLEX(*FULL) MAXOUT(7) MAXFRAME(265) CNN(*MP)
                TEXT('CD OS/400 line description')
```

Parameters not shown in the example were allowed to default. Confirm that the default values are appropriate for your environment. Definitions for the parameters in the example follow.

LIND
>   specifies the arbitrary, user-defined name of the line. If the remote node is OS/390 or VSE, LIND should match the corresponding line name in the VTAM NCP definitions.

RSRCNAME
>   specifies the name of the physical port to which this line is attached. Use the WRKHDWRSC *CMN command to access the Work with Communication Resources screen for the name of the port.

NRZI
>   specifies whether nonreturn-to-zero-inverted (NRZI) data coding is to be used for modems that are sensitive to certain bit patterns in the data stream. NRZI must match the NRZI parameter in the VTAM NCP definitions in the GROUP macro if the remote node is OS/390 or VSE. If the remote node is Tandem, NRZI must be NO.

ROLE
>   specifies the line description's role, primary or secondary, in the connection. Use *SEC (secondary) for remote OS/390, VM, VSE, and Tandem nodes.

LINESPEED
>   must match SPEED parameter in either the corresponding LINE macro in the VTAM NCP definitions or the Tandem CMI/SCF line definition.

MAXCTL
>   specifies the maximum number of controllers that is attached to this line description. MAXCTL must match MAXPU parameter in the corresponding LINE macro in the VTAM NCP definitions.

DUPLEX
specifies whether request-to-send (RTF) is permanently turned on (for duplex modems) or turned on only when transmission is required. DUPLEX must match the DUPLEX parameter in either the corresponding LINE macro in the VTAM NCP definitions or the Tandem CMI/SCF line definition.

MAXOUT
specifies the maximum number of frames that are sent before a response is required from the remote system. MAXOUT must match the MAXOUT parameter in the corresponding PU macro in the VTAM NCP definitions or must match WINDOW in the Tandem CMI/SCF PU definition.

MAXFRAME
specifies the largest frame size that is used on this line. MAXFRAME must match the MAXDATA parameter for corresponding PU macros in the VTAM NCP definitions or must match RECSIZE in the Tandem CMI/SCF PU definition.

CNN
specifies the type of line connection (user-defined). If the remote node is OS/390 or VSE, the value for CNN must match the line macro in the VTAM NCP definitions.

TEXT
describes the line.

Define Controller (SNUF)

The following example shows a controller description for Connect:Direct OS/400 communication in a SNUF environment using an SDLC line. Use the CRTCTLHOST command to define the controller.

If the controller definition already exists, verify that the parameters are defined correctly and continue with the next step.

```
CRTCTLHOST      CTLD(l1p1) LINKTYPE(*SDLC) APPN(*NO)
                LINE(lin1) SSCPID(0500000075F8)
                STNADR(c1) MAXFRAME(265)
                TEXT('CD OS/400 controller description')
```

Parameters not shown in the example were allowed to default. Confirm that the default values are appropriate for your environment. The parameters are defined as follows:

CTLD
specifies the arbitrary, user-defined name of this controller. CTLD should match the corresponding PU name in the VTAM NCP definitions.

LINKTYPE
specifies the type of line to which the controller is attached.

APPN
specifies whether the Advanced Peer-to-Peer Networking function is being used.

LINE
specifies the name of the line to which this controller is attached.

SSCPID
specifies the ID of the remote OS/390 or VSE system in the network. The first two digits are 05 and the following 10 digits are the hexadecimal representation of the SSCPID in the VTAM start-up list.

STNADR
   specifies the address of the remote system in the network. STNADR must match either the ADDR
   parameter in the corresponding PU macro in the VTAM NCP definitions or the ADDRESS parameter
   in the Tandem CMI/SCF PU definition.

MAXFRAME
   specifies the largest frame size that is used on this line of the remote system in the network.
   MAXFRAME must match either the MAXDATA parameter in the corresponding PU macro in the
   VTAM NCP definitions or the RECSIZE in the Tandem CMI/SCF PU definition.

TEXT
   describes the controller.

Define SNUF Device Descriptions

This step defines the SNUF device descriptions to be used by Connect:Direct OS/400 in a SNUF environment.
Use the CRTDEVSNUF command, as in the following example, to define the SNUF device description.

Note: Define one SNUF device for every LU specified in the SNODE.LUS parameter in the Connect:Direct
   OS/390 or Connect:Direct VSE NETMAP. This definition must be done for each Connect:Direct
   OS/390 or Connect:Direct VSE that can establish a session with Connect:Direct OS/400.

If the device description already exists, verify that the parameters are defined correctly and continue with the
next step.

```
CRTDEVSNUF      DEVD(lu04) RMTLOCNAME(nmvs04) ONLINE(*YES)
                LOCADR(04) CTL(l1p1) PGMSTRRQS(*YES) HOST(*CICS)
                APPID(hstappid) RCDLEN(32767) BLKLEN(32767)
                DFTPGM(prodlibname/SMMAIN)
                TEXT('CD OS/400 SNUF device description')
```

Parameters not shown in the example were allowed to default. Confirm that the default values are appropriate
for your environment.   Definitions for the parameters follow:

DEVD
   specifies the user-defined name for this device. DEVD must match the corresponding LU name in the
   VTAM NCP definitions.

RMTLOCNAME
   specifies the user-defined, unique remote location name. This name cannot be the same as the device
   name.

ONLINE
   specifies whether the device is online at IPL.

LOCADR
   specifies the address of the remote Connect:Direct node. LOCADR must match either the
   LOCADDR parameter in the corresponding LU macro in the VTAM NCP definitions or the
   ADDRESS parameter in the Tandem CMI/SCF LU definition.

CTL
   specifies the name of the controller to which this device is attached.

PGMSTRRQS
> specifies whether this device is reserved for host system call through a Program Start Request (PSR). Specify *YES.

HOST
> specifies the type of host environment.

APPID
> specifies the VTAM Application Identifier sent with the logon message. APPID is not used but must be specified.

RCDLEN
> specifies the maximum record length allowed when communicating with this device. The recommended value is 32767 for the most efficient use of Connect:Direct OS/400.

BLKLEN
> specifies the maximum block length allowed when communicating with this device. BLKLEN must be at least the size of the largest record to be sent, but it must not exceed the buffer size specified on the line description (MAXBUFFER parameter) to which this device is attached. The recommended value is 32767 for the most efficient use of Connect:Direct OS/400.

DFTPGM
> specifies the name of the Connect:Direct production library followed by /SMMAIN, which is the name of the Connect:Direct session manager program.

TEXT
> describes the controller.

Define 3270 Emulation Device Descriptions

This step defines the emulation device descriptions for 3270 emulation purposes.

Note: This device is independent of Connect:Direct OS/400 and does not need to be defined with the Connect:Direct user profile. The emulation device does not need to be attached to a Connect:Direct controller. However, the device must be on a line connected to the Connect:Direct OS/390 or Connect:Direct VSE host.

Use the CRTDEVHOST command, as shown in the following example, to define the mode description.

```
CRTDEVHOST      DEVD(emul1) LOCADR(01) RMTLOCNAME(NMVS05)
                CTL(l1p1) APPTYPE(*EML) EMLKBD(*LOWER)
                TEXT('3278 emulation device')
```

Parameters not shown in the example were allowed to default. Confirm that the default values are appropriate for your environment. The parameters are defined as follows:

DEVD
> specifies the arbitrary, user-defined name for this emulation device.

LOCADR
> specifies the address of the remote Connect:Direct node. LOCADR must match either the LOCADDR parameter in the corresponding LU macro in the VTAM NCP definitions or ADDRESS in the Tandem CMI/SCF LU definition.

RMTLOCNAME

  specifies the remote location name. You can specify an arbitrary value, but it must be unique.
  RMTLOCNAME cannot be the same as the device name, DEVD.

CTL

  specifies the name of the controller to which this device is attached.

APPTYPE

  specifies the application type used by this device. *EML specifies that this device is used by 3270
  device emulation.

EMLKBD

  specifies the type of 3270 display keyboard being emulated.

TEXT

  describes the device.

Defining the LU6.2 Environment

This appendix contains information used to determine the proper configuration parameter values when installing Connect:Direct OS/400 LU6.2 connectivity. This appendix contains both sample APPN and non-APPN definitions for connection to other Connect:Direct systems.

Refer to the *Connect:Direct Compatibility and Connectivity Chart* for additional assistance in defining your connectivity.

Supported Line Types

Examples shown in this appendix are for APPN and non-APPN controllers and devices on a non-switched (leased) SDLC line. Use any type of line supported by APPC/APPN to enable communications between Connect:Direct OS/400 and remote Connect:Direct nodes. The following line types are supported:

❖ SDLC point-to-point, non-switched

❖ IBM token-ring network

❖ SDLC point-to-point, switched (manual answer, automatic answer, manual call, automatic call)

❖ X.25 packet switched data network supporting both permanent virtual circuit and switched virtual circuit connections

The sample definitions in this appendix are not to be used as directions for defining your environments. Your Connect:Direct system administrator must consult the appropriate manual for instructions on defining the remote environment for an LU6.2 connection, as well as defining the OS/400 node.

APPN and Non-APPN Environments

Before defining the communication environment, you must decide whether to use Advanced Peer-to-Peer Networking (APPN). In general, if you are defining a direct link to another OS/400 node, you would create APPN-capable descriptions. If, however, you are defining a link to an OS/390 or VSE system running Connect:Direct, use non-APPN definitions.If you plan to have a Connect:Direct node establish sessions with a remote Connect:Direct node by routing requests through the OS/400 node, then you *must* use APPN-capable definitions, and the OS/400 node must be configured as an APPN network node. Read the following examples and definitions carefully, looking for parameters that have values dependent on an APPN or non-APPN configuration.

If you define a connection that is routed through an SNA subarea, the LU name defined to VTAM must match a location name known to the local OS/400 node. If it is an APPN connection, identify the location name (LU

name) in the Local Configuration List. If it is a non-APPN connection, the LU name must match the Default Local Location name on the local OS/400 node.

Independent and Dependent LUs

Connect:Direct OS/400 can use LU6.2 protocol to communicate with other Connect:Direct nodes. This protocol allows you to define your environment with independent and dependent LUs. Using LU6.2 and independent LUs allows parallel sessions between LUs, avoiding the overhead associated with using separate LUs for each session. Refer to the *Connect:Direct OS/400 Release Notes* for information about Connect:Direct OS/400 connections to remote nodes and the remote node connections for session initiation to Connect:Direct OS/400. The following table lists the types of connectivity for independent and dependent LUs. If the remote node is capable, use independent LUs.

Independent LUs	Dependent LUs
Can have parallel sessions.	Session limit of 1.
Is primary LUs (PLUs) or secondary LUs (SLUs).	Can only be secondary LUs.
Do not use the Extended Recovery Facility.	
Saves the overhead associated with multiple LU names for the same application subsystem and multiple control blocks within the application subsystems.	Uses single LU for each session with the application subsystem.

Differences Between Independent and Dependent Logical Units

Independent and dependent Logical Units (LUs) have several differences. The most important difference is that an independent LU supports multiple concurrent sessions, while a dependent LU only supports a single session. Not only can an independent LU and an application have multiple sessions active between them, but an independent LU can also support concurrent sessions with multiple applications.

This difference can significantly impact configuration. In a network where an OS/400 system is connected to an OS/390 system using dependent LUs, you must define enough LUs to support the maximum desired number of concurrent active sessions. If you add another system that routes sessions to the OS/400 node through VTAM, you must add another set of LUs for all active sessions with the third system. This same network could be configured using a single independent LU defined in VTAM and two independent devices defined on the OS/400 node.

Some networks contain nodes that do not support independent LUs. This restriction can result from back-level microcode in physical controllers or from an OS/400 node with a network ID that does not match the network ID of the remote system in the network. When the network contains these types of nodes, defining dependent LUs should allow successful communication between systems.

Defining the Link to Another OS/400 System

A direct connection to another OS/400 system is straightforward. However, if the connection is routed through an SNA subarea (VTAM) in the network, you must follow some strict naming conventions. The following steps define the link to a remote system, including routing through an SNA subarea.

1. Define a mode description (MODD) or use an existing mode description for Connect:Direct. Several mode descriptions are provided with the OS/400 operating system. One example is a MODD named BLANK, which works with Connect:Direct.

2. Define a line description (LIND) if one does not already exist for the link to the remote system.

3. Define a controller description (CTLD) if one does not already exist for the link to the remote system.

4. Define device descriptions (DEVD) if they do not already exist for the use of Connect:Direct.

5. If your connection is routed through an SNA subarea and you are using APPN, complete these additional steps:

    ❖ Define a Remote Configuration List entry because the SNA subarea is considered a Low-Entry Network Node (LEN node).

    ❖ Define a Local Configuration List entry if the name of the LU defined in VTAM does not match the default local location name of the OS/400 node.

6. If you define the link any time except during the initial installation of Connect:Direct, you must add a Communications entry to the Connect:Direct subsystem description.

Sample Definition OS/400 Links

The following sections describe example commands to define the configuration objects described on the previous page. Each command is followed by a description of the applicable parameters.

Creating a Mode Description

The following figure shows a sample mode description.

```
CRTMODD          MODD(cd624K) MAXSSN(8) MAXCNV(8)
                 LCLCTLSSN(4) PREESTSSN(0) INPACING(7)
                 OUTPACING(7) TEXT('MODE FOR Connect:Direct
                 OS/400')
```

Parameters are as follows:

MODD
specifies the name of the mode description. A MODD with the same name must exist on the remote OS/400 node. If this connection is routed through an SNA subarea, a logmode with this name must be defined to VTAM.

MAXSSN
specifies the maximum number of sessions per device. This should match the MAXSSN parameter of the mode description on the remote OS/400 node.

MAXCNV
specifies the maximum number of conversations per session. MAXCNV must be equal to or greater than MAXSSN.

LCLCTLSSN
specifies the minimum number of sessions in which the local system is the primary node, able to initiate requests.

PREESTSSN
specifies the number of sessions automatically started when the mode is started. The mode starts when the STRMOD command or when a session request specifies this mode name.

INPACING
specifies the maximum number of incoming RUs allowed before a pacing response is sent to the remote system. INPACING must match the OUTPACING parameter value of the mode description on the remote OS/400 node.

OUTPACING
specifies the maximum number of outgoing RUs sent before a pacing response is required from the remote system. OUTPACING must match the INPACING parameter value of the mode description on the remote OS/400 node.

TEXT
describes the mode.

COS
specifies the class of service. COS must match COS on the remote OS/400 node.

Creating a Line Description

Use the CRTLINSDLC command as shown in the following example line description for an SDLC connection.

```
CRTLINSDLC      LIND(CDIR2) RSRCNAME(LIN012) NRZI(*YES) ROLE(*NEG)
                LINESPEED(19200) MAXCTL(50) DUPLEX(*FULL) MAXOUT(7
                MAXFRAME(2057)TEXT('Connect:Direct OS/400
                line description')
```

The following example is a sample line description for a token-ring connection.

```
CRTLINTRN       LIND(CDLIN) RSRCNAME(LIN021) ADPTADR(400000000001)
                LINESPEED(16M) MAXCTL(10) MAXFRAME(1994)
```

Parameters are as follows:

LIND
specifies the arbitrary, user-defined name of the line description.

RSRCNAME
specifies the name of the physical port to which this line is attached. Use the WRKHDWRSC *CMN) command to access the **Work with Communication Resources** screen for the appropriate name.

ADPTADR
specifies the local token-ring adapter address. The value must match the ADPTADR value in the CTLD on the remote OS/400 system. Use this parameter for token-ring connections.

NRZI
specifies whether non-return-to-zero-inverted (NRZI) data coding is to be used for modems that are sensitive to certain bit patterns in the data stream. NRZI must match the NRZI parameter on the corresponding line description on the remote OS/400 node. Use this parameter for SDLC connections.

ROLE

    defines the line description's role, primary or secondary, in the connection. Use *NEG, which indicates negotiable, if the remote system is another OS/400 system. If the remote system is a 370 system, use *SEC. Use this parameter for SDLC connections.

LINESPEED

    specifies the speed of the link. LINESPEED must match the LINESPEED parameter on the corresponding line description on the remote OS/400 node.

MAXCTL

    specifies the maximum number of controllers that are attached to this line description. MAXCTL must match the MAXCTL parameter on the corresponding line description on the remote OS/400 node.

DUPLEX

    specifies whether request-to-send (RTF) is permanently turned on (for duplex modems) or turned on only when transmission is required. DUPLEX must match the DUPLEX parameter on the corresponding line description on the remote OS/400 node. Use this parameter for SDLC connections.

MAXOUT

    specifies the maximum number of frames that are sent before a response is required from the remote system. MAXOUT must match the MAXOUT parameter on the corresponding line description on the remote OS/400 node. Use this parameter for SDLC connections.

MAXFRAME

    specifies the largest frame size that is used on this line. MAXFRAME must match the MAXFRAME parameter on the corresponding line description on the remote OS/400 node.

MAXLENRU

    specifies the maximum request unit length to be used on this line. For connections to another OS/400 node, MAXLENRU must match the MAXLENRU parameter on the remote OS/400 node. Use this parameter for SDLC connections.

TEXT

    describes the line.

Creating a Controller Description

The following example CRTCTLAPPC command assumes an APPN-capable SDLC connection.

```
CRTCTLAPPC      CTLD(CDCTL) LINKTYPE(*SDLC) APPN(*YES)
                RMTNETID(CDNET) RMTCPNAME(CDNODEA) LINE(LIN011)
                MAXFRAME(2057) CPSSN(*YES) NODETYPE(*ENDNODE)
                TEXT('Connect:Direct OS/400 controller')
```

Definitions for the parameters in this example follow:

CTLD

    specifies the arbitrary, user-defined name of the controller description.

LINKTYPE

    describes the type of line to which the controller is attached.

APPN

    specifies whether the controller is capable of Advanced Peer-to-Peer Networking.

RMTNETID
> specifies the network ID of the remote system in the network. If the remote node is adjacent to the local system, RMTNETID is the Network ID of the remote OS/400 node.

RMTCPNAME
> specifies the control point name of the remote system in the network. If the remote node is adjacent to the local system, RMTCPNAME is the Network ID of the remote OS/400 node.

LINE
> specifies the name of the line to which the controller is attached.

MAXFRAME
> specifies the largest frame size that is used on this controller. MAXFRAME must match the MAXFRAME parameter on the corresponding controller description on the remote OS/400 node.

CPSSN
> specifies whether control point sessions are to be supported. In an APPN-capable connection, CP session support allows systems to maintain network topology information dynamically and eliminate the need for Remote Configuration List entries representing the remote node.
>
> If the remote system in the network does not support APPN and/or CP sessions, this value should be *NO. If a non-APPN connection is being defined, this parameter is ignored.

NODETYPE
> specifies the type of node the remote system represents with respect to APPN. If APPN(*NO) is specified, this parameter is ignored.

TEXT
> describes the controller.

Creating a Device Description

The following example command assumes an APPN-capable connection.

```
CRTDEVAPPC      DEVD(CDDEV) LCLLOCNAME(*NETATR) RMTLOCNAME(CDNODEA)
                RMTNETID(CDNET) LOCADR(00) CTL(CDCTL) MODE(CD624K)
                SNGSSN(*NO) APPN(*YES) TEXT('Connect:Direct
                OS/400 DEVD')
```

Parameters are as follows:

DEVD
> specifies the arbitrary, user-defined name of the device description.

LCLLOCNAME
> specifies the local system name as it is known to the network. The value *NETATR indicates that the default local location name of the local system is used. If the connection is routed through an SNA subarea, this name must match the name of the LU defined to VTAM.

RMTLOCNAME
> specifies the remote system name as it is known to the network. RMTLOCNAME should match the value specified on the LCLLOCNAME parameter of the corresponding device description on the remote OS/400 node.

RMTNETID
> specifies the network ID of the remote OS/400 node.

LOCADR

specifies the location address of the device description. The value must be 00, indicating an independent device.

CTL

specifies the name of the controller to which this device is attached.

MODE

specifies the name of the MODD used for sessions on this device.

SNGSSN

specifies whether the device is capable of multiple sessions. If a non-zero LOCADR value is specified, SNGSSN must be *YES.

APPN

specifies whether the device is used for Advanced Peer-to-Peer Networking.

Note: If APPN=*YES, add the appropriate entries to the QAPPNLCL and QAPPNRMT configuration lists. For additional information, refer to the *Creating a Remote Configuration List Entry* section on page B-35 and the *Creating a Local Location List Entry* section on page B-35.

TEXT

describes the device.

Adding a Communications Entry

Communications entries allow the Connect:Direct subsystem to take control of the device descriptions required for session establishment. When you installed Connect:Direct OS/400, you added communications entries for each device specified during the installation process. If you are adding a device after the initial installation, you must manually add the required entry.

The following example command assumes that Connect:Direct was installed in a library named CDLIB, using the subsystem name CDPROD, and that an administrator user profile named CDADMIN exists.

```
ADDCMNE       SBSD(CDLIB/CDPROD) DEV(CDDEV) DFTUSR(CDADMIN)
```

Parameters are as follows:

SBSD

specifies the Connect:Direct subsystem name and the library where it resides.

DEV

specifies the name of the device description to be used by Connect:Direct.

DFTUSR

specifies the default user profile to be used when another node requests a session on the specified device. This default user profile must be on the Connect:Direct user list as an Administrator-AUTH(A).

Defining the Link to an OS/390, VM, or VSE System Using SDLC

LU6.2 sessions between an OS/400 node and an OS/390 node require that the two systems have matching NETIDs or that the OS/390 system uses the IBM non-Native Network Connection (NNNC) support. Examples in this section include the parameters required for NNNC. Refer to the *VTAM Network Implementation Guide* and the *VTAM Resource Definition Reference* for more information on NNNC support.

Note: If you make any changes to VTAM, an NCPGEN may be required.

You must follow some strict naming conventions when defining the link to an OS/390, VM, or VSE system. VTAM cannot support APPN control point sessions because VTAM is a LEN node (Low Entry Networking Node) in an APPN network (except for VTAM 4.1 and above). Therefore, all parameters must be explicitly defined. Use the following steps to define the link:

1. Define a mode description (MODD) with a name that matches the logmode you intend to use on the 370 system.

2. Define a line description (LIND) if one does not already exist for the link to the remote system.

3. Define a controller description (CTLD) if one does not already exist for the link to the remote system.

4. If you create a network map entry with a remote location name and your OS/400 system set up allows auto configuration of devices, you do not need to create device descriptions (DEVD). Otherwise, define a DEVD if one does not already exist for the use of Connect:Direct. Add a Remote Configuration List entry for the remote system. If the name of the LU defined in VTAM does not match the default local location name of the OS/400 node, you must add a Local Configuration List entry.

5. If you define the link any time except the initial installation of Connect:Direct, you must add a Communications entry to the Connect:Direct subsystem description.

Sample Definitions for OS/390, VSE, or VM System Link

The following example commands define the configuration objects described previously. A description of the applicable parameters follows each command.

Note: Unless otherwise noted, the following examples indicate an independent setup. The text indicates which values should be changed for dependent connections.

Creating a Mode Description

The following example illustrates how to create a mode description.

```
CRTMODD          MODD(CD624K) COS(CONNECT) MAXSSN(8) MAXCNV(8)
                 LCLCTLSSN(4) PREESTSSN(0) INPACING(7) OUTPACING(7)
                 TEXT('Mode for Connect:Direct OS/400')
```

Parameters are as follows:

MODD
    specifies the name of the mode description. A logmode with the same name must exist on each node in the transfer path, including the remote node.

COS
    specifies the class of devices. If COS is defined on OS/390, this parameter must match that definition.

MAXSSN

specifies the maximum number of sessions per device. MAXSSN must match PARSESS in the host network map and the DSESLIM in the APPLID for independent configurations. MAXSSN must be 1 for dependent configurations.

MAXCNV

specifies the maximum number of conversations per remote node. MAXCNV must be equal to MAXSSN.

LCLCTLSSN

specifies the minimum number of sessions in which the local system is the primary node, able to initiate requests. This value should be equal to DMINWINR in the APPLID on the remote node. For dependent connections, this value should be zero.

PREESTSSN

specifies the number of sessions automatically started when the mode is started. The mode is started by using the STRMOD command or when a session request specifies this mode name. The recommended value for this parameter is **0**.

INPACING

specifies the maximum number of incoming RUs allowed before a pacing response is sent to the remote system.

OUTPACING

specifies the maximum number of outgoing RUs sent before a pacing response is required from the remote system.

TEXT

describes the mode.

Creating a Line Description

The following example CRTLINSDLC command assumes an SDLC connection. If you are defining a token-ring connection, refer to the *Creating a Line Description* section on page B-4.

```
CRTLINSDLC        LIND(CDIR2) RSRCNAME(LIN012) NRZI(*YES) ROLE(*NEG)
                  LINESPEED(19200) MAXCTL(50) DUPLEX(*FULL) MAXOUT(7)
                  MAXFRAME(2057) TEXT('Connect:Direct OS/400 line.')
```

Definitions for the parameters in this example follow:

LIND

specifies the arbitrary, user-defined name of the line description.

RSRCNAME

specifies the name of the physical port where this line is attached. Use the WRKHDWRSC *CMN command to access the **Work with Communication Resources** screen for the appropriate name.

NRZI

specifies whether non-return-to-zero-inverted (NRZI) data coding is used for modems that are sensitive to certain bit patterns in the data stream. NRZI must match the NRZI parameter on the corresponding group macro on the remote system.

ROLE

specifies the line description's role, primary or secondary, in the connection. For dependent connections, use *SEC. For independent connections, use *NEG.

LINESPEED
> specifies the speed of the link. LINESPEED must match the SPEED parameter on the corresponding line macro on the remote system.

MAXCTL
> specifies the maximum number of controllers that are attached to this line description. MAXCTL should match the MAXPU parameter on the corresponding line macro on the remote system.

DUPLEX
> specifies whether request-to-send (RTF) is permanently turned on (for duplex modems) or turned on only when transmission is required. DUPLEX must match the DUPLEX parameter on the corresponding line macro on the remote system.

MAXOUT
> specifies the maximum number of frames that are sent before a response is required from the remote system. MAXOUT must match the MAXOUT parameter on the PU macro on the remote system.

MAXFRAME
> specifies the largest frame size that is used on this line. MAXFRAME must match the MAXDATA parameter on the line PU macro on the remote system.

TEXT
> describes the line.

Creating a Controller Description

The following CRTCTLHOST command assumes an APPN-capable SDLC connection.

```
CRTCTLHOST    CTLD(CDIR22) LINKTYPE(*SDLC) APPN(*YES) RMTNETID(MVSNET)
              RMTCPNAME(CSDSA01) LINE(CDIR2) SSCPID(050000003AA7)
              MAXFRAME(2057) CPSSN(*NO) NODETYPE(*LENNODE)
              TEXT('Connect:Direct OS/400 controller')
```

The following example command assumes an SDLC connection that is not APPN-capable.

```
CRTCTLHOST    CTLD(CDIR22) LINKTYPE(*SDLC) APPN(*NO) RMTNETID(MVSET)
              RMTCPNAME(CSDSA01) LINE(CDIR2) SSCPID(050000003AA7)
              MAXFRAME(2057) CPSSN(*NO) TEXT('Connect:Direct
              OS/400 controller')
```

The parameters used in the CRTCTLHOST examples follow:

CTLD
> specifies the arbitrary, user-defined name of the controller description.

LINKTYPE
> specifies the type of line to which the controller is attached.

APPN
> specifies whether the controller is capable of Advanced Peer-to-Peer Networking.

RMTNETID
> specifies the network ID of the remote system in the network. RMTNETID must match the NETID in the VTAM startup list of the remote system.

RMTCPNAME
    specifies the control point name of the remote system in the network. RMTCPNAME must match the SSCPNAME in the VTAM startup list of the remote system.

LINE
    specifies the name of the line where the controller is attached.

SSCPID
    specifies the ID of the adjacent OS/390 or VSE system in the network. The first two digits are 05. The following 10 digits are the hexadecimal representation of the SSCPID in the VTAM startup list.

MAXFRAME
    specifies the largest frame size that is used on this controller. MAXFRAME must match the MAXDATA parameter on the PU macro on the remote system.

CPSSN
    specifies whether control point sessions are to be supported. The CPSSN value should be *NO.

NODETYPE
    specifies the type of node the remote system represents with respect to APPN. This value should be *LEN. If APPN(*NO) is specified, this parameter is ignored.

TEXT
    describes the controller.

Creating a Device Description

The following CRTDEVAPPC command assumes an APPN-capable independent connection:

```
CRTDEVAPPC    DEVD(CDIR22IT) LCLLOCNAME(CDIR22IT) RMTLOCNAME(CDCDDT35)
              RMTNETID(MVSNET) LOCADR(00) CTL(CDIR22) MODE(CD624K)
              SNGSSN(*NO) APPN(*YES)
```

This example command assumes an independent SDLC connection that is not APPN-capable:

```
CRTDEVAPPC    DEVD(CDIR22IT) LCLLOCNAME(CDIR22IT) RMTLOCNAME(CDCDDT35)
              RMTNETID(MVSNET) LOCADR(00) CTL(CDIR22) MODE(CD624K)
              SNGSSN(*NO) APPN(*NO) TEXT('Connect:Direct OS/400
              DEVD')
```

Definitions for the parameters used in the CRTDEVAPPC examples follow:

DEVD
    specifies the arbitrary, user-defined name of the device description.

LCLLOCNAME
    specifies the name of the local system as it is known to the network. This parameter and the name of the LU or CDRSC defined in VTAM must match.

RMTLOCNAME
    specifies the name of the remote application as it is known to the network. The RMTLOCNAME must match the name of the DTF APPLID used by Connect:Direct on the 370 system.

RMTNETID
    specifies the NETID in the VTAM startup list of the remote node.

LOCADR

   specifies the location address of the device description. A value of 00 indicates an independent device, while any other value indicates a dependent device. This value must match the LOCADDR on the LU. (LOCADDR is a decimal value on OS/390; LOCADR is a hexadecimal value on OS/400.) Refer to the *Independent and Dependent LUs* section on page B-2 for more detail.

CTL

   specifies the name of the controller to which this device is attached.

MODE

   specifies the name of the MODD used for sessions on this device.

SNGSSN

   specifies whether the device is capable of multiple sessions. If a non-zero LOCADR value is specified for a dependent connection, this value must be *YES. For an independent (LOCADDR(00)) connection, this value must be *NO.

APPN

   specifies whether the device is used for Advanced Peer-to-Peer Networking.

   Note: If APPN=*YES, add the appropriate entries to the QAPPNLCL and QAPPNRMT configuration lists. For additional information, refer to the *Creating a Remote Configuration List Entry* section on page B-35 and the *Creating a Local Location List Entry* section on page B-35.

TEXT

   describes the device.

Adding a Communications Entry

The communications entries allow the Connect:Direct subsystem to take control of the device descriptions required for session establishment. When you initially installed Connect:Direct OS/400, you added communications entries for each device specified during the installation process. However, if you are adding a device after the initial installation, you must manually add the required entry.

The following ADDCMNE command assumes that Connect:Direct has been installed in a library named CDLIB, using the subsystem name CDPROD, and that an administrator user profile named CDADMIN exists.

```
ADDCMNE     SBSD(CDLIB/CDPROD) DEV(CDIR22IT) DFTUSR(CDADMIN)
```

The parameters used in this example are defined as follows:

SBSD

   specifies the Connect:Direct subsystem name and the library where it resides.

DEV

   specifies the name of the device description to be used by Connect:Direct. This parameter is the DEVD that was created earlier in the *Creating a Device Description* section on page B-11.

DFTUSR

   specifies the default user profile to be used when another node requests a session on the specified device. This default user profile must be on the Connect:Direct user list as an Administrator-AUTH(A).

Adding Configuration List Entries

See the *Creating a Remote Configuration List Entry* section on page B-35 for more information on configuration list entries.

Sample OS/390 Definitions

The following sample environment definitions are required for environment definition connections between OS/390 and OS/400. For detailed information, refer to the *Connect:Direct OS/390 Administration Guide*.

LOGMODE Entries

Connect:Direct OS/400 uses a LOGMODE entry when establishing a session with the host Connect:Direct. The following example is a sample MODETAB with an LU6.2 independent LOGMODE entry.

```
LU62TAB MODETAB
*****************************************************
*              LU 6.2 WITH 4096-BYTE RU'S          *
*****************************************************
CD624K    MODEENT LOGMODE=CD624K,                   *
                TYPE=1,                             *
                COS=CDCOS1,                         *
                FMPROF=X'13',                       *
                TSPROF=X'07',                       *
                PRIPROT=X'B0',                      *
                SECPROT=X'B0',                      *
                COMPROT=X'D0B1',                    *
                RUSIZES=X'8989',                    *
                PSERVIC=X'0602000000000000000000300'
*                       0 1 2 3 4 5 6 7 8 9 1011
          MODEEND
```

The following example is a sample MODETAB with a dependent LOGMODE entry.

```
LU62TAB MODETAB
*****************************************************
*              LU 6.2 WITH 4096-BYTE RU'S          *
*****************************************************
CD624K    MODEENT LOGMODE=CD624K,                   *
                TYPE=1,                             *
                COS=CDCOS1,                         *
                FMPROF=X'13',                       *
                TSPROF=X'07',                       *
                PRIPROT=X'B0',                      *
                SECPROT=X'B0',                      *
                COMPROT=X'50B1',                    *
                RUSIZES=X'8989',                    *
                PSERVIC=X'0602000000000000000002C00'
*                       0 1 2 3 4 5 6 7 8 9 1011
          MODEEND
```

References to these two examples appear throughout this appendix.

Only the RUSIZES parameter in the LOGMODE is changed. The minimum allowed RU size is 512 (RUSIZES=x '8686').

Unformatted Systems Services (USS) Table

Connect:Direct does not use the USS table. However, if you define a USS table for the LUs to be used with APPC devices of the OS/400 node, you cannot include a MSG10 definition.

OS/390 Local Application ID (APPLID)

For Connect:Direct OS/390 to work with Connect:Direct OS/400, the VTAM APPL for Connect:Direct OS/390 (local node) must be capable of running an LU6.2 session. Refer to the following IBM publications for more information:

❖ *AS/400-S/370 Connectivity*, reference number GG24-3336-00

❖ *AS/400 Communication Definitions Examples*, reference number GG24-3449-00

The following example is an APPL for the OS/390 node.

```
CDAPPCDT VBUILD TYPE=APPL
CDCDDT35 APPL  ACBNAME=CDCDDT35,        VTAM APPLID                 X
AUTH=(ACQ,NOCNM,NOPASS,NOPO,NOTSO,VPACE),                          X
EAS=10,               APPROXIMATE # OF CONCURRENT SESS.            X
MODETAB=CDLGMTAB,     MODE TABLE NAME                              X
SONSCIP=NO,           NO UNBIND IN SCIP EXIT                       X
SRBEXIT=NO,           NO SRB PROCESSING                            X
VPACING=7,            RECEIVE PACING OF 7                          X
DLOGMOD=CDLCDK,       MODE TABLE ENTRY                             X
PARSESS=YES,          PARALLEL SESSIONS CAN BE USED                X
VTAMFRR=NO,           NO FUNCTION RECOVERY ROUTINE                 X
APPC=YES,                                                          X
DSESLIM=8,                                                         X
DMINWNL=4,                                                         X
DMINWNR=4,                                                         X
DDRAINL=ALLOW,                                                     X
DRESPL=ALLOW,                                                      X
LMDENT=4,                                                          X
AUTOSES=1             USER REQUESTED (TRACK 36577)
```

The following descriptions are for the pertinent parameters of the previous example, where *n* is the number in first PARSESS value on the OS/390 ADJACENT.NODE entry.

MODETAB
    specifies the mode table that contains entries for LU0, LU6.2, and SNA Service Manager mode (SNASVCMG).

DLOGMODE
    specifies default LOGMODE. *DLOGMOD must refer to an LU0 LOGMODE entry to ensure compatibility with prior releases of Connect:Direct.* The LU6.2 LOGMODE name is extracted from the network map.

PARSESS
    specifies that parallel sessions are used. PARSESS must be YES.

APPC=YES
    allows LU6.2 support. APPC must be YES.

DSESLIM=2n
    specifies the maximum number of sessions for this applid, where *2n* should be equal to or greater than the sum of DMINWNL and DMINWNR for any remote node using an independent connection.

DMINWNL=n
> specifies the total number of LU6.2 contention losers on this applid (independent connections only).

DMINWNR=n
> specifies the total number of LU6.2 contention winners on this applid (independent connections only).

DDRAINL=ALLOW
> allows CNOS (Change Number of Sessions) to drain sessions (independent connections only).
> DDRAINL must be ALLOW.

DRESPL=ALLOW
> specifies that the application program has responsibility for deactivating sessions (independent
> connections only). DRESPL must be ALLOW.

LMDENT=n
> specifies the number of entries to be used for the application program hash table of remote LUs.

AUTOSES=x
> specifies the number of sessions automatically started when a session request is made, where *x* must
> be a recommended value of **1** for any remote node.

Sample VTAM Start-up List

The following example is part of a sample VTAM start-up list. Record the required information from your
environment on the worksheet in the *Preparing the Installation Worksheet* section on page 2-3. SSCPID must
be converted to hexadecimal format for the OS/400 system.

Note: XNETALS=*YES is required if you are using NNNC.

```
   HOSTSA=01,                                               x
   NODETYPE=NN,                                             x
   CONNTYPE=LEN,                                            x
   CPCP=YES,                                                x
   GWSSCP=YES,                                              x
   NETID=MVSNET,                                            x
   SSCPID=15015,                                            x
   SSCPNAME=CSDSA01,                                        x
   LISTBKUP=DEFAULTS,                                       x
   TNSTAT,NOCNSL,TIME=60,                                   x
   PPOLOG=YES,                                              x
   XNETALS=YES,                                             x
   NCPBUFSZ=2048,                                           x
   HOTIOTRM=50,                                             x
   IOPURGE=5M,                                              x
   MSGLEVEL=V4R1,                                           x
   MAINTLVL=BASE,                                           x
   IOBUF=(950,320,50,,30,100,3000),                         x
   CRPLBUF=(500,,0,,25,1),                                  x
   LFBUF=(300,,0,,32,1),                                    x
   LPBUF=(80,,0,,12,1),                                     x
   SFBUF=(40,,0,,34,1),                                     x
   SPBUF=(32,,0,,32,1),                                     x
   BSBUF=(800,,0,,25,50),                                   x
   XDBUF=(40,,0,,5,1)                                       x
```

Defining OS/390 NCP Definitions

The following example is part of NCP source code, with sample definitions for a Connect:Direct OS/400 node, independent LU6.2 SDLC leased connection. Use this information to define the OS/400 environment. Record this information on the worksheet in the *Preparing the Installation Worksheet* section on page 2-3.

Note: If you are using NNNC, NETID is required on the PU.

```
G02SDLC  GROUP ANS=CONT,                                              *
CLOCKNG=EXT,                                                          *
DIAL=NO,                                                              *
DISCNT=NO,                                                            *
DUPLEX=FULL,                                                          *
ISTATUS=ACTIVE,                                                       *
LNCTL=SDLC,                                                           *
LUDR=YES,                                                             *
MAXDATA=2057,                                                         *
MAXOUT=7,                                                             *
MODETAB=CDLGMTAB,                                                     *
NEWSYNC=NO,                                                           *
NPACOLL=YES,                                                          *
NRZI=YES,                                                             *
OWNER=CSDSA01,                                                        *
PACING=5,                                                            *
PASSLIM=254,                                                          *
PUDR=YES,                                                             *
PUTYPE=2,                                                             *
REPLYTO=3,                                                            *
RETRIES=(2,5,10),                                                     *
SERVLIM=254,                                                          *
SSCPFM=USSSCS,                                                        *
SPEED=56000,                                                          *
TYPE=NCP

*        OS/400                                                       *
*--------------------------------------------------------------------*
*

CDIR2    LINE   ADDRESS=(000,FULL),                                   *
NRZI=YES,                                                             *
SERVLIM=10,                                                           *
PASSLIM=8,                                                            *
SPEED=19200
*


*--------------------------------------------------------------------*
*        OS/400 PU                                                    *
*--------------------------------------------------------------------*
CDIR22          PU     ADDR=C2,                                       *
DLOGMOD=EM3277,                                                       *
MODETAB=CDLGMTAB,                                                     *
USSTAB=RSUSSTAB,                                                      *
NETID=TRNNET,                                                         *
XID=YES,                                                              *
MAXDATA=2057
*--------------------------------------------------------------------*
*        OS/400 LU DEFINITION                                         *
*--------------------------------------------------------------------*
NETWORK NETID=TRNNET
CDIR22IT  CDRSC ISTATUS=ACTIVE,                                       *
ALSLIST=CDIR22,                         ADJ LINK STATION             *
ALSREQ=YES,                             USE ALS LIST ONLY            *
MODETAB=CDLGMTAB,                       LOGON MODE TABLE             *
DLOGMOD=CD624K,                         LOGON MODE TABLE ENTRY       *
RESSCB=5                                SESSION CONTROL BLOCKS
```

Each line defined to VTAM for use with OS/400 has a corresponding OS/400 line definition. Each PU on that line corresponds to a controller on the OS/400 system, and each LU corresponds to an APPC device description or 3270 emulation device description on the OS/400 system.

Defining OS/390 Adjacent Node Parameters

The Connect:Direct OS/390 administrator must define the Connect:Direct OS/400 node in the network map of the Connect:Direct OS/390 node. The *Connect:Direct OS/390 Administration Guide* contains instructions and examples.

The following example shows an adjacent node record for an environment using dependent LUs.

```
ADJACENT.NODE=  (PARSESS=(2 1)(OS400.CD400,,CD400,LU62)            -
                 ENVIRONMENT=OS400 LOGMODE=cd624k
                 SNODE.LUS=(LU01,LU02) PNODE.LUS(LU03,LU04))
```

The following example is a sample adjacent node record using an independent LU.

```
ADJACENT.NODE=( (OS400.CD400,CDIR22IT,CD400,LU62)                 -
                 PARSESS=(4 1)                                    -
                 ENVIRONMENT=OS400                                -
                 LOGMODE=CD624K )
```

Sample VSE Definitions

This subsection contains sample environment definitions required for connections between VSE and OS/400. Refer to the *Connect:Direct VSE/ESA Administration Guide* for more detailed information.

The following table lists the VTAM definitions required for each node location and their file names.

Required VTAM Definitions	File Name of Sample Definition
VTAM Definitions for DTF	NDMAPPL
VTAM Definitions for IUI or Batch Interface	NDMIAPPL
Mode Table Used with Connect:Direct	NDMMODET
Network Map Definition	NDMMAP01
Cross-Domain Resource Manager Node	NDMCDRM
Cross-Domain Resource Definition for Other Nodes	NDMCDRSC

The following example is a sample of VTAM application definitions for the data transmission facility for use with Connect:Direct VSE.

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                 *
*CDAPPL:                                                          *
*   EXAMPLE VTAM APPLICATION DEFINITIONS FOR THE                  *
*   DATA TRANSMISSION FACILITY (DTF).                             *
*                                                                 *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
CDAPP1    APPL  ACBNAME=NDMAPP1, VTAM APPLICATION ID             x
          AUTH=(ACQ,NOCNM,NOPASS,NOPO,VPACE),                    X
          EAS=4,            APPROXIMATE # OF CONCURRENT SESS.     X
          MODETAB=NDMTAB,   MODE TABLE NAME                      X
          SONSCIP=NO,       NO UNBIND IN SCIP EXIT               X
          VPACING=7,        RECEIVE PACING OF 7                  X
          DLOGMOD=NDMLOGM,  MODE TABLE ENTRY                     X
          PARSESS=YES       PARALLEL SESSIONS CAN BE USED
```

The following example illustrates VTAM application definitions for the operator interface for use with Connect:Direct VSE.

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                 *
* CDIAPPL:                                                        *
* 2 EXAMPLE VTAM APPLICATION DEFINITIONS FOR THE OPERATOR         *
* INTERFACE. THESE APPLICATION IDS MUST MATCH THOSE SPECIFIED     *
* IN THE CD NETWORK MAP.                                          *
*                                                                 *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
NAI01   APPL   ACBNAME=NAI01,                                    X
          DLOGMOD=CDLOGM,                                        x
          MODETAB=CDTAB,                                         X
          VPACING=6
*
NAI02   APPL   ACBNAME=NAI02,
          DLOGMOD=CDLOGM,                                        X
          MODETAB=CDTAB,                                         X
          VPACING=6
```

Refer to Chapter 7, *Maintaining the Network Map*, for information on adding a network map entry for each remote node.

Defining the Link to a OS/390, VM, or VSE System Using Token Ring

LU6.2 sessions between an OS/400 node and an OS/390 node require that the two systems have matching NETIDs or that the OS/390 system use the IBM non-Native Network Connection (NNNC) support. Examples in this section include the parameters required for NNNC. Refer to the *VTAM Network Implementation Guide* and the *VTAM Resource Definition Reference* for more information on NNNC support.

Note: If you make any changes to VTAM, an NCPGEN may be required.

You must follow some strict naming conventions when defining the link to an OS/390, VM, or VSE system. VTAM cannot support APPN control point sessions because VTAM is a LEN node (Low Entry Networking

Node) in an APPN network (except for VTAM 4.1 and above). Therefore, all parameters must be explicitly defined. Use the following steps to define the link:

1. Define a mode description (MODD) with a name that matches the logmode you intend to use on the 370 system.

2. Define a line description (LIND) if one does not already exist for the link to the remote system.

3. Define a controller description (CTLD) if one does not already exist for the link to the remote system.

4. If you create a network map entry with a remote location name and your OS/400 system setup allows auto configuration of devices, you do not need to create device descriptions (DEVD). Otherwise, define a DEVD if one does not already exist for the use of Connect:Direct.

5. Add a Remote Configuration List entry for the remote system.

6. If LU name defined in VTAM does not match the default local location name of the OS/400 node, you must add a Local Configuration List entry.

7. If you define the link any time except the initial installation of Connect:Direct, you must add a Communications entry to the Connect:Direct subsystem description.

Sample Definitions for OS/390, VSE, or VM System Link

The following subsections describe example commands to define the configuration objects described previously. Each command is followed by a description of the applicable parameters.

Note: Unless otherwise noted, the following examples indicate an independent setup. The text indicates which values should be changed for dependent connections.

Creating a Mode Description

The following CRTMODD command example creates a mode description.

```
CRTMODD          MODD(CD624K) MAXSSN(8) MAXCNV(8) LCLCTLSSN(4)
                 PREESTSSN(0) INPACING(7) OUTPACING(7)
                 TEXT('Mode for Connect:Direct OS/400')
```

Parameters are as follows:

MODD
    specifies the name of the mode description. A logmode with the same name must exist on each node in the transfer path, including the remote node.

MAXSSN
    specifies the maximum number of sessions per device. Must match PARSESS in the host network map and DSESLIM in and the APPLID for independent configurations. MAXSSN must be 1 for dependent configurations.

MAXCNV
    specifies the maximum number of conversations per remote node. MAXCNV must be equal to MAXSSN.

LCLCTLSSN
    specifies the minimum number of sessions in which the local system is the primary node, able to initiate requests.

PREESTSSN

specifies the number of sessions automatically started when the mode is started. The mode is started by using the STRMOD command or when a session request is made specifying this mode name. The recommended value for this parameter is **0**.

INPACING

specifies the maximum number of incoming RUs allowed before a pacing response is sent to the remote system.

OUTPACING

specifies the maximum number of outgoing RUs sent before a pacing response is required from the remote system.

TEXT

describes the mode.

Creating a Line Description

The following example CRTLINTRN command assumes a token-ring connection. If you are defining an SDLC connection refer to the *Creating a Line Description* section on page B-4.

```
CRTLINTRN    LIND(LINTRN01) RSRCNAME(LIN091) MAXCTL(40)
             LINESPEED(16M) MAXFRAME(1994) ADPTADR(400000000001)
             EXCHID(05602012) AUTOCRTCTL(*YES) TEXT(*BLANK)
```

Parameters are as follows:

LIND

specifies the arbitrary, user-defined name of the line description.

RSRCNAME

specifies the name of the physical port to which this line is attached. Use the WRKHDWRSC *CMN command to access the **Work with Communication Resources** screen for the appropriate name.

MAXCTL

specifies the maximum number of controllers that are attached to this line description. MAXCTL must match the MAXPU parameter on the corresponding line macro on the remote system.

LINESPEED

specifies the speed of the link. LINESPEED must match the SPEED parameter on the corresponding line macro on the remote system.

MAXFRAME

specifies the largest frame size that is used on this line.

ADPTADR

specifies the token-ring adapter address of this node. ADPTADR must match the DIALNO parameter in the PATH macro on the remote system.

EXCHID

specifies the local exchange identifier by which this node is known on the network. EXCHID must match IDNUM and IDBLK in the PU macro on the remote system.

AUTOCRTCTL

specifies whether the system automatically creates an APPC controller description when an incoming APPN call is received from an adjacent system on the LAN.

TEXT
> describes the line.

Creating a Controller Description

The example CRTCTLHOST command assumes a token-ring connection.

```
CRTCTLHOST        CTLD(M1T2012) LINKTYPE(*LAN) APPN(*YES) CODE(*EBCDIC)
                  MAXFRAME(02057) RMTNETID(MVSNET) RMTCPNAME(CSDSA01)
                  SSCPID(050000003AA7)LCLEXCHID(05602012) INLCNN(*DIAL)
                  SWTDSC(*NO) ADPTADR(400070001002) DSAP(04) SSAP(04)
                  CPSSN(*YES) NODETYPE(*NETNODE) AUTOCRTDEV(*ALL)
                  AUTODLTDEV(1440) CMNRCYLMT(2 5) SWTLINLST(LINTRN01)
                  TEXT(*BLANK)
```

Parameter definitions for the CRTCTLHOST examples follow:

CTLD
> specifies the arbitrary, user-defined name of the controller description.

LINKTYPE
> specifies the type of line to which the controller is attached.

APPN
> specifies whether the controller is capable of Advanced Peer-to-Peer Networking. See page B-1 for an explanation of APPN and non-APPN environments.

CODE
> specifies whether the extended binary-coded decimal interchange code (*EBCDIC) or the American National Standard Code for Information Interchange (*ASCII) character code is used on the line.

MAXFRAME
> specifies the largest frame size that is used on this controller. MAXFRAME should match the MAXDATA parameter on the PU macro on the remote system.

RMTNETID
> specifies the network ID of the remote system in the network. RMTNETID must match the NETID in the VTAM startup list of the remote system.

RMTCPNAME
> specifies the control point name of the remote system in the network. RMTCPNAME must match the SSCPNAME in the VTAM startup list of the remote system.

SSCPID
> specifies the ID of the adjacent OS/390 or VSE system in the network. The first two digits are 05. The following 10 digits are the hexadecimal representation of the SSCPID in the VTAM startup list on the remote system.

LCLEXCHID
> specifies the local exchange identifier by which this node is known on the network. LCLEXCHID must match IDNUM and IDBLK in the PU macro on the remote system.

INLCNN
> specifies the method used to establish a connection with this controller.

SWTDSC
   specifies whether the switched connection to this controller is dropped when the last device is varied off.

ADPTADR
   specifies the remote adapter address. ADPTADR must match the last 12 digits of the LOCADD parameter in the corresponding LINE macro on the remote system.

DSAP
   specifies the destination service access point (DSAP). This is the logical address this system sends to when it communicates with the remote controller. This address allows the controller to properly route the data that comes from this system. The default value for the destination service access point is 04.

SSAP
   specifies the source service access point (SSAP). This is the logical address the local system uses when it sends data to the remote controller. This address allows the controller to properly route the data that comes from the local system. The default value for the source service access point is 04.

LINE
   specifies the name of the line to which the controller is attached.

CPSSN
   specifies whether control point sessions are supported.

NODETYPE
   specifies the type of node the remote system represents with respect to APPN. If APPN(*NO) is specified, this parameter is ignored. NODETYPE should correspond to the NODETYPE parameter in the VTAM startup list on the corresponding remote node.

AUTOCRTDEV
   specifies which devices are automatically created.

AUTODLTDEV
   specifies the number of minutes an automatically created device can remain in an idle state (when there are not active conversations on that device). When the time expires, the system automatically varies off and deletes the device description.

CMNRCYLMT
   the number of recovery attempts to be made by the system before an inquiry message is sent to the system operator.

SWTLINLST
   specifies the names of the switched lines to which this controller attaches. The line descriptions must already exist. Up to 64 switched names are specified.

TEXT
   describes the controller.

Creating a Device Description

The following example CRTDEVAPPC command assumes an APPN-capable connection:

```
CRTDEVAPPC          DEVD(MIT2012LW) LCLLOCNAME(MIT20122)
                    RMTLOCNAME(MICDD7B5) RMTNETID(MVSET) LOCADR(00)
                    CTL(MIT2012) MODE(CD624K)SNGSSN(*NO) APPN(*YES)
```

The following command assumes a token-ring connection that is not APPN-capable:

```
CRTDEVAPPC          DEVD(CDDEV) LCLLOCNAME(*NETATR) RMTLOCNAME(CDNODEA)
                    RMTNETID(CDNET) LOCADR(00) CTL(CDCTL) MODE(CD624K)
                    SNGSSN(*NO) APPN(*NO) TEXT('Connect:Direct OS/400
                    DEVD')
```

Parameters are as follows:

DEVD
specifies the arbitrary, user-defined name of the device description.

LCLLOCNAME
specifies the name of the local system as it is known to the network. This parameter and the LU name defined in VTAM must match.

RMTLOCNAME
specifies the name of the remote application as it is known to the network. It must match the DTF APPLID used by Connect:Direct on the 370 system.

RMTNETID
specifies the NETID in the VTAM startup list of the remote node.

LOCADR
specifies the location address of the device description. A value of 00 indicates an independent device, while any other value indicates a dependent device. Refer to the section regarding independent and dependent LUs on page B-2 for more detail.

CTL
specifies the name of the controller to which this device is attached.

MODE
specifies the name of the MODD used for sessions on this device.

SNGSSN
specifies whether the device is capable of multiple sessions. If a non-zero LOCADR value is specified, this value must be *YES.

APPN
specifies whether the device is used for Advanced Peer-to-Peer Networking. See page B-1 for an explanation of APPN and non-APPN environments.

> Note: If APPN=*YES, add the appropriate entries to the QAPPNLCL and QAPPNRMT configuration lists. For additional information, refer to the *Creating a Remote Configuration List Entry* section on page B-35 and the *Creating a Local Location List Entry* section on page B-35.

TEXT
describes the device.

Adding a Communications Entry

The communications entries allow the Connect:Direct subsystem to take control of the device descriptions required for session establishment. When you initially installed Connect:Direct OS/400, you added

communications entries for each device specified during the installation process. However, if you are adding a device after the initial installation, you must manually add the required entry.

The following ADDCMNE command assumes that Connect:Direct is installed in a library named CDLIB, using the subsystem name CDPROD, and that an administrator user profile named CDADMIN exists.

```
    ADDCMNE    SBSD(CDLIB/CDPROD) DEV(CDDEV) DFTUSR(CDADMIN)
```

The parameters used in this sample command are defined as follows:

SBSD
> specifies the Connect:Direct subsystem name and the library where it resides.

DEV
> specifies the name of the device description to be used by Connect:Direct.

DFTUSR
> specifies the default user profile to be used when another node requests a session on the specified device. This default user profile must be on the Connect:Direct user list as an Administrator-AUTH(A).

Sample OS/390 Definitions

This section contains sample environment definitions required for connections between OS/390 and OS/400. For detailed information, refer to the *Connect:Direct OS/390 Administration Guide*.

LOGMODE Entries

Connect:Direct OS/400 uses a LOGMODE entry when establishing a session with the host Connect:Direct. The following example is a sample MODETAB with an LU6.2 independent LOGMODE entry.

```
    LU62TAB MODETAB
    ****************************************************
    *              LU 6.2 WITH 4096-BYTE RU'S          *
    ****************************************************
    NDM624K MODEENT LOGMODE=CD624K,                     *
                    TYPE=1,                             *
                    COS=NDMC0S1,                        *
                    FMPROF=X'13',                       *
                    TSPROF=X'07',                       *
                    PRIPROT=X'B0',                      *
                    SECPROT=X'B0',                      *
                    COMPROT=X'D0B1',                    *
                    RUSIZES=X'8989',                    *
                    PSERVIC=X'06020000000000000000000300'
    *                     0 1 2 3 4 5 6 7 8 9 1011
          MODEEND
```

The following sample MODETAB has a dependent LOGMODE entry.

```
   LU62TAB MODETAB
   ****************************************************
   *             LU 6.2 WITH 4096-BYTE RU'S           *
   ****************************************************
   CD624K MODEENT LOGMODE=CD624K,                      *
                  TYPE=1,                              *
                  COS=NDMC0S1,                         *
                  FMPROF=X'13',                        *
                  TSPROF=X'07',                        *
                  PRIPROT=X'B0',                       *
                  SECPROT=X'B0',                       *
                  COMPROT=X'50B1',                     *
                  RUSIZES=X'8989',                     *
                  PSERVIC=X'060200000000000000002C00'
   *                          0 1 2 3 4 5 6 7 8 9 1011
            MODEEND
```

These two examples are referred to throughout this appendix.

Only the RUSIZES parameter in the LOGMODE is changed. The minimum allowed RU size is 512 (RUSIZES=x'8686').

Unformatted Systems Services (USS) Table

Connect:Direct does not use the USS table. However, if you define a USS table for the LUs to be used with APPC devices of the OS/400 node, you cannot include a MSG10 definition.

OS/390 Local Application ID (APPLID)

For Connect:Direct OS/390 to work with Connect:Direct OS/400, the VTAM APPL for Connect:Direct OS/390 (local node) must be capable of running an LU6.2 session. Refer to the following IBM publications for more information:

❖ *AS/400-S/370 Connectivity*, reference number GG24-3336-00

❖ *AS/400 Communication Definitions Examples*, reference number GG24-3449-00

The following example is an APPL for the OS/390 node.

```
   CDCDDT35 APPL    ACBNAME=CDCDDT35,    VTAM APPLID
                    AUTH=(ACQ,NOCNM,NOPASS,NOPO,NOTSO,VPACE)
                    AUTOSES=1,
                    DDRAINL=ALLOW,
                    DMINWNL=4,
                    DMINWNR=4,
                    DRESPL=ALLOW,
                    DSESLIM=8,
                    LMDENT=8,
                    EAS=509,
                    MODETAB=CDLGMTAB,    MODE TABLE NAME
                    SONSCIP=NO,          NO UNBIND IN SCIP EXIT
                    SRBEXIT=NO,          NO SRB PROCESSING
                    VPACING=7,           RECEIVE PACING OF 7
                    DLOGMOD=CDLM1K,      MODE TABLE ENTRY
                    PARSESS=YES,         PARALLEL SESSIONS CAN BE USED
                    VTAMFRR=NO,          NO FUNCTION RECOVERY ROUTINE
                    APPC=YES             LU62 CAPABLE
```

The following descriptions are for the pertinent parameters of the previous example, where *n* is the number in first PARSESS value on the OS/390 ADJACENT.NODE entry.

Parameters are as follows:

APPC=YES
    allows LU6.2 support. APPC must be YES.

DDRAINL=ALLOW
    allows CNOS (Change Number of Sessions) to drain sessions (independent connections only).
    DDRAINL must be ALLOW.

DMINWNL=n
    specifies the total number of LU6.2 contention losers on this applid (independent connections only).

DMINWNR=n
    specifies the total number of LU6.2 contention winners on this applid (independent connections only).

DRESPL=ALLOW
    specifies that the application program has responsibility for deactivating sessions (independent
    connections only). DRESPL must be ALLOW.

DSESLIM=2n
    specifies the maximum number of sessions for this applid, where *2n* should be equal to or greater than
    the sum of DMINWNL and DMINWNR for any remote node using an independent connection.

DLOGMODE
    specifies default LOGMODE. *DLOGMOD must refer to an LU0 LOGMODE entry to ensure
    compatibility with prior releases of Connect:Direct.* The LU6.2 LOGMODE name is extracted from
    the network map.

LMDENT=n
    specifies the number of entries to be used for the application program hash table of remote LUs.

MODETAB
    specifies the mode table that contains entries for LU0, LU6.2, and SNA Service Manager mode
    (SNASVCMG).

PARSESS
    specifies that parallel sessions are used. PARSESS must be YES.

AUTOSES=x
    specifies number of sessions automatically started when a session request is made, where *x* must be a
    minimum of **1** for any remote node.

Sample VTAM Start-up List

The following example is part of a sample VTAM start-up list. Information necessary for defining the OS/400
environment is shown. Record the corresponding information from your environment on the worksheet in the
Preparing the Installation Worksheet section on page 2-3. Convert SSCPID to hexadecimal format for the
OS/400 system.

Note: XNETALS=*YES is required if you are using NNNC.

```
    HOSTSA=01,                                                        x
    NODETYPE=NN,                                                      X
    CONNTYPE=LEN,                                                     x
    CPCP=YES,                                                         x
    GWSSCP=YES,                                                       x
    NETID=MVSNET,                                                     x
    SSCPID=15015,                                                     x
    SSCPNAME=CSDSA01,                                                 x
    LISTBKUP=DEFAULTS,                                                x
    TNSTAT,NOCNSL,TIME=60,                                            x
    PPOLOG=YES,                                                       x
    XNETALS=YES,                                                      x
    NCPBUFSZ=2048,                                                    x
    HOTIOTRM=50,                                                      x
    IOPURGE=5M,                                                       x
    MSGLEVEL=V4R1,                                                    x
    MAINTLVL=BASE,                                                    x
    IOBUF=(950,320,50,,30,100,3000),                                  x
    CRPLBUF=(500,,0,,25,1),                                           x
    LFBUF=(300,,0,,32,1),                                             x
    LPBUF=(80,,0,,12,1),                                              x
    SFBUF=(40,,0,,34,1),                                              x
    SPBUF=(32,,0,,32,1),                                              x
    BSBUF=(800,,0,,25,50),                                            x
    XDBUF=(40,,0,,5,1)                                                x
```

Defining OS/390 NCP Definitions

The following example is part of NCP source code, with sample definitions for a Connect:Direct OS/400 node, independent LU6.2 token-ring connection. Use the information to define your OS/400 environment. Record this information on the worksheet in the *Preparing the Installation Worksheet* section on page 2-3.

Note: If you are using NNNC, NETID is required on the PU.

```
CDIRGPGP GROUP ECLTYPE=PHYSICAL          PHYSICAL GROUP
*
* NTRI PHYSICAL LINE DEFINITION
*
CDIRG    LINE  ADDRESS=(1088,FULL),      LAN
               LOCADD=400070001002,      'SOFT' ADDRESS FOR TIC
               MAXTSL=16732,             RANGE 265 TO 16732
               OWNER=CSDSA01,            OS390   OWNS THIS LINE
               NPACOLL=YES,              NPM
               PORTADD=0,                 WHERE ACRS3LGP POINTS TO
               RCVBUFC=4141,             RANGE 6*BFRS TO 4095
               ADAPTER=TIC2,             TIC2
               MAXPU=40,
               SPAN=(8000)               NETVIEW OPERAND
*
CDIRG1   PU    SPAN=(8000)
*
CDIRG100 LU    ISTATUS=INACTIVE,         IBM RECOMMENDED
               SPAN=(8000)               NETVIEW OPERAND
*---------------------------------------------------------------
CDIRGLGP GROUP ECLTYPE=LOGICAL,          LOGICAL GROUP
               CALL=INOUT,               ALLOW DIAL IN AND DIAL OUT
               NPACOLL=YES,              NPM
OWNER=CSDSA01,          OS390   OWNS THIS LINE GROUP
               PHYPORT=0,                POINTS TO ACRS3 LINE PORTADD
               SPAN=(8000),              NETVIEW OPERAND
               TYPE=NCP                  NETWORK CONTROL MODE
*
CDIRGT00 LINE  AUTOCOPY=(35,CDIRGT01,D)
*
CDIRGP00 PU    NEXT=(CDIRGP01,D
               ENDAUTO                                          CDT2012
VBUILD TYPE=SWNET,MAXGRP=1,MAXNO=1
*
CDT2012P PU    ADDR=C2,
               ISTATUS=ACTIVE,
               DISCNT=YES,
               IDBLK=056,
               IDNUM=02012,
               MAXOUT=7,
               MAXPATH=1
               PUTYPE=2,
               SSCPFM=USSSCS,
               DLOGMOD=SNUG256,
               MODETAB=CDLGMTAB,
               USSTAB=OS400USS,
               MAXDATA=2057,
               VPACING=7
*
PATH     PATH  DIALNO=0004400000000001,
               GRPNM=CDIRGLGP,
               PID=1,GID=1,
               USE=YES
*
*
CDGRP12  GROUP ISTATUS=ACTIVE,
               ALSLIST=CDT2012P,         ADJ LINK STATION
               MODETAB=CDLGMTAB,         LOGON MODE TABLE
               DLOGMOD=CD624K,           LOGON MODE TABLE ENTRY
               RESSCB=5                  SESSION CONTROL BLOCKS
*
CDT2012L CDRSC ISTATUS=ACTIVE
```

Each line defined to VTAM for use with OS/400 has a corresponding OS/400 line definition. Each PU on that line corresponds to a controller on the OS/400 system, and each LU corresponds to an APPC device description or 3270 emulation device description on the OS/400 system.

Defining OS/390 NETMAP Adjacent Node Parameters

The OS/400 node must be defined to Connect:Direct OS/390 through the network map file. You can enter a domain name in place of the IP address (listen address) in the Netmap remote node entries. The following example shows an adjacent node record for an environment using dependent LUs.

```
ADJACENT.NODE=(PARSESS=(2 1)(OS400.dallas,,cdtest, LU62)              -
              ENVIRONMENT=OS400 LOGMODE=CD624K                        -
              SNODE.LUS=(LU01,LU02, LU03) PNODE.LUS(LU04,LU05))
```

The following example is a sample adjacent node record using an independent LU.

```
ADJACENT.NODE = (PARSESS=(6 1)                                       -
              (OS400.CD400,CDT2012L,CD400,LU62)                      -
              ENVIRONMENT=OS400 LOGMODE=CD624K)
```

Sample VSE Definitions

This subsection contains sample environment definitions required for environment definitions connections between VSE and OS/400. Refer to the *Connect:Direct VSE/ESA Administration Guide* for more detailed information.

The following table lists the VTAM definitions required for each node location and their file names.

Required VTAM Definitions	File Name of Sample Definitions
VTAM Definitions for DTF	NDMAPPL
VTAM Definitions for IUI or Batch Interface	NDMIAPPL
Mode Table Used with Connect:Direct	NDMMODET
Network Map Definition	NDMMAP01
Cross-Domain Resource Manager Node	NDMCDRM
Cross-Domain Resource Definition for Other Nodes	NDMCDRSC

The following example is a sample of VTAM application definitions for the data transmission facility for use with Connect:Direct VSE.

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                 *
*CDAPPL:                                                          *
*   EXAMPLE VTAM APPLICATION DEFINITIONS FOR THE                  *
*   DATA TRANSMISSION FACILITY (DTF).                             *
*                                                                 *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
CDAPP1    APPL   ACBNAME=NDMAPP1, VTAM APPLICATION ID               x
          AUTH=(ACQ,NOCNM,NOPASS,NOPO,VPACE),                       X
          EAS=4,                APPROXIMATE # OF CONCURRENT SESS.    X
          MODETAB=NDMTAB,       MODE TABLE NAME                     X
          SONSCIP=NO,           NO UNBIND IN SCIP EXIT              X
          VPACING=7,            RECEIVE PACING OF 7                 X
          DLOGMOD=NDMLOGM,      MODE TABLE ENTRY                    X
          PARSESS=YES           PARALLEL SESSIONS CAN BE USED
```

The following example illustrates VTAM application definitions for the operator interface for use with Connect:Direct VSE.

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                 *
* CDIAPPL:                                                        *
* 2 EXAMPLE VTAM APPLICATION DEFINITIONS FOR THE OPERATOR         *
* INTERFACE. THESE APPLICATION IDS MUST MATCH THOSE SPECIFIED     *
* IN THE CD NETWORK MAP.                                          *
*                                                                 *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
NAI01     APPL  ACBNAME=NAI01,                                      X
          DLOGMOD=CDLOGM,                                           X
          MODETAB=CDTAB,                                            X
          VPACING=6
*
NAI02     APPL  ACBNAME=NAI02,                                      X
          DLOGMOD=CDLOGM,                                           X
          MODETAB=CDTAB,                                            X
          VPACING=6
```

Refer to Chapter 7, *Maintaining the Network Map*, for information on adding a network map entry for each remote node.

Creating a Line Description

The following example assumes a token-ring connection. If you are defining an SDLC connection, use the CRTLINSDLC command instead of CRTLINTRN.

```
CRTLINTRN    LIND(CDLIN) RSRCNAME(LIN031) MAXCTL(10) LINESPEED(16M)
             MAXFRAME(4060) ADPTADR(400000000001)
             TEXT('Connect:Direct OS/400 line.')
```

Parameters used in this command are as follows:

LIND
     specifies the arbitrary, user-defined name of the line description.

RSRCNAME
> specifies the name of the physical port where this line is attached. Use the WRKHDWRSC *CMN command to access the **Work with Communication Resources** screen for the appropriate name.

MAXCTL
> specifies the maximum number of controllers that are attached to this line description. MAXCTL must match the MAXPU parameter on the corresponding line macro on the remote system.

LINESPEED
> specifies the speed of the link.

MAXFRAME
> specifies the largest frame size that is used on this line.

ADPTADR
> specifies the token-ring adapter address of the local node. ADPTADR must match the LOCADD parameter in the APPCCFG PU main menu on the remote system. This parameter is for token ring only.

TEXT
> describes the line.

Creating a Controller Description

The following example command assumes a token-ring connection.

```
CRTCTLAPPC      CTLD(CDCTL) LINKTYPE(*LAN) APPN(*NO) SWTLINLST(CDLIN)
                RMTCPNAME(CDNODEPC) ADPTADR(100000000001)
                MAXFRAME(4060) TEXT('Connect:Direct OS/400
                controller')
```

Parameters are as follows:

CTLD
> specifies the arbitrary, user-defined name of the controller description.

LINKTYPE
> specifies the type of line to which the controller is attached.

APPN
> specifies whether the controller is capable of Advanced Peer-to-Peer Networking. APPN must be set to *NO.

SWTLINLST
> specifies the name of the line to which the controller is attached.

RMTCPNAME
> specifies the control point name of the remote system in the network. If the remote node is adjacent to the local system, this is the network ID of the remote system. This parameter should match the local device name defined on the Remote node.

ADPTADR
> specifies the token-ring adapter address on the remote node. ADPTADR must match the token-ring address on the PC token-ring adapter. This parameter is for token ring only.

MAXFRAME
     specifies the largest frame size that is used on this controller.

CPSSN
     specifies whether control point sessions are to be supported. CPSSN should be *NO.

NODETYPE
     specifies type of node the remote system represents with respect to APPN. NODETYPE should be
     *LEN. If APPN(*NO) is specified, NODETYPE is ignored.

TEXT
     describes the controller.

Creating a Device Description

The following example command assumes a token-ring connection.

```
CRTDEVAPPC      DEVD(CDDEV) LCLLOCNAME(REMOTEDEV)
                RMTLOCNAME(CDNODEPC) LOCADR(00) CTL(CDCTL)
                MODE(CD624K) SNGSSN(*YES) APPN(*NO)
                EXT('Connect:Direct OS/400')
```

Definitions for the parameters follow:

DEVD
     specifies the arbitrary, user-defined name of the device description.

LCLLOCNAME
     specifies the name of the local system as it is known to the network. The value *NETATR indicates
     that the default local location name of the local system is used. LCLLOCNAME and the remote
     device name defined in the NETMAP on the Remote node must match.

RMTLOCNAME
     specifies the name of the MS-DOS node as it is known to the network. RMTLOCNAME must match
     the local device name defined on the MS-DOS node.

LOCADR
     specifies the location address of the device description. A value of 00 indicates an independent
     device, while any other value indicates a dependent device. The value must be 00.

CTL
     specifies the name of the controller to which this device is attached.

MODE
     specifies the name of the MODD used for sessions on this device.

SNGSSN
     specifies whether the device is capable of multiple sessions. SNGSSN must be *YES.

APPN
    specifies whether the device is used for Advanced Peer-to-Peer Networking.

Note: If APPN=*YES, add the appropriate entries to the QAPPNLCL and QAPPNRMT
        configuration lists. For additional information, refer to the *Creating a Remote Configuration
        List Entry* section on page B-35 and the *Creating a Local Location List Entry* section on page
        B-35.

CONV
    specifies the number of conversations possible on this device. The value must be **1**.

TEXT
    describes the device.

Adding a Communications Entry

The communications entries allow the Connect:Direct subsystem to take control of the device descriptions
required for session establishment. When you initially installed Connect:Direct OS/400, you added
communications entries for each device specified during the installation process. If you add a device after the
initial installation, you must manually add the required entry.

The following example command assumes that Connect:Direct is installed in a library named CDLIB, using
the subsystem name CDPROD, and that an administrator user profile named CDADMIN exists.

```
ADDCMNE      SBSD(CDLIB/CDPROD) DEV(CDDEV) DFTUSR(CDADMIN)
```

SBSD
    specifies the Connect:Direct subsystem name and the library where it resides.

DEV
    specifies the name of the device description to be used by Connect:Direct.

DFTUSR
    specifies the default user profile to be used when another node requests a session on the specified
    device. This default user profile must be on the Connect:Direct user list as an
    Administrator-AUTH(A).

Defining the Link to UNIX

The connection between Connect:Direct UNIX and Connect:Direct OS/400 is not configured as other
Connect:Direct connections. The Connect:Direct UNIX system administrator must consult the *Connect:Direct
UNIX Getting Started Guide*.

Observe the following for all UNIX platforms:

❖   The Connect:Direct OS/400 network map entry must have ' ' for the library name.

❖   In a Process, the user ID and password must be surrounded with single quotation marks.

Create the line description (LIND) and the mode description (MODD), then complete the following steps on
the UNIX platform according to platform type.

❖   Create a remote configuration list entry according to the instructions in the *Connect:Direct Compatibility
    and Connectivity Chart*.

❖   Create a local location list entry according to the instructions in the *Connect:Direct Connectivity Guide*.

Perform the automatic configuration on the OS/400 as follows:

❖   Execute the WRKSYSVAL QAUTOCFG on the OS/400

❖   Select Option **5** to display the configuration

❖   The Autoconfigure device parameter must be set to **1**

After you complete the automatic configuration on the OS/400, start the SNA on UNIX.

Connectivity Between RS/6000 and OS/400 Systems

To configure RS/6000 to OS/400 connections, run the cdsnacfg script on the RS/6000. You must then modify the default AIX SNA Server/6000 configuration to allow the automatic OS/400 configuration to build the proper connections.

To modify the default AIX SNA Server/6000 configuration, enter the following commands. PUNAME is the PU name entered in the cdsnacfg script.

```
chsnaobj -t'sna_dlc_token_ring' -b 'no' trdlcl1
chsnaobj -t'link_station' -w'token_ring' -y 'trdlcl1' -a 'no' PUNAME
```


Connectivity Between Brixton and OS/400 Systems

OS/400 definitions should include the following in the DLC directive:

```
RMTNQ_CP_NAME=CDUNET.CP_NAME    //Rmt Network Qualified Name
```

After running the Brixton configuration for the OS/400 connection, change the OS/400 device description to match the Mode_Name defined in the Brixton configuration.

Connectivity Between HP and OS/400 Systems

OS/400 definitions should include the following in the DLC directive:

```
RMTNQ_CP_NAME=CDUNET.CP_NAME    //Rmt Network Qualified Name
```

After running the HP configuration for the OS/400 connection, change the OS/400 device description to match the Mode_Name defined in the HP configuration.

Connectivity Between SCO and OS/400 Systems

OS/400 definitions should include the following in the DLC directive:

```
RMTNQ_CP_NAME=CDUNET.CP_NAME    //Rmt Network Qualified Name
```

After running the SCO configuration for the OS/400 connection, change the OS/400 device description to match the Mode_Name defined in the SCO configuration.

Connectivity Between Sun Solaris and OS/400 Systems

OS/400 definitions should include the following in the DLC directive:

```
RMTNQ_CP_NAME=CDUNET.CP_NAME    //Rmt Network Qualified Name
```

After running the Sun Solaris configuration for the OS/400 connection, change the OS/400 device description to match the Mode_Name defined in the Sun Solaris configuration.

Creating a Remote Configuration List Entry

Follow this step if you are defining an APPN connection. To create a remote configuration list entry, type the following command:

```
CHGCFGL TYPE(*APPNRMT)
```

This command displays the **Change Configuration List** screen. Add an entry for the device according to the following criteria:

Remote Location
> specifies the name of the remote location. Remote Location should match the value specified for the RMTLOCNAME parameter on the device description.

Remote Network ID
> specifies the ID of the remote network. Remote Network ID should match the value specified for the RMTNETID parameter on the device description.

Local Location
> specifies the name of the local location. Local Location should match the value specified for the LCLLOCNAME parameter on the device description.

Remote Control Point
> specifies the name of the control point that provides network function for the remote location. Remote control point should match the value specified for the RMTCPNAME parameter on the controller description.

Control Point Net ID
> specifies the ID of the network where the remote control point resides. Control Point Net ID should match the value specified for the RMTNETID parameter on the controller description.

Text
> describes the entry.

Creating a Local Location List Entry

This step is required if you are defining an APPN connection. To create a local location list entry, type the following command:

```
CHGCFGL TYPE(*APPNLCL)
```

This command displays the **Change Configuration List** screen. Add an entry for the device according to the following criteria.

Local Location
specifies the name of the remote location. Local Location should match the value specified for the LCLLOCNAME parameter on the device description.

Text
describes the entry.

Defining the TCP/IP Environment

To use the TCP/IP connectivity feature of Connect:Direct OS/400, you must configure your OS/400 node for TCP/IP then prepare the Connect:Direct OS/400 software for TCP/IP.

Refer to the *Connect:Direct Compatibility and Connectivity Guide* for assistance in defining your connectivity.

Configuring OS/400 Node

To configure your OS/400 node for TCP/IP connectivity, follow the instructions as outlined in *OS/400 TCP/IP Configuration and Reference*, V3R1. The steps described in the manual include:

❖ Configuring a line description

❖ Configuring a TCP/IP interface

❖ Configuring host table entries

❖ Configuring local domain and host name

❖ Starting TCP/IP

❖ Verifying the TCP/IP connection

Perform these steps as required by your installation.

Updating Initialization Parameters File

During the installation of Connect:Direct, you add the IP address and port number of the local Connect:Direct OS/400 node to the Connect:Direct initialization parameters file. These parameters are described in the *Applying Parameter Changes* section on page 5-12. You can also update the initialization parameters by using the CHGCDPARM command as detailed in the *Understanding the Connect:Direct Parameters (CHGCDPARM) Command* section on page 5-1.

Preparing Connect:Direct Network Map

After you have configured your OS/400 node for TCP/IP as described in the OS/400 manual, you have to prepare your Connect:Direct OS/400 network map to include the IP address and port address for the remote nodes. See Chapter 7, *Maintaining the Network Map*, for the parameters that relate to TCP/IP node definitions.

Implementing Firewall Navigation

Firewall navigation enables controlled access to a Connect:Direct OS/400 system running behind a packet-filtering firewall without compromising your security policies or those of your trading partners. You create this access by assigning a specific TCP/IP source port number or a range of port numbers with a particular TCP/IP address (or addresses) for outgoing Connect:Direct OS/400 sessions. These ports must also be available on the firewall of your trading partner to allow incoming Connect:Direct OS/400 sessions.

To implement firewall navigation:

1. Coordinate IP addresses and associated port assignments with your firewall administrator before implementing this enhancement.

2. Specify the following parameters by using the CHGCDPARM screens. See Chapter 5, *Modifying Initialization Parameters*, for parameter descriptions and values.

    ❖   TCPSRCPORT =*(IP address 1/optional subnet mask | IP address pattern 1, associated port number | associated range of port numbers | associated port number, associated range of port numbers)*   -

        .
        .
        .

    (IP address n/optional subnet mask | IP address pattern n, associated port number | associated range of port numbers | associated port number, associated range of port numbers)

    ❖   TCPLSTITR = 1. . . 255

3. Restart Connect:Direct OS/400.

4. Coordinate the specified port numbers with the firewall administrator at the remote site. These ports must also be available for Connect:Direct OS/400 communications on the firewall of your trading partner.

The following message indicates that Connect:Direct OS/400 cannot find an idle port.

```
SCPA001I - TGT.ADDR=nnn.nnn.nnn.nnn, TCPSRCPORT exhausted
```

If this message occurs frequently, increase the pool of available ports.

Configuring an APPN Network

This chapter details parameters for configuring Connect:Direct OS/400 for an APPN network. The configuration parameters for each of the four different nodes in a sample network include the Connect:Direct OS/390, Connect:Direct OS/400, and Connect:Direct Windows nodes.

Refer to the *Connect:Direct Connectivity Guide* for assistance in defining your connectivity.

Configuring Connect:Direct an APPN Network

The Connect:Direct OS/400 node can function as an intermediate node in a network with Connect:Direct OS/390 nodes and other Connect:Direct OS/400 nodes. For example, a transaction routed from the Connect:Direct Windows node to a Connect:Direct OS/390 node can go directly to the OS/390 node, or it can be routed through the intermediate Connect:Direct OS/400 node. The following illustration shows a sample network configuration that uses a Connect:Direct OS/400 node to perform intermediate session routing.

Connect:Direct OS/400 enables use of device descriptions that are dynamically created by APPN. See Chapter 7, *Maintaining the Network Map*, and the *Changing Communication Entries* section beginning on page 9-1.

If you specify RMTLOCNAME, LCLLOCNAME, RMTNETID, and MODE in the network map and add a communications entry using the RMTLOCNAME, you allow Connect:Direct to utilize any existing or dynamically created device description that APPN determines is suitable. This procedure allows Connect:Direct to take advantage of the network load balancing capabilities of the APPN network.

In the following illustration, the two OS/400 nodes are shown as OS/400 A and OS/400 B. Solid lines represent an actual connection. Dotted lines represent a virtual connection.
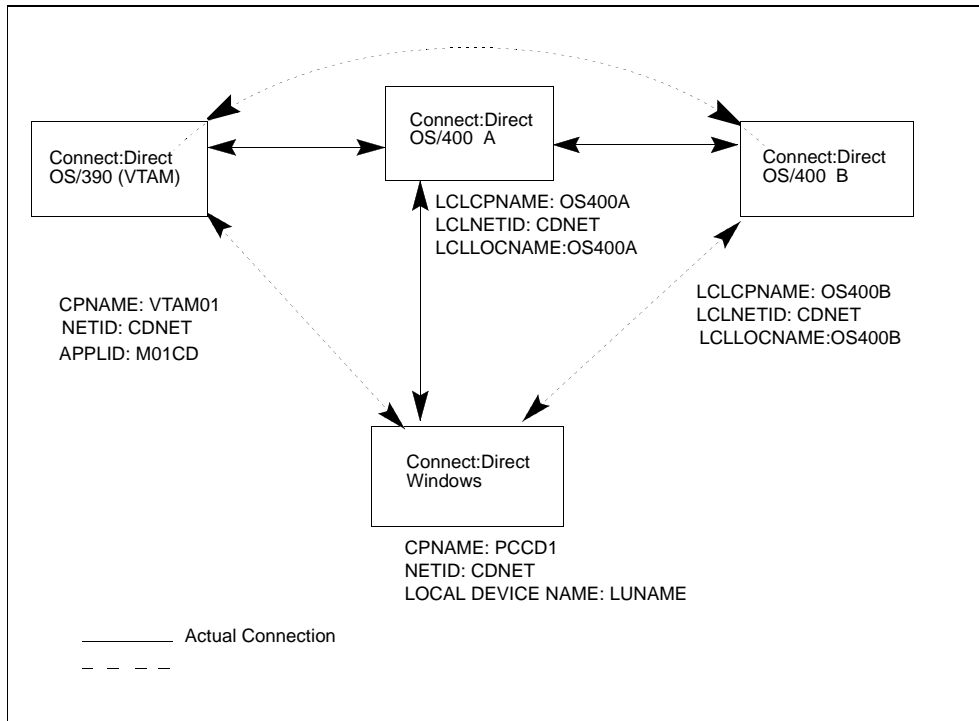
The following sections list and describe the configuration parameters for each of the nodes in the above sample network. These parameters are shown as examples only; they do not address all the possible configurations.

Refer to Appendix B, *Defining the LU6.2 Environment*, for more information on defining the APPN environment.

Definitions on the Connect:Direct OS/390 Node

This section lists the configuration parameters for the Connect:Direct OS/390 node (VTAM01) in the example network illustration. A sample of Connect:Direct OS/390 definitions follows.

```
   G11L1  GROUP  LNCTL=SDLC,
          DUPLEX=FULL,
          NPACOLL=YES,
          NRZI=YES,
          REPLYTO=1,
          RETRIES=(7,4,5),
          TYPE=NCP
  LIN1   LINE   ADDRESS=(1,FULL),
          ATTACH=DIRECT,
           ANS=CONTINUE,
          CLOCKNG=DIRECT,
          DUPLEX=FULL,
          ISTATUS=ACTIVE,
          ETRATIO=30,
           MAXPU=1,
          SERVLIM=10,
          SRT=(,64),
          SPEED=19200
          STATOPT='OS/400 LINE'
  L1P1   PU   ADDR=C1,
          PUTYPE=2,
          NETID=NETNAME,
          ANS=CONTINUE,
          ISTATUS=ACTIVE,
          PASSLIM=8,
          DISCNT=(NO),
          DLOGMOD=EM3277,
          MODETAB=MTGS3X,
          SSCPFM=USSSCS,
          RETRIES=(,1,4),
          USSTAB=RSUSSTAB,
          PACING=0,
          VPACING=0,
          MAXDATA=265,
          MAXOUT=7
          XID=YES
```

Logical Unit for the Connect:Direct OS/400 A Node

The following table lists LU definitions for sessions with the Connect:Direct OS/400 A node displayed in the sample network configuration.

Parameter	Definition
LOCADDR	0
ISTATUS	Active
DLOGMOD	CD624K
MODETAB	LOGMTAB
USSTAB	OS400USS

Logical Unit for the Connect:Direct OS/400 B Node

The following table lists LU definitions for sessions with the Connect:Direct OS/400 B node that was displayed in the sample network configuration.

Parameter	Definition
LOCADDR	0
ISTATUS	Active
DLOGMOD	CD624K
MODETAB	LOGMTAB
USSTAB	OS400USS

Logical Unit for the Connect:Direct Windows Node

The following table lists LU definitions for sessions with the Connect:Direct Windows node that was displayed in the sample network configuration.

Parameter	Definition
LOCADDR	0
ISTATUS	Active
DLOGMOD	CD624K
MODETAB	LOGMTAB
USSTAB	OS400USS

Network Map Entries

The following network map entries are for the OS/400 nodes in the sample network configuration.

An example network map entry for the intermediate OS/400 node (OS/400A) in the sample network follows.

```
REMOTE.NODE =    (PARSESS=(4 1) (CD.OS400A,OS400A,CDPROD,LU62      -
                  ENVIRONMENT=OS400 LOGMODE=CD624K)
```

An example network map entry for the destination OS/400 node (OS/400B) in the sample network follows.

```
REMOTE.NODE =    (PARSESS=(4 1) (CD.OS400B,OS400B,CDPROD,LU62      -
                  ENVIRONMENT=OS400 LOGMODE=CD624K)
```

An example network map entry for the Connect:Direct Windows node (CD.PC1) in the sample network follows.

```
REMOTE.NODE =    ((CD.PC1,PCCD1,,LU62)                             -
                  ENVIRONMENT=NT
```

Definitions on the Connect:Direct OS/400 B Node

This section lists the configuration parameters on the destination Connect:Direct OS/400 node (OS/400B) in the sample network illustrated in the *Configuring Connect:Direct an APPN Network* section beginning on page D-1. Configuration list entries should not be required because the Connect:Direct OS/400 B node should be able to share topology information with the Connect:Direct OS/400 A node.

Defining the Connect:Direct OS/400 A Node

The following sections show sample commands to define the line, controller, and device for the Connect:Direct OS/400 A node.

Line

A sample CRTLINSDLC command and parameters that define the line on the Connect:Direct OS/400 B node for the Connect:Direct OS/400 A node follows.

```
   CRTLINSDLC       LIND(LINOS400A) RSRCNAME(LIN012) NRZI(*YES)
                    ROLE (*NEG) LINESPEED(19200) MAXCTL(2)
                    DUPLEX (*FULL) MAXOUT (7) MAXFRAME(2057)
```

Controller

A sample CRTCTLAPPC command and parameters that define the controller on the Connect:Direct OS/400 B node for the Connect:Direct OS/400 A node follows.

```
   CRTCTLAPPC       CTLD(CTLOS400A) LINKTYPE(*SDLC) APPN(*YES)
                    LINE(LINOS400A) MAXFRAME(2057) RMTCPNAME(OS400A)
                    CPSSN (*YES) NODETYPE(*NETNODE)
```

Device

A sample CRTDEVAPPC command and parameters that define the device on the Connect:Direct OS/400 B node for the Connect:Direct OS/400 A node follow.

```
   CRTDEVAPPC       DEVD(DEVOS400A) RMTLOCNAME(OS400A)
                    LCLLOCNAME(OS400B) CTL(CTLOS400A) MODE(CD624K)
                    APPN(*YES) LOCADR(00)
```

Defining the Connect:Direct Windows Node

A sample CRTDEVAPPC command and parameters that define the device on the Connect:Direct OS/400 B node for the Connect:Direct Windows node follows.

```
   CRTDEVAPPC       DEVD(DEVPCCD1) RMTLOCNAME(PCCD1)
                    LCLLOCNAME(OS400B) CTL(CTLOS400A) MODE(CD624K)
                    APPN(*YES) SNGSSN(*YES 1)  LOCADR(00)
```

Defining the Connect:Direct OS/390 Node

A sample CRTDEVAPPC command and parameters that define the device on the Connect:Direct OS/400 B node for the Connect:Direct OS/390 node follows.

```
CRTDEVAPPC      DEVD(DEVVTAM01) RMTLOCNAME(M01CD)
                LCLLOCNAME(OS400B) CTL(CTLOS400A) MODE(CD624K)
                APPN(*YES) LOCADR(00)
```

Network Map Entries on the Connect:Direct OS/400 B Node

The following table shows the device, library, and description entries on the Connect:Direct OS/400 B node for the other nodes in the sample network.

Node Name	Device	Library	Description
CD.OS400A	DEVOS400A	CDPROD	CD on OS/400 A node
CD.OS/390	DEVVTAM01	CDLIB	CD on VTAM01 node
CD.PC1	DEVPCD1	CDLIB	CD on PC1 node

LU6.2 Interface Parameters Screen

The following table lists the parameters for the Connect:Direct OS/390, Connect:Direct OS/400 A, and Connect:Direct OS/400 B nodes on the Connect:Direct NT Interface Parameters screen.

Parameter Name	OS/400 A	OS/400 B	OS/390 (VTAM01)
Remote Library	CDPROD	CDPROD	CDLIB
Remote Device Name	OS400A	OS400B	M01CD
Remote Net ID	CDNET	CDNET	CDNET
Peer	Y	Y	Y
PU Name			
APPN	N	N	N
Link/Line Type			
Local ADPTR PRI	Y	Y	Y
Remote ADPTR PRI	N	N	N
Remote CP Name	OS400A	OS400A	OS400A

Definitions on the Connect:Direct Windows Node

This section describes the configuration parameters on the Connect:Direct Windows node as shown in the sample network.

Connect:Direct Windows Base LU6.2 Parameters Screen

The following table lists the required parameters on the Base LU6.2 Parameters screen in the Connect:Direct Windows configuration program.

Field	Value
Local Device Name	PCCD1
Local CP Name	PCCD1
Local NETID	CDNET

Connect:Direct Windows Network Map Entries

To set up an Connect:Direct Windows node to communicate with the other nodes in the network, a separate remote node record must be defined for each of the other network nodes.

The following table lists sample parameters on the Remote Node Record screen for the other nodes (OS/400 A, OS/400 B, and OS/390) in the network.

Field Name on Remote Node Record Screen	OS/400 A	OS/400 B	OS/390 (VTAM01)
Remote Node Record	OS400A	OS400B	Connect:Direct OS/390
Remote Node Type	400	400	OS/390
Remote Node Name	CD.OS400A	CD.OS400B	Connect:Direct OS/390
Local Node Name	CD.PC1	CD.PC1	CD.PC1
Logmode	CD624K	CD624K	CD624K

Definitions on the Connect:Direct OS/400 A Node

This section describes the configuration parameters on the OS/400 A node as shown in the sample network.

Defining the Connect:Direct OS/390 Node

The following examples show sample commands to define the line, controller, and device for the Connect:Direct OS/390 node.

Line

A sample CRTLINSDLC command and parameters that define the line on the Connect:Direct OS/400 A node for the Connect:Direct OS/390 node follows.

```
CRTLINSDLC      LIND(LINVTAM01) RSRCNAME(LIN012) NRZI(*YES)
                ROLE(*SEC) LINESPEED(19200) MAXCTL(2) DUPLEX(*FULL)
                MAXOUT(7) MAXFRAME(2057)
```

Controller

A sample CRTCTLHOST command and parameters that define the controller for a Connect:Direct OS/390 node follows.

```
CRTCTLHOST      CTLD(CTLVTAM01) LINKTYPE(*SDLC) APPN(*YES)
                LINE(LINVTAM01) MAXFRAME(2057) RMTCPNAME(VTAM01)
                CPSSN(*NO) NODETYPE(*LENNODE)
```

Device

A sample CRTDEVAPPC command and parameters define the device on the Connect:Direct OS/400 A node for a Connect:Direct OS/390 node follows.

```
CRTDEVAPPC  DEVD(DEVVTAM01) RMTLOCNAME(M01CD)
            LCLLOCNAME(OS400A) CTL(CTLVTAM01) MODE(CD624K)
            APPN(*YES) LOCADR(00)
```

Defining the Connect:Direct OS/400 B Node

The following sections show sample commands to define the line, controller, and device for the Connect:Direct OS/400 B node.

Line

A sample CRTLINSDLC command and parameters that define the line on the Connect:Direct OS/400 A node for the Connect:Direct OS/400 B node follows.

```
CRTLINSDLC      LIND(LINOS400B) RSRCNAME(LIN021) NRZI(*YES)
                ROLE(*NEG) LINESPEED(19200) MAXCTL(2) DUPLEX(*FULL)
                MAXOUT(7) MAXFRAME(2057)
```

Controller

A sample CRTCTLAPPC command and parameters that define the controller on the Connect:Direct OS/400 A node for the Connect:Direct OS/400 B node follows.

```
CRTCTLAPPC      CTLD(CTLOS400B) LINKTYPE(*SDLC) APPN(*YES)
                LINE(LINOS400B) MAXFRAME(2057) RMTCPNAME(OS400B)
                CPSSN(*YES) NODETYPE(*NETNODE)
```

Device

A sample CRTDEVAPPC command and parameters that define the device on the Connect:Direct OS/400 A node for the Connect:Direct OS/400 B node follows.

```
CRTDEVAPPC      DEVD(DEVOS400B) RMTLOCNAME(OS400B)
                LCLLOCNAME(OS400A) CTL(CTLOS400B) MODE(CD624K)
                APPN(*YES) LOCADR(00)
```

Remote Configuration List

You must only make entries for the Connect:Direct OS/390 and Connect:Direct Windows nodes, because the two Connect:Direct OS/400 nodes can share information about the physical makeup of the network.

The following table lists the remote configuration entries for the Connect:Direct OS/390 and Connect:Direct Windows nodes for the Connect:Direct OS/400 A node.

OS/400	OS/390 Node	Windows Node
Remote Location	M01CD	PCCD1
Remote NetID	CDNET	CDNET
Local Location	OS400A	OS400A
Remote CP	VTAM01	PCCD1
Remote CP NetID	CDNET	CDNET
Single Session	*NO	*YES

Glossary

A

Adjacent Node

An adjacent node is an entry in the Network Map that defines a Connect:Direct node with which the local Connect:Direct node can communicate. The adjacent node is also referred to as a remote node.

Application Program Interface (API)

The Application Program Interface (API) is a Connect:Direct component that accepts commands and places them in an executable format.

Asynchronous

Asynchronous Process execution occurs when the system starts the job. The CDSUBPROC command execution is asynchronous.

C

Checkpoint Restart

The Checkpoint Restart feature eliminates the need to retransmit an entire file in the event of a transmission failure. If a copy procedure is interrupted, Connect:Direct restarts that copy at the last checkpoint.

Command Line Interface

The Command Line Interface is a Connect:Direct interface that allows users to submit Connect:Direct Processes and commands from their native command line environment.

Commands

Connect:Direct commands initiate and monitor activity within the Connect:Direct system.

I

Integrated File System

The integrated file system provides an integrated structure of all stored information. This file system provides stream files, directory structure accessed by path, and a user and application interface that accesses all information stored in the OS/400.

L

Local Node

The local node is the Connect:Direct server on which the Process is submitted. The local node may also be referred to as the primary node, controlling node or initiating node, but should not necessarily be interpreted as the sending node, since PNODE can be the receiver. In every Process, there is one local (PNODE) and one remote (SNODE) specified. The submitter of a Process is always the PNODE.

Local Process

A local Process is a Connect:Direct Process initiated on the local Connect:Direct OS/400 node.

N

Native File System

The native file system accepts the file name in the following formats: library-name/file-name and library-name/file-name(member-name).

Network Map (Netmap)

The Network Map (netmap) is a file that identifies all valid Connect:Direct nodes in the network. One Network Map is associated with each Connect:Direct local node. The netmap has one entry for each of the other Connect:Direct nodes to which the local Connect:Direct node communicates. The netmap entries also contain the rules or protocol that the nodes adhere to when communicating.

Node

A node is any site in a network from which information distribution can be initiated.

P

Permanent Session Managers

Permanent Session Managers are reusable session managers submitted when Connect:Direct is started or when the Connect:Direct administrator increases the number of permanent session managers.

Primary Node (PNODE)

The local node or primary node (PNODE) is the Connect:Direct node on which the Process is submitted. The primary node may also be referred to as the controlling node or initiating node, but should not necessarily be interpreted as the sending node, since PNODE can be the receiver. In every Process, there is one local (PNODE) and one remote (SNODE) specified. The submitter of a Process is always the PNODE.

Process

A Process is a series of statements that initiate Connect:Direct activity, such as copying files, running jobs, and so on.

Process Management Queue

The Process Management Queue (PMQ) holds information about Connect:Direct Processes that are currently executing or scheduled to execute in the future.

Process Manager (PMGR)

The Process Manager initiates and manages the Connect:Direct environment.

Process Statements

Process Statements are instructions for transferring files, running operating system jobs, executing programs, or submitting other Connect:Direct Processes. They are used to build a Connect:Direct Process.

Q

Queue Manager (QMGR)

The Queue Manager is a fixed Connect:Direct OS/400 component. The Process Manager starts the Queue manager when it starts Connect:Direct, and the QMGR remains active while Connect:Direct is active. The Queue Manager has five logical queues: ACTIVQ, executing processes; WAITQ, processes waiting to run; HOLDQ, processes currently held; TIMERQ, processes waiting to be moved to the WAITQ; and STARTQ, asynchronous processes being activated.

R

Remote Node

A remote node is an entry in the Network Map that defines a Connect:Direct node with which the local Connect:Direct node can communicate. The remote node is also referred to as an adjacent node.

Remote Process

A remote Process is a Connect:Direct Process initiated on the remote Connect:Direct node.

Retry Interval

The retry interval is the interval at which retries are performed as a part of the checkpoint-restart feature.

S

Secondary Node (SNODE)

The remote or secondary node (SNODE) is the Connect:Direct node that interacts with the primary node (PNODE) during Process execution. SNODE may also be referred to as the participating (non-controlling) or partner node. Every Process has one PNODE and one SNODE.

Session Manager (SMGR)

The session manager component executes the Connect:Direct Processes. You can set the initialization parameters to make the SMGR either fixed or dynamic.

Spool Monitor (CDSPLMON)

The Connect:Direct Spool Monitor (CDSPLMON) is a variable component of Connect:Direct OS/400. CDSPLMON uses Spool Monitor entries to associate output queues with destination Connect:Direct nodes. These entries also include default values used to transfer spooled files.

Statistics Facility

The Connect:Direct Statistics Facility records Connect:Direct activities.

Statistics File

The statistics file holds Connect:Direct statistics records that document the history of a Process.

Statistics Manager (STATMGR)

Connect:Direct OS/400 logs statistics information for all Connect:Direct Processes. Each component of Connect:Direct OS/400 generates statistics data to the statistics manager (STATMGR). The long-running STATMGR formats the statistics information and writes it to the statistics file.

Submitted Session Managers are session managers submitted by the Process Manager.

Synchronous

Synchronous Process execution occurs when you submit a Connect:Direct command. Processes such as CDSND and CDRCV are submitted by the user and they execute immediately.

T

TCP/IP Listener

The TCP/IP Listener component requests session managers from the Process Manager when it receives connection requests. The Process Manager starts and controls the TCPLIST component.

Timer Queue (TIMER)

This Connect:Direct OS/400 component provides timer services to the other components. The process manager submits and controls the TIMER. The TIMER is always present when Connect:Direct is active.

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