

IBM Sterling Connect:Direct for UNIX



# Getting Started Guide

*Version 4.1*



IBM Sterling Connect:Direct for UNIX



# Getting Started Guide

*Version 4.1*

**Note**

Before using this information and the product it supports, read the information in "Notices" on page 63.

This edition applies to version 4.1 of IBM Sterling Connect:Direct and to all subsequent releases and modifications until otherwise indicated in new editions.

© **Copyright IBM Corporation 2000, 2014.**

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

---

# Contents

## Chapter 1. Sterling Connect:Direct for UNIX Overview . . . . . 1

Sterling Connect:Direct for UNIX File Transfer . . . . .	1
Process Manager . . . . .	1
Command Manager . . . . .	1
Session Manager . . . . .	2
User Authorization . . . . .	2
Process Restart. . . . .	2
Archive Statistics Files . . . . .	3
Sample Processes, Shell Scripts, and API Programs . . . . .	4
Sterling Connect:Direct for UNIX Configuration Files . . . . .	5
Sterling Connect:Direct for UNIX Directory Structure . . . . .	6

## Chapter 2. Installing Sterling Connect:Direct for UNIX . . . . . 7

Before You Begin the Installation . . . . .	7
Preparing to Install Sterling Connect:Direct for UNIX in a Cluster Environment . . . . .	7
High-Availability Cluster Environments . . . . .	7
Preparing to Install Sterling Connect:Direct for UNIX on the Linux for zSeries Operating System . . . . .	9
Conventions to Observe When Installing Sterling Connect:Direct for UNIX . . . . .	10
Installing Sterling Connect:Direct . . . . .	10
Customizing Sterling Connect:Direct for UNIX . . . . .	12
Setting Up the Sterling Connect:Direct for UNIX Server . . . . .	12
Customizing the User Authorization Information File . . . . .	13
Creating an Authentication Key File . . . . .	14
Setting Up the Sterling Connect:Direct for UNIX Client . . . . .	14
Configuring Sterling Connect:Direct for UNIX Using Root Privilege . . . . .	15
Customizing the Owner and Permissions for the Executable Files . . . . .	15
Installing Sterling Connect:Direct File Agent . . . . .	16
Installing Sterling Connect:Direct Secure Plus . . . . .	18
SNA Support for Sterling Connect:Direct for UNIX . . . . .	19
Defining High-Availability Settings in the Configuration Files . . . . .	19
Setting Up Additional Configuration Requirements in a SunCluster 3.X Environment . . . . .	20
Configuring Additional Requirements in a SunCluster 2.2 Environment . . . . .	21
Setting Up Additional Configuration Requirements for IBM HACMP . . . . .	21
Setting Up Additional Configuration Requirements for Hewlett-Packard MC/ServiceGuard . . . . .	21
Verifying the Installation . . . . .	22

## Chapter 3. Managing Files with Sterling Connect:Direct File Agent . . . . . 25

Sterling Connect:Direct File Agent Overview . . . . .	25
---	----

Sterling Connect:Direct File Agent Operation . . . . .	26
Sterling Connect:Direct File Agent Logging Capabilities . . . . .	27
Sterling Connect:Direct File Agent Configuration Interface and Help . . . . .	27
Planning the Sterling Connect:Direct File Agent Configuration . . . . .	27
IBM Sterling Connect:Direct File Agent Worksheet . . . . .	28
IBM Sterling Connect:Direct File Agent Configuration Examples . . . . .	29
Example: Detecting a File Added to a Watched Directory on a z/OS System. . . . .	30
Example: Detecting a System Event by Title on a Microsoft Windows System . . . . .	30
Example: Passing the UNIX Pathname for a Detected File to a Process. . . . .	31

## Chapter 4. Installation Worksheets . . . . . 33

Worksheet Instructions . . . . .	33
Installation Worksheet . . . . .	33
Customization Worksheet. . . . .	33
User Authorization Information File Worksheet . . . . .	34
CLI/API Configuration File Worksheet . . . . .	38
Network Map Remote Node Information File Worksheet (TCP/IP and UDT Only) . . . . .	39
Server Authentication Key File Worksheet . . . . .	39
Client Authentication Key File Worksheet . . . . .	39

## Chapter 5. SNA LU6.2 Connectivity . . . . . 41

About SNA LU6.2 Connections . . . . .	41
AIX SNA Server Configuration . . . . .	42
Manually Configuring the AIX SNA Server. . . . .	42
About the Configuration Script. . . . .	43
Running the Configuration Script . . . . .	44
HP SNAplus2 Configuration Requirements . . . . .	45
SNAP-IX SNA Gateway Support Configuration Requirements. . . . .	45
Brixton 4.1 SNA for Sun Solaris Requirements . . . . .	48
Configuring BrxGMAN Software . . . . .	49
Configuring BrxGMI Software . . . . .	49
Configuring BrxPU21 Software . . . . .	50
Starting BrxGMAN. . . . .	50
Sample Brixton BrxPU2.1 Configuration . . . . .	50
Configuring SunLink SNA 9.1 Support for Sun Solaris . . . . .	52
Sample z/OS Definitions for an LU6.2 Connection . . . . .	53
Token Ring 3174-R Gateway Controller Configuration . . . . .	53
Token Ring 3745 Token Ring Interface Coupler (TIC) Configuration. . . . .	55
VTAM Application Definition . . . . .	55
VTAM Logmode Table Entries . . . . .	56
NTRI Switched Major Node Definition . . . . .	56
ILU CDRSC Definitions . . . . .	57
Sterling Connect:Direct Remote Node Entry . . . . .	57

Special Considerations When Configuring LU6.2 . . . 58

    Obtaining Traces for the Brixton LU6.2 API and SunLink P2P . . . . . 58

    Stopping Sterling Connect:Direct on SNA Systems . . . . . 58

    Connectivity Between IBM pSeries and i5/OS Systems . . . . . 59

    AIX SNA Error Messages. . . . . 59

**Notices . . . . . 63**

**Index . . . . . 67**

**Chapter 6. Sterling Connect:Direct Manual Pages. . . . . 61**

Setting Up Sterling Connect:Direct for UNIX Manual Pages . . . . . 61

Accessing Sterling Connect:Direct Manual Pages . . . 61

---

## Chapter 1. Sterling Connect:Direct for UNIX Overview

---

### Sterling Connect:Direct for UNIX File Transfer

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

Sterling Connect:Direct for UNIX is based on client-server architecture. The Sterling Connect:Direct for UNIX server components interact with the user interfaces (API, CLI, IBM Sterling Connect:Direct Browser User Interface, and IBM Sterling Control Center) to enable you to submit, execute, and monitor Sterling Connect:Direct for UNIX statements and commands.

---

### Process Manager

The Process Manager (PMGR) is the daemon that initializes the Sterling Connect:Direct for UNIX server environment. Any application, including End User Applications (EUA), can run on any computer as long as it can connect to the PMGR. The PMGR provides the following functions:

- Initializes Sterling Connect:Direct for UNIX
- Accepts connection requests from Sterling Connect:Direct for UNIX client APIs and remote nodes
- Creates Command Manager and Session Manager child Processes to communicate with APIs and remote nodes
- Accepts requests from Command Managers and Session Managers when centralized Sterling Connect:Direct for UNIX functions are required
- Stops Sterling Connect:Direct for UNIX Command Manager

---

### Command Manager

A Command Manager (CMGR) is created for every API connection that is successfully established. The number of Command Managers that a PMGR can create is system-dependent and limited by the number of file descriptors available for each UNIX Process. The number of file descriptors set up by the UNIX operating system may affect Sterling Connect:Direct for UNIX operation. You must define enough file descriptors to handle the number of concurrent Sterling Connect:Direct for UNIX sessions allowed, which can be as many as 999.

The CMGR provides the following functions:

- Executes commands sent by the API and sends the results back to the API
- Carries out the Sterling Connect:Direct for UNIX authentication procedure, in conjunction with the API, to determine access to Sterling Connect:Direct for UNIX
- Interacts with the PMGR when executing commands

---

## Session Manager

The Session Manager (SMGR) is created and invoked by the PMGR when resources are available and either a Process is ready to run or a remote node requests a connection with a local node. The SMGR provides the following functions:

- Performs the necessary Sterling Connect:Direct for UNIX work
- Acts as a primary node (PNODE) and initiates Process execution
- Acts as a secondary node (SNODE) to participate in a Process initiated by the PNODE

When an SMGR is created to execute a Process submitted to a node, it creates the connection to the remote node. If the SMGR is started by the PMGR to execute local Processes, the SMGR runs each Process on this session until all Processes are completed.

If an SMGR is created because a remote node initiated a connection, the SMGR completes the connection. If the SMGR is started by the PMGR to execute remote Processes, the SMGR executes remote Process steps supplied by the remote SMGR until the remote SMGR completes all of its Processes.

The SMGR depends on the PMGR for Transmission Control Queue (TCQ) services and other centralized services.

---

## User Authorization

Sterling Connect:Direct for UNIX can authorize local and remote users to perform certain Sterling Connect:Direct for UNIX tasks. In order to use Sterling Connect:Direct for UNIX, each user must have a record defined in the user authorization file, called `userfile.cfg`. Each local user must have a record in the user authorization file, and remote users may be mapped to a local user ID in a proxy relationship.

To provide a method of preventing an ordinary user from gaining root access through Sterling Connect:Direct for UNIX, a second access file called the Strong Access Control (SACL) file is created when you install Sterling Connect:Direct for UNIX and is named `sysacl.cfg`. The `root:deny.access` parameter, which is specified in the `sysacl.cfg` file, allows, denies, or limits root access to Sterling Connect:Direct for UNIX. If the SACL file is deleted or corrupted, access to Sterling Connect:Direct for UNIX is denied to all users.

---

## Process Restart

Several facilities are provided for Process recovery after a system malfunction. The purpose of Process recovery is to resume execution as quickly as possible and to minimize redundant data transmission after a system failure. The following Sterling Connect:Direct for UNIX facilities are available to enable Process recovery:

- Process step restart—As a Process runs, the steps are recorded in the TCQ. If a Process is interrupted for any reason, the Process is held in the TCQ. When you release the Process to continue running, the Process automatically begins at the step where it halted.
- Automatic session retry—Two sets of connection retry parameters are defined in the remote node information record of the network map file: short-term and long-term. If you do not specify a value for these parameters in the remote node



information record, default values are used from the local.node entry of the network map file. The short-term parameters allow immediate retry attempts. Long-term parameters are used after all short-term retries are attempted. Long-term attempts assume that the connection problem cannot be fixed quickly and retry attempts occur after a longer time period, thus saving the overhead of connection retry attempts.

- Checkpoint restart—This feature is available with the copy statement. Checkpoint restart can be explicitly configured within a **copy** step through the **ckpt** parameter. If it is not configured in the **copy** step, it can be configured in the Initparms through the **ckpt.interval** parameter.
- Run Task restart—If a Process is interrupted when a run task on an SNODE step is executing, Sterling Connect:Direct for UNIX attempts to synchronize the previous run task step on the SNODE with the current run task step. Synchronization occurs in one of the following ways:
  - If the SNODE is executing the task when the Process is restarted, it waits for the task to complete, and then responds to the PNODE with the task completion status. Processing continues.
  - If the SNODE task completes before the Process is restarted, it saves the task results. When the Process is restarted, the SNODE reports the results, and processing continues.If synchronization fails, Sterling Connect:Direct for UNIX reads the **restart** parameter in the **run task** step or the initialization parameters file to determine whether to perform the **run task step** again. The restart parameter on the run task step overrides the setting in the initialization parameter. For example, if the SNODE loses the run task step results due to a Sterling Connect:Direct for UNIX cold restart, Sterling Connect:Direct for UNIX checks the value defined in the restart parameter to determine whether to perform the **run task** again. Run task restart works differently when Sterling Connect:Direct for UNIX runs behind a connection load balancer.
- Interruption of Process activity when the SNODE is a Sterling Connect:Direct for UNIX node—When the SNODE is a Sterling Connect:Direct for UNIX node and the PNODE interrupts Process activity by issuing a command to suspend Process activity, deleting an executing Process, or when a link fails or an I/O error occurs during a transfer, the Process is placed in the Wait queue in WS status. If Process activity does not continue, you must manually delete the Process from the TCQ. You cannot issue a change process command from the SNODE to continue Process activity; the Process can only be restarted by the PNODE, which is always in control of the session.

---

## Archive Statistics Files

Sterling Connect:Direct for UNIX provides a utility to archive and purge statistics files. When you configure Sterling Connect:Direct for UNIX, you identify when to archive a statistics file by setting the parameter, max.age, in the stats record of the initialization parameters file. The max.age parameter defines how old a statistics file must be before you want to archive the file.

Once a day, the script called statarch.sh is started. This script identifies the statistics files that are equal to the max.age. It then runs the tar command and the compress command to create a compressed archived file of all the statistics records that match the max.age parameter. Once the statistics files are archived, these files

are purged. For files archived on a Linux computer, the archived statistics files have the .gz suffix since these files are compressed with the gzip format. Archived files on all other UNIX platforms have the .Z suffix to indicate they are compressed using the compress format.

The archived files are stored in the directory where the statistics files and TCQ are stored. The shell script, statarch.sh, is located in the ndm/bin directory. If necessary, modify the script to customize it for your environment.

If you want to restore statistics files that have been archived, run the **statrestore.sh** script. It uses the **uncompress** and **tar** commands to restore all the statistics files in the archive. You supply two arguments to the **statrestore** command. The first argument is the directory path where the statistics files are located and the second argument identifies the archived file name followed by as many archived file names as you want to restore. Below is a sample **statrestore** command:

```
qa160sol: ./statrestore.sh /export/home/users/cd4000/ndm/bin archive1
```

After files are restored, the statistics records can be viewed using the select statistics command.

---

## Sample Processes, Shell Scripts, and API Programs

Sterling Connect:Direct for UNIX provides sample Processes and shell scripts in d\_dir/ndm/src, where d\_dir indicates the destination directory of the Sterling Connect:Direct for UNIX software. You can create similar files with a text editor. In addition, instructions for creating sample Processes and shell scripts are in the README file in the same directory.

The following list displays the file names of sample Processes and the type. Modify the Processes as required.

**cpunx.cd**

copy

**rtunx.cd**

run task

**rjunx.cd**

run job

**sbunx.cd**

submit

The following table displays the names of sample shell scripts. Modify the shell scripts as required.

File Name	Type of Shell Script
selstat.sh	select statistics
send.sh	send
recv.sh	receive
wildcard	send multiple files to a PDS
statarch.sh	archive statistics files
staterestore.sh	restore statistics files that have been archived

File Name	Type of Shell Script
lcu.sh	launch the Local Connection Utility tool
spadmin.sh	launch the Secure+ Admin Tool
spcli.sh	launch the Secure+ CLI
spcust_sample1.sh	configure Secure+ for the STS protocol
spcust_sample2.sh	configure Secure+ for the STS protocol
spcust_sample2.sh	configure Secure+ for the SSL or TLS protocol

The following information displays the names of sample programs and a description:

- apicheck.c - Submits a Process to copy a file to a remote system. MAXDELAY is used in this example, which means that the program will not finish execution until the file has been transferred. A standard c compiler is used to compile this module.
- apicheck.C - Same as apicheck.c, except that it is compiled with one of the C++ compilers listed in the Sterling Connect:Direct for UNIX User Guide.
- exit\_skeleton.c - This program is a skeleton of a user exit program that works in conjunction with Sterling Connect:Direct for UNIX. It demonstrates usage of all three user exits.
- exit\_skeleton.C - Same as exit\_skeleton\_c, except that it is compiled with one of the C++ compilers listed in the Sterling Connect:Direct for UNIX User Guide.
- exit\_sample.c - This is the same program as the skeleton user exit program, except that the security exit is demonstrated with code that approximates PassTicket functionality.

---

## Sterling Connect:Direct for UNIX Configuration Files

Sterling Connect:Direct for UNIX creates the following configuration files during installation and customization. These files are required for the Sterling Connect:Direct for UNIX server to operate correctly.

### Initialization parameters file

Provides information to the server to use at start up. During the installation, you identify the settings necessary for the initialization parameters file.

### User authorization information file

Contains the local user information and remote user information record types. You customize this file during installation to map remote user IDs to local user IDs and create remote user information records in the user authorization information file.

### Strong access control file

Improves the security of Sterling Connect:Direct for UNIX and allows, denies, or limits root access control. This file is created when you install Sterling Connect:Direct for UNIX. If the file is deleted or corrupted, access to Sterling Connect:Direct for UNIX is denied to all users.

### Network map file

Describes the local node and other Sterling Connect:Direct for UNIX nodes in the network. You can define a remote node record for each node that Sterling Connect:Direct for UNIX communicates with.

**Server authentication key file**

Verifies client API connection requests. Only verified clients are granted a connection.

**Client configuration file**

Identifies the port and host name used by a client to connect to Sterling Connect:Direct for UNIX.

**Client authentication key file**

Identifies Sterling Connect:Direct for UNIX servers that a Sterling Connect:Direct for UNIX client connects to. You can have multiple entries for multiple servers.

---

## **Sterling Connect:Direct for UNIX Directory Structure**

The following figure illustrates the Sterling Connect:Direct for UNIX directory structure. The directory tree starts at `d_dir/`, the destination directory where the software is installed. This directory structure provides for multiple nodes on the same network and possibly on the same computer. The directory structure organization enables you to share Sterling Connect:Direct for UNIX programs, such as `cdpmgr` and `ndmcmgr`. The `secure+` directory is available only when Sterling Connect:Direct for UNIX Secure Plus is installed.

If multiple nodes exist, each node must have its own `d_dir/ndm/cfg/cd_node/` directory structure for configuration files, where `cd_node` is the Sterling Connect:Direct for UNIX node name.

A `d_dir/work/cd_node` directory is created for each node. The following figure displays the work directory for multiple nodes and illustrates the working files created for each node, such as TCQ files:

---

## Chapter 2. Installing Sterling Connect:Direct for UNIX

---

### Before You Begin the Installation

Before you install Sterling Connect:Direct for UNIX, complete the worksheets to identify all information required to perform the installation.

Sterling Connect:Direct for UNIX requires that you install a server and at least one client location. You can install Sterling Connect:Direct for UNIX in two different configurations:

- Install the server on a local system and the clients on remote systems
- Install the server and at least one client on a local system and the remaining clients on remote systems

Install Sterling Connect:Direct for UNIX on a local drive. Do not install Sterling Connect:Direct for UNIX on a Network File System (NFS) resource.

---

### Preparing to Install Sterling Connect:Direct for UNIX in a Cluster Environment

Sterling Connect:Direct for UNIX supports clustering software to allow two or more computers to appear to other systems as a single system. All computers in the cluster are accessible through a single IP address. Sterling Connect:Direct for UNIX can be installed in two types of clustering environments: high availability and load balancing clustering environments.

#### High-Availability Cluster Environments

Consider the following information when planning to use Sterling Connect:Direct for UNIX in a high-availability cluster environment.

#### Supported High-Availability Cluster Environments

Sterling Connect:Direct for UNIX is certified to operate in the following high-availability cluster environments:

- IBM high-availability cluster multiprocessing (HACMP) environment
- Hewlett-Packard MC/Service Guard
- SunCluster versions 2.2, 3.0, and 3.2.

If you plan to install Sterling Connect:Direct for UNIX in a high-availability cluster environment, complete the following tasks:

- Install the clustering software on each computer in the cluster, including setting up a logical host or application package.
- Create a user with the same name and user ID on each cluster node.
- Create a Sterling Connect:Direct Secure Plus subdirectory on a shared file system on a shared volume group.
- Ensure that the shared file system is owned by the Sterling Connect:Direct user.
- Install Sterling Connect:Direct on the shared file system.
- Perform the procedures necessary to define the high-availability settings and configure the cluster environment.

## Limitations of High-Availability Clusters

When running Sterling Connect:Direct for UNIX in a high-availability cluster environment, be aware of the following limitations:

- If a failure occurs, all Processes being held will be restarted when Sterling Connect:Direct is restarted. This includes Processes that are held by the operator as well as Processes held in error. This could cause a security risk.
- When a Sterling Connect:Direct ndmsmgr process associated with a Sterling Connect:Direct Process is killed, the Process is not automatically restarted and is put in the Held in Error state. It must be manually restarted; otherwise, the Sterling Connect:Direct Process is restarted when the cluster restart occurs.

## Load-Balancing Cluster Environments

In a load-balancing cluster environment, an incoming session is distributed to one of the Sterling Connect:Direct for UNIX instances based on criteria defined in the load balancer. Generally, from the point of view of the nodes behind the load balancer, only incoming or SNODE sessions are affected by the load balancer. PNODE, or outgoing sessions, operate the same way as non-cluster Sterling Connect:Direct for UNIX PNODE sessions.

## SNODE Server Considerations for Load-Balancing Clusters

Consider the following when planning and setting up the Sterling Connect:Direct for UNIX SNODE servers in a load balancing cluster:

- The servers used for the Sterling Connect:Direct for UNIX instances behind the load balancer must all have access to common shared disk storage because of the following:
  - Any copy statement source and destination files for SNODE processes must reside in directories accessible to all servers.
  - All nodes must have access to a common SNODE work area and that area must be on a cluster file system and not a Network File System (NFS) resource.
  - All servers must be of the same platform type (for example, all Solaris SPARC or all Linux Intel) and the same Sterling Connect:Direct for UNIX version and maintenance level.
- The system clocks on all servers must be synchronized in order for copy checkpoint/restart and run task synchronization to work.
- The administrator user ID used to install Sterling Connect:Direct for UNIX must be defined on each server and must be the same user and group number on each server.

## SNODE Setup for Load-Balancing Clusters

Consider the following when planning and setting up the Sterling Connect:Direct for UNIX SNODEs in a load-balancing cluster:

- One Sterling Connect:Direct for UNIX node should be installed on each server behind the load balancer.
- Each node should be installed by the same user ID.
- Each node should have the same Sterling Connect:Direct for UNIX node name.
- Each node should have the same node-to-node connection listening port.
- A directory should be established for the shared SNODE work area used by the Sterling Connect:Direct for UNIX nodes behind the load balancer. This directory

should be owned by the Sterling Connect:Direct for UNIX administrator ID and must be accessible to all of the servers behind the load balancer.

- Each node should specify the same path to the directory used for the shared SNODE work area. Specify this path in the **snode.work.path** parameter of the ndm.path record in the initialization parameter file.

## Limitations of Load Balancing Clusters

When running Sterling Connect:Direct for UNIX in a cluster environment, be aware of the following limitations:

- If an incoming session fails and is restarted by the PNODE, then the restarted session may be assigned to any of the instances behind the load balancer and will not necessarily be established with the original SNODE instance.
- When shared SNODE work areas are configured and the **run task** is on the SNODE, then at restart time, Sterling Connect:Direct for UNIX cannot determine whether the original task is still active or not because the restart session may be with a different server. If you set the global run task restart parameters to yes in the initialization parameters file, a task could be restarted even though it may be active on another machine. Therefore, exercise caution when specifying restart=y.
- Each SNODE instance that receives a session for a given Process creates a TCQ entry for the Process. Each SNODE instance has its own TCQ file, and these files are not shared among SNODE instances. Only the work files created in the shared work area are shared among SNODE instances.
- When a Process is interrupted and restarted to a different SNODE instance, the statistics records for that Process is distributed between the two SNODE instances involved. As a result, you cannot select all the statistics records for a Process.

## Preparing to Install Sterling Connect:Direct for UNIX on the Linux for zSeries Operating System

Sterling Connect:Direct for UNIX is distributed on a DVD-ROM. Because the Linux for zSeries operating system does not support the DVD-ROM drive installation, you must use ftp to transfer installation files from a UNIX or Microsoft Windows operating system. To transfer the files from a Microsoft Windows or UNIX platform to the Linux for zSeries operating system, use the following procedure:

### Procedure

1. Create a temporary directory on the computer running Linux for zSeries.
2. Insert the DVD-ROM into the appropriate drive on the computer running Microsoft Windows or UNIX and perform one of the following actions:
  - From Microsoft Windows, select Start > Programs > Accessories > Command Prompt.
  - From UNIX, use the mount command to locate the DVD-ROM drive.
3. Type the following command, where ip address is the IP address of the computer running Linux for zSeries:

---

`ftp ip address`

4. At the prompt, type the user name and password for a user on the computer running Linux for zSeries.
5. At the ftp prompt, set the transfer mode to binary by typing the following command:



```
binary
```

6. Change to the temporary directory you created on the computer running Linux for zSeries by typing the following command, where *temp\_dir* is the directory you created in step 1:

```
cd temp_dir
```

7. To copy the installation script from the DVD-ROM to the computer running Linux for zSeries, perform one of the following actions:
  - From Microsoft Windows, type the following command, where *x* is the location of the DVD-ROM drive:

```
put x:\IBMS390_linux\cdinstall cdinstall
```

- From UNIX, type the following command:

```
put /cdrom/IBMS390_linux/cdinstall cdinstall
```

8. To copy the Sterling Connect:Direct cpio file from the CD-ROM to the computer running Linux for zSeries, perform one of the following actions:
  - From Microsoft Windows, type the following command, where *x* is the location of the DVD-ROM drive:

```
put x:\IBMS390_linux\cdunix cdunix
```

- From UNIX, type the following command:

```
put /cdrom/IBMS390_linux/cdunix cdunix
```

9. To exit the ftp application, type **quit**.

---

## Conventions to Observe When Installing Sterling Connect:Direct for UNIX

Observe the following conventions when you install Sterling Connect:Direct for UNIX:

- If a file name contains a semicolon, precede the semicolon with a backslash (\) character; otherwise, the shell interprets the semicolon as the start of a new command. For example, specify the file name *SNA;1* as *SNA\;1*.
- Acceptable responses to prompts are listed in brackets, where *y* specifies yes, *n* specifies no, and *a* specifies all.
- The default response is capitalized. Press Enter to accept the default value.
- Do not use colons (:) for values in the installation and customization scripts.
- Do not use keywords for values.
- Press Enter after each entry to continue.
- Terminate any procedure by pressing Ctrl-C.

---

## Installing Sterling Connect:Direct

To install Sterling Connect:Direct for UNIX:



## Procedure

1. Log on to the UNIX system with the privileges required to install software. You can create an account specifically for this purpose. Do not install as root.
2. Type the following command and press **Enter** to change to the DVD-ROM drive and the directory that correspond to the UNIX platform:

```
cd /cdrom/<platform directory>
```

Refer to the following information for the name of the platform directory for each platform.

### HP PA-RISC

HP\_PA-RISC

### HP UX Itanium

HP\_Itanium

### IBM System pSeries

IBM

### Sun SPARC systems

Sun\_Solaris

### Red Hat

RedHat\_linux

### SuSE

SuSE\_linux

### Linux for zSeries

IBMS390\_linux

### Solaris/x86

Solaris\_x86

3. Type the following command to start the installation and press **Enter**:

```
cdinstall
```

4. Read the information displayed and press **Enter**.
5. Type the path name of the directory where Sterling Connect:Direct for UNIX will be installed and press **Enter**.
6. Press **Enter** to confirm the location
7. Do one of the following:
  - Press **Enter** to accept install the Server and Client on the same computer.
  - Type 2 to install the Server only and press **Enter**.
  - Type 3 to install the Client only and press **Enter**.The following screen is displayed:
8. Type the path and filename of the installation file and press **Enter**.  
If you are installing the Server and Client, a message is displayed to confirm that the server and client are being installed. If you selected option 2 or 3, the screen displays the software that will be installed.
9. Press **Enter**.

If the destination directory does not have enough disk space, delete files to provide the necessary disk space. If disk space is available, the installation script copies files from the distribution media to the destination directory and verifies that the correct number of files and blocks are copied.

The customization script starts automatically when the installation is complete.

---

## Customizing Sterling Connect:Direct for UNIX

The customization script starts automatically after the installation is complete to set up the Sterling Connect:Direct for UNIX operating environment. It is located in `d_dir/etc`, where `d_dir` is the Sterling Connect:Direct installation directory, and may be run by itself if needed for future configuration changes. The option you select determines what Sterling Connect:Direct for UNIX operating environment is configured: the Sterling Connect:Direct for UNIX Server only, the Sterling Connect:Direct for UNIX Client only, or the Sterling Connect:Direct for UNIX Server and Client.

### About this task

After you customize the environment, you need to configure Sterling Connect:Direct for UNIX for using root privilege to create a Strong Access Control List (SACL) file and to set the owner and permissions of Sterling Connect:Direct executables. You must create the SACL file and set the owner and permissions before you can run Sterling Connect:Direct for UNIX. See *Configuring Sterling Connect:Direct for UNIX Using Root Privilege* for more information about this process.

The customization script prompts you to begin the customization procedure:

### Procedure

1. Read the information and press Enter. The customization menu is displayed.
2. Do one of the following. Be sure to select the same configuration you selected during the installation.
  - Type 3 to customize the Server and Client and press Enter.  
If you are installing both the Client and the Server, complete the procedures in *Setting Up the Sterling Connect:Direct for UNIX Server* and *Setting Up the Sterling Connect:Direct for UNIX Client*.
  - Type 2 to customize the Client only and press Enter.  
If you are installing the Client only, complete the procedure *Setting Up the Sterling Connect:Direct for UNIX Client*.
  - Type 1 to customize the Server only and press Enter.  
If you are installing the Sterling Connect:Direct for UNIX Server only, complete the procedure, *Setting Up the Sterling Connect:Direct for UNIX Server*.

---

## Setting Up the Sterling Connect:Direct for UNIX Server

After you install Sterling Connect:Direct for UNIX, define the parameters needed by the Server for startup. If you installed the Server, the process to customize the Server starts automatically. To customize the server, enter the node to customize.

## Procedure

1. Type the name of the node, up to 16 characters, that you want to customize and press Enter.
2. If you have SNA configured, press **Enter** to configure SNA in the Sterling Connect:Direct initialization parameters file.
3. If you do not use SNA, type **n** and press **Enter** to continue customizing Sterling Connect:Direct for UNIX.
4. Type the TCP/IP port number that Sterling Connect:Direct monitors for requests from remote nodes. If available, use the default port, 1364. If the default port number is being used by another service, use any other available port.  
This value is entered into the initialization parameters file in the `comm.info` parameter.
5. Type the hostname or IP address that Sterling Connect:Direct Monitors for requests from remote nodes.  
If you use 0.0.0.0, Sterling Connect:Direct will listen for requests from remote nodes on all network adapters configured on the UNIX server.  
This value is entered into the initialization parameters file in the `comm.info` parameter.
6. Type the TCP/IP port number that Sterling Connect:Direct monitors for requests from Clients. If available, use the default value of **1363**. If the default port number is being used by another service, use any other available port.  
This value is entered into the network map file in the `tcp.api` parameter.
7. Type the hostname or IP address that Sterling Connect:Direct monitors for requests from Clients.  
This value is entered into the network map file in the `tcp.api` parameter.  
Sterling Connect:Direct creates the network map file and displays the directory path and file name.  
After you define the initialization parameters file, the customization script creates the network map file. A remote node record is added to the network map file. The remote node record is assigned the name of the local node you specified.
8. Press Enter. The netmap file is automatically created.

## Customizing the User Authorization Information File

After the user authorization information file is created, you are ready to customize the file. Use this procedure to map remote user IDs to local user IDs and create remote user information records in the user authorization information file.

### About this task

After the user authorization information file is created, the following message is displayed to prompt you to create an authorization information record for a remote user:

```
Insert remote user record? [Y/n]
```

## Procedure

1. Press Enter to add a remote user record.
2. Type the login or ID of the remote user and press Enter.

3. Type the name of the remote node and press Enter. The submitter ID and remote node name become the record name for the remote user information record.
4. Type the local user ID where the remote user ID will be mapped and press Enter. The local user ID is the UNIX account name. This value is associated with local.id in the remote user information record and defines the local user ID used to check security for the remote user.
5. Do one of the following:
  - To create another remote user record, press Enter and repeat steps 2-4.
  - Type n and press Enter if you do not want to create another remote user record.
6. Do one of the following:
  - If you do not want to create a local user record, type n and press Enter.
  - To create a local user record, press Enter.
7. Type the user ID for the local user and press Enter. This value is associated with userid in the user authorization information file.
8. Press Enter to grant administrative authority to the local user ID. All Sterling Connect:Direct capabilities that you specify in the local user information record are assigned to the user.

This value is assigned to admin.auth in the local user information record.
9. Do one of the following:
  - Press Enter and repeat this procedure to create another local user record.
  - Type n and press Enter to continue to the next task.

## Creating an Authentication Key File

A server authentication key file verifies connection requests. Only authorized clients are granted a connection. Sterling Connect:Direct generates the server authentication key file automatically. A message is displayed when the authentication key file is generated.

### Before you begin

Press **Enter** to continue.

---

## Setting Up the Sterling Connect:Direct for UNIX Client

After you install and customize Sterling Connect:Direct for UNIX Server, define the parameters needed by the Client for startup. To configure the client, configure the client configuration file and the client authentication key file to define all of the servers that this node connects to.

### About this task

The Client configuration file is created during the customization process. A message is displayed after the Client configuration file is created.

To set up the client:

### Procedure

1. Type the port of the Server that the Client connects to and press Enter when ready.

This value is associated with tcp.port in the Client configuration file.

2. Press Enter to accept the host name. This value is displayed in the tcp.hostname parameter in the Client configuration file.  
A message is displayed when the client authentication key file is created.
3. Press Enter .

## Configuring Sterling Connect:Direct for UNIX Using Root Privilege

You must create the SACL file and set the owner and permissions of the Sterling Connect:Direct executables to run Sterling Connect:Direct for UNIX.

### About this task

To configure the SACL file:

### Procedure

1. If you know the root password or if a system administrator is standing by who knows the root password, select option 4.
2. If you do not know the root password, but are authorized to gain root authority using sudo or a similar utility, type 5 to exit the Sterling Connect:Direct for UNIX customization script.  
A message is displayed to warn you that the SACL was not configured.
3. Read the information displayed and press **Enter**.  
A message is displayed to notify you of the creation of the test configuration.
4. To exit the customization, type **n** and press Enter.
5. If you did not select option 4 above, type cdcust (located in /<product install directory>/etc) using sudo to become root before creating the SACL and setting the owner and permissions of the executables.

## Customizing the Owner and Permissions for the Executable Files

You must change the file attributes of the Session Manager (d\_dir/ndm/bin/ndmsmgr), Process Manager (d\_dir/ndm/bin/cdpmgr), Command Manager (d\_dir/ndm/bin/ndmcmgr) User Manager (d\_dir/ndm/bin/ndmumgr), Statistics Manager (d\_dir/ndm/bin/cdstatm), Client Authenticator (d\_dir/ndm/bin/ndmauthc), and Server Authenticator (d\_dir/ndm/bin/ndmauths).

### About this task

To customize the SACL file and set the owner and permissions of the Sterling Connect:Direct Select executable files:

### Procedure

1. Type the full path of the Sterling Connect:Direct Select destination directory and press **Enter**.
2. Press **Enter** to continue the customization. The following screen is displayed:
3. Type 4 to select Configurations requiring root privilege and press Enter.
4. Press Enter to configure the SACL file.
5. Press **Enter** to use root authority to create and check the SACL file.
6. If you have already assumed root authority by using a utility such as sudo, press **Enter**. Otherwise, type the root password and press **Enter**.

If you type the root password incorrectly, a message informs you that the configuration tasks were not completed. Otherwise, a SACL file is created, the owner and permissions of the Sterling Connect:Direct Select executable files are set, and the following messages and prompt are displayed.

7. Type y or n and press Enter. You are returned to the Customization menu.

The following parameters are modified during the customization:

Parameter	Value	File
SNAFILE=/ndm/lib/libcdsna.s	Defines SunLink as the SNA software	Initialization parameters file
BRXSNAFILE=/ndm/lib/libcdbrxsna.s	Defines Brixton as the SNA software	Initialization parameters file
SNPSNAFILE=/ndm/lib/libcdsnpsna.so	Defines SNAP-IX as the SNA software	Initialization parameters file
comm.info	Identifies the IP address and port that Sterling Connect:Direct Select monitors for requests from remote nodes	Initialization parameters file
tcp.api	Identifies the IP address and port monitored by Sterling Connect:Direct for requests from clients	Network map file
rnode.listen	Identifies the host used to monitor LU 6.2 connections	Initialization parameters file
admin.auth	Determines if user ID has administrative authority	User authorization information file
tcp.port	Specifies port number of the server that the client connects to	Client configuration file
tcp.hostname	Specifies host name of the server that the client connects to	Client configuration file

---

## Installing Sterling Connect:Direct File Agent

After you install Sterling Connect:Direct, install Sterling Connect:Direct File Agent at any time.

### About this task

If you are installing on Linux for zSeries, download the Java 1.6 software from the manufacturer's Web site before continuing the installation. Your PATH environment variable must include the full path to the installed Java software.

To install Sterling Connect:Direct File Agent:

### Procedure

1. Log on to the UNIX system with the privileges required to install software. Do not install as root.
2. Type the following command and press **Enter** to change to the DVD-ROM drive and the directory for your UNIX platform:

```
cd /cdrom/<platform directory>
```

Refer to the following list for the name of the platform directory for each platform:

**HP PA-RISC**

HP\_PA-RISC

**HP UX Itanium**

HP\_Itanium

**IBM System pSeries**

IBM

**Sun SPARC systems**

Sun\_Solaris

**Red Hat**

RedHat\_linux

**SuSE**

SuSE\_linux

**Linux zSeries**

IBMS390\_linux

**Solaris/x86**

Solaris\_x86

3. Type the following command to start the installation and press **Enter**:

```
cdinstall
```

4. Read the information displayed and press **Enter**.
5. Type the path and press **Enter**. A warning that the directory exists is displayed:
6. Press **Enter** to continue. The following message is displayed:

```
Installed components detected in this directory.  
A previous version of C:D for UNIX was detected.  
Would you like this procedure to detect and upgrade your currently installed  
options with minimal interaction?  
If yes, the configuration files will be left in place and reused.  
If not, the full installation procedure will prompt to either reuse, or purge  
and rebuild, each configuration file.  
Caution: If you are upgrading from earlier version of C:D for UNIX,  
existing Processes in the tcq may encounter conversion error.  
They will need to be deleted and resubmitted.  
Type y or press Enter to continue with the upgrade procedure, or  
type n to run the full installation procedure:[Y/n]
```

7. Type **n** and press **Enter**. The installation options menu is displayed:
8. Select 4 and press **Enter**.
9. Type the full Sterling Connect:Direct for UNIX installation path and filename and press **Enter**.
10. Press **Enter** to confirm the installation.

If sufficient space is available, the installation begins. If not, you are prompted to delete files to provide the necessary disk space and the installation exits. After you have enough space, restart the installation.

11. After the installation completes, press **Enter** to return to the installation menu.

---

## Installing Sterling Connect:Direct Secure Plus

After you install Sterling Connect:Direct for UNIX, you can install Sterling Connect:Direct Secure Plus at any time.

### About this task

To install Sterling Connect:Direct Secure Plus:

### Procedure

1. Log on to the UNIX system with the privileges required to install software. You can create an account specifically for this purpose. Do not install as root.
2. From the distribution media, type the following command and press **Enter** to change to the directory that correspond to the UNIX platform:

```
cd /cdrom/<platform directory>
```

Refer to the following list for the name of the platform directory for each platform:

#### HP PA-RISC series

HP\_PA-RISC

#### HP UX Itanium

HP\_Itanium

#### IBM System pSeries

IBM

#### Sun SPARC systems

Sun\_Solaris

#### Red Hat

RedHat\_linux

#### SuSE

SuSE\_linux

#### Linux zSeries

IBMS390\_linux

#### Solaris/x86

Solaris\_x86

3. Type the following command to start the installation and press **Enter**:

```
cdinstall
```

4. Read the information displayed and press **Enter**.
5. Type the path and press **Enter**. A warning that the directory exists is displayed.



6. Press **Enter** to continue. The message that installed components are detected is displayed.
7. Type **n** and press **Enter** to run the full installation procedure. The following screen is displayed:

```
Connect:Direct for UNIX installation directory specified:
[directory path]
Please select one of the following installation options:

(1) Connect:Direct for UNIX Server and Client(CLI/API)
(2) Connect:Direct for UNIX Server
(3) Connect:Direct for UNIX Client(CLI/API)
(4) Connect:Direct for UNIX File Agent
(5) Connect:Direct for UNIX Secure+ Option for UNIX
(6) EXIT
Enter your choice:[1]
```

8. Type **5** and press **Enter**.
9. Type the full installation path and filename and press **Enter**.
10. Press **Enter** to confirm the installation. The program determines if space exists to complete the operation. If so, the Sterling Connect:Direct Secure Plus installation script and cpio files are extracted. If not, you are prompted to delete enough files. After you clear enough space, restart the installation procedure.
11. Read the information and press **Enter**.
12. Press **Enter** to confirm the installation location. A message is displayed regarding the amount of disk space required to install Sterling Connect:Direct Secure Plus. If sufficient space is available, press **Enter**. If not, you are prompted to delete enough files to provide the enough space. The installation then exits. After you have cleared enough space, restart the installation. A screen is displayed as the files are extracted and the JRE is configured. After the JRE is configured, the following prompt is displayed:
13. Press **Enter** if your node name is displayed. If your node name is not displayed, type your node name and press **Enter**.
14. Type a passphrase of at least 32 random characters and press **Enter**. The installation is complete.
15. Press **Enter** to return to the installation menu.

---

## SNA Support for Sterling Connect:Direct for UNIX

For LU6.2 connectivity, you must configure SNA support. Refer to SNA LU6.2 Connectivity for instructions on modifying both the initialization parameters and network map files.

---

## Defining High-Availability Settings in the Configuration Files

After you install Sterling Connect:Direct for UNIX on a shared file system, modify Sterling Connect:Direct parameters to support a clustering environment. Install Sterling Connect:Direct for UNIX on a shared cluster file system to use it in a cluster environment. Complete the following procedure to modify the configuration files for a cluster environment:

## Procedure

1. Modify the following parameters:
  - In the initialization parameters file (initparm.cfg), set :comm.info=0.0.0.0;nnnn:\ where nnnn is the number of the listening port you defined during installation.
  - In the api.parms record of the NDMAPI configuration file (ndmapi.cfg), set :tcp.hostname=*logical\_host\_ip\_name*:\ where *logical\_host\_ip\_name* is the virtual address of the cluster.
  - In the network map file (netmap.cfg), set :tcp.api=*logical\_host\_ip\_name*;nnnn:\ where nnnn is the API port you defined during installation.
2. In the network map file (netmap.cfg), set the outgoing address parameter in the local.node record to specify the local host IP name or address of the floating address to the following value. The remote node will also use this value for network map checking.

```
:outgoing.address=(host name | nnnnnn.nnn):\
```

3. Modify the following records in the network map file:
  - Set :comm.info=*logical\_host\_ip\_name*;1364:\ to configure the loopback remote node record.
  - Set tcp.max.time.to.wait to a value other than zero and less than the value set in the resource group manager of the cluster software to allow for clean shutdowns.
4. In the same volume group as the installation file system, create a user data file system that is shared by all cluster nodes.

## Setting Up Additional Configuration Requirements in a SunCluster 3.X Environment

The High-Availability cluster commands shown below are not intended to be a complete set of instructions for setting up the High-Availability cluster software. Additional steps may be required to complete the configuration of the High-Availability environment. High-Availability cluster expertise is the responsibility of the customer. White papers detailing specific environments, setup steps, and testing of various High-Availability clusters are available on the Support On Demand web site. In addition to modifying the configuration files, complete the following procedure to set up a SunCluster 3.X cluster:

### Procedure

1. Type the following command to create the cluster resource:

```
scdscreate -V SCI -T cd
```

Use the V parameter to define the vendor ID and T parameter to define the resource ID.

2. Type the following command to configure the custom resource scripts:

```
scdsconfig
```

3. Edit the SCI.cd resource file and change the value of RT\_BASEDIR as follows:

```
RT_BASEDIR=/opt/SCIcd/bin;
RT_BASEDIR=/global/vol1/sci/cduserk1/3.5.00/suncluster+scripts/SCIcd/bin;
```

## Configuring Additional Requirements in a SunCluster 2.2 Environment

In addition to modifying the configuration files, complete the following steps to complete the SunCluster 2.2 setup:

### Procedure

1. Place the following sample scripts and configuration files in a directory that is available to SunCluster 2.2 software:
  - cd\_start.sh
  - cd\_stop.sh
2. Update the scripts as required for your environment.
3. Copy the sample scripts to all nodes in the cluster.
4. Issue the **hareg** command to register the Sterling Connect:Direct data service. Refer to the SunCluster documentation for more information. Following is a sample command:

```
hareg -r cd \
```

---

## Setting Up Additional Configuration Requirements for IBM HACMP

In addition to modifying the configuration files, complete the following steps to complete the IBM high-availability cluster multiprocessing (HACMP) setup:

### Procedure

1. Place the following sample scripts and configuration files in a directory that is available to the IBM HACMP software:
  - cd\_start\_net.sh
  - cd\_stop\_net.sh
2. Update the scripts as required for your environment.
3. Copy the sample scripts to all nodes in the cluster.

---

## Setting Up Additional Configuration Requirements for Hewlett-Packard MC/ServiceGuard

The HP Solutions Competency Center (SCC) has successfully integrated Sterling Connect:Direct with MC/Service Guard. The implementation and certification of Sterling Connect:Direct followed the SCC's high availability Implementation and Certification Process. Refer to the Implementation and Certification With Hewlett-Packard's MC/ServiceGuard High Availability Software document located on the Support on Demand Web site.

---

## Verifying the Installation

### Procedure

1. Type the following command to identify the release and platform operating system release, where `d_dir` is the destination directory and `binaryx` is a file in the `bin/` directory (for example, `cdpmgr`):

```
% d_dir/etc/cdver d_dir/ndm/bin/[binary1 binary2 ...]
```

2. Log in with the user account under which Sterling Connect:Direct was installed.
3. Type the following command to start Sterling Connect:Direct for UNIX Server, where `d_dir` is the destination directory and `cd_node` is the Sterling Connect:Direct node name.

```
$ d_dir/ndm/bin/cdpmgr -i d_dir/ndm/cfg/cd_node/initparm.cfg
```

4. Do one of the following to set the environment variable `NDMAPICFG` to point to the client configuration file:
  - If you are using the Bourne or Korn shell, type the following command:

```
$ NDMAPICFG=d_dir/ndm/cfg/cliapi/ndmapi.cfg  
$ export NDMAPICFG
```

- If you are using the C shell, type the following command:

```
% setenv NDMAPICFG d_dir/ndm/cfg/cliapi/ndmapi.cfg
```

5. Type the following command to invoke the Sterling Connect:Direct client:

```
$ d_dir/ndm/bin/direct
```

6. Type the following command:

```
Direct> select statistics;
```

Read the statistics information and ensure that the initialization started with no errors. If any errors are displayed, resolve the errors before continuing.

7. Type the following command to submit a sample Process:

```
Direct> submit file=d_dir/ndm/bin/sample.cd;
```

This sample Process copies a binary file named `msgfile.cfg` to the file `cddelete.me` in your `HOME` directory (your node is both the `PNODE` and the `SNODE`). The checkpointing interval is set to 2M and extended compression is used.

8. Type the following select process command to monitor data transmission activity:

```
Direct> select process pnumber=1;
```

Sterling Connect:Direct generates a report with the Process name and number, user, submitter node, queue, and status.

9. After the Process is complete, type the following select statistics command to review the statistics log for the Process:

```
Direct> select statistics pnumber=1;
```

10. Do one of the following:

- Type the following command to manually shut down the Sterling Connect:Direct server:

```
Direct> stop;
```

- When running Sterling Connect:Direct with the LU6.2 feature on HP SNA, NCR SNA, Brixton SNA, or SunLink SNA, type the following command to stop Sterling Connect:Direct: Direct> stop force;
- Type the following command to quit the Sterling Connect:Direct client without shutting down the server: Direct> quit;  
The client terminates automatically when you stop the server.



---

## Chapter 3. Managing Files with Sterling Connect:Direct File Agent

---

### Sterling Connect:Direct File Agent Overview

Sterling Connect:Direct File Agent is a component of Sterling Connect:Direct that provides unattended file management. Before using Sterling Connect:Direct for UNIX, you must plan how to configure it to automate file management for your site. After planning what you need to accomplish, configure Sterling Connect:Direct File Agent to connect to a Sterling Connect:Direct server, watch the directories that files of interest will be added to, and submit a specified Sterling Connect:Direct Process to the server when a file is detected.

Sterling Connect:Direct File Agent provides monitoring and detection capabilities that enhance the automation you accomplish with Sterling Connect:Direct Processes. You cannot create Processes with Sterling Connect:Direct File Agent; however, Sterling Connect:Direct File Agent variables can be used to pass arguments to a Process. Sterling Connect:Direct File Agent does not delete, copy, or move files directly, but it helps you accomplish such tasks by submitting the Process you specify in the configuration to the Sterling Connect:Direct server. Before you specify a Sterling Connect:Direct Process in the Sterling Connect:Direct File Agent configuration, you must create and test the Processes to ensure that it performs tasks as expected when Sterling Connect:Direct File Agent submits the Process.

Using the Sterling Connect:Direct File Agent configuration interface and Help system, you define the default configuration file (Default\_Config.ser). The default configuration file defines the Sterling Connect:Direct server that Sterling Connect:Direct for UNIX communicates with; the directory, or directories, that Sterling Connect:Direct File Agent monitors; and how a file added to a watched directory or a detected system event are processed.

You can configure Sterling Connect:Direct File Agent to operate in either of the following ways:

- Watch for any file to appear in one or more watched directories and submit the default Process after detecting the newly added file.
- Override the default Process specified and apply either watched file event rules (Submit Process rule) or system event rules that is enabled for the configuration. Sterling Connect:Direct File Agent applies a watched file event rule to a detected file by checking file properties to determine whether criteria specified by the rule are met. A system event rule checks whether a system event meets criteria specified by the rule. When all criteria for a rule are met, Sterling Connect:Direct File Agent submits the Sterling Connect:Direct Process associated with that rule.

You can create Sterling Connect:Direct File Agent rules based on the following properties:

- Full or partial name of the file detected in a watched directory
- Size of the file detected in a watched directory
- System event title
- System event contents (as included in a stack trace)

You can specify more than one rule in a Sterling Connect:Direct File Agent configuration; each rule can have Sterling Connect:Direct File Agent submit a different Process.

Although you can create multiple rules as part of a Sterling Connect:Direct File Agent configuration, Sterling Connect:Direct File Agent processing ends when all criteria for a rule are met. Therefore, you should specify rules so that those with more specific criteria (properties) are listed first in the configuration.

For optimum performance, you should configure Sterling Connect:Direct File Agent to communicate with the Sterling Connect:Direct node where it is installed. You can configure Sterling Connect:Direct File Agent to use continuous signon and remain connected to the API port for the Sterling Connect:Direct server at all times, or configure it to connect to the port only when it needs to. Sterling Connect:Direct File Agent can be installed on UNIX, Microsoft Windows, and z/OS operating systems. When you use Sterling Connect:Direct with UNIX or Microsoft Windows, the watched directory is a UNIX pathname or a Microsoft Windows path to the directory. When you use Sterling Connect:Direct with z/OS, the watched directory can be the HFS pathname for a file or a directory, the full MVS data set name, or a partial MVS data set name.

Sterling Connect:Direct File Agent can monitor multiple directories, including local and network directories. Sterling Connect:Direct File Agent scans the watched directories you specify in the configuration for newly added files (unless you specify a rule to force other operation). By default, Sterling Connect:Direct File Agent scans a watched directory once per minute. For example, if you start Sterling Connect:Direct File Agent at 1:00 p.m., a file added to that watched directory at 12:55 a.m. is not detected as newly added. If you start Sterling Connect:Direct File Agent at 1:00 p.m., and a file is placed in the watched directory at 1:01 p.m., then Sterling Connect:Direct File Agent detects this newly added file. Sterling Connect:Direct File Agent detects a file only one time, unless the file is accessed and saved with a later timestamp.

Using Sterling Connect:Direct File Agent requires an understanding of Sterling Connect:Direct Processes, operating systems, and scripting (for regular expression operator use with Sterling Connect:Direct File Agent rules).

## **Sterling Connect:Direct File Agent Operation**

You can run Sterling Connect:Direct File Agent from a UNIX or command line, configure it to start automatically as a Microsoft Windows Service at system startup, or configure it to run from a Microsoft Windows shortcut. Use the command line to verify that Sterling Connect:Direct File Agent is working correctly or to specify an alternate configuration file. After you run Sterling Connect:Direct File Agent from the command line to verify that Sterling Connect:Direct File Agent is operating correctly, run it using the method that requires the least user intervention.

When Sterling Connect:Direct File Agent runs as a Microsoft Windows service, it is fully automated, requiring little user intervention. On UNIX, you can modify the initialization sequence of the computer to call the `cdfa.sh` script and run Sterling Connect:Direct File Agent whenever you restart the computer. On z/OS, you must run the appropriate job to start the Sterling Connect:Direct File Agent configuration interface, or start or shutdown the Sterling Connect:Direct File Agent.



Depending on your network and how you use Sterling Connect:Direct, there might be more than one Sterling Connect:Direct File Agent running (on different hosts). The first Sterling Connect:Direct File Agent that connects to a Sterling Connect:Direct server becomes the Sterling Connect:Direct File Agent gate keeper. The gate keeper port is used to keep track of locations monitored in case multiple Sterling Connect:Direct File Agents are configured to watch a single directory. The gate keeper ensures that only one Sterling Connect:Direct File Agent detects a file that appears in a watched directory.

## **Sterling Connect:Direct File Agent Logging Capabilities**

Sterling Connect:Direct File Agent logging capabilities vary by platform. Running Sterling Connect:Direct File Agent from a command line using the verbose argument turns on Sterling Connect:Direct File Agent logging when it is available. When you run Sterling Connect:Direct File Agent as Microsoft Windows service, no information is logged unless an error occurs.

Sterling Connect:Direct File Agent provides the following levels of status information when logging is available on a platform:

- System log—Shows all system activity. This log is created only when you specify verbose mode or if an error occurs. If you are running verbose mode from the command line, this log information is shown in the command line window. If you are not running in verbose mode, the system log appears in the snaps directory (located in the Sterling Connect:Direct File Agent installation directory), which is created when the first event occurs.
- First Failing Status (FFS) log—One or more logs created when an error occurs. The snaps directory is created as needed and contains the FFS logs for any errors encountered by Sterling Connect:Direct File Agent.

Using trace commands provided for your platform can also help capture details related to Sterling Connect:Direct File Agent operation.

## **Sterling Connect:Direct File Agent Configuration Interface and Help**

Instructions for configuring Sterling Connect:Direct File Agent are available in the online Help system that you access from the configuration interface. Field-level Help is displayed in the bottom pane of the configuration interface. Clicking **Help** displays the online configuration procedures.

---

## **Planning the Sterling Connect:Direct File Agent Configuration**

Before you begin configuring Sterling Connect:Direct File Agent, you must use Sterling Connect:Direct to choose or create the Processes that perform the actions you want to automate. You will need to carefully configure Sterling Connect:Direct File Agent to connect to the Sterling Connect:Direct server and to monitor and detect conditions (such as a file addition to a directory). At detection, Sterling Connect:Direct File Agent submits the Process for executing actions that need to be performed in response to those conditions.

Refer to Sterling Connect:Direct for UNIX Configuration Examples to review some configuration scenarios that can help you plan your Sterling Connect:Direct File Agent configuration. When you configure Sterling Connect:Direct File Agent, it is best to take an incremental approach; that is, first specify the server connection, a default Process, and the watched directories. Run a test from the command line to ensure that the default Sterling Connect:Direct File Agent configuration is working

correctly. After a successful test of the default configuration, you can run the Sterling Connect:Direct File Agent Configuration Interface again to start building and testing any Sterling Connect:Direct File Agent rules that you want to apply, one by one. After you successfully create a default configuration, you can use the file as the basis for other configuration files.

Use the Sterling Connect:Direct File Agent Worksheet to gather the information to configure Sterling Connect:Direct File Agent. Contact your system administrator for the site-specific information to establish a connection to the Sterling Connect:Direct server. As you complete the worksheet, run the Sterling Connect:Direct File Agent Configuration Interface and use the Sterling Connect:Direct File Agent Help system to learn about entering parameters. The Help system provides descriptions of parameters and arguments to specify in the configuration file. Make copies of this worksheet if you have to configure Sterling Connect:Direct File Agent on multiple Sterling Connect:Direct servers.

The following diagram illustrates the flow of steps for setting up Sterling Connect:Direct File Agent for use in a production environment.

---

## IBM Sterling Connect:Direct File Agent Worksheet

Worksheet	
<b>Sterling Connect:DirectServer Connection Information</b>	
Userid for API (for connecting to the Sterling Connect:Direct server) <b>Required</b>  Must match the user ID used to submit the default Process.	
Password for API (for connecting to the Sterling Connect:Direct server) <b>Required</b>  Must match the password used to submit the default Process.	
API host DSN name (name of the host on which the Sterling Connect:Direct server is located) <b>Required</b>	
API port (default =1363)1-5 digit port number that Sterling Connect:Direct for UNIX uses to connect to the Sterling Connect:Direct server API. <b>Required</b>	
Gatekeeper port (default=65530)Port used to track directory monitoring and ensure that multiple Sterling Connect:Direct File Agents do not monitor a single directory. <b>Required</b>	
Gate keeper DNS name (optional)(default=127.0.0.1)	
<b>Default Process and Watched Directory Information</b>	

<b>Worksheet</b>	
<p>Watched directories:</p> <p>For Microsoft Windows and UNIX, one or more valid specifications of paths (Microsoft Windows) or pathnames (UNIX). For z/OS, one or more fully specified HFS pathnames of a file or directory, or a full or partial MVS data set name. <b>Required</b>List one valid entry per line.</p>	
<b>Default Process and Watched Directory Information</b>	
<p>Default Process:</p> <p>Microsoft Windows and UNIX: Valid path and name of the file that contains the default Process on the Sterling Connect:Direct server. z/OS: Member Name in DMPUBLIB</p> <p><b>Note:</b> If you do not specify a default Process or create a rule, no processing is performed when a file or event is detected.</p>	
<p>Default arguments.</p> <p>Argument string to pass to the default Process in the following format:</p> <p>&amp;FA_XXXX_XXX.The percent sign (&amp;) and period (.) are required.</p>	
Error Process:	
Error arguments	
Process class (default=1) <b>Required</b>	
Process priority (default=1)	
Watched file interval (default=1 minute)	
File completion delay (default=1 minute)	

If you are using X Windows, the X11 display variable is used to connect to the GUI server for terminal emulation. The Sterling Connect:Direct File Agent Configuration Interface will display on the monitor specified for the X11 display variable. If you want to display the Sterling Connect:Direct File Agent Configuration Interface on a Microsoft Windows computer, you must specify the network ID of the terminal you want to use for displaying the Sterling Connect:Direct File Agent Configuration Interface.

---

## IBM Sterling Connect:Direct File Agent Configuration Examples

The following examples illustrate three typical scenarios for using Sterling Connect:Direct File Agent. Fields that are not required for the operation demonstrated in the example are not included in the configuration parameters. Use the sample scenarios to become familiar with settings for parameters you must set using the configuration interface in order to accomplish watched directory monitoring and file detection needs.

See the Sterling Connect:Direct File Agent Worksheet for a description of the parameters required to establish the connection. The tables of sample data for these scenarios assume that you have already configured the site-specific parameters required to establish a connection to the Sterling Connect:Direct server where Sterling Connect:Direct File Agent is installed. The sample scenarios also assume that the Sterling Connect:Direct Processes that will perform tasks associated with Sterling Connect:Direct File Agent file detection activities have been created.

## Example: Detecting a File Added to a Watched Directory on a z/OS System

Some users need to access a report file that is expected to be transferred to a location that only administrators can access. Sterling Connect:Direct File Agent can be configured to perform the processing on a z/OS system:

- Monitor the watched data set called EASTERN.Q1.REPTS.
- Submit a default Process called DEFPROC. The default Process has been created to copy a file detected in the watched data set to a specified location for access by users.

Tab	Field	Sample or Description
File agent	Watched directories	Type EASTERN.Q1.REPTS to specify the fully qualified MVS data set name to watch.
	Default Process	Type DEFPROC, the member name for the Process in DMPUBLIB. <b>Note:</b> If no default Process is specified and the file does not match a rule, then no processing occurs.

## Example: Detecting a System Event by Title on a Microsoft Windows System

IndexOutOfRangeException is the title of an event that indicates a number is outside of an expected range. In the following example, Sterling Connect:Direct File Agent is used to detect an event with IndexOutOfRangeException in the title, pass a string (the event title) to a Sterling Connect:Direct Process, and then submit a Process to the Sterling Connect:Direct server that will perform actions the environment requires for this type of event. In this scenario, the event IndexOutOfRangeException could indicate activity that a network administrator should investigate. Because the site uses a Sterling Connect:Direct mailbox system, the configuration will include the administrator's account to be notified when Sterling Connect:Direct File Agent submits a Process for the IndexOutOfRangeException rule.

The sample values in the following table accomplish the following processing:

- Override the default Process and submit \processfolder\oo\_boundserrproc.cdp
- Send a message to the administrator's mailbox system account after submitting the oo\_boundserrproc.cdp Process for the rule.

Tab	Dialog Box, Window, or Field	Description/Example
Rules	Create rule dialog box	Type index out of bounds as the name of the rule you are creating.
	Match criteria list for rule "index out of bounds" window	Select the default criteria <b>Not enabled: System event title matches " "</b> and click <b>Edit match</b> .

Tab	Dialog Box, Window, or Field	Description/Example
	Edit match criterion for rule "index out of bounds" dialog box	<ul style="list-style-type: none"> <li>Click Enabled to enable the criteria you are about to specify.</li> <li>Click System event title as the criterion to match for the rule.</li> <li>Click <b>Matches</b> on the drop-down field to see the options for comparison to a string.</li> <li>Click <b>Contains</b> to specify how the compare string should relate to a system event title that Sterling Connect:Direct File Agent detects.</li> <li>Type <b>IndexOutoffBounds</b> as the Compare String to indicate that the system event title should include this string.</li> <li>Click <b>OK</b>.</li> </ul>
	Submit Process information for system event rule "index out of bounds" window	Type information into the fields that will define the Process to submit and the mailbox user to notify after the Process is submitted.
	Process name field	Type <b>c:\processfolder\errproc.cdp</b> to specify the path and file name for the Process Sterling Connect:Direct File Agent submits when a file meets the rule criteria.
	Notification userid field	Type <b>adminjim@company.com</b> to specify the user to notify when Sterling Connect:Direct File Agent submits the Process.

## Example: Passing the UNIX Pathname for a Detected File to a Process

Because Sterling Connect:Direct File Agent can watch multiple directories for the appearance of a new file, the Sterling Connect:Direct Process that Sterling Connect:Direct File Agent is to submit to the server at the appearance of a new file might need to reference the Microsoft Windows Path or UNIX pathname for the detected file as part of commands and statements in the Process.

In the following example, a UNIX pathname is passed to the default Process, copynewfile.cdp.

Tab	Dialog box, Window, or Field	Sample Entry
File agent	Watched directories	<p>Type one UNIX pathname per line for each location Sterling Connect:Direct File Agent is to watch for the appearance of files:</p> <p><b>user/bin/monthend/</b></p> <p><b>quartend/easterndiv/errorfiles</b></p> <p><b>managers/special/reports</b></p> <p>Sterling Connect:Direct File Agent checks these pathnames for new files.</p>

Tab	Dialog box, Window, or Field	Sample Entry
	Default process	<p>Type the UNIX pathname and filename for the Sterling Connect:Direct Process that Sterling Connect:Direct File Agent is to run when a file appears in any watched directory specified:</p> <p><b>user/bin/admin/copynewfile.cdp</b></p> <p>The pathname where Sterling Connect:Direct File Agent detected a new file is passed to this Process.</p>
	Default arguments	<p>Type the Sterling Connect:Direct File Agent variable for passing a UNIX pathname or Microsoft Windows path, including the leading percent sign (%) and the ending period (.):</p> <p><b>&amp;FAP=%FA_PATH_FOUND.</b></p> <p>In this example, &amp;FAP is the variable to which Sterling Connect:Direct File Agent will pass the UNIX pathname where the file was detected. <b>%FA_PATH_FOUND. is the Sterling Connect:Direct File Agent variable used to indicate the information to pass to the Sterling Connect:Direct Process.</b></p>

---

## Chapter 4. Installation Worksheets

---

### Worksheet Instructions

Before you install Sterling Connect:Direct for UNIX, complete the worksheets to help you gather the information needed to complete the installation.

Complete the following worksheets before you begin the installation.

- Installation Worksheet
- User Authorization Information File Worksheet
- CLI/API Configuration File Worksheet

The following worksheets are provided for your convenience:

- Network Map Remote Node Information File Worksheet
- Server Authentication key File Worksheet
- Client Authentication key File Worksheet

---

### Installation Worksheet

Complete this worksheet to assist you during the installation procedure.

Parameter	Value
TCP/IP host name of the computer where the Sterling Connect:Direct server is installed	
Directory or path on which the distribution media will be mounted	
Destination directory where Sterling Connect:Direct will be installed, including the full path name	

---

### Customization Worksheet

Use this worksheet during customization. Refer to the Customizing Sterling Connect:Direct for UNIX.

Parameter	Default Value	Value to Use
Sterling Connect:Direct node name you are customizing, up to 16 characters long.		
Initialization Parameters File Information		
TCP/IP port number that the server monitors for an API connection request.	1363	
TCP/IP port number that the server monitors for a remote Sterling Connect:Direct connection request: <b>Note:</b> Use the default port number, if available. If the default port number is being used by another service, use any other available port. Check the /etc/services file for a list of ports.	1364	

---

## User Authorization Information File Worksheet

Use this worksheet when you are defining the user authorization information which includes the remote user information records and local user information records.

All Sterling Connect:Direct users must have an entry in the user authorization information file.

### Remote User Information Record

Sterling Connect:Direct uses the remote user information record to establish a proxy relationship between remote and local user IDs. Remote user IDs are translated to valid local user IDs on the system where you are installing Sterling Connect:Direct for UNIX. Sterling Connect:Direct also uses the remote and local user information records to determine the functionality of the user IDs that are translated and connected to it through a client using a Sterling Connect:Direct API.

Use the following table to create a list of remote user IDs and the local user IDs to which they will be mapped. If necessary, make copies of this page to record additional remote user IDs and local user IDs.

For more information on creating remote user information records and for information on using special generic characters to map remote user IDs, refer to the IBM Sterling Connect:Direct for UNIX Administration Guide.

Remote User ID	@	Remote Node Name	mapped to	Local User ID
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	
	@		=	

### Local User Information Record

Use the following table to record the local user ID records to create and the parameters to define. Define the additional parameters by editing the userfile.cfg file using any standard UNIX editor.



Default values are shown as capital letters in brackets. Before you begin defining local user information records, make copies of this worksheet for the number of users you plan to create.

Local User ID	Parameter	Description	Value to Assign
	admin.auth	Determines if the user has administrative authority.  y—All the other command parameter capabilities in the local user information record are automatically assigned to this user.  n—You must grant specific command parameters individually.	
	cmd.chgproc	Specifies whether the user can issue the change Process command.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.  a—Allows all users to issue this command.	
	cmd.delproc	Specifies whether the user can issue the delete Process command.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.  a—Allows all users to issue this command.	y   n   a y—Default a—For all users
	cmd.flsproc	Specifies whether the user can issue the flush Process command.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.  a—Allows all users to issue this command.	y   n   a y—Default a—For all users
	cmd.selproc	Specifies whether the user can issue the select Process command.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.  a—Allows all users to issue this command.	

Local User ID	Parameter	Description	Value to Assign
	cmd.selstats	Specifies whether the user can issue the select statistics command.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.  a—Allows all users to issue this command.	
	cmd.stopndm	Specifies whether the user can issue the stop command.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.	
	cmd.submit	Specifies whether the user can issue the submit Process command.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.	
	cmd.trace	Specifies whether the user can issue the trace command.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.	
	descrip	Permits the administrator to add descriptive notes to the record.	text string _____
	name	Specifies the name of the user.	user name _____
	phone	Specifies the telephone number of the user.	user phone _____
	pstmt.copy	Specifies whether the user can issue the copy command.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.	

Local User ID	Parameter	Description	Value to Assign
	pstmt.copy. ulimit	<p>Specifies the action to take when the limit on a user output file size is exceeded during a copy operation.</p> <p>The value for this parameter overrides the equivalent value for the ulimit parameter in the initialization parameters file. If a value is not defined in the initialization parameters file, the default is n.</p> <p>y or n or nnnnnnnK or nnnnM or nG where nnnnnnnK, nnnnM or nG establishes a default output file size limit for all copy operations.</p> <p>K—Thousands of bytes.</p> <p>M—Denotes millions of bytes.</p> <p>G—Denotes trillions of bytes.</p> <p>The maximum value you can specify is 1 terabyte.</p>	
	pstmt.download	<p>Specifies whether the user can download files.</p> <p>y—Allows the user to issue the command.</p> <p>n—Prevents the user from issuing the command.</p>	
	pstmt.download _dir	Specifies the directory to which the user can download files.	
	pstmt.runjob	<p>Specifies whether the user can issue the run job statement.</p> <p>y—Allows the user to issue the command.</p> <p>n—Prevents the user from issuing the command.</p>	
	pstmt.runtask	<p>Specifies whether the user can issue the run task statement.</p> <p>y—Allows the user to issue the command.</p> <p>n—Prevents the user from issuing the command.</p>	

Local User ID	Parameter	Description	Value to Assign
	pstmt.submit	Specifies whether the user can issue the submit statement.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.	
	snode.ovrd	Specifies whether the user can code the snodeid parameter on the submit command and Process and submit statements.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.	
	pstmt.upload	Specifies whether the user can upload files.  y—Allows the user to issue the command.  n—Prevents the user from issuing the command.	
	pstmt.upload_dir	Specifies the directory from which the user can upload files.	
	run_dir	Specifies the directory that contains the programs and scripts the user can execute.	
	submit_dir	Specifies the directory from which the user can submit Processes.	

## CLI/API Configuration File Worksheet

Use this worksheet to define the parameters needed to create a client configuration file. Create a separate file for each client attached to the server.

Parameter	Default Value	Value To Use
Port number of the Sterling Connect:Direct for UNIX server to which this client will connect. <b>Note:</b> Use the default port number if available. If the default port number is being used by another service, use any other available port. Check the /etc/services file for a list of ports.	1363	
Host name of the Sterling Connect:Direct for UNIX server to which this API will connect.  You can also type the IP address of the server.		

---

## Network Map Remote Node Information File Worksheet (TCP/IP and UDT Only)

The initial network map file containing a local node definition is created for you during the installation procedure; however, you must add a remote node record to the network map for each remote node you will communicate with unless you plan to specify the IP address or host name with the SNODE parameter when you submit a Process.

You must define a remote node information record for any node you plan to communicate with using UDT. You cannot specify a hostname or IP address for the SNODE in a Process if you are using UDT to communicate with the remote node.

Use the information on this worksheet when you modify the network map. Make a copy of this worksheet for each remote node in the network.

Parameter	Default Value	Value To Use
Remote Connect:Direct node name		
Host name or IP address on which the remote Sterling Connect:Direct server will run.		
Communication port number to call the remote Connect:Direct server:	<b>1364</b>	
comm.transport (UDT only)		

---

## Server Authentication Key File Worksheet

The initial server authentication key file is created during the installation procedure; however, you can update your key later. Use the information on this worksheet when you modify your key.

Parameter	Default Value	Value To Use
The host name on which the API is executed.	*	
An asterisk (*) stands for any host.		

Sterling Connect:Direct security depends on a key (similar to a password) in a Sterling Connect:Direct server and an identical key in each API that communicates with that server. The keys are defined and coordinated by the system administrator of the specific node or nodes, and should be kept secure. Be sure the authentication keys are available during installation, but do not record them on this worksheet or where they can be lost.

---

## Client Authentication Key File Worksheet

The initial client authentication key file is created automatically during the installation; however, you can update your key at a later date. Use the information on this worksheet when you modify the key.

Parameter	Default Value	Value To Use
The host name on which a Sterling Connect:Direct is executed.	*	
An asterisk (*) stands for any host.		

Sterling Connect:Direct security depends on a key, similar to a password, in a Sterling Connect:Direct server and an identical key in each API that will communicate with that server. The keys are defined and coordinated by the system administrator of the specific node or nodes, and should be kept secure.

Have the authentication keys you will use available during installation, but do not record them on this worksheet or anywhere else that could compromise security.

---

## Chapter 5. SNA LU6.2 Connectivity

---

### About SNA LU6.2 Connections

The Sterling Connect:Direct for UNIX product supports SNA LU6.2 connections in addition to TCP/IP connections.

#### Supported Interfaces

Following is a list of supported interfaces:

- Token ring
- Ethernet
- SDLC
- X.25 (QLLC)

#### Session Support

Sterling Connect:Direct for UNIX supports both independent and dependent LU6.2 sessions. Configuring independent LU sessions simplifies the management of communication between nodes and ensures appropriate recovery in some situations. Dependent LU sessions must be managed manually for communications between Sterling Connect:Direct nodes and do not recover properly in some situations.

The maximum number of independent LU sessions you configure defines the maximum number of concurrent transfers between nodes. The total number of sessions determines the number of UNIX transfers that can run simultaneously. Type an even number for the maximum number of sessions so that you can divide equally between the number of contention winner and contention loser sessions. The recommended number of maximum sessions is 8. The recommended number of contention winner sessions is 4. If supported, the recommended number of automatically established sessions is 4.

#### APPC Requirements

APPC requirements are described in the following list:

- Sterling Connect:Direct for UNIX uses a fixed transaction program (TP) name, NNV2DTF.
- Sterling Connect:Direct for UNIX uses basic conversations, sync level = confirm, no conversation level security, and no PIP (program initialization parameters).
- Do not specify the transaction program (TP) name in hexadecimal.

#### Configuration Requirements

Configuration requirements are described in the following list:

- The Sterling Connect:Direct for UNIX daemon must start the session manager, the LU6.2 communications component of Sterling Connect:Direct for UNIX. The Sterling Connect:Direct for UNIX daemon monitors for inbound ALLOCATEs and starts a session manager to handle the Process submitted by the remote node. The SNA communications package cannot start a session manager.
- Do not configure the TP as dynamically attachable or as an autostart program.

- Do not configure a path name to a Sterling Connect:Direct for UNIX program when you define the TP.
- For SNA packages that require that you provide a program name for a TP definition, you must type a program name that does not exist.

## SNA Considerations

SNA considerations are listed in the following section:

- Sterling Connect:Direct for UNIX is tested with the following link LU6.2 types. Currently, not all link types are tested on all platforms.
  - Token ring
  - Ethernet
  - SDLC leased line
  - X.25 (QLLC)
- Sterling Connect:Direct for UNIX, as an LU6.2 conversation partner, supports any defined link type supported by the SNA package manufacturer. There are no special support or configuration requirements in Sterling Connect:Direct for UNIX when using different link types to communicate with the remote node.
- The RU size selected for use with Sterling Connect:Direct for UNIX can strongly affect the observed file transfer throughput. Sterling Connect:Direct for UNIX is tested with 1K, 2K, and 4K RU sizes, with inbound and outbound pacing set to 7. Use a 1K RU size to confirm basic functionality, and then use 2K and 4K RU sizes while monitoring network congestion. You can realize a significant gain in throughput by increasing RU sizes from 1K to 4K. Increasing the RU size beyond 4K or increasing the pacing above 7 generally provides marginal improvement, but can severely degrade network performance. VTAM resource names must be typed in uppercase.

---

## AIX SNA Server Configuration

For AIX SNA support, you must install and configure either the AIX SNA Server/6000 or the eNetwork Communications Server. You can perform the configuration manually or use the Sterling Connect:Direct for UNIX configuration script. The script generates a set of communications profiles, which are used by Sterling Connect:Direct for UNIX. Review and modify the values in the profile entries to suit your environment.

The following sections provide the parameter definitions required by Sterling Connect:Direct for UNIX and a description of the script included with Sterling Connect:Direct.

### Manually Configuring the AIX SNA Server

You can manually configure AIX SNA by modifying the values in the default profile entries, as appropriate for your environment; however, Sterling Connect:Direct requires that you add a TP profile name with specific parameters.

#### Procedure

1. Log in as root
2. Type one of the following commands:
  - For AIX SNA Server/6000

```
mksnaobj -t'local_tp' -c 'basic' -w '/usr/lpp/sna' CDUTPPRO
```



- For eNetwork Communications Server

```
smitsnaadmin -x define_tp, tp_name='CDUTPPRO' conv_type='BASIC', \
security_rqd='NO', sync_level='CONFIRM_SYNC_LEVEL', pip_allowed='YES'
```

The following table lists the parameters required by Sterling Connect:Direct. You can assign default values to all other parameters.

**Profile name**

CDUTPPRO

**Conversion type**

basic

**Full path to TP executable**

/usr/lpp/sna

The path must be a valid directory that differs from the Sterling Connect:Direct for UNIX installation directory.

## About the Configuration Script

If you want to use a script to generate the Sterling Connect:Direct for UNIX configuration for AIX SNA Server/6000 support, run the script located in etc/cdsnacfg. After running the script, use SMIT to review the configuration to ensure that the profile values are appropriate for your environment. Sample profiles are provided as a reference.

Using the script, you can configure your IBM pSeries workstation for any of the following options:

- Token ring
- SDLC leased line

Do not use the cdsnacfg script to configure more than one connection. The script archives and deletes the current profile entries before adding values required by Sterling Connect:Direct.

The script issues commands to perform the following tasks:

- Stop AIX SNA support.
- Back up the current configuration to /snadirs/sna\_XXXX.sav, where XXXX is the current month and day.
- Delete the current AIX SNA profiles. You can restore or merge saved profiles with the smit importsna command.
- Regenerate base profiles.
- Configure AIX SNA support as required by Sterling Connect:Direct.
- Verify the AIX SNA configuration.
- Start AIX SNA support.
- Start the required SNA connections.

## Running the Configuration Script Procedure

1. Log in as root.
2. From the `d_dir/etc` directory, type the following command:

```
# cdsnacfg
```

The configuration script can run even if messages indicating irregular processing are returned. Read any messages as you proceed through the configuration. Refer to the AIX SNA documentation as required.

3. Do one of the following:
  - Type 1 to select Token Ring as the connection type and press Enter. The default is a token ring connection [1]. Go to step 5.
  - Type 2 to select SDLC Lease Line as the connection type and press Enter. Go to the next step.
4. Type the appropriate value for the following prompts or press Enter to select the default as listed in the brackets. The token ring adapter name is an AIX SNA assigned name. All other default values are samples that you can modify. For a VTAM host, the Adjacent Control Point Name is the SSCPNAME. Type host resource names in uppercase letters.

```
Please enter Network Name ..... [CDUNET] :
Please enter Adjacent Control Point Name ..... [HOSTCP] :
Please enter PU name ..... [RS6PU01] :
Please enter Remote Link Address..... [400076543210] :
Please enter XID node ID..... [07143210] :
Please enter local LU name ..... [RS6LU01] :
Please enter remote LU name (C:D MVS APPLID) .. [NDMAPP4] :
Please enter mode name ..... [NDM621K] :
Please enter Token Ring Adapter name ..... [tok0] :
Please enter Token Ring Adapter name ..... [0]
```

5. Type the appropriate value for an SDLC leased line connection or press Enter to select the default values in brackets. The Portmaster Adapter/A port name is an AIX SNA assigned name. All other default values are samples that you can modify. For a VTAM host, the Adjacent Control Point Name is the SSCPNAME. Type host resource names in uppercase letters.

```
Please enter Network Name ..... [CDUNET] :
Please enter Adjacent Control Point Name ..... [HOSTCP] :
Please enter PU name ..... [RS6PU01] :
Please enter PU address (decimal)..... [02] :
Please enter local LU name ..... [RS6LU01] :
Please enter remote LU name (C:D MVS APPLID) .. [NDMAPP4] :
Please enter mode name ..... [NDM621K] :
Please enter Portmaster Adapter/A port name ... [mpq0] :
```

6. Review the messages as the configuration script completes its final steps. If you receive a message that Sterling Connect:Direct is unable to determine the installed version of AIX SNA support, then perform the following steps:
  - Verify your installation with SMIT.
  - Run `etc/snaver.sh` to test for the correct installation of AIX SNA Server/6000.
  - Rerun the `cdsnacfg` script.

For special considerations for connectivity between IBM pSeries and i5/OS systems, refer to [Connectivity Between IBM pSeries and i5/OS Systems](#).

Refer to the AIX SNA Server/6000 documentation for further information about AIX SNA Server/6000.

---

## HP SNAplus2 Configuration Requirements

For HP SNA support, you must install and configure HP SNAplus2API, SNAplus2-Common, and SNAplus2-Link software. Perform the following steps to configure your system:

### Procedure

1. Use a text editor or `xsnapadmin` to create a configuration file named `/etc/opt/sna/sna_node.cfg`.
2. Add the following entry to the `/etc/opt/sna/sna_tps` file:

```
["NNV2DTF"]  
TYPE=QUEUED-BROADCAST  
USERID=XXXXX
```

3. To start the SNA 3.0 support, log in as root and type the following command:

```
snap start
```

4. To validate or modify your configuration, start the local node, log in as root, and type the following command:

```
snapadmin
```

For additional information about configuring for SNAplus2 10.10 connectivity, refer to the Hewlett-Packard documentation.

The following example displays the contents of a file that contains the required Sterling Connect:Direct AT&T Servers SNA 3.0 Invokable TP definition. This file, `sna_tps`, is provided in the directory `d_dir/etc`.

```
["NNV2DTF"]  
TYPE=QUEUED-BROADCAST
```

---

## SNAP-IX SNA Gateway Support Configuration Requirements

For SNAP-IX support, you must install and configure the SNAP-IX SNA server software. Documentation about SNAP-IX can be found at the following Web site: <http://www.dataconnection.com/sna/docs.htm> or with the SNAP-IX product.

### Procedure

1. Log on as root before executing any SNAP-IX commands.
2. Type the following command to start the SNAP-IX SNA Server application:

```
/opt/sna/bin/sna start
```

3. Create a configuration file that defines configuration statements for your system, including the communications protocol. Either use the command line program `/opt/sna/bin/snaadmin` to create or modify the `/etc/opt/sna/sna_node.cfg` configuration file or use the `/opt/sna/bin/X11/xsnaadmin` program to create or modify a configuration file. Refer to the SNAP-IX documentation for a description of the available parameters.

4. Type the following command to define the NNV2DTF transaction program:

```
/opt/sna/bin/snaadmin  
define_tp,tp_name=NNV2DTF,conv_type=BASIC,sync_level=CONFIRM_SYNC_LEVEL, pip_allowed=NO
```

Following are sample statements in the file /etc/opt/sna/sna\_tps, where 'xxxxxx' is a valid user ID.

```
[NNV2DTF]  
LUALIAS = ""  
DESCRIPTION = ""  
USERID = xxxxxx  
TIMEOUT = -1  
TYPE = QUEUED-BROADCAST
```

Following is a sample configuration statement that is defined in the SNAP\_IX sna\_node.cfg file and defines a SNAP\_IX SNA Server for LU6.2 connectivity between an Ethernet attached SUN Solaris 8 system and an z/OS mainframe. It defines a single independent LU and one Sterling Connect:Direct node LU on the mainframe. The VTAM resource names correspond to the samples.

```

[define_node]
cp_alias = CDUPU01
description = Control Point Node
fqcp_name = CDUNET.CDUPU01
node_type = END_NODE
mode_to_cos_map_supp = YES
mds_supported = YES
node_id = <01702160>
[define_ethernet_dlc]
dlc_name = ETHER0
description = Ethernet dlc
neg_ls_supp = YES
initially_active = NO
adapter_number = 0
lan_type = 802_3_DIX
[define_ethernet_port]
port_name = ETSAP0
description = Ethernet Port 0
dlc_name = ETHER0
port_type = PORT_SATF
port_number = 0
max_rcv_btu_size = 1033
[define_ethernet_ls]
ls_name = ETHL0
description = Ethernet Link Station
port_name = ETSAP0
adj_cp_name = <00000000000000000000000000000000>
adj_cp_type = LEARN_NODE
mac_address = <10005ad172fc>
solicit_sscp_sessions = YES
pu_name = ETHL0
[define_partner_lu]
plu_alias = NDMAPP4
description = QC.OS390.V4300 C:D Node
fqplu_name = CDUNET .NDMAPP4
plu_un_name = <0000000000000000>
parallel_sess_supp = YES
[define_local_lu]
lu_alias = CDULU01
list_name = ""
description = Local LU
lu_name = CDULU01
lu_session_limit = 0
pu_name = <0000000000000000>
[define_mode]
mode_name = NDM621K
description = NDM621K
default_ru_size = NO
max_ru_size_upp = 1024
[define_mode]
mode_name = NDM622K
description = NDM622K
default_ru_size = NO
max_ru_size_upp = 2048

```

```

[define_mode]
mode_name = NDM624K
description = NDM624K
default_ru_size = NO
max_ru_size_upp = 4096
Sample configuration statement (continued)
[define_directory_entry]
resource_name = CDUNET .CSDSA01
resource_type = ENCP_RESOURCE
description = MVSA SSCP
parent_name = <00000000000000000000000000000000>
parent_type = ENCP_RESOURCE
[define_directory_entry]
resource_name = CDUNET .CSDSA01
resource_type = LU_RESOURCE
description = (Auto defined - default LU)
parent_name = CDUNET .CSDSA01
parent_type = ENCP_RESOURCE
[define_directory_entry]
resource_name = CDUNET .NDMAPP4
resource_type = LU_RESOURCE
description = QC.OS390.V4300 C:D Node
parent_name = CDUNET .CSDSA01
parent_type = ENCP_RESOURCE
[define_tp]
tp_name = NNV2DTF
description = C:D-UNIX TP
list_name = ""
conv_type = BASIC
security_rqd = NO
sync_level = NONE
enabled = YES
pip_allowed = NO
tp_instance_limit = 0

```

---

## Brixton 4.1 SNA for Sun Solaris Requirements

For Brixton SNA support, use the procedures in this section to install and configure the Brixton BrxPU2.1 SNA Server.

- For Brixton SNA support, Sterling Connect:Direct for UNIX requires Brixton software packages BrxAPPC, BrxGMAN, BrxGMI, and BrxPU21

### **BrxGMAN**

Brixton Gateway Manager

### **BRXGMI**

Brixton Graphical Management Interface

### **BrxAPPC**

Brixton LU6.2 and CPI-C APIs

- Sterling Connect:Direct for UNIX requires that you configure BrxGMAN, BrxGMI, and BrxPU2.1 packages.
- The BrxGMI (Graphical Management Interface) generates a working configuration that can be altered to match your needs.

**Note:** This is not an SNA configuration.

## Configuring BrxGMAN Software

Perform the following steps to configure the BrxGMAN software:

### Procedure

1. Type the following commands to run the PU2.1 setup program:

```
# cd /opt/BrxPU21
# ./brxsetup
```

2. To configure the BrxGMAN software, type 1 and press Enter.  
The BrxGMAN configuration file directory root is currently set to /etc/brixton.  
The following prompt is displayed:

```
The BrxGMAN configuration file directory root is currently set to /etc/brixton.
Do you want to change it (Yes/No) [N]?
```

3. Type n and press Enter to use the default directory.  
The BrxGMAN is configured for a site that runs a main DNS Server. The setup script prompts you to change the setting.
4. Type n and press Enter to use the default DNS server configuration.  
The following screen is displayed. The DNS domain name is currently set to stercomm.com.

```
The DNS domain name is currently set to stercomm.com.
Do you want to change it (Yes/No) [N]?
```

5. Type n and press Enter to use the default DNS domain name.  
The following prompt is displayed. The Brixton subdomain name is currently set to csg.

```
The Brixton subdomain name is currently set to csg.
Do you want to change it (Yes/No) [N]?
```

6. Type n and press Enter to use the default Brixton subdomain name.  
The following prompt is displayed. BrxGMAN product is set to startup automatically each time your system reboots. The setup script prompts you to change this setting.

```
The BrxGMAN product is set to startup automatically each time your system reboots.
Do you want to change it (Yes/No) [N]?
```

7. Type n and press Enter to continue to automatically start the BrxGMAN product at startup.  
The screen displays a prompt to verify the BrxGMAN configuration:
8. Type y and press Enter to confirm the configuration.

## Configuring BrxGMI Software

To configure the BrxGMI software.

### Procedure

1. Type 2 and press Enter.  
The following screen prompts you to change the current Help browser.

```
The BrxGMI help browser is currently set to mosaic.  
Do you want to change it (Yes/No) [N]?
```

2. Type n and press Enter to use the default browser.  
The script prompts you to change the working directory.
3. Type n and press Enter to use the default BrxGMI working directory.  
The script prompts you to verify the configuration.
4. If the configuration is correct, type y and press Enter.

## Configuring BrxPU21 Software

To configure the BrxPU21 software:

### Procedure

1. Type 3 to and press Enter configure BrxPU21. The setup script prompts you to change the working directory.
2. Type n and press Enter. The setup script prompts you to change the root directory.
3. Type n and press Enter. The setup script prompts you to change the startup setting.
4. Type n and press Enter.
5. If the configuration is correct, type y and press Enter.

## Starting BrxGMAN

To start the BrxGMAN software:

### Procedure

1. Type 5 to start the BrxGMAN and press Enter.
2. Type the following command to start the Graphical Manager and configure SNA LU6.2 definitions:

```
#!/brxgmi.sh
```

Refer to the Brixton documentation for additional information about configuring the UNIX system for Brixton SNA connectivity.

## Sample Brixton BrxPU2.1 Configuration

Sterling Connect:Direct for UNIX supports platforms running Brixton SNA 4.1 Server for LU6.2 connectivity. The following sample displays a sample Brixton 4.1 SNA definition for a token ring-attached workstation. This file template is provided in the directory `d_dir/etc`. The VTAM resource names correspond to the samples given in this appendix:



```

// Brixton BrxPU2.1 SNA Server Sample Configuration -
Sterling Connect:Direct for UNIX//
CP
NAME = CDUPU01
NQ_CP_NAME = CDUNET.CDUPU01
;
LU
COMMENT = "LOCAL ILU"
NAME = CDULU01
LUTYPE = 6.2
PACING = 0
SESS_LMT = 8
;
TRLINE
COMMENT = "NCP Token Interface"
NAME = NCPTIC
SOURCE_ADDRESS = X'400050000000'
LAN_RATE = RING_16Mbs
;
PU2
COMMENT = "VTAM PU"
NAME = CDUPU01
LINK_NAME = NCPTIC
MAXDATA = 2057
ROLE = Negotiable
TERMID = X'05700004'
ALS_CONNECT = Active
LMT_RES = No
ACTPU_SUPPRESS = No
RMTTERMID = X'05700004'
RMTNQ_CP_NAME = CDUNET.HOSTCP
RMTMACADDR = X'400050000004'
;
PTNR_LU
NAME = NDMAPP4
LOC_LU_NAME = CDULU01
INIT_TYPE = INITIATE_OR_QUEUE
;
MODE
NAME = NDM624K
PTNR_LU_NAME = NDMAPP4
DLC_NAME = CDUPU01
SND_MAX_RU_LB = 8
RCV_MAX_RU_LB = 8
PREF_SND_RU = 4096
PREF_RCV_RU = 4096
LCL_MAX_SESS_LMT = 8
MIN_CW_SESS = 4
MIN_CL_SESS = 4
CW_AUTOACT_LMT = 4
AUTOINIT_SL = Yes
;
TP
TP_NAME = NNV2DTF
LOC_LU_NAME = CDULU01
CONV_TYPE = BASIC
SYNC_LVL = CONFIRM
PIP = NO
PRIVILEGE = NONE
;

```

The LU SESS\_LMT must be 2 greater than the MODE LCL\_MAX\_SESS\_LMT.

The i5/OS definitions include the following in the DLC directive:

```
RMTNQ_CP_NAME=CDUNET.CP_NAME //Rmt Network Qualified Name
```

After running the Brixton configuration for the i5/OS connection, change the i5/OS device description to match the Mode\_Name defined in the Brixton configuration.

---

## Configuring SunLink SNA 9.1 Support for Sun Solaris

For SunLink SNA support, use the following procedure to install and configure the SunLink SUNWpu2.1 SNA server. For SunLink SNA support, configure the SunLink software packages: SUNWlu62, SUNWgmi, SUNWgman, and SUNWpu21. Sterling Connect:Direct for UNIX requires that you configure SUNWgman, SUNWgmi, and SUNWpu21 packages. The SUNWgmi (Graphical Management Interface) generates a working configuration that can be altered to match your needs. This is not an SNA configuration.

### Procedure

1. Type the following commands to run the PU2.1 setup program:

```
# cd /opt/SUNWPU21
# ./sunsetup
```

2. Type **1** to configure the SUNWgman software. You are prompted you to change the root directory:
3. Type **n** and press **Enter**.
4. Type **n** and press **Enter**.  
The setup script prompts you to change the DNS domain name.
5. Type **n** and press **Enter**. The setup script prompts you to change the startup option.
6. Type **n** and press **Enter**.  
The following message prompts you to verify the SUNWgman configuration.
7. Do one of the following:
  - If the configuration is correct, type **y** and press **Enter**.
  - If necessary, type new parameters for each option. Type **y** and press **Enter**.
8. To configure the SUNWgmi software, type **2**. The following message prompts you to change the current Help browser.
9. Type **n** and press **Enter**. The script prompts you to change the working directory.
10. Type **n** and press **Enter**. The script prompts you to verify the configuration.
11. Do one of the following:
  - If the configuration is correct, type **y** and press **Enter**.
  - If necessary, type new parameters for each option. Type **y** and press **Enter**.
12. Type **3** to configure SUNWpu21 and press **Enter**. The setup script prompts you to change the working directory.
13. Type **n** and press **Enter**. The setup script prompts you to change the root directory.
14. Type **n** and press **Enter**. The setup script prompts you to change the startup setting.
15. Type **n** and press **Enter**. The setup script prompts you to verify the configuration.

16. Do one of the following:
  - If the configuration is correct, type **y** and press **Enter**.
  - If necessary, type new parameters for each option. Type **y** and press **Enter**.  
You are prompted you to select a task.
17. Type **4** to start the SUNWgman.
18. Type the following command to configure SNA LU6.2 definitions:

```
#./sungmi.sh
```

---

## Sample z/OS Definitions for an LU6.2 Connection

This section provides samples of the z/OS NCP and VTAM definitions required for LU6.2 connectivity between Sterling Connect:Direct for UNIX and Sterling Connect:Direct for z/OS®. A sample Sterling Connect:Direct for z/OS network map definition is also included.

### Token Ring 3174-R Gateway Controller Configuration

The following sample displays sample line, PU, and LU definitions used by VTAM to define a token ring 3174-R gateway controller for an LU6.2 connection:

```

REAL 3174 CONTROLLER, FUNCTIONS AS THE GATEWAY CONTROLLER
D1IRR1  PU ADDR=01,
          DATMODE=HALF,      *
          MAXDATA=521,      *
          MAXOUT=7,         *
          PACING=2,         *
          PUDR=YES,         *
          DLOGMOD=SNX32702, *
          MODETAB=DALLMTAB, *
          USSTAB=LSUSSTAB,  *
          SSCPFM=USSSCS,   *
          PUTYPE=2,         *
          DISCNT=(NO),      *
          SECNET=NO,        *
          VPACING=4,        *
          XID=YES,          *
          ISTATUS=ACTIVE    *
*
* COAX PORTS
D1IRR102 LU LOCADDR=2, ISTATUS=ACTIVE
D1IRR103 LU LOCADDR=3, ISTATUS=ACTIVE
D1IRR104 LU LOCADDR=4, ISTATUS=ACTIVE
D1IRR105 LU LOCADDR=5, ISTATUS=ACTIVE
D1IRR106 LU LOCADDR=6, ISTATUS=INACTIVE
D1IRR107 LU LOCADDR=7, ISTATUS=INACTIVE
D1IRR108 LU LOCADDR=8, ISTATUS=INACTIVE
D1IRR109 LU LOCADDR=9, ISTATUS=INACTIVE
* FOR LU6.2 ILU
CDULU01 LU LOCADDR=0, DLOGMOD=NDM621K, RESSCB=5, ISTATUS=ACTIVE
CDULU02 LU LOCADDR=0, DLOGMOD=NDM621K, RESSCB=5, ISTATUS=ACTIVE
CDULU03 LU LOCADDR=0, DLOGMOD=NDM621K, RESSCB=5, ISTATUS=ACTIVE
CDULU04 LU LOCADDR=0, DLOGMOD=NDM621K, RESSCB=5, ISTATUS=ACTIVE
*
*****
* DOWNSTREAM PU OFF OF THE REAL 3174 GATEWAY CONTROLLER *
* INDEPENDENT LU6.2 *
*****
CDUPU01 PU ADDR=02, *
          DATMODE=HALF, *
          MAXDATA=521, *
          MAXOUT=7, *
          PACING=2, *
          PUDR=YES, *
          DLOGMOD=SNX32702, *
          MODETAB=DALLMTAB, *
          USSTAB=LSUSSTAB, *
          SSCPFM=USSSCS, *
          PUTYPE=2, *
          DISCNT=(NO), *
          SECNET=YES, *
          VPACING=4, *
          ISTATUS=ACTIVE
*
DISPLAY2 LU LOCADDR=2, ISTATUS=ACTIVE
DISPLAY3 LU LOCADDR=3, ISTATUS=ACTIVE

```

The 3174-R token ring gateway requires that the IBM pSeries token ring adapter address match the address configured in the 3174-R.

## Token Ring 3745 Token Ring Interface Coupler (TIC) Configuration

The following figure displays sample line, PU, and LU definitions used by VTAM to define a token ring TIC for an LU6.2 connection:

```

M1IRGPGP GROUP ECLTYPE=PHYSICAL          PHYSICAL GROUP
* NTRI PHYSICAL LINE DEFINITION
M1IRG  LINE ADDRESS=(1088,FULL),          LAN                      *
        LOCADD=400076543210,             'SOFT' ADDRESS FOR TIC   *
        MAXTSL=4060,                     RANGE 265 TO 16732       *
        OWNER=SA01,                      MVS OWNS THIS LINE     *
        NPACOLL=YES,                     NPM                     *
        PORTADD=0,                       WHERE ACRS3LGP POINTS TO *
        RCVBUFC=1440,                   RANGE 6*BFRS TO 4095   *
        ADAPTER=TIC2,                   TIC2                    *
        TRSPEED=4,                      SPEED OF LAN            *
        SPAN=(8000)                      NETVIEW OPERAND
M1IRG1  PU SPAN=(8000)
M1IRG100 LU ISTATUS=INACTIVE,           IBM RECOMMENDED        *
            SPAN=(8000)                 NETVIEW OPERAND
M1IRGLGP GROUP ECLTYPE=LOGICAL,         LOGICAL GROUP          *
            CALL=INOUT,                 ALLOW DIAL IN AND DIAL OUT *
            NPACOLL=YES,                 NPM                     *
            OWNER=SA01,                 MVS OWNS THIS LINE GROUP *
            PHYPORT=0,                  POINTS TO ACRS3 LINE PORTADD *
            SPAN=(8000),                 NETVIEW OPERAND        *
            TYPE=NCP                     NETWORK CONTROL MODE
M1IRGT00 LINE AUTOCOPY=(35,M1IRGT01,D)
M1IRGP00 PU NEXT=(M1IRGP01,D)
          ENDAUTO
*****
          TOKEN RING NTRI SWITCHED SNA DEFINITION *
*****
M1T2001 VBUILD TYPE=SWNET
CDUPU01 PU ADDR=01,                      *
        PUTYPE=2,                        *
        DISCNT=NO,                       *
        MAXOUT=7,                        *
        PASSLIM=7,                       *
        ISTATUS=ACTIVE,                  *
        IDBLK=071,                      *
        IDNUM=43210,                    *
        SSCPFM=USSSCS,                  *
        MODETAB=DALLMTAB,               *
        USSTAB=LSUSSTAB,                *
        DLOGMOD=NDM621K
CDULU01 LU LOCADDR=0,DLOGMOD=NDM621K,RESSCB=5

```

## VTAM Application Definition

The following figure shows a VTAM application (APPL) definition for an LU6.2 connection between Sterling Connect:Direct for z/OS and Sterling Connect:Direct for UNIX:

NDMAPP4 APPL ACBNAME=NDMAPP4,	VTAM APPLICATION ID	*
APPC=YES,	ENABLE TO RUN LU6.2 SESSIONS	*
AUTH=(ACQ,NOCNM,NOPASS,NOPO,NOTSO,VPACE),		*
EAS=6,	APPROXIMATE # OF CONCURRENT SESS	*
MODETAB=NDMTAB,	MODE TABLE NAME	*
SONSCIP=NO,	NO UNBIND IN SCIP EXIT	*
SRBEXIT=NO,	NO SRB PROCESSING	*
VPACING=7,	RECEIVE PACING OF 7	*
DLOGMOD=NDMLOGM,	MODE TABLE ENTRY	*
PARSESS=YES,	PARALLEL SESSIONS CAN BE USED	*
DSESLIM=8,	# OF CONCURRENT LU6.2 SESSIONS	*
DMINWNL=4,	# OF LOCAL CONTENTION WINNERS	*
DMINWNR=4,	# OF REMOTE CONTENTION WINNERS	*
AUTOSES=4,	# OF AUTOMATIC LU6.2 SESSIONS	*
DDRAIN=ALLOW,	ALLOW CNOS TO DRAIN SESSIONS	*
DRESPL=ALLOW,	DEF RESPONSIBILITY FOR LOCAL CNOS*	
VTAMFRR=NO		

## VTAM Logmode Table Entries

The following figure displays a sample mode table entry for an LU6.2 connection using a 1-K RU.

* LU6.2 LOGMODE		
*		
NDM621K MODEENT LOGMODE=NDM621K,		*
TYPE=1,		*
COS=NJE,		*
FMPROF=X'13',		*
TSPROF=X'07',		*
PRIPROT=X'B0',		*
SECPROT=X'B0',		*
COMPROT=X'D0B1',		*
RUSIZES=X'8787', 1K SEND AND RECV RUSIZE		*
PSERVIC=X'06020000000000000000300'		*

The following figure displays a sample mode table entry for an LU6.2 connection using a 4-K RU:

* LU6.2 LOGMODE		
*		
NDM624K MODEENT LOGMODE=NDM624K,		*
TYPE=1,		*
COS=NJE,		*
FMPROF=X'13',		*
TSPROF=X'07',		*
PRIPROT=X'B0',		*
SECPROT=X'B0',		*
COMPROT=X'D0B1',		*
RUSIZES=X'8989', 4K SEND AND RECV RUSIZE		*
PSERVIC=X'06020000000000000000300'		*

## NTRI Switched Major Node Definition

The following figure displays a sample token ring NTRI switched SNA definition for an LU6.2 connection between Sterling Connect:Direct for z/OS and Sterling Connect:Direct for UNIX:

```

*
CDUPU    VBUILD TYPE=SWNET
*

CDUPU01  PU    ADDR=01,                                X
           PUTYPE=2,                                    X
           IDBLK=071,                                   X
           IDNUM=54321,                                  X
           SSCPFM=USSSCS,                                X
           MODETAB=DALLMTAB,                              X
           USSTAB=RSUSSTAB,                               X
           DLOGMOD=NDM621K

```

## ILU CDRSC Definitions

The following figure displays a sample VTAM 3.4 CDRSC definition for independent LUs used between Sterling Connect:Direct for z/OS and Sterling Connect:Direct for UNIX:

```

*CDULU    VBUILD TYPE=CDRSC
*
CDULU01  CDRSC  ISTATUS=ACTIVE,                          X
                ALSLIST=CDUPU01,  ADJ LINK STATION      X
                MODETAB=DALLMTAB,  LOGON MODE TABLE    X
                DLOGMOD=NDM621K,    LOGON MODE TABLE ENTRY X
                RESSCB=5             SESSION CONTROL BLOCKS
*
CDULU02  CDRSC  ISTATUS=ACTIVE,                          X
                ALSLIST=CDUPU01,  ADJ LINK STATION      X
                MODETAB=DALLMTAB,  LOGON MODE TABLE    X
                DLOGMOD=NDM624K,    LOGON MODE TABLE ENTRY X
                RESSCB=5             SESSION CONTROL BLOCKS
*
CDULU03  CDRSC  ISTATUS=ACTIVE,                          X
                ALSLIST=CDUPU01,  ADJ LINK STATION      X
                MODETAB=DALLMTAB,  LOGON MODE TABLE    X
                DLOGMOD=NDM621K,    LOGON MODE TABLE ENTRY X
                RESSCB=5             SESSION CONTROL BLOCKS
*
CDULU04  CDRSC  ISTATUS=ACTIVE,                          X
                ALSLIST=CDUPU01,  ADJ LINK STATION      X
                MODETAB=DALLMTAB,  LOGON MODE TABLE    X
                DLOGMOD=NDM622K,    LOGON MODE TABLE ENTRY X
                RESSCB=5             SESSION CONTROL BLOCKS

```

## Sterling Connect:Direct Remote Node Entry

The following sample displays a UNIX remote node definition for the Sterling Connect:Direct for z/OS network map. You must specify an LU6.2 logmode entry:

```

ADJACENT.NODE=(PARSESS=(6, 2) -
                (UNIX.LU62.DALLAS, CDULU01, , LU62) -
                LOGMODE=NDM621K -
                ENVIRONMENT=UNIX)

```

---

## Special Considerations When Configuring LU6.2

This information applies to the following operating systems:

- HP SNA
- SNAP-IX

After you install Sterling Connect:Direct for UNIX, the file pointed to by the `comm.info` parameter (default name `hostl1`) is located in the same directory as the configuration files. This file includes communications information for the SNA configuration.

To configure an LU6.2 connection, modify the values for `local_lu`, `remote_lu`, and `mode`. These names must correspond to the names defined in the SNA package. The `local_lu` field is a required field. The following figure displays the contents of the `hostl1` file:

```
comm.info:\
:local_lu=LOCAL_LU:\
:remote_lu=REMOTE_LU:\
:mode=HOSTMODE:
```

The following figure displays values for `lu` and `mode` that correspond to the sample MVS definitions for an LU6.2 connection as illustrated in Token Ring 3174-R Gateway Controller Configuration.

```
comm.info:\
:local_lu=CDULU01:\
:remote_lu=NDMAPP4:\
:mode=NDM624K:
```

## Obtaining Traces for the Brixton LU6.2 API and SunLink P2P

The `trace comm` command also provides Brixton LU6.2 API and SunLink P2P tracing control.

To activate the Brixton LU6.2 API and SunLink P2P traces, type the following command:

```
trace comm level=2|3|4
```

To deactivate the Brixton and SunLink traces, type the following command:

```
trace comm level=0|1
```

Trace files are created in the directory where Sterling Connect:Direct for UNIX is started. Refer to the Brixton documentation and the SunLink documentation for additional details.

## Stopping Sterling Connect:Direct on SNA Systems

### Before you begin

When running Sterling Connect:Direct for UNIX with the LU6.2 on an HP SNA, AT&T Global Information Solutions SNA, or Brixton SNA system, you must issue the following command to stop Sterling Connect:Direct:



```
Direct> stop force;
```

## Connectivity Between IBM pSeries and i5/OS Systems

To configure IBM pSeries to i5/OS connections, run the `cdsnacfg` script on the pSeries. You must then modify the default AIX SNA Server/6000 configuration to allow the automatic i5/OS configuration to build the appropriate connections.

### Before you begin

To modify the default AIX SNA Server/6000 configuration, type the following commands. PUNAME is the PU name typed in the `cdsnacfg` script.

```
chснаobj -t'sna_dlc_token_ring' -b 'no' trdlc11  
chснаobj -t'link_station' -w'token_ring' -y 'trdlc11' -a 'no' PUNAME
```

## AIX SNA Error Messages

AIX SNA return codes are documented in the AIX SNA Server/6000: Transaction Program Reference or in the file `/usr/include/luxsna.h`.



---

## Chapter 6. Sterling Connect:Direct Manual Pages

---

### Setting Up Sterling Connect:Direct for UNIX Manual Pages

The UNIX operating system organizes all Help into manual (man) pages.

1. For syntax of a UNIX command, type the following where *command* is the UNIX command:

```
% man command
```

Most UNIX systems store online manual pages in `/usr/man/man1`. Sterling Connect:Direct stores its manual pages in `d_dir/ndm/man1`, where *d\_dir* is the Sterling Connect:Direct installation directory.

2. Type the following command to copy the Sterling Connect:Direct manual pages into the UNIX manual pages directory:

```
% cp d_dir/ndm/man1/*.1 /usr/man/man1
```

You must have write privileges to the directory `/usr/man/man1` to perform this command.

You can also use symbolic links instead of copying the files. Refer to UNIX manual pages.

3. Type the following command to access Sterling Connect:Direct manual pages that you combined with UNIX manual pages, where *command* can be `cdpmgr`, `ndmxlt`, or `ndmmsg`:

```
% man command
```

---

### Accessing Sterling Connect:Direct Manual Pages

On an HP PA-RISC system, you must set the environment variable, `MANPATH`, to locate the Sterling Connect:Direct manual pages.

#### Procedure

1. Type the following to access Sterling Connect:Direct manual pages on an HP PA-RISC using the B shell, where *command* can be `cdpmgr`, `ndmxlt`, or `ndmmsg`:

```
$ MANPATH=/usr/man:/usr/contrib/man:d_dir/ndm/man1  
$ export MANPATH  
$ man command
```

2. On an HP PA-RISC system, set the environment variable, `MANPATH`, to locate the Sterling Connect:Direct manual pages.
3. Type the following command to access Sterling Connect:Direct manual pages on an HP PA-RISC using the C shell, where *command* can be `cdpmgr`, `ndmxlt`, or `ndmmsg`:

```
% setenv MANPATH /usr/man:/usr/contrib/man:d_dir/ndm/man1  
% man command
```

4. Type the following command to access Sterling Connect:Direct manual pages on IBM pSeries, or Sun Sparc running the Solaris operating system, if the system is using the BSD version of the man command (/usr/ucb/man). The command can be `cdpmgr`, `ndmxlt`, or `ndmmsg`.

```
% man -M d_dir/ndm command
```

---

## Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

*IBM Director of Licensing*

*IBM Corporation*

*North Castle Drive*

*Armonk, NY 10504-1785*

*U.S.A.*

For license inquiries regarding double-byte character set (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

*Intellectual Property Licensing*

*Legal and Intellectual Property Law*

*IBM Japan Ltd.*

*19-21, Nihonbashi-Hakozakicho, Chuo-ku*

*Tokyo 103-8510, Japan*

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:**

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be

incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

*IBM Corporation*

*J46A/G4*

*555 Bailey Avenue*

*San Jose, CA 95141-1003*

*U.S.A.*

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

All IBM prices shown are IBM's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

#### COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. The sample programs are provided "AS IS", without warranty of any kind. IBM shall not be liable for any damages arising out of your use of the sample programs.

Each copy or any portion of these sample programs or any derivative work, must include a copyright notice as follows:

© IBM 2014. Portions of this code are derived from IBM Corp. Sample Programs. © Copyright IBM Corp. 2014.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

#### **Trademarks**

IBM, the IBM logo, and [ibm.com](http://www.ibm.com)<sup>®</sup> are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at <http://www.ibm.com/legal/copytrade.shtml>.

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency which is now part of the Office of Government Commerce.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

ITIL is a registered trademark, and a registered community trademark of the Office of Government Commerce, and is registered in the U.S. Patent and Trademark Office.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Java™ and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license therefrom.

Linear Tape-Open, LTO, the LTO Logo, Ultrium and the Ultrium Logo are trademarks of HP, IBM Corp. and Quantum in the U.S. and other countries.

Connect Control Center®, Connect:Direct®, Connect:Enterprise®, Gentran®, Gentran®:Basic®, Gentran:Control®, Gentran:Director®, Gentran:Plus®, Gentran:Realtime®, Gentran:Server®, Gentran:Viewpoint®, Sterling Commerce™, Sterling Information Broker®, and Sterling Integrator® are trademarks or registered trademarks of Sterling Commerce®, Inc., an IBM Company.

Other company, product, and service names may be trademarks or service marks of others.



---

## Index

### D

Description

CMGR 1

PMGR 1

SMGR 2

### S

Server Components 1

### U

User authorization information file  
description 2







Product Number: xxxx-xxx

Printed in USA