

ServerNet Cluster 6780 Operations Guide

Abstract

This guide describes operations and troubleshooting tasks for ServerNet clusters that use the HP NonStop™ ServerNet Switch (model 6780) in a layered topology.

Product Version

NA

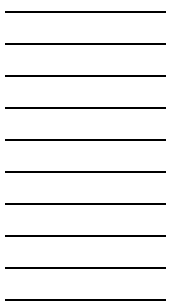
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This guide supports G06.28 and subsequent G-series RVUs, and H06.05 and subsequent H-series RVUs, unless otherwise indicated in its replacement publication.

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ServerNet Cluster 6780

Operations Guide

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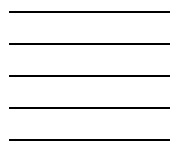
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What's New in This Manual

Manual Information

Abstract

This guide describes operations and troubleshooting tasks for ServerNet clusters that use the HP NonStop™ ServerNet Switch (model 6780) in a layered topology.

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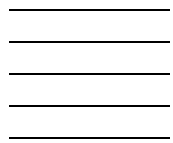
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New and Changed Information

These changes have been made to this guide for the G06.28 and H06.05 RVUs:

- The External ServerNet SAN Manager Subsystem now has a SUBSYS object. This object can be the target of ALTER, INFO, and VERSION commands. See [Section 5, SCF Commands for the External ServerNet SAN Manager Subsystem](#).
- Several new SCF error messages have been defined. For descriptions, see [Section 6, SCF Error Messages](#).



About This Manual

This table describes the sections of the manual:

Section	Title	This section...
1	Monitoring a ServerNet Cluster	Describes tasks for monitoring a layered topology ServerNet cluster and its components.
2	Controlling ServerNet Cluster Processes	Describes tasks for controlling process in a ServerNet cluster.
3	Troubleshooting and Replacement Procedures	Describes how to use the HP Open System Management (OSM) Interface, the Subsystem Control Facility (SCF), and guided procedures to troubleshoot and diagnose a layered topology ServerNet cluster. This section also contains replacement procedures for the main hardware components of a ServerNet cluster.
4	SCF Commands for SNETMON and the ServerNet Cluster Subsystem	Describes the SCF commands that are supported specifically for SNETMON and the ServerNet cluster (SCL) subsystem.
5	SCF Commands for the External ServerNet SAN Manager Subsystem	Describes the SCF commands that are supported specifically for the external system area network manager (SANMAN) process (SMN) subsystem.
6	SCF Error Messages	Describes the SCF error messages generated by the SCL and SMN subsystems. Provides the cause, effect, and recovery information for the error messages.
Appendix	Title	This appendix...
A	ServerNet Cluster Software	Describes the software components of a ServerNet cluster.
B	Cable Connections in a Layered Topology	Shows the cable connections between switches in a layered topology
C	Part Numbers	Lists part numbers and service classifications for hardware associated with the layered topology.
D	ESD Information	Provides guidelines for preventing damage caused by electrostatic discharge (ESD) when you work with electronic components.
E	Numeric Selector Settings for the Long-Distance Option	Refers to the <i>ServerNet Cluster 6780 Planning and Installation Guide</i> for the list of numeric selector settings for the long-distance option.
Glossary		Lists and defines terms used in this manual.

Notation Conventions

Hypertext Links

Blue underline is used to indicate a hypertext link within text. By clicking a passage of text with a blue underline, you are taken to the location described. For example:

This requirement is described under [Backup DAM Volumes and Physical Disk Drives](#) on page 3-2.

General Syntax Notation

The following list summarizes the notation conventions for syntax presentation in this manual.

UPPERCASE LETTERS. Uppercase letters indicate keywords and reserved words; enter these items exactly as shown. Items not enclosed in brackets are required. For example:

MAXATTACH

lowercase italic letters. Lowercase italic letters indicate variable items that you supply. Items not enclosed in brackets are required. For example:

file-name

[] Brackets. Brackets enclose optional syntax items. For example:

TERM [*\system-name.*] *\$terminal-name*

INT[ERRUPTS]

A group of items enclosed in brackets is a list from which you can choose one item or none. The items in the list may be arranged either vertically, with aligned brackets on each side of the list, or horizontally, enclosed in a pair of brackets and separated by vertical lines. For example:

FC [*num*]
[*-num*]
[*text*]

K [X | D] *address-1*

{ } Braces. A group of items enclosed in braces is a list from which you are required to choose one item. The items in the list may be arranged either vertically, with aligned braces on each side of the list, or horizontally, enclosed in a pair of braces and separated by vertical lines. For example:

LISTOPENS PROCESS { *\$appl-mgr-name* }
{ *\$process-name* }

ALLWSU { ON | OFF }

| Vertical Line. A vertical line separates alternatives in a horizontal list that is enclosed in brackets or braces. For example:

```
INSPECT { OFF | ON | SAVEABEND }
```

... Ellipsis. An ellipsis immediately following a pair of brackets or braces indicates that you can repeat the enclosed sequence of syntax items any number of times. For example:

```
M address [ , new-value ]...
[ - ] { 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 }...
```

An ellipsis immediately following a single syntax item indicates that you can repeat that syntax item any number of times. For example:

```
"s-char..."
```

Punctuation. Parentheses, commas, semicolons, and other symbols not previously described must be entered as shown. For example:

```
error := NEXTFILENAME ( file-name ) ;
LISTOPENS SU $process-name.#su-name
```

Quotation marks around a symbol such as a bracket or brace indicate the symbol is a required character that you must enter as shown. For example:

```
"[ repetition-constant-list ]"
```

Item Spacing. Spaces shown between items are required unless one of the items is a punctuation symbol such as a parenthesis or a comma. For example:

```
CALL STEPMOM ( process-id ) ;
```

If there is no space between two items, spaces are not permitted. In the following example, there are no spaces permitted between the period and any other items:

```
$process-name.#su-name
```

Line Spacing. If the syntax of a command is too long to fit on a single line, each continuation line is indented three spaces and is separated from the preceding line by a blank line. This spacing distinguishes items in a continuation line from items in a vertical list of selections. For example:

```
ALTER [ / OUT file-spec / ] CONTROLLER
      [ , attribute-spec ]...
```

!i and !o. In procedure calls, the !i notation follows an input parameter (one that passes data to the called procedure); the !o notation follows an output parameter (one that returns data to the calling program). For example:

```
CALL CHECKRESIZESEGMENT ( segment-id          !i
                        , error                !o
                        ) ;
```

- !i,o.** In procedure calls, the !i,o notation follows an input/output parameter (one that both passes data to the called procedure and returns data to the calling program). For example:

```
error := COMPRESSEDIT ( filenum ) ; !i,o
```

- !i:i.** In procedure calls, the !i:i notation follows an input string parameter that has a corresponding parameter specifying the length of the string in bytes. For example:

```
error := FILENAME_COMPARE_ ( filename1:length !i:i
                             , filename2:length ) ; !i:i
```

- !o:i.** In procedure calls, the !o:i notation follows an output buffer parameter that has a corresponding input parameter specifying the maximum length of the output buffer in bytes. For example:

```
error := FILE_GETINFO_ ( filenum !i
                        , [ filename:maxlen ] ) ; !o:i
```

Notation for Messages

The following list summarizes the notation conventions for the presentation of displayed messages in this manual.

- Bold Text.** Bold text in an example indicates user input entered at the terminal. For example:

```
ENTER RUN CODE
```

```
?123
```

```
CODE RECEIVED:      123.00
```

The user must press the Return key after typing the input.

- Nonitalic text.** Nonitalic letters, numbers, and punctuation indicate text that is displayed or returned exactly as shown. For example:

```
Backup Up.
```

- lowercase italic letters.** Lowercase italic letters indicate variable items whose values are displayed or returned. For example:

```
p-register
```

```
process-name
```

- [] Brackets.** Brackets enclose items that are sometimes, but not always, displayed. For example:

```
Event number = number [ Subject = first-subject-value ]
```

A group of items enclosed in brackets is a list of all possible items that can be displayed, of which one or none might actually be displayed. The items in the list might be arranged either vertically, with aligned brackets on each side of the list, or

horizontally, enclosed in a pair of brackets and separated by vertical lines. For example:

```
proc-name trapped [ in SQL | in SQL file system ]
```

{ } Braces. A group of items enclosed in braces is a list of all possible items that can be displayed, of which one is actually displayed. The items in the list might be arranged either vertically, with aligned braces on each side of the list, or horizontally, enclosed in a pair of braces and separated by vertical lines. For example:

```
obj-type obj-name state changed to state, caused by
{ Object | Operator | Service }

process-name State changed from old-objstate to objstate
{ Operator Request. }
{ Unknown. }
```

| Vertical Line. A vertical line separates alternatives in a horizontal list that is enclosed in brackets or braces. For example:

```
Transfer status: { OK | Failed }
```

% Percent Sign. A percent sign precedes a number that is not in decimal notation. The % notation precedes an octal number. The %B notation precedes a binary number. The %H notation precedes a hexadecimal number. For example:

```
%005400
%B101111
%H2F
```

Change Bar Notation

Change bars are used to indicate substantive differences between this edition of the manual and the preceding edition. Change bars are vertical rules placed in the right margin of changed portions of text, figures, tables, examples, and so on. Change bars highlight new or revised information. For example:

The message types specified in the REPORT clause are different in the COBOL85 environment and the Common Run-Time Environment (CRE).

The CRE has many new message types and some new message type codes for old message types. In the CRE, the message type SYSTEM includes all messages except LOGICAL-CLOSE and LOGICAL-OPEN.

1 Monitoring a ServerNet Cluster

This section describes how to perform tasks that allow you to check the general health of the ServerNet Cluster without altering the state of the cluster or any of its components.

Understanding the Tools for Monitoring a Cluster

To perform the monitoring tasks in this section, you should be familiar with the HP NonStop Open System Management (OSM) Interface and the Subsystem Control Facility (SCF):

- | | |
|-----|--|
| OSM | You use the OSM Service Connection to perform many of the monitoring tasks described in this section. Figure 1-1 on page 1-4 shows the Management window of the OSM Service Connection. The view pane (on the right side of the Management window) shows a graphical representation of the local system. The tree pane (on the left side of the Management window) contains names of resources in a hierarchical tree structure. For more detail on using the OSM Service Connection, see the OSM online help. |
| SCF | You use SCF commands to display general information about the ServerNet Cluster subsystem. For detailed syntax and descriptions of the SCF commands used in this section, see Section 4, SCF Commands for SNETMON and the ServerNet Cluster Subsystem , and Section 5, SCF Commands for the External ServerNet SAN Manager Subsystem . |

The first part of this section describes monitoring tasks using OSM. See [Using OSM to Monitor a ServerNet Cluster](#) on page 1-3.

The second part of this section describes monitoring tasks using SCF. See [Using SCF to Monitor a ServerNet Cluster](#) on page 1-18.

The features of OSM and SCF overlap considerably. As you become familiar with the tools, you might prefer to use one tool for most of the monitoring tasks.

Understanding the Components of a ServerNet Cluster

This manual describes how to monitor the components of a ServerNet cluster that uses the layered topology, built with the HP NonStop ServerNet Switch (model 6780). The layered topology can scale by adding up to four cluster switch layers and three zones. The layered topology supports up to 64 ServerNet nodes.

To learn more about the layered topology and the hardware components within it, see the *ServerNet Cluster 6780 Planning and Installation Guide*.

For a description of the software components of a ServerNet cluster, see [Appendix A, ServerNet Cluster Software](#).

6780 Switch and Component Names

The layered topology is built with 6780 switches. A 6780 switch is represented in OSM as a switch module. The full OSM switch name takes this form:

```
Switch Module $ZZSMN.Y23 (1021.3)
```

In this example:

- Y21 indicates the fabric (Y), zone (2), and layer (3) of the switch.
- (1021.3) contains the group and module number. The first two digits of all switch group numbers is always 10. The next two digits of the group number represent the zone (2) and fabric (where 0=X and 1=Y). The last digit (3) represents the switch module number.

Note that the switch module number and layer number are equivalent.

For a listing of all possible switch names and identifiers, see [Table 3-5](#) on page 3-29.

The components of the 6780 switch are named in the same manner, except that the portion of the name in parentheses is extended to include a slot and possibly a port number. For example, consider this name:

```
Switch Port $ZZSMN.Y21 (1021.1.6.2)
```

The part of the name in parentheses (1021.1.6.2) specifies group 1021, module 1, slot 6, and port 2.

Learning More About Cluster Components

To become more familiar with the cluster components:

- Read the following OSM subsections. They show you how to display information about the different ServerNet cluster resources.
- Select a cluster resource in the OSM Service Connection and press F1 to display the online help. A description of the resource, including its attributes and any available actions, appears.

Looking at a ServerNet Cluster From the Remote Nodes

Because the view of a ServerNet Cluster can change significantly from one node to another, you should gather data at each node by using both OSM and SCF. Then compare the information:

- With the OSM Service Connection, you can compare information by logging on to the system console for each node in the cluster. Or, if an OSM dedicated LAN or a public LAN is available that links multiple nodes, you can log on to any member node from the same system console.

- With SCF, you can compare information by logging on to a remote TACL process and then running SCF at the remote node or by entering `\nodename.$ZZSMN` at a TACL prompt. Both methods require matching remote passwords.

Using OSM to Monitor a ServerNet Cluster

OSM monitoring tasks for a ServerNet cluster include:

- Obtaining information about the cluster-related hardware resources such as MSEBs, the local node, the remote nodes, the external X and Y fabrics, the cluster switches, and the cluster switch subcomponents.
- Obtaining information about the cluster-related processes such as the ServerNet system area network manager (SANMAN), the ServerNet cluster monitor process (SNETMON), and the Expand-over-ServerNet lines.
- Checking for alarms on cluster resources. An alarm describes a detected fault or abnormal conditions and recommended repair actions. For more information, see [Using OSM Alarms](#) on page 3-11.
- Generating and viewing statistical information for the cluster and the ServerNet nodes within it.

The OSM Service Connection obtains information about the local node and the fabrics from both SANMAN and SNETMON. Information about the remote nodes comes only from SNETMON.

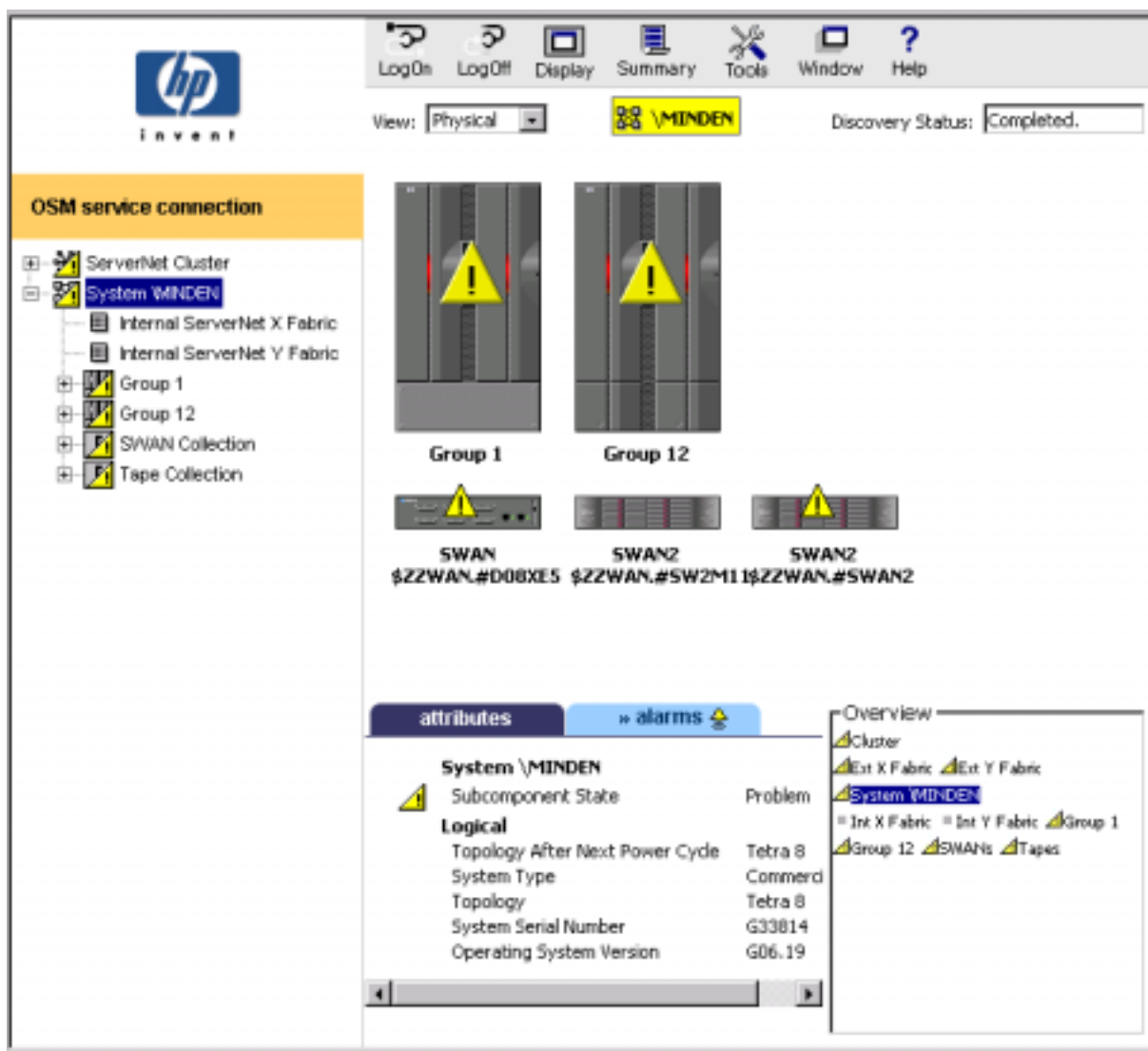
To see the ServerNet cluster resources in the tree pane, click the plus sign (+) next to the ServerNet Cluster resource to expand it. You can expand other subordinate cluster resources in the same manner. To select a resource in the tree pane, click the name of the resource itself. The examples in this section use the tree pane to navigate to and select cluster resources.

Starting an OSM Session

Using an HP NonStop System Console attached to any functioning node in the ServerNet cluster, log on and start the OSM Service Connection.

After OSM discovers the system and cluster resources, the Management window appears as shown in [Figure 1-1](#).

Figure 1-1. OSM Management Window

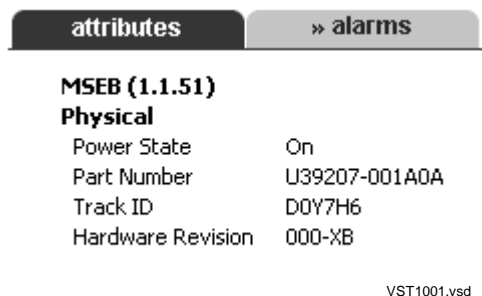


VST1017.vsd

Using OSM to View Cluster Resource Attributes

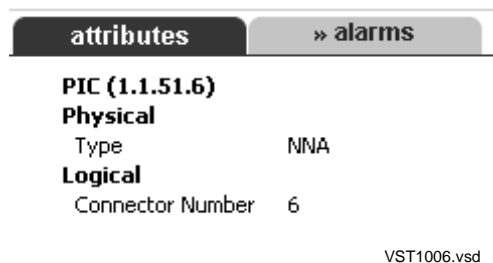
1. In the tree pane, expand Group 1 and then Module 1.1 to display all of the components in the Group 1 processor enclosure.
2. Select a Modular ServerNet Expansion Board (MSEB).
3. In the details pane, click the **Attributes** tab. [Figure 1-2](#) shows the attributes for this resource.

Figure 1-2. Attributes for the MSEB



4. In the tree pane, expand the MSEB so that you can see each plug-in card (PIC).
5. In the tree pane, select the PIC in port 6, PIC (1.1.51.6). [Figure 1-3](#) shows the attributes for this resource.

Figure 1-3. Attributes for the MSEB PIC



6. In the tree pane, select the ServerNet Cluster resource. [Figure 1-4](#) shows the attributes for the ServerNet Cluster resource.

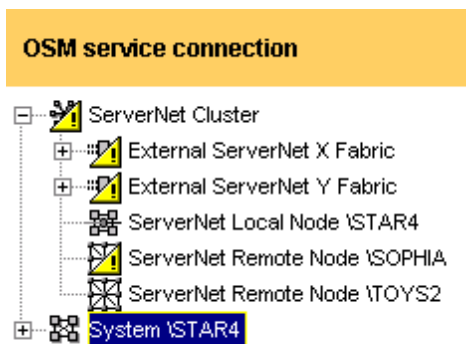
Note. The ServerNet Cluster resource appears in the Management window if the external ServerNet SAN manager process (SANMAN) can communicate with at least one of the cluster switches. The ServerNet Cluster resource does not appear if SANMAN cannot communicate with any cluster switches.

Figure 1-4. Attributes for the ServerNet Cluster Resource

attributes		» alarms
ServerNet Cluster		
Logical		
SNETMON Version	SCL - T0294G08 - (11AUG03) - (16JUN03) - (AAL)	
Maximum Number of Nodes	32	
Current Number of Nodes	19	
ServerNet Cluster Service		
ServerNet Cluster State	Started	
SNETMON Process Pair		
Redundancy Status	Fully Redundant	
Backup		
Process ID	2,309	
Primary		
Process ID	1,274	
SANMAN Process Pair		
Redundancy Status	Fully Redundant	
Primary		
Process ID	1,273	
Backup		
Process ID	2,292	

VST1002.vsd

- In the tree pane, expand the ServerNet Cluster resource. The tree pane displays the high-level cluster resources below it. See [Figure 1-5](#).

Figure 1-5. Tree Pane With ServerNet Cluster Resource Expanded

VST1015.vsd

- Select the local node. [Figure 1-6](#) shows the attributes for this resource.

Figure 1-6. Attributes for the ServerNet Local Node

attributes		» alarms
ServerNet Local Node \STAR4		
Logical		
Y Fabric Connection State	Up	
Expand Node Number	254	
ServerNet Node Number	10	
X Fabric Connection State	Up	
VST1004.vsd		

9. In the tree pane, select a remote node. [Figure 1-7](#) shows the attributes for this resource.

Figure 1-7. Attributes for a ServerNet Remote Node

attributes		» alarms
ServerNet Remote Node \TOY52		
Logical		
Y Fabric Connection State	Up	
Expand Node Number	2	
ServerNet Node Number	2	
X Fabric Connection State	Up	
Expand-Over-ServerNet Configuration		
Connectivity State	Connected	
Line LDEV Name	\$5C002	
Line LDEV State	Up	
Line LDEV	135	
Remote Line LDEV State	Up	
VST1007.vsd		

10. In the tree pane, select either **External_ServerNet_X_Fabric** or **External_ServerNet_Y_Fabric**. [Figure 1-8](#) shows the attributes for this resource.

Figure 1-8. Attributes for the External Fabric

attributes		» alarms
External ServerNet X Fabric		
Logical		
Number Of Nodes	2	
Fabric State	Up	
VST1003.vsd		


11. In the tree pane, expand the External_ServerNet_X_Fabric object, and then select a switch group, such as Switch Group 1010. [Figure 1-10](#) shows the attributes for the switch group.

Figure 1-9. Attributes for a Switch Group

attributes		» alarms
Switch Group 1010		
Logical		
Presence	Present	
VST1030.vsd		

12. In the tree pane, expand Switch Group 1010, and then select Switch Module \$ZZSMN.X11. [Figure 1-10](#) shows the attributes for the 6780 switch module.

Figure 1-10. Attributes for the Switch Module

attributes		» alarms 	
Switch Module \$ZZSMN.X11 (1010.1)			
Midplane Physical			
Primary AC Power State		On	
Backup AC Power State		On	
Part Number		523440-001	
Track ID		D10RVN	
Hardware Revision		AX	
Logical			
Globally Unique ID		0x000008008E04B313	
Current Numeric Selector Setting		9611	
Locator		Lab 2450, Rack next to \star1, Top switch	
Numeric Selector Setting Used By Firmware		9611	
Temperature			
Current Value		44.0 Degrees C	
Normal Maximum Value		65.0 Degrees C	

VST1011.vsd

13. In the tree pane, expand the switch module, and then select any switch PIC such as Switch PIC \$ZZSMN.X11.1. Switch PICs plug in to slots on the switch logic board and are usually populated with transceivers. The transceivers provide the ports used to connect to other cluster switches or nodes in the cluster. [Figure 1-11](#) shows the attributes for a switch PIC.

Figure 1-11. Attributes for the Switch PIC

attributes

» alarms

Switch PIC \$ZZSMN.X11.11 (1010.1.11)

Physical

Type	Multimode fiber-optic
Part Number	523809-001
Fault LED state	Off
Track ID	D10R86
Hardware Revision	AX

Logical

Enabled State	Enabled
Device State	OK

VST1012.usd

14. In the tree pane, expand the switch PIC in slot 6, and then select a switch port under it. This type of port is a transceiver that connects the switch module to an MSEB on a ServerNet node. In this manual, this type of port is called a switch-to-node port. Only the PICs in slots 6 through 9 contain switch-to-node ports.

[Figure 1-12](#) shows the attributes for this resource. The Neighbor ServerNet Node attributes provide information on the node connected to this switch-to-node port.

Figure 1-12. Attributes for the Switch Node Port

attributes		» alarms
Switch Port (1010.1.6.2)		
Transceiver Physical		
Type	9/125 Micron SMF	
Part Number	FTRJ1319P1BTL	
Serial Number	P11KSCL	
Hardware Revision	A	
Logical		
Connectivity Status	Port enabled	
Current Speed	400,000,000 Bits per Second	
Transceiver Device State	OK	
Transceiver Enabled State	Enabled	
Fabric State	Up	
Transceiver Bit Rate		
Nominal Value	2.1E7 Bits Per Second	
Neighbor ServerNet Node		
Neighbor Node Number	2	
Node Name	ServerNet Local Node \MINDEN	

VST1020.vsd

15. In the tree pane, expand the Switch PIC in slot 2, and then select a Switch Port under it. Each port contains a transceiver that connects this 6780 switch to a 6780

switch in another zone or layer. In this manual, this type of port is called a switch-to-switch port. The PICs in slots 2 and 3 contain the ports that connect to another switch zone. The PICs in slots 11 through 13 contain the ports that connect to another cluster switch layer.

[Figure 1-13](#) shows the attributes for this resource. The Neighbor ServerNet Switch Port attributes provide information on the other switch connected to this switch-to-switch port.

Figure 1-13. Attributes for a Switch Port

attributes		» alarms
Switch Port (1010.1.2.2)		
Transceiver Physical		
Type	9/125 Micron SMF	
Part Number	HFCT-5710L	
Serial Number	0205150627590270	
Hardware Revision	BETA	
Logical		
Connectivity Status	Port enabled	
Current Speed	400,000,000 Bits per Second	
Transceiver Device State	OK	
Transceiver Enabled State	Enabled	
Neighbor ServerNet Switch Port		
Neighbor Switch GUID	0x000008008E04B313	
Neighbor Switch Port	Switch Port (1020.1.2.2)	
Transceiver Bit Rate		
Nominal Value	1.2E7 Bits Per Second	

VST1019.vsd

-
- In the tree pane, under the Switch Module, select the Switch Logic Board. In addition to providing switching logic for the cluster, a switch logic board provides slots for the PICs, fans, and power supplies that make up the 6780 switch. [Figure 1-14](#) shows the attributes for this resource.

Figure 1-14. Attributes for the Switch Logic Board

attributes

» alarms

Switch Logic Board (1010.1.14)

Physical

Part Number	523978-002
Fault LED state	Blinking
Track ID	V18LF8
Hardware Revision	ABX5

Logical

Last Reset Type	Power on reset
Time Of Last Soft Reset	00000000000000.000000:000
Time Of Last Hard Reset	Jul 12, 2003 08:49:49 AM PDT
Firmware State	Active

Configuration

Configuration Tag	9611
Version	T2790A01^30AUG2003^30JUN2003^AAB (4.3)
Default File Name	\STAR4.\$SYSTEM.SYS00.C2790
Default File Version	T2790A01^30AUG2003^30JUN2003^AAB (4.3)
Compare State	Same

Firmware

Version	T2789A01^30AUG2003^10JUL2003^AAB (5.11)
Default File Name	\STAR4.\$SYSTEM.SYS00.M2789
Default File Version	T2789A01^30AUG2003^10JUL2003^AAB (5.11)
Compare State	Same

FPGA

Version	T2819A01^30AUG2003^03JUN2003 (6.0)
Default File Name	\STAR4.\$SYSTEM.SYS00.LBC2819
Default File Version	T2819A01^30AUG2003^03JUN2003 (6.0)
Compare State	Same

VST1009.vsd

VST1009.vsd

17. In the tree pane, under the Switch Module, select the Power Supply. The Switch Module has two power supplies that plug in to slots 15 and 18 of the switch logic board. [Figure 1-15](#) shows the attributes for a switch power supply.

Figure 1-15. Attributes for a Switch Power Supply

attributes
» alarms

Power Supply (1010.1.15)

Physical

Part Number

523588-002

Fault LED state

Off

Track ID

D10RW0

Hardware Revision

BX

Logical

Enabled State

Enabled

Device State

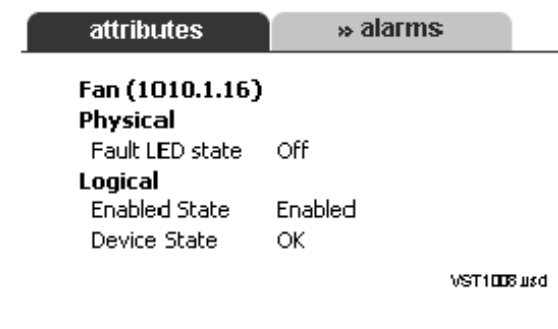
OK

VST10.13.usb

VST1013.vsd

18. In the tree pane, under the Switch Module, select a Switch Fan. A switch module has two fans that plug into slots 16 and 17 of the switch logic board. [Figure 1-16](#) shows the attributes for a switch fan.

Figure 1-16. Attributes for a Switch Fan

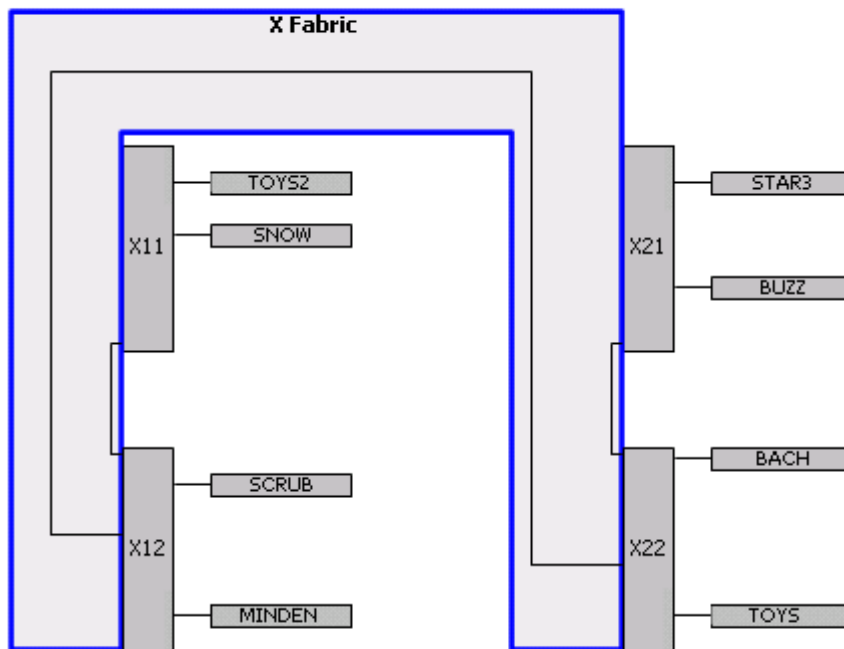


Using OSM to Display the Physical View of a Fabric

1. In the tree pane, select **External_ServerNet_X_Fabric** or **External_ServerNet_Y_Fabric**.
2. From the **View** menu, select **Physical**. The view pane displays a physical representation of the nodes, cluster switches, and connections on the external fabric.

[Figure 1-17](#) shows the External_ServerNet_X_Fabric in a cluster with two zones and two layers.

Figure 1-17. Physical View of External Fabric in a Layered Topology



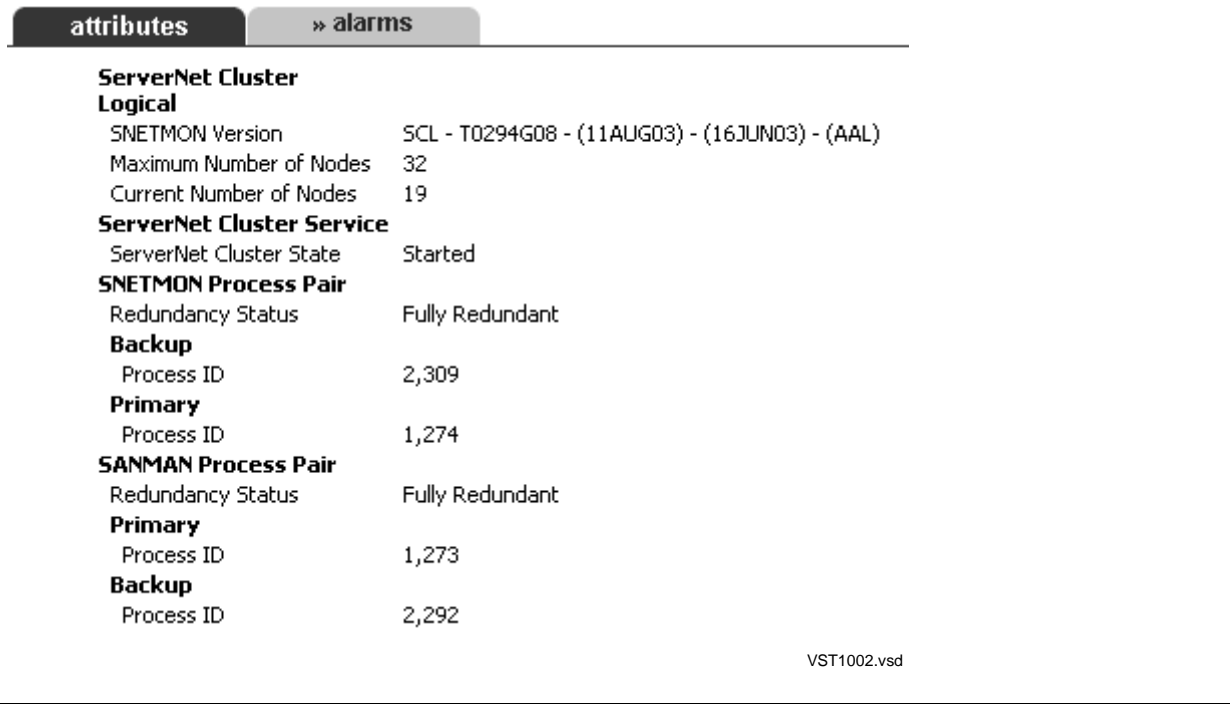
VST1025.vsd

Using OSM to Check the Status of the ServerNet Cluster Subsystem

- 1. In the Tree pane, select the **ServerNet Cluster** resource.
- 2. In the Details pane, click the **Attributes** tab.
- 3. Check the **ServerNet Cluster State** attribute.

See [Figure 1-18](#) on page 1-14

Figure 1-18. ServerNet Cluster State



Using OSM to Monitor Expand-Over-ServerNet Lines

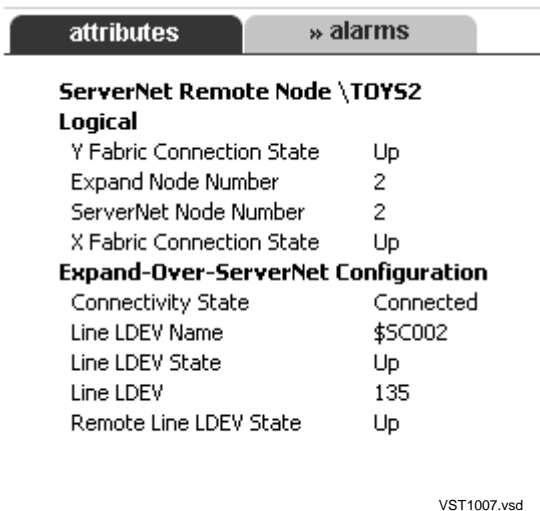
You can use two methods to monitor Expand-over ServerNet lines:

- Check the attributes of the remote node in the OSM Service Connection.
- Perform the Add Node to ServerNet Cluster action on the local node.

Using the OSM Service Connection

1. Expand the ServerNet Cluster resource.
2. For information about the line configured from the local node to a specific remote node, click the **Remote Node** resource.
3. In the details pane, click the **Attributes** tab.
4. Check the **Line LDEV State** attribute in the Expand-Over-ServerNet Configuration. See [Figure 1-19](#).

Figure 1-19. Checking the Expand-Over-ServerNet Lines



Using the Add Node to ServerNet Cluster Action

If you perform the Add Node to ServerNet Cluster action on a local node that has already been added to the cluster, you can see the currently configured Expand-Over-ServerNet lines.

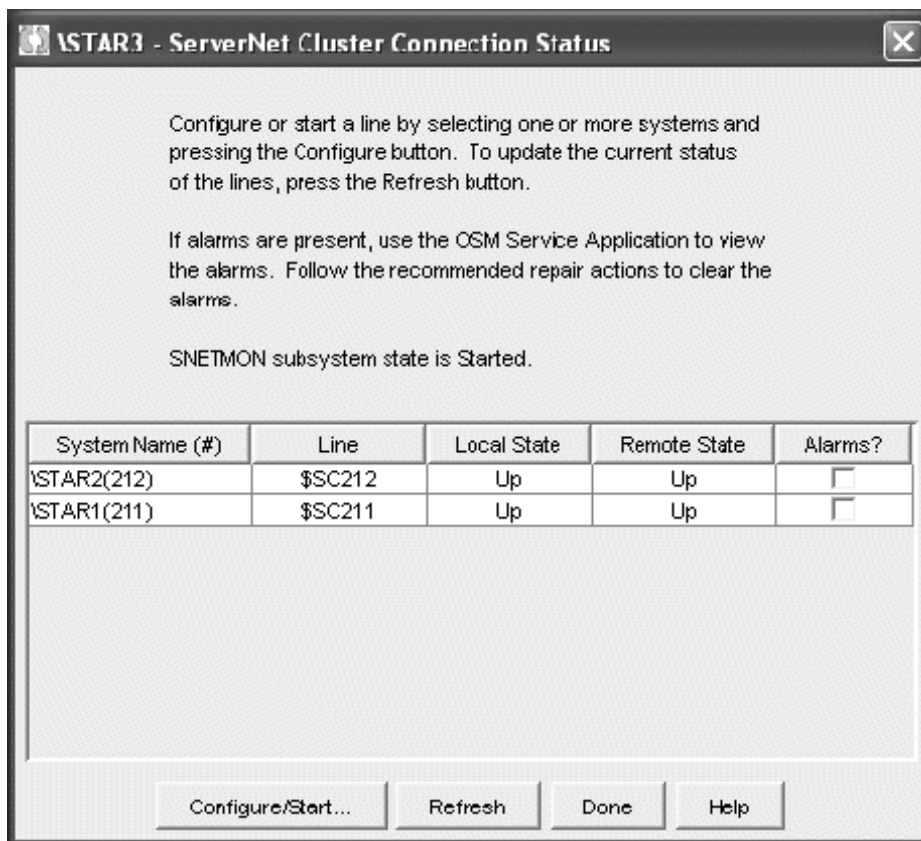
To run the Add Node to ServerNet Cluster guided procedure:

1. Right-click the local node resource and select **Actions**.
2. In the Actions list, select **Add Node to ServerNet Cluster**.

3. Click **Perform Action**. The procedure quickly cycles through its list of software checks and displays the ServerNet Cluster Connection Status dialog box. See [Figure 1-20](#).

The online help can help you understand the dialog boxes.

Figure 1-20. ServerNet Cluster Connection Status Dialog Box



vst058.vsd

Using OSM to Generate ServerNet Cluster Statistics

Each processor in every node of a ServerNet cluster keeps message system counters regarding communication with each node in the cluster, including the local node. In addition, each processor keeps a set of generic counters that are not associated with any particular node.

Each hour, SNETMON sends a request to the MSGMON process in each processor to send message system statistics to the service log (\$ZLOG). The data is in the form of an event: the ZSCL-EVT-STATISTICS: Node Statistics (1200) event. This event provides a snapshot of message-system error counters for the ServerNet Cluster subsystem. The counters are reset after the statistics data is recorded.

Using the OSM EMS Event Viewer Application, you can view Node Statistics events as they are logged hourly. Or you can use the OSM Service Connection to generate these events at random for the server where you are logged on.

Note. Statistics should be interpreted only by a service provider trained by HP.

To generate and view the statistics event for a node:

1. Right-click the local or remote node, and select Actions. The Actions dialog box appears.
2. Select **Generate ServerNet Statistics** from the Available Actions list.
3. Click **Perform action**. The Action Status window shows the progress of the action.
4. Click **Close** to close the Actions dialog box.
5. Use the OSM Event Viewer Application to check the statistics event for the system you are validating:
 - a. Start the event viewer and log on. Be sure to include the service log (\$ZLOG) in the event source criteria.
 - b. Find the Node Statistics (1200) event.
 - c. Double-click the event to show the tokens and their descriptions. Or select the event, and then select **Detail** from the Display menu. The Event Viewer displays the Event Detail window for the selected event. For more information about the Node Statistics (1200) event, see the *Operator Messages Manual*.

Note. The counters are reset automatically each hour. To reset the counters manually at any time, use the Reset ServerNet Statistics action for the ServerNet Cluster resource. Resetting the counters also produces a series of Node Statistics (1200) events.

Using SCF to Monitor a ServerNet Cluster

The Subsystem Control Facility (SCF) provides commands that display general information about the ServerNet Cluster subsystem. SCF monitoring tasks include:

- Displaying information and status for SNETMON and the ServerNet cluster subsystem
- Checking ServerNet cluster connections
- Getting information for Expand-over-ServerNet processes, lines, and paths

Using SCF to Display Information About SNETMON

You can use the Kernel subsystem SCF INFO PROCESS command to display configuration information for the ServerNet cluster monitor process. The recommended generic process name is \$ZZKRN.#ZZSCL. This process is also referred to as SNETMON. [Example 1-1](#) shows an SCF INFO PROCESS command and its output.

Note. In this section, the ServerNet cluster monitor process (\$ZZSCL) is referred to by its abbreviation, SNETMON. And the symbolic name for the SNETMON generic process is assumed to be ZZSCL, which is the recommended symbolic name.

Example 1-1. INFO PROCESS Command

```
> INFO PROCESS $ZZKRN.#ZZSCL
NONSTOP KERNEL - Info PROCESS \MINDEN.$ZZKRN.#ZZSCL
Symbolic Name      *Name      *Autorestart  *Program
ZZSCL              $ZZSCL      10           $SYSTEM.SYSTEM.SNETMON
```

For more information about the SCF INFO PROCESS command, refer to the *SCF Reference Manual for the Kernel Subsystem*.

You can also use the SCF LISTDEV command to display the SNETMON logical device (LDEV) number, name, and device type. [Example 1-2](#) shows an SCF LISTDEV command and its output.

Example 1-2. LISTDEV Command

```
> LISTDEV $ZZSCL
LDev Name PPID BPID  Type   Rsize  Pri  Program
66 $ZZSCL 5,284 6,271 (64,0) 132 199 \KENO.$SYSTEM.SYS01.SNETMON
```

For more information about the SCF LISTDEV command, refer to the *SCF Reference Manual for G-Series RVUs*.

Using SCF to Check SNETMON Status

You can use the Kernel subsystem SCF STATUS PROCESS command to check the status of SNETMON. [Example 1-3](#) shows an SCF STATUS PROCESS command and its output.

Example 1-3. STATUS PROCESS Command

```
> STATUS PROCESS $ZZKRN.#ZZSCL
```

```
NONSTOP KERNEL - Status Process \MINDEN.$ZZKRN.#ZZSCL
```

Symbolic Name	Name	State	Sub Primary PID	Backup PID	Owner ID
ZZSCL	\$ZZSCL	STARTED	0, 11	1, 11	255,255

For more information about the SCF STATUS PROCESS command, refer to the *SCF Reference Manual for the Kernel Subsystem*.

Using SCF to Check ServerNet Cluster Subsystem Status

You can use the ServerNet cluster subsystem SCF STATUS command to display status information about the ServerNet cluster subsystem. [Example 1-4](#) shows the information returned by the STATUS SUBSYS command.

Example 1-4. STATUS SUBSYS \$ZZSCL Command

```
> STATUS SUBSYS $ZZSCL
```

```
Servernet Cluster - Status SUBSYS \MINDEN.$ZZSCL  
Subsystem..... STARTED
```

For more information about the STATUS command, refer to [Section 4, SCF Commands for SNETMON and the ServerNet Cluster Subsystem](#).

You can also use the Kernel subsystem INFO SUBSYS command to display start-state and command-state information about the ServerNet cluster subsystem. [Example 1-5](#) shows the information returned by the INFO SUBSYS command.

Example 1-5. INFO SUBSYS \$ZZSCL Command

```
> INFO SUBSYS $ZZSCL
```

```
ServerNet Cluster - Info SUBSYS \TOYS.$ZZSCL  
Start state..... STARTED  
Command state... STARTED  
Command time.... 06 Jun 2003, 9:43:18.936  
Stats event..... LOCALONLY
```

Using SCF to Check ServerNet Cluster Connections

You can use the SCF STATUS SUBNET command to check connections to other systems in the ServerNet cluster. [Example 1-6](#) shows the output of a STATUS SUBNET command.

Example 1-6. STATUS SUBNET \$ZZSCL Command

```
> STATUS SUBNET $ZZSCL
```

		SNETMON		Remote ServerNet				SNETMON	
		SysName	Num	0<--CPU States-->15	LocLH	RemLH	SCL	EXPAND	State,Cause
Node-----									
1|	RMT \SCQA35	35	1100,0000,0000,0000	UP	150	UP	CONN	CONN	. . . . .
2|	RMT \SCQA40	40	1100,0000,0000,0000	UP	191	UP	CONN	CONN	. . . . .
3|	RMT \SCQA33	33	1100,0000,0000,0000	UP	151	UP	CONN	CONN	. . . . .
4|	RMT \SCQA36	36	1100,0000,0000,0000	UP	149	UP	CONN	CONN	. . . . .
5|	RMT \SCQA39	39	1100,0000,0000,0000	UP	146	UP	CONN	CONN	. . . . .
6|	RMT \SCQA38	38	1100,0000,0000,0000	UP	147	UP	CONN	CONN	. . . . .
7|	LCL \SCQA34	34	1100,0000,0000,0000	.	.	.	.	.	STRD,AUTO
8|	RMT \SCQA37	37	1100,0000,0000,0000	UP	148	UP	CONN	CONN	. . . . .
17|	RMT \CCQA12	56	1100,0000,0000,0000	UP	144	UP	CONN	CONN	. . . . .
18|	RMT \SCQA32	132	1100,0000,0000,0000	UP	129	UP	CONN	CONN	. . . . .
19|	RMT \CCQA07	63	1100,0000,0000,0000	UP	142	UP	CONN	CONN	. . . . .
20|	RMT \SCQA29	129	1100,0000,0000,0000	UP	132	UP	CONN	CONN	. . . . .
21|	RMT \CCQA09	61	1100,0000,0000,0000	UP	143	UP	CONN	CONN	. . . . .
22|	RMT \SCQA28	128	1100,0000,0000,0000	UP	133	UP	CONN	CONN	. . . . .
23|	RMT \SCQA31	131	1100,0000,0000,0000	UP	130	UP	CONN	CONN	. . . . .
24|	RMT \SCQA30	130	1100,0000,0000,0000	UP	131	UP	CONN	CONN	. . . . .
25|	RMT \SCQA25	125	1100,0000,0000,0000	UP	136	UP	CONN	CONN	. . . . .
26|	RMT \SCQA27	127	1100,0000,0000,0000	UP	134	UP	CONN	CONN	. . . . .
27|	RMT \SCQA24	124	xx00,0000,0000,0000	UP	137	UP	CONN	CONN	. . . . .
28|	RMT \SCQA26	126	xx00,0000,0000,0000	UP	135	UP	CONN	CONN	. . . . .
29|	RMT \SCQA23	123	1100,0000,0000,0000	UP	138	UP	CONN	CONN	. . . . .
30|	RMT \SCQA20	254	1100,0000,0000,0000	UP	120	UP	CONN	CONN	. . . . .
31|	RMT \SCQA22	122	xx00,0000,0000,0000	UP	139	UP	CONN	CONN	. . . . .
32|	RMT \SCQA21	121	xx00,0000,0000,0000	UP	140	UP	CONN	CONN	. . . . .

For more details on the different options and output of this command, see the [STATUS SUBNET Command Example](#) on page 4-15.

You can also use the SCF STATUS SERVERNET command to check connections between processors within a system. For detailed examples, see [Using SCF to Check the Internal ServerNet Fabrics](#) on page 3-21.

Using SCF to Check the Version of the ServerNet Cluster Subsystem

You can use the SCF VERSION command to display version information about the ServerNet cluster subsystem. [Example 1-7](#) shows the information returned by the VERSION, DETAIL command.

Example 1-7. VERSION SUBSYS, DETAIL Command

```
> VERSION SUBSYS $ZZSCL, DETAIL
Detailed VERSION SUBSYS \SYS.$ZZSCL
SYSTEM \SYS
  SCL - T0294G08 - (11AUG03) - (07JUL03) - (AAL)
  GUARDIAN - T9050 - (Q06)
  SCF KERNEL - T9082G02 - (30APR03) (29JAN02)
  SCL PM - T0294G08 - (11AUG03) - (07JUL03) - (AAL)
```

For more information, refer to the [VERSION Command](#) on page 4-29.

Using SCF to Monitor Expand-Over-ServerNet Line-Handler Processes

You can use the SCF STATUS DEVICE command for the WAN subsystem to obtain information about the state of a line-handler process. [Example 1-8](#) shows a line-handler process in the STARTED state.

Example 1-8. STATUS DEVICE Command Showing STARTED Line-Handler Process

```
> STATUS DEVICE $ZZWAN.#SC001
WAN Manager STATUS DEVICE for DEVICE \BUZZ.$ZZWAN.#SC001
  State : ..... STARTED

  LDEV number ..... 97
  PPIN..... 0 ,19 BPIN..... 1 ,15
```

[Example 1-9](#) shows a line-handler process in the STOPPED state.

Example 1-9. STATUS DEVICE Command Showing STOPPED Line-Handler Process

```
> STATUS DEVICE $ZZWAN.#SC003
WAN Manager STATUS DEVICE for DEVICE \BUZZ.$ZZWAN.#SC003
  State : ..... STOPPED
```

Using SCF to Monitor Expand-Over-ServerNet Lines and Paths

You can use SCF commands for the Expand subsystem to obtain detailed information about Expand-over-ServerNet lines and paths.

For more information about using SCF commands for the Expand subsystem, refer to the *Expand Configuration and Management Manual*.

Using the SCF STATUS LINE, DETAIL Command

Use the STATUS LINE, DETAIL command to check the status for the Expand-over-ServerNet line. [Example 1-10](#) shows an SCF STATUS LINE, DETAIL command and output for an Expand-over-ServerNet line named \$SC003.

Example 1-10. STATUS LINE, DETAIL Command

```
> STATUS LINE $SC054, DETAIL

EXPAND   Detailed Status   LINE $SC054

PPID..... ( 2,   263)   BPID..... ( 5,   265)
State.....          STARTED   Path LDEV.....          123
Trace Status.....          OFF   Effective line priority          1
Detailed State.....        CONNECTED   Status          READY
Detailed Info...          None
Trace File Name....          none
```

Using the SCF STATUS PATH, DETAIL Command

Use the STATUS PATH, DETAIL command to display detailed information about the path. [Example 1-11](#) shows this command.

Example 1-11. STATUS PATH, DETAIL Command

```
> STATUS PATH $SC054, DETAIL

EXPAND   Detailed Status   PATH $SC054

PPID..... ( 2,   263)   BPID..... ( 5,   265)
State.....          STARTED   Number of Lines..          1
Trace Status          OFF   Superpath.....          OFF
Line LDEVs..          123
Trace File Name....none
```

Using the SCF STATS LINE Command

Use the STATS LINE command to display statistical information about the Expand-over-ServerNet line. [Example 1-12](#) shows this command.

Example 1-12. STATS LINE Command

```
> STATS LINE $SC003

EXPAND  Stats LINE  $SC003, PPID  ( 0,  22), BPID  ( 1,  18)
Resettime... MAY 17,2003 17:15:59   Sampletime... MAY 17,2003 17:36:02
```

	Bind	Aconn	Pconn	Query	Disc
MsgSent	2	4	10	14565	0
RepRecv	2	4	8	14565	0
MsgTout	0	0	2	0	0
ErrRecv	0	3	8	0	0
LastErr	0	140	201	0	0

	Unbind	Data		Notif	Data
MsgSent	1	178016	MsgRecv	0	221051
RepRecv	1	178016	RepSent	0	221051
MsgTout	0	0	ErrSent	0	0
ErrRecv	1	1	LastErr	0	0
LastErr	201	201			

Proc lookup failures	0	Inactivity timeouts	0
----------------------	---	---------------------	---

Using the SCF STATS PATH Command

Use the STATS PATH command to display statistical information about the path.

[Example 1-13](#) shows a sample listing for this command.

Example 1-13. STATS PATH Command

```
> STATS PATH $SC55

EXPAND  Stats PATH  $SC55,  PPID  ( 0,  284), BPID  ( 1,  278)

Reset Time.... JUN 18,2003 16:31:19   Sample Time.. JUL 08,2003 15:08:26
Current Pool Pages Used                288   Curr OOS Used in Pages          0
Max Pool Pages Used                    4384   Max OOS Used in Pages              0
Pool Size in Pages                    4384   Number of OOS Timeouts            0
Total Number of Pool Fails             1409   Number of Known System            1
```

----- LEVEL 4 MESSAGE HISTOGRAM -----

<= 64 ..	970729	<= 128 ..	14	<= 256..	969922
<= 512 ..	778	<= 1024 ..	16	<= 2048..	0
<= 4096 ..	64	> 4096 ..	246		

----- LEVEL 4 / LEVEL 3 -----Average-----Average---

	Packets	Forwards	Links	Packets/Frame	Bytes/Frame
Sent	988927	0	207248	1.0	24
Rcvd	1002518	10	764733	1.0	24
L4 Packets Discarded.....			0		

----- LEVEL 4 / LEVEL 3 DETAIL -----

	CONN	TRACE	NCPM	LRQ	LCMP
Sent	63	0	4596	205987	764733
Rcvd	54	0	4588	764733	205977

	CANCEL	ACK	NAK	ENQ	PING	PCHG
Sent	0	13517	0	0	0	31
Rcvd	0	27127	0	0	0	29

----- LEVEL 4 / CONGESTION CONTROL -----

Xmit Timeouts	0	ReXmit Timeouts	0
ReXmit Packets	0	ReIdle Timeouts	0
CWND Closed	0		

Using the SCF INFO LINE, DETAIL Command

Use the INFO LINE, DETAIL command to check operational information for an Expand-over-ServerNet line. [Example 1-14](#) shows an SCF INFO LINE, DETAIL command and output for an Expand-over-ServerNet line named \$SC002.

Example 1-14. INFO LINE, DETAIL Command

```
> INFO LINE $SC002, DETAIL
```

```
EXPAND    Detailed Info    LINE    $SC002        (LDEV    186)

L2Protocol      Net^Nam    TimeFactor ...      1 *SpeedK.....      SNET
Framesize....      132 -Rsize.....      -Speed.....
*LinePriority..      1  StartUp.....      OFF  Delay.          0:00:00.10
*Rxwindow.....      7 *Timerbind..0:01:00.00 *L2Timeout..      0:00:01.00
*Txwindow.....      7 *Maxreconnects...      0 *AfterMaxRetries      PASSIVE
*Timerreconnect 0:01:00.00 *Retryprobe....      10 *Timerprobe...      0:00:30.00
*Associateddev... $ZZSCL *Associatesubdev      *Timerinactivity 0:00:00.00
*ConnectType...  ACTIVEANDPASSIVE
```

Using the SCF INFO PATH, DETAIL Command

Use the INFO PATH, DETAIL command to display detailed information about the current or default attribute values for the path. [Example 1-15](#) shows this command.

Example 1-15. INFO PATH, DETAIL Command

```
> INFO PATH $SC043, DETAIL
```

```
EXPAND    Detailed Info    PATH    $SC043

*Compress....      OFF *Nextsys.....      #43 *OSspace....      32767
*OStimeout... 0:00:03:00 *L4Retries.....      3  OldTF.....      32767
*L4Timeout... 0:00:20:00 *L4SendWindow..      254 TimeFactor..      inf
L4ExtPackets      ON  *L4CongCtrl....      OFF *Superpath          OFF
                                Local      Remote      Negotiated      Maximum
*PathBlockBytes      0          0          0          4095
*PathPacketBytes      4095      0          0          4095
```

Using the SCF INFO PROCESS \$NCP, LINESET Command

Use the INFO PROCESS \$NCP, LINESET command to display the status of all the Expand lines currently active on the system. [Example 1-16](#) shows this command.

Example 1-16. INFO PROCESS \$NCP, LINESET Command

```
> INFO PROCESS $NCP, LINESET
EXPAND  Info  PROCESS  $NCP      , LINESET
        LINESETS AT \MS12  (209) #LINESETS=2 TIME:  AUG 12,2003 17:11:20
LINESET  NEIGHBOR    LDEV    TF    PID    LINE    LDEV    STATUS  FileErr#
  1      \YUMA      (054)   123    --  --  -----
                                     1      123  NOT READY (140)
  2      \YUMA1     (055)   122  190K ( 0,  284)
                                     1      122      READY
```

Using the SCF INFO PROCESS \$NCP, NETMAP Command

Use the INFO PROCESS \$NCP, NETMAP command to display the status of the network as seen from a specific system.

Example 1-17. INFO PROCESS \$NCP, NETMAP Command

```
> INFO PROCESS $NCP, NETMAP
EXPAND  Info  PROCESS  $NCP, NETMAP
        NETMAP AT \MS12 (209) #LINESETS=2 TIME:  AUG 12,2003 17:11:56
SYSTEM      TIME      (DISTANCE)  BY    PATH      INDEX
  54 \YUMA      inf(-- )    inf(-- )
  55 \YUMA1     inf(-- )    190K(01)*
-----
        LINESETS AT \MS12  (209) #LINESETS=2
LINESET  NEIGHBOR    LDEV    TF    PID    LINE    LDEV    STATUS  FileErr#
  1      \YUMA      (054)   123    --  --  -----
                                     1      123  NOT READY (140)
  2      \YUMA1     (055)   122  190K ( 0,  284)
                                     1      122      READY
```

Controlling ServerNet Cluster Processes

This section describes how to perform tasks that control the state of the ServerNet cluster processes.

The Subsystem Control Facility (SCF) is the primary tool for performing these tasks. For detailed syntax and descriptions of the SCF commands used in this section, see [Section 4, SCF Commands for SNETMON and the ServerNet Cluster Subsystem](#), and [Section 5, SCF Commands for the External ServerNet SAN Manager Subsystem](#).

The tasks for controlling the processes in a ServerNet cluster include:

- [Starting the Message Monitor Process \(MSGMON\)](#) on page 2-3
- [Aborting the Message Monitor Process \(MSGMON\)](#) on page 2-3
- [Starting the External ServerNet SAN Manager Process \(SANMAN\)](#) on page 2-4
- [Aborting the External ServerNet SAN Manager Process \(SANMAN\)](#) on page 2-4
- [Restarting the External ServerNet SAN Manager Process \(SANMAN\)](#) on page 2-5
- [Starting the ServerNet Cluster Monitor Process \(SNETMON\) on page 2-5](#)
- [Starting ServerNet Cluster Services](#) on page 2-6
- [Stopping ServerNet Cluster Services](#) on page 2-8
- [Switching SNETMON or SANMAN Primary and Backup Processes](#) on page 2-9

Some of these tasks can also be performed with the OSM Service Connection. These tasks include stopping and starting ServerNet Cluster Services and switching the primary processor for SNETMON and SANMAN. The OSM method for performing each of these tasks appears along with the corresponding SCF example.

ServerNet Cluster Processes

This table describes the ServerNet cluster processes that are affected by the tasks in this section:

MSGMON	A monitor process that resides in each processor of a server and executes functions required by the message system. MSGMON is a helper for SNETMON. MSGMON handles communications between SNETMON and individual processors. MSGMON also logs events from and generates events on behalf of the message system. MSGMON was created to relieve the system monitor subsystem.
SANMAN	A process pair that runs in every HP NonStop S-series server connected to a ServerNet cluster. SANMAN provides the services needed to manage the external ServerNet fabrics and the system's access to the fabric.
SNETMON	A fault-tolerant process pair that exists on every node in a functioning ServerNet cluster. It monitors and responds to events relevant to ServerNet cluster operation. It also manages the ServerNet cluster subsystem. Total failure of the SNETMON process spawns a new SNETMON.
ServerNet Cluster Subsystem	The system configuration environment that enables ServerNet communication between processors in different nodes of a ServerNet cluster.

For more details about these ServerNet cluster processes, see [Appendix A, ServerNet Cluster Software](#).

SCF Process Objects for a ServerNet Cluster

Before using commands to control a ServerNet cluster, be sure to review the objects that represent processes of the ServerNet cluster subsystem.

Kernel Subsystem PROCESS Objects

SNETMON, MSGMON, and SANMAN are represented by Kernel subsystem PROCESS objects. For SCF commands for configuring, starting, stopping, and displaying information about PROCESS, see the *SCF Reference Manual for the Kernel Subsystem*.

ServerNet Cluster Subsystem (SCL) SUBSYS Object

The SCL subsystem SUBSYS object represents the way in which the ServerNet cluster monitor process starts ServerNet cluster services and joins systems to the ServerNet cluster. For SCF commands for configuring, starting, stopping, and displaying information about the SUBSYS object, see [Section 4, SCF Commands for SNETMON and the ServerNet Cluster Subsystem](#).

Starting the Message Monitor Process (MSGMON)

For details about adding MSGMON to the configuration database, see the *ServerNet Cluster 6780 Planning and Installation Guide*.

To run MSGMON after adding it but before the next system load, or after stopping it by using the SCF ABORT PROCESS \$ZZKRN.#MSGMON command, use the SCF START command:

```
> START PROCESS $ZZKRN.#MSGMON
```

Note. In this section, the message-system monitor process (\$ZIMnn) is referred to as MSGMON. The symbolic name for the MSGMON generic process is assumed to be MSGMON, which also is the recommended symbolic name.

Aborting the Message Monitor Process (MSGMON)

Note. Normally, you should not need to abort MSGMON—even if a system is no longer a member of a ServerNet cluster.

You might have to abort MSGMON in these two cases:

- During installation of a T0294 software product revision (SPR) that includes a new version of MSGMON. In this case, follow the installation instructions in the softdoc for that SPR.
- Before you can alter one or more MSGMON process configuration attributes with SCF ALTER PROCESS \$ZZKRN.#MSGMON. Normally, you should not need to alter any of the MSGMON process configuration attributes if you configured MSGMON with the TACL macro documented in the *ServerNet Cluster 6780 Planning and Installation Guide*.

Aborting MSGMON on a node does not change the state of ServerNet Cluster IPC connectivity and Expand-over-ServerNet lines to and from that node. However, while MSGMON is not running, the node cannot:

- Bring up remote IPC connectivity to any processor that is reloaded in the cluster
- Bring up IPC connectivity to any new node that is added to the cluster
- Automatically repair any failed remote IPC connections.

Expand-over-ServerNet lines to any new node that is added to the cluster while MSGMON is not running are not brought up either.

To abort MSGMON on the local system, use the SCF ABORT PROCESS command:

```
> ABORT PROCESS $ZZKRN.#MSGMON
```

Starting the External ServerNet SAN Manager Process (SANMAN)

For details about adding the external ServerNet SAN manager process (SANMAN) to the configuration database, see the *ServerNet Cluster 6780 Planning and Installation Guide*.

HP recommends that you set the STARTMODE attribute for SANMAN to SYSTEM. If you do so, SANMAN starts automatically after a system load or a processor reload.

To run SANMAN after adding it but before the next system load, or after stopping it with the SCF ABORT PROCESS \$ZZKRN.#ZZSMN command, use the SCF START PROCESS command:

```
> START PROCESS $ZZKRN.#ZZSMN
```

Note. In this section, the external ServerNet SAN manager process (\$ZZSMN) is referred to as SANMAN. The symbolic name for the SANMAN generic process is assumed to be ZZSMN, which is the required symbolic name.

Aborting the External ServerNet SAN Manager Process (SANMAN)

Note. Although it has no effect on data traffic, aborting SANMAN causes the ServerNet Cluster resource to disappear from the OSM Service Connection. Consequently, you cannot view or manage cluster resources such as external fabrics and cluster switches. Normally, you should not need to abort SANMAN—even if a system is no longer a member of a ServerNet cluster.

You might have to abort SANMAN in these two cases:

- During installation of a T0502 software product revision (SPR) that includes a new version of SANMAN. In this case, follow the installation instructions in the softdoc for the SPR.
- Before you can alter one or more SANMAN process configuration attributes with SCF ALTER PROCESS \$ZZKRN.#ZZSMN. Normally, you should not need to alter any of the SANMAN process configuration attributes if you configured SANMAN with the TACL macro documented in the *ServerNet Cluster 6780 Planning and Installation Guide*.

To stop SANMAN, use the SCF ABORT PROCESS command:

```
> ABORT PROCESS $ZZKRN.#ZZSMN
```

Restarting the External ServerNet SAN Manager Process (SANMAN)

You might restart SANMAN for one of the following reasons:

- Both processors in which the SANMAN process pair is running are stopped. The \$ZPM persistence manager automatically restarts the process pair as soon as any processor in its processor list becomes available.
- An operator issues an SCF ABORT PROCESS \$ZZKRN.#ZZSMN command followed by an SCF START PROCESS \$ZZKRN.#ZZSMN command.

Starting the ServerNet Cluster Monitor Process (SNETMON)

For details about adding SNETMON to the configuration database, see the *ServerNet Cluster 6780 Planning and Installation Guide*.

HP recommends that you set the STARTMODE attribute for the ServerNet cluster monitor process to SYSTEM. If you do so, SNETMON starts automatically after a system load or a processor reload.

To start SNETMON after configuring it but before the next system load, or after stopping it by using the SCF ABORT PROCESS \$ZZKRN.#ZZSCL command, use the SCF START command:

```
> START PROCESS $ZZKRN.#ZZSCL
```

Aborting the ServerNet Cluster Monitor Process (SNETMON)

To stop the ServerNet cluster monitor process, use the SCF ABORT PROCESS command:

```
> ABORT PROCESS $ZZKRN.#ZZSCL
```

Note. Normally, you should not need to abort SNETMON—even if a system is no longer a member of a ServerNet cluster. The ServerNet statistics provided by the Node Statistics (1200) event are not available when SNETMON is aborted.

You might have to abort SNETMON in these two cases:

- During installation of a T0294 software product revision (SPR) that includes a new product version of SNETMON. In this case, follow the installation instructions in the softdoc for the SPR.
- Before you can alter one or more SNETMON process configuration attributes using SCF ALTER PROCESS \$ZZKRN.#ZZSCL. Normally, you should not need to alter

any of the SNETMON process configuration attributes if you configured SNETMON with the TACL macro documented in the *ServerNet Cluster 6780 Planning and Installation Guide*.

Aborting SNETMON on a node does not change the state of ServerNet Cluster IPC connectivity to and from that node. However, while SNETMON is not running, the node cannot:

- Bring up remote IPC connectivity to any processor that is reloaded in the cluster
- Bring up IPC connectivity to any new node that is added to the cluster
- Automatically repair any failed remote IPC connections.

Expand-over-ServerNet lines to any new node that is added to the cluster while SNETMON is not running cannot be brought up either.

Although ServerNet Cluster IPC connectivity is not brought down when the SNETMON process is aborted, Expand-over-ServerNet lines tolerate only temporary absences of SNETMON. Typically, Expand-over-ServerNet lines for the node are brought down if SNETMON is aborted and is not restarted within five minutes.

Starting ServerNet Cluster Services

You can use OSM or SCF to start ServerNet cluster services.

Note. If you try to start ServerNet cluster services before the fiber-optic cables are connected between the MSEBs in group 01 and the cluster switches, you receive an error.

Using OSM to Start ServerNet Cluster Services

1. In the tree pane of the OSM Management window, right-click the **ServerNet Cluster** resource, and select **Actions**.
2. From the Available Actions list, select **Set ServerNet Cluster State** and click **Perform Action**.
3. In the ServerNet Cluster State drop-down list, select **Started** and click **OK**. The Action Status box shows the progress of the action.
4. Click **Close** to close the Actions dialog box.
5. Verify that ServerNet cluster services are started. (See [Using OSM to Check the Status of the ServerNet Cluster Subsystem](#) on page 1-14.)

Using SCF to Start ServerNet Cluster Services

To start ServerNet cluster services on the local system, use the SCF START SUBSYS \$ZZSCL command:

```
> START SUBSYS $ZZSCL
```

When a System Joins a ServerNet Cluster

These steps describe what happens when a system joins a ServerNet cluster:

1. The ServerNet cluster monitor process is started (by the \$ZPM persistence manager or with an SCF START PROCESS command, depending on the STARTMODE configuration).
2. The ServerNet cluster monitor process checks the configuration of its associated ServerNet cluster (SCL) subsystem SUBSYS object:
 - If the SUBSYS object is configured with a STARTSTATE attribute set to STOPPED—which is the default—the ServerNet cluster monitor process waits for an SCF START SUBSYS \$ZZSCL command before starting ServerNet cluster services and joining the system to the ServerNet cluster.
 - If the SUBSYS object is configured with a STARTSTATE attribute set to STARTED, the ServerNet cluster monitor process automatically starts ServerNet cluster services and joins the system to the ServerNet cluster.

Note. For detailed information about the summary states for the SCL subsystem SUBSYS object and the STARTSTATE attribute, see [Section 4, SCF Commands for SNETMON and the ServerNet Cluster Subsystem](#).

Do not confuse the PROCESS object STARTMODE attribute with the SUBSYS object STARTSTATE attribute:

- The STARTMODE attribute controls the way the \$ZPM persistence manager starts the ServerNet cluster monitor process after a system load.
 - The STARTSTATE attribute controls the way the ServerNet cluster monitor process joins the system to the ServerNet cluster.
-
3. Once ServerNet cluster services on the local system are started, the ServerNet cluster monitor process establishes ServerNet connections with all other systems in the ServerNet cluster that are in the STARTED or STARTING states.
 4. If the Expand-over-ServerNet line-handler processes are configured and are in the STARTED state, Expand-over-ServerNet connectivity with the other systems in the ServerNet cluster is established.
 5. When the ServerNet cluster startup is completed, the ServerNet cluster monitor process has a list of all systems known to be in the ServerNet cluster, and ServerNet connections are established with each system.
 6. If ServerNet connection attempts fail or if successful connections subsequently fail, periodic attempts are made to establish or reestablish the connection. Failures and successful reconnections are logged to the event log. Failures to connect are logged as path or other failures. In addition, each ServerNet Cluster subsystem state change (to STARTING and then to STARTED) is logged. If no other systems are discovered, that fact is also logged.

Stopping ServerNet Cluster Services

You can use OSM or SCF to stop ServerNet cluster services.

Using OSM to Stop ServerNet Cluster Services

1. In the tree pane of the OSM Management window, right-click the ServerNet Cluster resource, and select **Actions**.
2. From the Actions list, select **Set ServerNet Cluster State** and click **Perform Action**.
3. In the drop-down list, select **Stopped** and click **OK**. The Action Status box shows the progress of the action.
4. Click **Close** to close the Actions dialog box.

Verify that ServerNet cluster services are stopped. (See [Using OSM to Check the Status of the ServerNet Cluster Subsystem](#) on page 1-14)

Using SCF to Stop ServerNet Cluster Services

Note. The STOP SUBSYS command stops ServerNet data traffic for a node on both external fabrics (X and Y). By contrast, the SCF STOP SERVERNET \$ZSNET command, when used on a ServerNet node, stops internal and external ServerNet data traffic for only one fabric (X or Y). No SCF command can stop ServerNet data traffic on only one external fabric.

To stop ServerNet Cluster services on the local system, use the SCF STOP SUBSYS \$ZZSCL command:

```
> STOP SUBSYS $ZZSCL
```

When ServerNet Cluster Services Are Stopped

When you stop ServerNet cluster services, the ServerNet cluster monitor process brings ServerNet cluster services to a STOPPED logical state. The ServerNet cluster monitor process itself does not stop but remains an active process. Terminating access to the ServerNet cluster proceeds:

1. The ServerNet cluster monitor process sets the ServerNet cluster subsystem state to STOPPING and logs the state change.
2. The ServerNet cluster monitor process informs each remote ServerNet cluster monitor process that the subsystem is stopping.
3. The ServerNet cluster monitor process instructs each local processor to terminate ServerNet connectivity.
4. When the processors have finished terminating connectivity, the ServerNet cluster monitor process moves the subsystem to the STOPPED state and logs the

change. Only the subsystem state changes are logged. Individual path state changes are not logged.

5. On remote systems, as the ServerNet cluster monitor processes receive word that a ServerNet cluster member has departed, they instruct their local processors to bring down the ServerNet connections with the departing system. These remote ServerNet cluster monitor processes then log the node disconnection to the event log.

To fully terminate ServerNet cluster services on a system and stop the ServerNet cluster monitor process, you must issue two SCF commands:

```
> STOP SUBSYS $ZZSCL  
> ABORT PROCESS $ZZKRN.#ZZSCL
```

Note. Normally, you should not need to abort SNETMON—even if a system is no longer a member of a ServerNet cluster.

Stopping the ServerNet cluster monitor process by using the SCF ABORT PROCESS command alone terminates the \$ZZSCL process but does not bring down ServerNet cluster services on the local system.

If you use only the SCF ABORT PROCESS command, the system remains joined to the ServerNet cluster for up to 30 seconds if the ServerNet cluster state for the node is STARTED (as represented by the SUBSYS \$ZZSCL object for the node). After 30 seconds, the Expand-over-ServerNet line handlers, which periodically exchange status messages with the local ServerNet cluster monitor process, terminate the Expand-over-ServerNet connections.

Switching SNETMON or SANMAN Primary and Backup Processes

You can use OSM or SCF to cause either the SNETMON or SANMAN primary and backup processes to switch roles. For example, if the primary process is configured to run in processor 0 and the backup process is configured to run in processor 1, you can switch the primary to processor 1 and the backup to processor 0.

You can switch SANMAN or SNETMON primary and backup processes to repair ServerNet connectivity problems. See [Methods for Repairing ServerNet Connectivity Problems](#) on page 3-18.

Using OSM to Switch the Primary and Backup Processes

To switch the primary and backup processes using the OSM Service Connection:

1. In the tree pane, right-click the **ServerNet Cluster** resource, and select **Actions**. The Actions dialog box appears.
2. In the Available Actions list, select the **Switch SNETMON Process Pair** action or the **Switch SANMAN Process Pair** action.

3. Click **Perform action**. A confirmation dialog box asks if you are sure you want to perform the action.
4. Click **OK**. The Action Status window shows the progress of the action.
5. Click **Close** to close the Actions dialog box.

Using SCF to Switch the Primary and Backup Processes

Use the SCF PRIMARY PROCESS command to switch the primary and backup processes for SNETMON or for SANMAN. For example:

```
> PRIMARY PROCESS $ZZSCL  
> PRIMARY PROCESS $ZZSMN
```

For more information about SCF commands for SNETMON and for SANMAN, refer to [Section 4, SCF Commands for SNETMON and the ServerNet Cluster Subsystem](#), and [Section 5, SCF Commands for the External ServerNet SAN Manager Subsystem](#).

Troubleshooting and Replacement Procedures

This section describes how to use software tools to diagnose and troubleshoot a ServerNet Cluster. The software tools available to you are:

- Components of the HP NonStop Open System Management (OSM) Interface: the OSM Service Connection, the OSM Event Viewer, and the OSM Guided procedures
- The Subsystem Control Facility (SCF)

This section also contains replacement procedures for the main hardware components of a ServerNet cluster.

This section contains these subsections:

Heading	Page
Troubleshooting Procedures	3-1
Replacement Procedures	3-30

Troubleshooting Procedures

For a list of problems and recovery actions for ServerNet cluster components, see [Table 3-1](#) and [Table 3-2](#). For a general approach to troubleshooting, read the [Troubleshooting Tips](#) on page 3-1.

This section does not include common troubleshooting information for NonStop S-series servers. Instead, refer to the CSSI Web. (**Start>Programs>HP CSSI Web>CSSI Web.**)

Troubleshooting Tips

As you troubleshoot ServerNet cluster problems:

- Perform visual checks to help isolate problems:
 - Check the LEDs of the 6780 switch and the MSEBs to look for fault conditions. See [Figure 3-8](#) on page 3-27 and [Figure 3-7](#) on page 3-26
 - Check the display on the 6780 switch logic board. See [Logic Board Display on the 6780 Switch](#) on page 3-28.
 - Look for loose or disconnected ServerNet cables. Check the link-alive LED associated with each cable connection.

- Use the OSM Service Connection to obtain more information about a problem. In many cases, the OSM Service Connection not only identifies the problem component but can tell you how to fix it.
- If possible, gather information about a problem from multiple perspectives. The view of a ServerNet cluster can change significantly from one node to another, so gather data at each node using SCF and the OSM Service Connection and then compare the information.
- Use more than one tool. For example, you can use the OSM Service Connection, SCF, and a guided procedure to check the status of an Expand-over-ServerNet line. Using all three methods allows you to compare the information returned by each method.
- Sometimes it can be difficult to determine if a problem is related to faulty hardware, faulty software, or both. In general, check the software first.

Software Problem Areas

[Table 3-1](#) lists some common software problem areas, describes troubleshooting steps, and provides references for more information.

Table 3-1. Software Problem Areas (page 1 of 3)

Problem Area	Symptom	Recovery
OSM Service Connection	The ServerNet Cluster resource does not appear.	See ServerNet Cluster Resource Missing From Tree Pane on page 3-10
	All other symptoms	For additional troubleshooting information, see the OSM online help.
Guided procedures	Any	See the online help for the guided procedure you are using.
SNETMON	Any	See Troubleshooting SNETMON on page 3-13.
MSGMON	Any	See Troubleshooting MSGMON on page 3-14.
SANMAN	Any	See Troubleshooting SANMAN on page 3-15.
ServerNet communication	Any	See Methods for Repairing ServerNet Connectivity Problems on page 3-18.
	Communication on an internal fabric is disrupted.	To check for alarms and repair actions for the Internal Fabric resource, use the OSM Service Connection. See Using OSM Alarms on page 3-11. To get more information, perform SCF and OSM diagnostic actions. See Checking the Internal ServerNet X and Y Fabrics on page 3-20.

Table 3-1. Software Problem Areas (page 2 of 3)

Problem Area	Symptom	Recovery
ServerNet communication	Communication on an external fabric is disrupted.	<p>Use OSM to check for alarms and repair actions for the External Fabric resource. See Using OSM Alarms on page 3-11.</p> <p>Use the Node Connectivity ServerNet Path Test. See Checking the External ServerNet X and Y Fabrics on page 3-23.</p>
	<p>Communication on an external fabric is disrupted by:</p> <ul style="list-style-type: none"> ● BTE timeouts ● CRC checksum errors ● TPB errors <p>These symptoms appear in event messages or statistics.</p>	<p>One of the fiber-optic cable connections might be faulty. Reseat or replace the fiber-optic cable connecting the MSEB with the switch port. See Replacing a Fiber-Optic Cable Between an MSEB and a Switch-to-Node Port on page 3-31.</p>
ServerNet Communication	Communication with a remote node is disrupted.	<p>Use OSM to check for alarms and repair actions for the Remote Node resource. See Using OSM Alarms on page 3-11.</p> <p>Verify that SNETMON is operating properly. See Troubleshooting SNETMON on page 3-13.</p> <p>Verify that SANMAN is operating properly. See Troubleshooting SANMAN on page 3-15.</p> <p>Perform the Node Responsive Test. Checking Communications With a Remote Node on page 3-18.</p>
	The OSM Service Connection shows the remote node name as \Remote_Node_\nn, where <i>nnn</i> is the Expand node number.	<p>Verify that the Expand-over-ServerNet line-handler processes between the local node and the remote node are up. See Troubleshooting Expand-Over-ServerNet Line-Handler Processes and Lines on page 3-16.</p>

Table 3-1. Software Problem Areas (page 3 of 3)

Problem Area	Symptom	Recovery
ServerNet Communication	The OSM Service Connection shows the remote node name as \UNKNOWN_Remote_Node_ <i>n</i> , where <i>n</i> is the ServerNet node number.	Verify that SNETMON is operating properly on the remote node. See Troubleshooting SNETMON on page 3-13.
	The OSM Service Connection shows the Switch-to-Node link as X | Y Fabric_to_\nnn, where <i>nnn</i> is the Expand node number.	Verify that the Expand-over-ServerNet line-handler processes between the local node and the remote node are up. See Troubleshooting Expand-Over-ServerNet Line-Handler Processes and Lines on page 3-16.
	The OSM Service Connection shows the Switch-to-Node link as X | Y Fabric_to_\Node_ <i>n</i> , where <i>n</i> is the ServerNet node number.	Verify that SNETMON is operating properly on the remote node. See Troubleshooting SNETMON on page 3-13.
	Communication between a cluster switch and a local or remote node is disrupted.	Use OSM to check for alarms and repair actions for the Switch-to-Node port. See Using OSM Alarms on page 3-11.
Expand-over-ServerNet line-handler processes and lines	Communication between the local node and a remote node is disrupted.	See Troubleshooting Expand-Over-ServerNet Line-Handler Processes and Lines on page 3-16.

Hardware Problem Areas

[Table 3-2](#) lists some common hardware problem areas, describes troubleshooting steps, and provides references for more information.

Table 3-2. Hardware Problem Areas (page 1 of 4)

Problem Area	Symptom	Recovery
MSEB	Any	<ol style="list-style-type: none"> 1. Use OSM to check for alarms and repair actions for the MSEB resource. See Using OSM Alarms on page 3-11. 2. Use the OSM Service Connection to perform the CRU Responsive Test action on the MSEB. 3. Check the LEDs. See MSEB LEDs on page 3-26. 4. Check for ServerNet cable and PIC problems before you consider replacing the MSEB. 5. See Replacing an MSEB on page 3-30.
PIC (installed in MSEB only)	Any	<ol style="list-style-type: none"> 1. Use the OSM Service Connection to check the PIC Type. Check that the PIC Type is NNA for port 6 of the MSEBs installed in slots 51 and 52 of group 01. 2. Use OSM to check for alarms and repair actions for the MSEB resource. See Using OSM Alarms on page 3-11. 3. Check the link-alive LEDs. See MSEB LEDs on page 3-26. 4. If recommended by a service provider or by the repair action text for an OSM alarm, perform the Internal Loopback Test action on the PIC. See Using the Internal Loopback Test Action on page 3-24.

Table 3-2. Hardware Problem Areas (page 2 of 4)

Problem Area	Symptom	Recovery
ServerNet cable (SEB to SEB, SEB to MSEB, or MSEB to MSEB)	Internal fabric communication	<ol style="list-style-type: none"> 1. Use OSM to check for alarms and repair actions for the Internal Fabric resource. See Using OSM Alarms on page 3-11. 2. To get more information, perform SCF and OSM diagnostic actions. See Checking the Internal ServerNet X and Y Fabrics on page 3-20. 3. Check that all ServerNet cables between enclosures within a system are securely connected. 4. Refer to the CSSI Web site. (Start>Programs>HP CSSI Web>CSSI Web.)
Fiber-optic ServerNet cable (switch-to-node or switch-to-switch)	External fabric communication problem	<ol style="list-style-type: none"> 1. Use OSM to check for alarms and repair actions for the External Fabric resource, the switch-to-node port and the switch-to-switch port. See Using OSM Alarms on page 3-11. 2. Perform the Node Connectivity ServerNet Path Test. See Checking the External ServerNet X and Y Fabrics on page 3-23. 3. Check that the fiber-optic ServerNet cables are securely connected between the MSEBs in group 01 and the X- and Y-fabric switch-to-node ports. 4. Check the link-alive LEDs. See MSEB LEDs on page 3-26.
6780 Switch	Any	<ol style="list-style-type: none"> 1. Use OSM to check for alarms and repair actions for the Switch Module. See Using OSM Alarms on page 3-11. 2. Check the LEDs on the different components of the 6780 ServerNet Switch. See LEDs on the 6780 Switch on page 3-27 3. Check the display on the 6780 ServerNet Switch. See Logic Board Display on the 6780 Switch on page 3-28 4. See Replacing a 6780 Switch on page 3-32.
	Wrong Numeric Selector Setting alarm.	Follow the repair actions to set the numeric selector correctly. If your cluster uses the long-distance option, see Appendix E, Numeric Selector Settings for the Long-Distance Option .

Table 3-2. Hardware Problem Areas (page 3 of 4)

Problem Area	Symptom	Recovery
Switch logic board	Any	<ol style="list-style-type: none"> 1. Use OSM to check for alarms and repair actions for the switch logic board. See Using OSM Alarms on page 3-11. 2. Check the LEDs on the front panel of the logic board. See Figure 3-8 on page 3-27. 3. See Replacing a Switch Logic Board (Slot 14) on page 3-33.
	Power LED not lit.	See Green Power LED Is Not Lit on page 3-9.
	Fault LED is lit.	See Yellow Fault LED Is Lit on page 3-9.
	Fault LED is blinking.	See Yellow Fault LED Is Blinking on page 3-9.
Switch PIC	Any	<ol style="list-style-type: none"> 1. Use OSM to check for alarms and repair actions for the switch PIC. See Using OSM Alarms on page 3-11. 2. Check the power and fault LEDs on the switch PIC. See Figure 3-8 on page 3-27. 3. See Replacing a Node PIC (Slots 6 Through 9) on page 3-33.
	Power LED not lit.	See Green Power LED Is Not Lit on page 3-9.
	Fault LED is lit.	See Yellow Fault LED Is Lit on page 3-9.
	Fault LED is blinking.	See Yellow Fault LED Is Blinking on page 3-9.
Switch port	Any	<ol style="list-style-type: none"> 1. Use OSM to check for alarms and repair actions for the switch port. See Using OSM Alarms on page 3-11. 2. Check the link-alive LEDs on the switch ports. See Figure 3-8 on page 3-27.
	Link-alive LED not lit.	See Green Link-Alive LED Is Not Lit on page 3-9.

Table 3-2. Hardware Problem Areas (page 4 of 4)

Problem Area	Symptom	Recovery
Switch fan	Any	1. Use OSM to check for alarms and repair actions for the switch fan. See Using OSM Alarms on page 3-11.
		2. Check the power and fault LEDs on the switch fan. See Figure 3-8 on page 3-27.
		3. See Replacing a 6780 Switch Fan (Slots 16 and 17) on page 3-34
	Power LED is not lit.	See Green Power LED Is Not Lit on page 3-9.
	Fault LED is lit.	See Yellow Fault LED Is Lit on page 3-9.
	Fault LED is blinking.	See Yellow Fault LED Is Blinking on page 3-9.
Switch power supply	Any	1. Use OSM to check for alarms and repair actions for the switch power supply. See Using OSM Alarms on page 3-11.
		2. Check the power and fault LEDs on the switch power supply. See Figure 3-8 on page 3-27.
		3. See Replacing a 6780 Switch Power Supply (Slots 15 and 18) on page 3-34
	Power LED is not lit.	See Green Power LED Is Not Lit on page 3-9.
	Fault LED is lit.	See Yellow Fault LED Is Lit on page 3-9.
	Fault LED is blinking.	See Yellow Fault LED Is Blinking on page 3-9.

Green Power LED Is Not Lit

If the green power LED does not light:

1. If the CRU has just been replaced, wait several minutes for the power-on self tests (POSTs) to complete.
2. Make sure the power cords are properly connected.
3. Make sure that the switch components are properly seated in their slots.
4. If you continue to have problems, disconnect and reconnect the power cord.

Green Link-Alive LED Is Not Lit

If the link-alive LED does not light:

1. Disconnect and reconnect the cable, using care to align the key on the cable plug with the connector.
2. If possible, try connecting a different cable. Make sure to use the correct type of cable (single-mode fiber-optic (SMF) or multimode fiber-optic (MMF)).
3. If the cables are properly connected and one or both LEDs fail to light, a PIC or cable might be faulty.

Yellow Fault LED Is Lit

A yellow fault LED that is lit (not blinking) indicates an error. The CRU may not be correctly seated in the slot, or the CRU might have been inserted too slowly.

1. Wait a few minutes to see if the fault LED clears.
2. If the problem continues, completely remove the CRU from its slot.
3. For power supplies, wait 5 seconds before reinserting the CRU.
4. Reinsert the CRU into its slot.

Yellow Fault LED Is Blinking

A blinking yellow Fault LED does not indicate an error. Both OSM and SCF allow you to blink this LED on a CRU to help you locate the CRU.

To turn the blinking off, either:

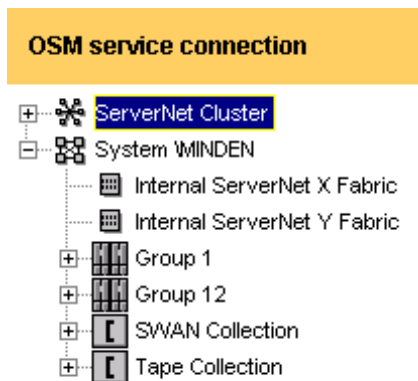
- From OSM perform the Blink LED Off action for the CRU.
- From SCF use the [ALTER SWITCH Command](#) to set the BLINK option to NONE.

ServerNet Cluster Resource Missing From Tree Pane

The ServerNet Cluster resource appears in the tree pane of the OSM Management window if the external ServerNet SAN manager process (SANMAN) can communicate with at least one cluster switch. The ServerNet Cluster resource does not appear if SANMAN cannot communicate with a cluster switch.

[Figure 3-1](#) shows the tree pane of the OSM Service Connection with the ServerNet Cluster resource selected.

Figure 3-1. OSM Tree Pane Showing ServerNet Cluster Resource



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If the local system is part of a ServerNet cluster, but the ServerNet Cluster resource does not appear in the tree pane:

1. Check that SANMAN is running. If it is not running, the ServerNet Cluster resource will not appear. Restart SANMAN if necessary. See [Troubleshooting SANMAN](#) on page 3-19.

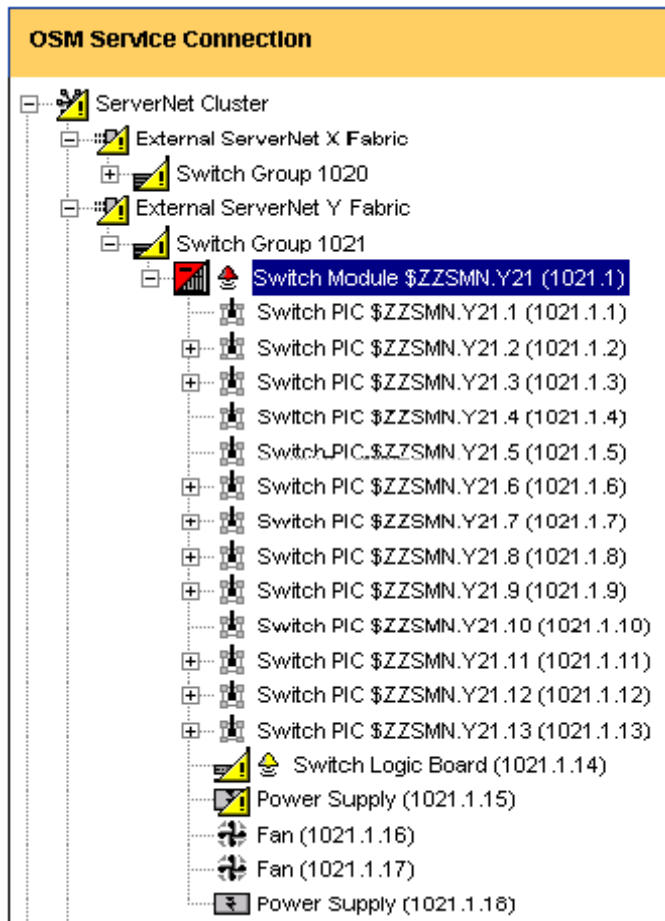
If the ServerNet Cluster resource does not appear soon, try opening a new browser window and logging on again.

2. Check that the ServerNet cables are connected from the local node to the cluster switches.
3. Check that the cluster switches are powered and operating normally. For more information, refer to the *ServerNet Cluster 6780 Planning and Installation Guide*.

Using OSM Alarms

An alarm is a message, similar to an event message, that reports detected faults or abnormal conditions for a CRU or component. In the tree pane, an alarm appears as a bell-shaped icon. [Figure 3-2](#) shows alarms displayed in the tree pane of the OSM Management window.

Figure 3-2. Alarm Example





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You can use the OSM Service Connection to gather information about an alarm in order to diagnose a problem.

Viewing OSM Alarms

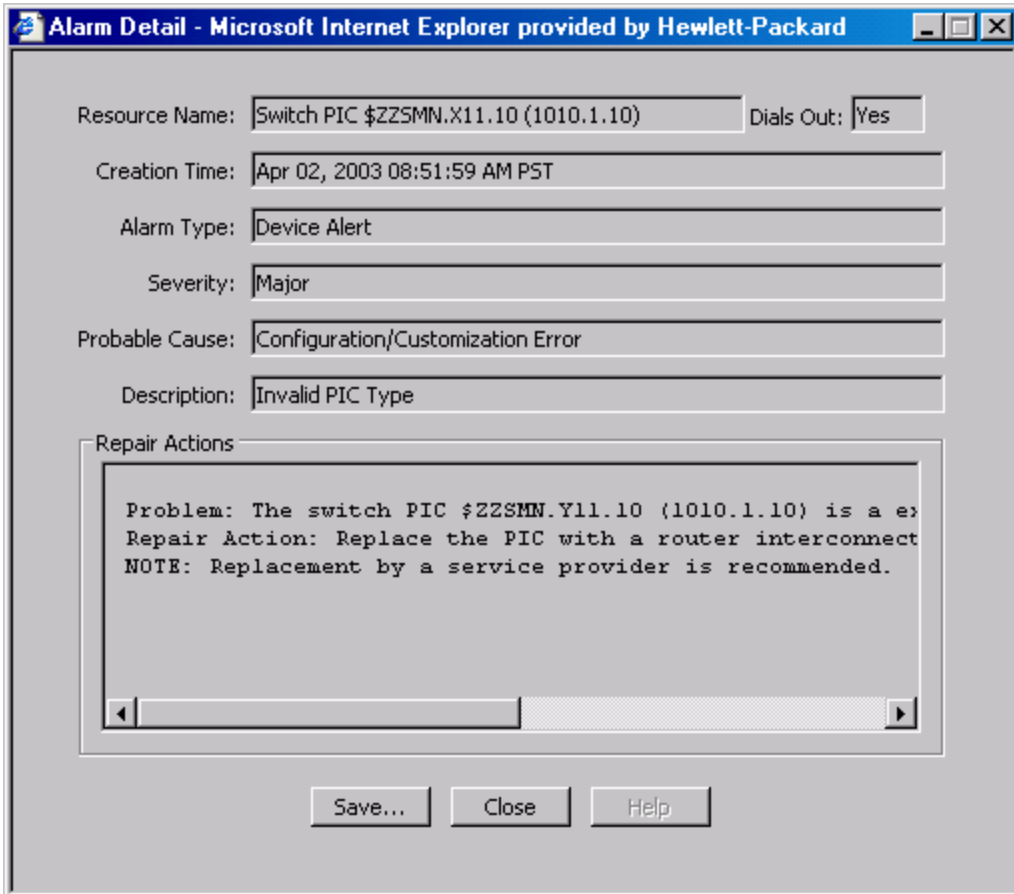
1. Log on to the OSM Service Connection.
2. In either the tree pane or the view pane, click a resource to select it.
3. In the details pane, click the Alarms tab to view the alarm. See [Figure 3-3](#).

Figure 3-3. Alarms Tab Example

» attributes		alarms 	
Severity ↑	Creation Time	Description	Dials Out
 Critical	Mar 20, 2003 03:54:57 PM PST	Primary AC Power Failure	Yes

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- In the Alarms tab, right-click the alarm icon and select **Details** from the menu.
The **Alarm Detail** dialog box appears, showing detailed information about the alarm. See [Figure 3-4](#).
- Check the Repair Actions window for a list of steps you can take to respond to the alarm. Perform the repair actions to fix the problem and remove the alarm.

Figure 3-4. Alarm Detail Example


Alarm Detail - Microsoft Internet Explorer provided by Hewlett-Packard

Resource Name: Switch PIC \$ZZSMN.X11.10 (1010.1.10) Dials Out: Yes

Creation Time: Apr 02, 2003 08:51:59 AM PST

Alarm Type: Device Alert

Severity: Major

Probable Cause: Configuration/Customization Error

Description: Invalid PIC Type

Repair Actions

Problem: The switch PIC \$ZZSMN.Y11.10 (1010.1.10) is a ex
 Repair Action: Replace the PIC with a router interconnect
 NOTE: Replacement by a service provider is recommended.

Save... Close Help

VST1028.vsd

Using ZZAA* (Attachment) Files

More detailed information is provided in the OSM alarm attachment file for the alarm. OSM alarm attachment files are named ZZAA* and are attached to problem incident reports.

To find the ZZAA* file for the alarm you are interested in:

- List all of the ZZAA* files in the \$SYSTEM.ZSERVICE subvolume using the FILEINFO command:

```
TACL> FILEINFO $SYSTEM.ZSERVICE.ZZAA*
```

- Look for the ZZAA* file with the same timestamp as the time shown in the Alarm time field on the Alarm Detail dialog box.

To view a ZZAA* (attachment) file, refer to the OSM Notification Director online help for viewing an incident report attachment.

ServerNet Cluster Alarms

The OSM Service Connection can display ServerNet cluster alarms on the MSEB, ServerNet Cluster, Switch, and ServerNet Fabric resources. Repair actions are provided for each alarm.

Many alarms are dialed out to your service provider. Some are dialed out from all reporting nodes in the cluster, and others are only dialed out from one node (the first node that discovers the problem).

Troubleshooting SNETMON

The SNETMON process (\$ZZKRN.#ZZSCL) and the ServerNet cluster subsystem (\$ZZSCL) must be in the STARTED state on a system in order for the system to join a ServerNet cluster. \$ZZKRN.#ZZSCL is a persistent process that should be configured to be started at all times.

To troubleshoot SNETMON:

1. Verify that SNETMON and the ServerNet cluster subsystem are started. Either:
 - Using the OSM Service Connection, select the **ServerNet Cluster** resource in the tree pane. In the attributes pane, check the value of the **ServerNet Cluster State** attribute. See [Figure 3-5](#) on page 3-14.
 - At an SCF prompt:


```
-> STATUS PROCESS $ZZKRN.#ZZSCL
-> STATUS SUBSYS $ZZSCL
```

Note. If SNETMON (\$ZZKRN.#ZZSCL) does not appear to be available, it might be configured using a different symbolic name. Use the SCF INFO PROCESS \$ZZKRN.* command to display a list of all currently configured generic processes.

Figure 3-5. ServerNet Cluster Attributes Showing ServerNet Cluster State

attributes

» alarms

ServerNet Cluster

Logical

SNETMON Version	SCL - T0294G08 - (11AUG03) - (16JUN03) - (AAL)
Maximum Number of Nodes	32
Current Number of Nodes	19

ServerNet Cluster Service

ServerNet Cluster State	Started
-------------------------	---------

SNETMON Process Pair

Redundancy Status	Fully Redundant
-------------------	-----------------

Backup

Process ID	2,309
------------	-------

Primary

Process ID	1,274
------------	-------

SANMAN Process Pair

Redundancy Status	Fully Redundant
-------------------	-----------------

Primary

Process ID	1,273
------------	-------

Backup

Process ID	2,292
------------	-------

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2. If \$ZZKRN.#ZZSCL is not configured, refer to the *ServerNet Cluster 6780 Planning and Installation Guide* for information about configuring and starting it. If \$ZZKRN.#ZZSCL is configured but not started, try starting it at an SCF prompt:


```
-> START PROCESS $ZZKRN.#ZZSCL
```
3. If the SUBSYS object is not started, either:
 - Type this command at an SCF prompt:


```
-> START SUBSYS $ZZSCL
```
 - Use the OSM Service Connection to perform the Start ServerNet Cluster Services action on the ServerNet Cluster resource. For more information, refer to [Starting ServerNet Cluster Services](#) on page 2-6.
4. If you continue to have problems, contact your service provider.

Troubleshooting MSGMON

A MSGMON process must be running in every processor of a system. \$ZZKRN.#MSGMON is a persistent process that should always be configured to be started. Use these steps to troubleshoot MSGMON:

1. Verify that MSGMON is started. At an SCF prompt, type:

```
-> STATUS PROCESS $ZZKRN.#MSGMON
```

Note. If \$ZZKRN.#MSGMON does not appear to be available, it might be configured using a different symbolic name. Use the SCF INFO PROCESS \$ZZKRN.* command to display a list of all currently configured generic processes.

2. If \$ZZKRN.#MSGMON is not configured, refer to the *ServerNet Cluster 6780 Planning and Installation Guide* for information about configuring it.
3. If \$ZZKRN.#MSGMON is configured but not started, you can start it by typing this command at an SCF prompt. This command starts a copy of MSGMON on every available processor on the system:


```
-> START PROCESS $ZZKRN.#MSGMON
```
4. If you continue to have problems, contact your service provider.

Troubleshooting SANMAN

SANMAN must be in the STARTED state on a system in order for the system to join a ServerNet cluster. \$ZZKRN.#ZZSMN is a persistent process that should be configured to be started at all times.

Use these steps to troubleshoot SANMAN:

1. Verify that SANMAN is started. Either:
 - Using the OSM Service Connection, click the ServerNet Cluster resource to select it, and check the SANMAN Process Pair attributes. See [Figure 3-5](#) on page 3-14.
 - At an SCF prompt, type:

```
-> STATUS PROCESS $ZZKRN.#ZZSMN
```

Note. If \$ZZKRN.#ZZSMN does not appear to be available, it might be configured using a different symbolic name. Use the SCF INFO PROCESS \$ZZKRN.* command to display a list of all currently configured generic processes.

2. If \$ZZKRN.#ZZSMN is not configured, refer to the *ServerNet Cluster 6780 Planning and Installation Guide* for information about configuring it.
3. If \$ZZKRN.#ZZSMN is configured but not started, use SCF to start it:


```
-> START PROCESS $ZZKRN.#ZZSMN
```
4. If you continue to have problems, contact your service provider.

Troubleshooting Expand-Over-ServerNet Line-Handler Processes and Lines

The Expand-over-ServerNet line-handler processes are responsible for managing security-related messages and forwarding packets outside the ServerNet cluster. For general information about Expand-over-ServerNet lines and line-handler processes, see [Appendix A, ServerNet Cluster Software](#).

For information on configuring Expand-over-ServerNet line-handler processes, refer to the *ServerNet Cluster 6780 Planning and Installation Guide* or the *Expand Configuration and Management Manual*.

If you suspect a problem with an Expand-over-ServerNet line-handler process or line:

1. Verify the status of the line-handler processes. Either
 - In the OSM Service Connection, perform the Add Node to ServerNet Cluster action to display the ServerNet Cluster Connection Status dialog box. This dialog box indicates whether or not line-handler processes are configured between the local node and remote nodes and shows the line states. For information about running the guided procedure, refer to [Using the Add Node to ServerNet Cluster Action](#) on page 1-15.
 - At an SCF prompt, type:

```
-> STATUS DEVICE $ZZWAN.*
```
2. If the line-handler processes are in the STOPPED state, you can start them using the SCF START DEVICE command. For example:

```
-> START DEVICE $ZZWAN.#SC004
```
3. If the line-handler processes need to be configured, either:
 - Configure line-handler processes using the guided procedure for adding a node to a ServerNet cluster. To start the procedure from OSM, log on to each node and perform the Add Node to ServerNet Cluster action. See [Using the Add Node to ServerNet Cluster Action](#) on page 1-15.
 - Configure the line-handler processes manually using SCF. See the *Expand Configuration and Management Manual*.
4. Verify the status of the Expand-over-ServerNet lines. Either:
 - Using the OSM Service Connection, click a remote node to select it, and check the Expand attributes in the details pane. See [Figure 3-7](#).
 - At an SCF prompt, type:

```
-> STATUS LINE $SC004, DETAIL  
-> STATUS PATH $SC004, DETAIL
```


Figure 3-6. Remote Node Attributes Showing Expand Information

attributes		» alarms
ServerNet Remote Node \TOY52		
Logical		
Y Fabric Connection State	Up	
Expand Node Number	2	
ServerNet Node Number	2	
X Fabric Connection State	Up	
Expand-Over-ServerNet Configuration		
Connectivity State	Connected	
Line LDEV Name	\$SC002	
Line LDEV State	Up	
Line LDEV	135	
Remote Line LDEV State	Up	

VST1007.vsd

5. If the Expand-over-ServerNet lines are stopped, start them. Either:
 - Use the guided procedure to Add a node to a ServerNet cluster. To start the procedure from OSM:
 1. Right-click the local node and select **Actions**.
 2. In the Actions list, select **Add Node to ServerNet Cluster**.
 3. Click **Perform Action**.
 - At an SCF prompt, type:


```
-> START LINE $SC004
```
6. Use the INFO PROCESS \$NCP, NETMAP command to gain additional information about the lines:


```
-> INFO PROCESS $NCP, NETMAP
```
7. If you continue to have problems, refer to the *Expand Network Management and Troubleshooting Guide*.

Checking Communications With a Remote Node

Use the Node Responsive Test action in the OSM Service Connection to test communications with a remote node. This action pings the remote node, verifying whether or not the node is connected and responding.

To ping a remote node:

1. In the tree pane, right-click the X or Y **Switch Port** for the node that you want to ping, and select **Actions**. The Actions dialog box appears.
2. From the Actions drop-down list, click **Node Responsive Test**.
3. Click **Perform action**. The Action Status window shows the progress of the action. If the action status shows Completed, the action passed. If the action status shows Failed, the action failed.
4. If the action failed, click **Show detail** for more information

Methods for Repairing ServerNet Connectivity Problems

ServerNet connectivity problems refer to the inability of one or more processors to communicate with one or more other processors over a ServerNet path.

You can use several methods to repair ServerNet connectivity problems. These subsections describe these methods:

Procedure	Page
Switching the SANMAN Primary and Backup Processes	3-18
Switching the SNETMON Primary and Backup Processes	3-19
Using the SCF START SERVERNET Command	3-19
Stopping and Starting the ServerNet Cluster Subsystem	3-19
Aborting and Restarting SNETMON	3-20

Switching the SANMAN Primary and Backup Processes

The SCF PRIMARY PROCESS \$ZZSMN command forces a takeover of the SANMAN primary process. The backup process, upon becoming the new primary, queries the switches connected to the node and attempts to program any NNA PICs that are not programmed.

The SCF PRIMARY PROCESS \$ZZSMN command is a noninvasive command. It does not cause the SANMAN process to stop running, and it does not cause any ServerNet connectivity that is already up to go down.

Switching the SNETMON Primary and Backup Processes

The SCF PRIMARY PROCESS \$ZZSCL command forces a takeover of the SNETMON primary process. The backup process, upon becoming the new primary, queries all processors in the node to find the state of ServerNet connections to all other nodes. If it finds any connections that are down, it initiates a sequence to bring the connections to an online state.

Using the SCF START SERVERNET Command

The SCF START SERVERNET \$ZSNET.fabric.cpu command provides a noninvasive manual method for recovering ServerNet paths. The SCF START SERVERNET \remotenode.\$ZSNET.fabric.* command is recommended for speeding up automatic interprocessor communication after a cluster switch hard reset.

The processor that receives the command always checks and brings up any remote IPC paths that are down on the fabric, regardless of whether the fabric is down or up at the processor when the command is received.

Stopping and Starting the ServerNet Cluster Subsystem

You can also use this SCF command sequence to repair connectivity problems:

```
-> STOP SUBSYS $ZZSCL  
-> START SUBSYS $ZZSCL
```

This sequence of commands does not result in a takeover. The primary and backup SNETMON processes continue to run on their respective processors.

Stopping and starting ServerNet cluster services to repair connectivity problems is less preferable than using SCF PRIMARY PROCESS \$ZZSCL. The SCF STOP SUBSYS \$ZZSCL command stops ServerNet cluster services. The SNETMON process pair continues to run, but it brings down all ServerNet connectivity between the node on which the command is issued and all other nodes in the cluster.

The SCF START SUBSYS \$ZZSCL command brings up ServerNet cluster connectivity from scratch. The final effect is that connectivity comes up after this sequence of commands. However, connectivity was fully brought down before being brought up again.

HP does not recommend stopping and starting the ServerNet cluster subsystem to repair ServerNet connectivity. The SCF STOP SUBSYS \$ZZSCL command is used primarily to ensure the orderly removal of a node from the cluster. The SCF STOP SUBSYS \$ZZSCL command normally is used prior to:

- Physically disconnecting a node from the cluster
- Halting the processors on a node, possibly in preparation for a system load to a new product version of the operating system
- Aborting the SNETMON process pair for the purpose of upgrading the SNETMON software unless recommended otherwise by HP

Aborting and Restarting SNETMON

You can also use this sequence of commands to repair connectivity problems:

```
SCF ABORT PROCESS $ZZKRN.#ZZSCL
SCF START PROCESS $ZZKRN.#ZZSCL
```

This sequence of commands aborts the SNETMON process pair (SNETMON ceases to exist). However, ServerNet cluster connectivity is left intact. When the SNETMON process is started again, it queries all processors in the node to find the state of ServerNet connections to all other nodes. If it finds any connections that are down, it initiates a sequence to bring the connections to an online state. The outcome is therefore similar to issuing the SCF PRIMARY PROCESS \$ZZSCL command, but there is a key difference.

The Expand-over-ServerNet line-handler processes tolerate only temporary absences of the SNETMON process. After three minutes of absence, the Expand-over-ServerNet line-handler processes declare the lines to other nodes to be down. Consequently, you should abort and start SNETMON with caution. Because of the possibility of Expand-over-ServerNet lines going down (in case the SNETMON process pair is not running for more than three minutes), HP recommends using the SCF PRIMARY PROCESS \$ZZSCL command to repair ServerNet cluster connectivity.

Checking the Internal ServerNet X and Y Fabrics

You can use the OSM Service Connection or SCF to check the internal ServerNet fabrics.

Using OSM to Check the Internal ServerNet Fabrics

Use the Group Connectivity ServerNet Path Test action in the OSM Service Connection to check the internal ServerNet X and Y fabrics for the local system. Use this test when you want to check the integrity of group-to-group connections along one ServerNet fabric at a time. This test checks these components:

- ServerNet cables
- PMF CRUs
- IOMF CRUs

- SEBs
- 1. Using an OSM workstation attached to the node whose internal fabric you want to check, log on to the OSM Service Connection. The Management window appears.
- 2. In the tree pane, right-click either **Internal_ServerNet_X_Fabric** or **Internal_ServerNet_Y_Fabric** and select **Actions**. The Actions dialog box appears.
- 3. From the Actions list, select **Group Connectivity ServerNet Path Test**.
- 4. Click **Perform action**. The Action Status window shows the progress of the action.
- 5. Check for an alarm on Internal_ServerNet_X_Fabric or Internal_ServerNet_Y_Fabric. If no alarm is present, the action completed successfully, and ServerNet messages can use the fabric.
- 6. If an alarm is present, refer to [Using OSM Alarms](#) on page 3-11 to identify the repair actions for the alarm.

Using SCF to Check the Internal ServerNet Fabrics

Use the SCF STATUS SERVERNET command to check processor-to-processor connectivity for both fabrics within a system:

```
>SCF STATUS SERVERNET $ZSNET
```

The system displays:

NONSTOP KERNEL - Status SERVERNET																	
X-FABRIC																	
TO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
FROM																	
00	UP	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
01	UP	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
02	UP	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
03	UP	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
04	UP	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
05	UP	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
06	UP	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
07	UP	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
08	<- DOWN																
09	<- DOWN																
10	<- DOWN																
11	<- DOWN																
12	<- DOWN																
13	<- DOWN																
14	<- DOWN																
15	<- DOWN																
Y-FABRIC																	
TO	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
FROM																	
00	UP	UP	UP	UP	DN	DN	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
01	UP	UP	UP	UP	DN	DN	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
02	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
03	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
04	DN	DN	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
05	DN	DN	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
06	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
07	UP	UP	UP	UP	UP	UP	UP	UP	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA	UNA
08	<- DOWN																
09	<- DOWN																
10	<- DOWN																
11	<- DOWN																
12	<- DOWN																
13	<- DOWN																
14	<- DOWN																
15	<- DOWN																

In this example, the boldface type shows that the Y-fabric connection between the processors in group 01 (processors 0 and 1) and the processors in group 03 (processors 4 and 5) is down. The X fabric is functioning normally.

For more information about the STATUS SERVERNET command, refer to the *SCF Reference Manual for the Kernel Subsystem*.

Checking the External ServerNet X and Y Fabrics

You use the OSM Service Connection to check the external ServerNet X and Y fabrics. You can also perform internal and external loopback tests on an NNA PIC in an MSEB.

If no alarms are visible on the external fabrics, but you still want to check the connectivity between the local node and the cluster switch, you can use the Node Connectivity ServerNet Path Test action. This action tests a path from the local MSEB to the 6780 switch module on one fabric. If problems are found, OSM generates alarms based on the result. This action is provided for diagnostic purposes only. It has no destructive effect.

[Table 3-4](#) describes the scope of the Node Connectivity ServerNet Path Test action.

Table 3-3. Scope of Node Connectivity ServerNet Path Test

On This Fabric	The test checks from . . .	To the . . .
X fabric	Port 6 of the MSEB in slot 51 of group 01	Switch-to-Node port of the X-fabric 6780 switch module.
Y fabric	Port 6 of the MSEB in slot 52 of group 01	Switch-to-Node port of the Y-fabric 6780 switch module.

If an alarm is generated, the problem lies between the local node and the cluster switch. The problem might be any of these components:

- The MSEB in slot 51 or 52 of the group 01 enclosure of the local system
- The PIC in port 6 of the MSEB in slot 51 or 52 of the group 01 enclosure of the local system
- The cable from the PIC in port 6 of the MSEB in slot 51 or 52 of the group 01 enclosure to a switch-to-node port of the 6780 switch module
- The switch-to-node port to which the local system is connected
- The PIC in slots 6 through 9 of the 6780 switch module that contains the switch-to-node port to which the local system is connected
- The 6780 switch module itself

To check ServerNet connectivity on the external fabrics:

Note. An error is returned if you try to run this path test when another Node Connectivity ServerNet Path Test is in progress on the same fabric. The Path Test in Progress attribute indicates if a path test is currently being conducted on the fabric.

1. Log on to the OSM Service Connection.
2. In the tree pane, expand the ServerNet Cluster resource.

3. In the tree pane, right-click either **External_ServerNet_X_Fabric** or **External_ServerNet_Y_Fabric** and select **Actions**. The Actions dialog box appears.
4. From the Actions list, select **Node Connectivity ServerNet Path Test**.
5. Click **Perform action**. The Action Status window shows the progress of the action.
6. Check for an alarm on External_ServerNet_X_Fabric or External_ServerNet_Y_Fabric. If no alarm is present, the action completed successfully.

If an alarm is present (an alarm bell appears next to the object), click the object to select it. See [Using OSM Alarms](#) on page 3-11 for more information about the alarm.

Using the Internal Loopback Test Action

The Internal Loopback Test action tests the circuitry of a plug-in card (PIC) installed in an MSEB to determine if ServerNet traffic can pass through the PIC. You can use the Internal Loopback Test action on a PIC installed in any port of an MSEB. However, you can perform this action on only one PIC at a time.

-
- △ **Caution.** Use the Internal Loopback Test action only if you have been instructed to do so by your service provider or by the repair action text for an OSM alarm. Do not use the Internal Loopback Test action on a PIC that you believe is operating normally. Doing so shuts down ServerNet traffic through the PIC.
-

The Internal Loopback Test action indicates with high probability whether or not the PIC circuitry is operational or faulty. However, it does not test the connector on the PIC. As a result, the Internal Loopback Test Action might succeed even though communication through the PIC is not possible.

Typically, you use the Internal Loopback Test action to isolate the cause of a malfunctioning ServerNet path where a PIC is part of that path. You can perform the action with a ServerNet cable connected to the PIC. The action isolates the MSEB port occupied by the PIC, preventing the port from sending or receiving ServerNet traffic during the action. However, the action tests only the PIC and not the cable connected to it.

1. Log on to the OSM Service Connection.
2. In the tree pane, navigate to the PIC you want to test. (PICs are subcomponents of MSEBs.)
3. Right-click the PIC and select **Actions**. The Actions dialog box appears.
4. From the Actions list, select **Internal Loopback Test**.
5. Click **Perform action**. The Action Status window shows the progress of the action.

The action status indicates that the action completed or failed. If the action completed, the PIC is probably functioning normally.

If the action failed, click the Action detail button to get more information.

6. Click **Close** to close the Action dialog box.

Using SCF to Check Processor-to-Processor Connections

You can use the SCF STATUS SUBNET command to check processor-to-processor connections. For details, see the [STATUS SUBNET, DETAIL Command Example](#) on page 4-20.

Finding ServerNet Cluster Event Messages in the Event Log

Before you search the event log (\$ZLOG) for ServerNet cluster subsystem event messages, you should be familiar with the subsystems listed in [Table 3-5](#).

Table 3-4. Names of Associated Subsystems

Subsystem	Subsystem Name	Subsystem Number	What to Look For
ServerNet cluster	SCL	218	Messages that indicate a fabric or a node has been disconnected
SANMAN	SMN	237	Messages that indicate attachment to the external ServerNet fabric failed Messages that indicate the external ServerNet fabric was not discovered
Message system	IPC	203	Messages that indicate a path is down or a fabric is down

When you view events using the OSM Event Viewer, the subsystem name (or, in rare cases, the subsystem number) appears in the SSID column. The OSM Event Viewer allows you to specify:

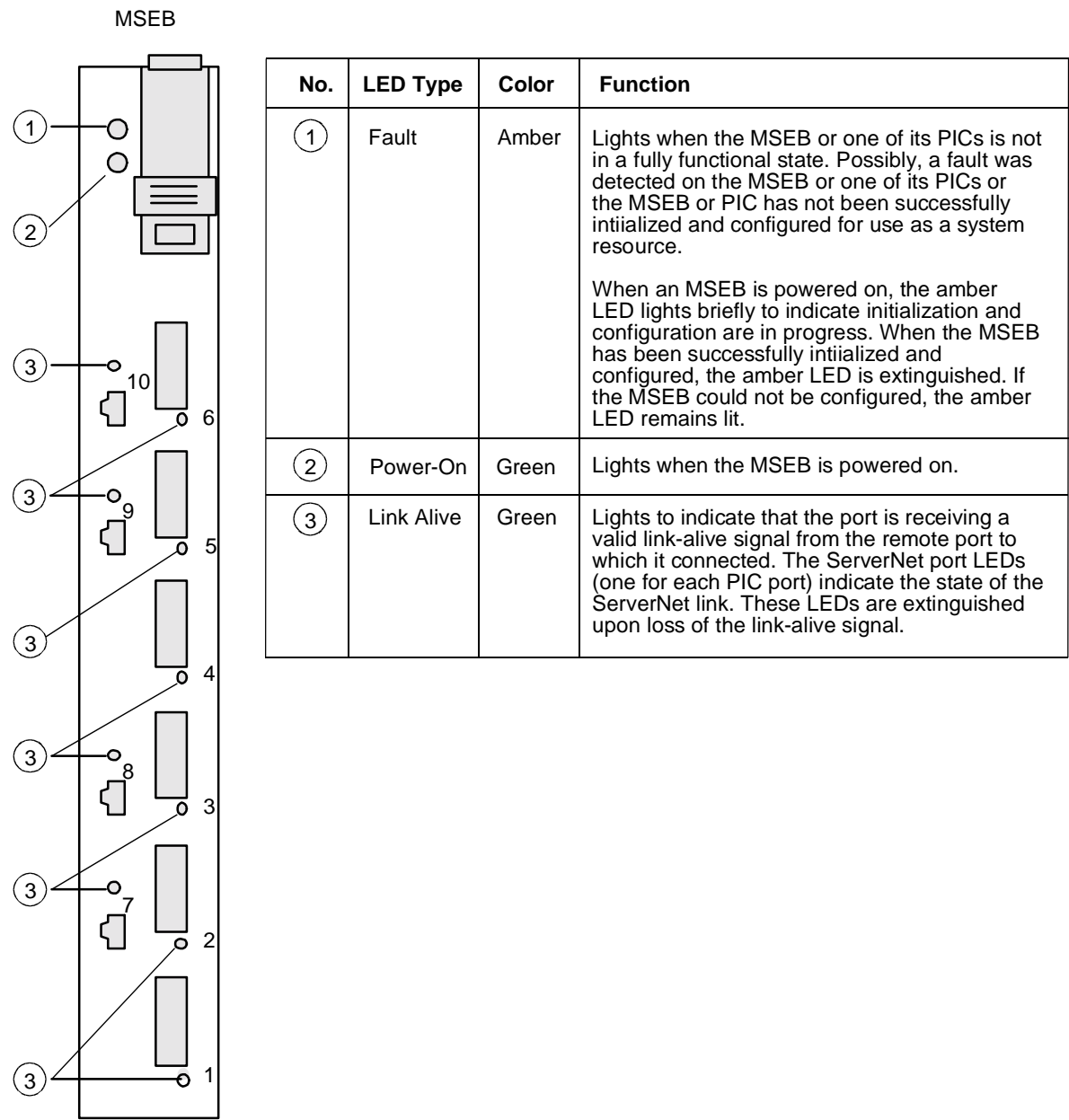
- The date and time ranges of the events you want displayed
- The logs (such as \$0 and \$ZLOG) from which you want events displayed
- The subsystems from which you want events displayed

For cause, effect, and recovery information for event messages, refer to the *Operator Messages Manual*.

MSEB LEDs

You can use the LEDs on the MSEB to help diagnose problems. [Figure 3-8](#) describes the LEDs on the MSEB.

Figure 3-7. MSEB LEDs

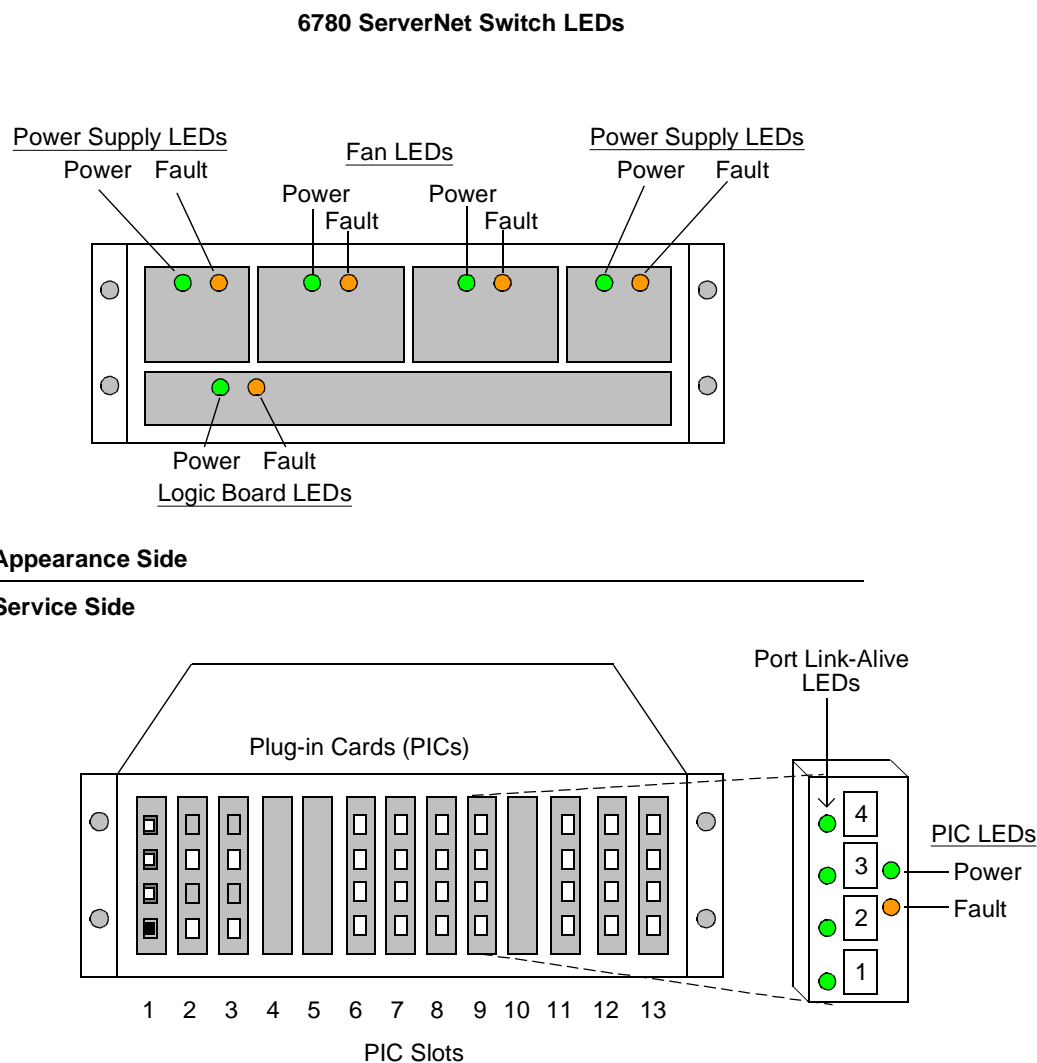


vst 130 vsd

LEDs on the 6780 Switch

You can use the LEDs on the different components of the 6780 switch to help diagnose problems. [Figure 3-8](#) shows the LEDs on the 6780 switch.

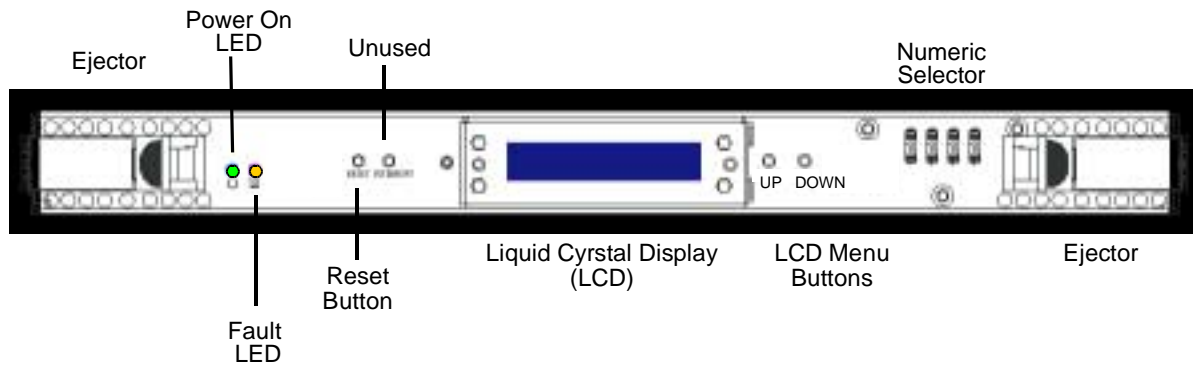
Figure 3-8. LEDs on the 6780 Switch



Logic Board Display on the 6780 Switch

You can use the liquid-crystal display (LCD) on the logic board of the 6780 switch to help diagnose problems associated with the switch. Use the UP and DOWN buttons to scroll through the display. [Figure 3-9](#) shows the Switch Logic Board.

Figure 3-9. 6780 Switch Logic Board



VST602.vsd

The LCD on the logic board contains this information (in the order shown):

- The switch name and numeric selector setting
- The group number and module number
- The ServerNet node numbers supported by the switch
- The fabric, zone, and layer of the switch
- The VPROC string of the firmware image
- The VPROC string of the configuration image
- The VPROC string of the FPGA image
- The logic board part number
- The logic board revision level
- The logic board tracking ID
- The switch model number (6780)

Look for information that might reveal incorrect switch settings or configuration. For example:

- Check the numeric selector settings for corresponding X and Y switches to see if they were accidentally set the same. For example, switch X12 and switch Y12 must have different numeric selector settings: the setting for Switch X12 should be 9612, and the setting for switch Y12 should be 9712.

- Check settings that are inconsistent with the position of the switch in the layered topology. For example, switch X22 on the X fabric, zone 2, layer 2 should have a numeric selector setting of 9622. See [Table 3-5, 6780 Switch Identifiers](#) for a complete listing of numeric selector settings and what they represent.

Note. If your cluster uses the long-distance option, check that the numeric selectors are set to the special settings listed in [Appendix E, Numeric Selector Settings for the Long-Distance Option](#). For more information about the long-distance option, see the *ServerNet Cluster 6780 Planning and Installation Guide*.

Table 3-5. 6780 Switch Identifiers

Switch Name	Numeric Selector	Fabric	Zone	Layer	Group.Module
X11	9611	X	1	1	1010.1
X12	9612	X	1	2	1010.2
X13	9613	X	1	3	1010.3
X14	9614	X	1	4	1010.4
X21	9621	X	2	1	1020.1
X22	9622	X	2	2	1020.2
X23	9623	X	2	3	1020.3
X24	9624	X	2	4	1020.4
X31	9631	X	3	1	1030.1
X32	9632	X	3	2	1030.2
X33	9633	X	3	3	1030.3
X34	9634	X	3	4	1030.4
Y11	9711	Y	1	1	1011.1
Y12	9712	Y	1	2	1011.2
Y13	9713	Y	1	3	1011.3
Y14	9714	Y	1	4	1011.4
Y21	9721	Y	2	1	1021.1
Y22	9722	Y	2	2	1021.2
Y23	9723	Y	2	3	1021.3
Y24	9724	Y	2	4	1021.4
Y31	9731	Y	3	1	1031.1
Y32	9732	Y	3	2	1031.2
Y33	9733	Y	3	3	1031.3
Y34	9734	Y	3	4	1031.4

For more information about the numeric selector, see the *ServerNet Cluster 6780 Planning and Installation Guide*.

Replacement Procedures

This subsection includes these replacement procedures:

Procedure	Page
Replacing an MSEB	3-30
Replacing a PIC in an MSEB	3-30
Replacing a Fiber-Optic Cable Between an MSEB and a Switch-to-Node Port	3-31
Replacing a Fiber-Optic Cable Between Cluster Switches	3-31
Replacing a 6780 Switch	3-32
Replacing a Switch Logic Board (Slot 14)	3-33
Replacing a Node PIC (Slots 6 Through 9)	3-33
Replacing a Layer PIC (Slots 11, 12, and 13)	3-33
Replacing a Zone PIC (Slots 2 and 3)	3-34
Replacing a Router Interconnect PIC (Slots 4, 5, and 10)	3-34
Replacing a Maintenance PIC (Slot 1)	3-34
Replacing a 6780 Switch Fan (Slots 16 and 17)	3-34
Replacing a 6780 Switch Power Supply (Slots 15 and 18)	3-34

To service or replace all other server components, refer to the CSSI Web.
(**Start>Programs>HP CSSI Web>CSSI Web.**)

Do not attempt to replace a component unless you have exhausted all other troubleshooting techniques and are reasonably certain that replacement is the only alternative.

Replacing an MSEB

You use the guided replacement procedure to replace an MSEB. To launch the Replace SEB or MSEB guided procedure from OSM:

1. In the tree pane, navigate to the MSEB you need to replace and right-click it.
2. Select **Actions**. The Actions dialog box appears.
3. From the Actions list, select **Replace**.
4. Click **Perform action**.

Online help is available to assist you in performing the procedure. You can replace only one MSEB at a time.

Replacing a PIC in an MSEB

PICs installed in an MSEB can be replaced, but the MSEB must first be removed from the enclosure. To remove the MSEB safely, you must use the guided procedure. Start the guided procedure as described in [Replacing an MSEB](#).

Perform each step in the guided procedure up to and including removing the MSEB from the enclosure. Then refer to the guided procedure online help for instructions on replacing the PIC. When the PIC is replaced, use the guided procedure to reinstall the MSEB in the enclosure.

Replacing a Fiber-Optic Cable Between an MSEB and a Switch-to-Node Port

To replace a fiber-optic cable between an MSEB and switch-to-node port:

1. Before starting, check that the internal and external ServerNet fabrics served by the cable opposite the one you are replacing are healthy. See [Checking the External ServerNet X and Y Fabrics](#) on page 3-23. For example, if you are replacing the cable for the X fabric, check that the internal Y fabric for all other nodes and the external Y fabric are fully operational.
2. Review the information on connecting fiber-optic cables in the *ServerNet Cluster 6780 Planning and Installation Guide*.
3. Route the replacement cable between the MSEB and the switch port.
4. Disconnect the suspected bad cable from the MSEB and from the switch port.
5. If the replacement cable has dust caps, remove the dust caps and install them on the suspected bad cable.
6. Connect the replacement cable to the switch port and then to the MSEB. Make sure that you connect the replacement cable to the ports from which you removed the suspected bad cable.
7. Use the OSM Service Connection to check for alarms, as described in [Using OSM Alarms](#) on page 3-11.
8. After a while, most OSM alarms should clear automatically. If the alarms do not clear, run the Node Connectivity ServerNet Path Test. See [Checking the External ServerNet X and Y Fabrics](#) on page 3-23.
9. If the alarms persist, perform the repair actions for clearing the alarms.

Replacing a Fiber-Optic Cable Between Cluster Switches

The two different types of connections between switches in a layered topology are: layer-to-layer connections and zone-to-zone connections. Before starting, read this procedure all the way through, especially if your cluster switches are in different sites. To replace a fiber-optic cable between two switches:

1. Use the SCF STATUS SUBNET \$ZZSCL, PROBLEMS command to check connectivity on the peer fabric. This command reports connectivity problems on all nodes.

If connectivity is down on the peer fabric, repair the problem, if possible, before attempting to replace a cable.

2. Label the connectors of the replacement cable with the cluster switch names and port numbers to which the suspected bad cable is connected (such as X11, slot 12, port 1 at one end, and X13, slot 12, port 1 at the other end).

If necessary, refer to the cabling tables in [Appendix B, Cable Connections in a Layered Topology](#).

3. Physically route the replacement cable along the same path as the suspected bad cable.
4. Disconnect the suspected bad cable at both ends.
5. If the connectors on the replacement cable have dust caps, remove the dust caps and install them on the connectors of the suspected bad cable.
6. Connect the replacement cable as labeled in Step 2.
7. Confirm that the link-alive LED lights at both ends. The link-alive LEDs should light within a few seconds. If the link-alive LEDs do not light:
 - Try reconnecting the cable, using care to align the key on the cable plug with the connector.
 - If possible, try connecting a different cable.
8. Direct ServerNet connectivity is automatically restored after an interval of approximately 50 seconds times the number of nodes in the cluster (25 seconds for nodes running G06.14 or later). If you do not want to wait, you can manually force recovery of ServerNet connectivity:

```
SCF START SERVERNET $ZNET
```

9. Repeat Step 1 to confirm that IPC connectivity is up between all nodes on both fabrics.
10. If connectivity problems continue with the cable, contact your service provider.

Replacing a 6780 Switch

You use the guided replacement procedure to replace a switch module.

Note. Be sure to remove the PICS from the original switch for installation into the new switch.

To replace a 6780 Switch using the OSM guided procedure:

1. In the tree pane, navigate to the switch module you need to replace and right-click.
2. Select **Actions**. The Actions dialog box appears.
3. From the Actions list, select **Replace**.
4. Click **Perform action**.

Online help is available to assist you in performing the procedure.

Replacing a CRU in a 6780 Switch

You also use the guided procedure to replace a Switch Logic Board or a Switch PIC in slots 6 through 9. The remaining CRUs in a 6780 switch require a manual procedure.

Replacing a Switch Logic Board (Slot 14)

To replace a 6780 switch logic board using the OSM guided procedure:

1. In the tree pane, navigate to the switch logic board you need to replace and right-click.
2. Select **Actions**. The Actions dialog box appears.
3. From the Actions list, select **Replace**.
4. Click **Perform action**.

Online help is available to assist you in performing the procedure.

Replacing a Node PIC (Slots 6 Through 9)

To replace a switch PIC in slots 6 through 9 using the OSM guided procedure:

1. In the tree pane, navigate to the switch PIC you need to replace and right-click. (The last digit of the PIC name should be between 6 and 9.)
2. Select **Actions**. The Actions dialog box appears.
3. From the Actions list, select **Replace**.
4. Click **Perform action**.

Online help is available to assist you in performing the procedure.

Replacing a Layer PIC (Slots 11, 12, and 13)

The PICs in slots 11, 12, and 13 are used for connections to another switch layer. To replace a PIC in slot 11, 12, or 13:

1. Use OSM or SCF to check the health of the corresponding PIC on the other fabric. If there are any problems on the corresponding PIC, resolve them before continuing.
2. Check that the cables connected to the PIC are properly labeled.
3. Disconnect the cables connected to the PIC and remove the PIC.
4. Install a replacement PIC in the same slot and be sure it is fully seated.
5. Wait for power LED to light. Be sure the fault LED does not light.
6. Reconnect the cables to the PIC. Confirm that the link-alive LED lights.

Replacing a Zone PIC (Slots 2 and 3)

The PICs in slots 2 and 3 are used for connections to another switch zone. To replace a PIC in slot 2 or 3:

1. Use OSM or SCF to check the health of the other zone PICs on the same fabric. If there are any problems on the other PICs, resolve them before continuing.
2. Check that the cables connected to the PIC are properly labeled.
3. Disconnect the cables connected to the PIC and remove the PIC
4. Install a replacement PIC in the same slot and be sure it is fully seated.
5. Wait for power LED to light. Be sure the fault LED does not light.
6. Reconnect the cables to the PIC. Confirm that the link-alive LED lights.

Replacing a Router Interconnect PIC (Slots 4, 5, and 10)

The PICs in slots 4, 5, and 10 are used for router interconnections. To replace a PIC in slot 4, 5, or 10:

1. Remove the PIC.
2. Install a replacement PIC in the same slot and be sure it is fully seated.
3. Wait for power LED to light. Be sure the fault LED does not light.

Replacing a Maintenance PIC (Slot 1)

The PIC in slot 1 is reserved for future use. It is not used in ServerNet cluster applications, so you should not need to replace it. However, if for some reason it does need replacement:

1. Remove the PIC
2. Install a replacement PIC in the same slot and be sure it is fully seated.
3. Wait for power LED to light. Be sure the fault LED does not light.

Replacing a 6780 Switch Fan (Slots 16 and 17)

The fans reside in slots 16 and 17. To replace a fan:

1. Remove the fan.
2. Install a replacement fan in the same slot and be sure it is fully seated.
3. Wait for power LED to light. Be sure the fault LED does not light.

Replacing a 6780 Switch Power Supply (Slots 15 and 18)

The power supplies reside in slots 15 and 18. To replace a power supply:

1. Remove the power supply.
2. Wait at least five seconds and then install a replacement power supply in the same slot. Be sure it is fully seated.
3. Wait for power LED to light. Be sure the fault LED does not light.

Diagnosing Performance Problems

Diagnosis of performance problems in any environment involves multiple steps and requires extensive knowledge of performance fundamentals and methodologies. If there are ServerNet Cluster performance issues, you might want to explore these areas:

- Throughput: How much traffic is flowing through nodes and between individual processors?
- Latency: How well does traffic flow?
- Problem isolation: What is responsible for the problem?

The Measure performance tool can assist you in collecting data for throughput and latency analysis. Measure has a SERVERNET entity that tracks all the interprocessor communication for remote nodes (remote IPC type). This information allows you to isolate and examine the flow of ServerNet cluster traffic. Another area to investigate, if you suspect performance degradation, is the health of your Expand lines. For more information on the SERVERNET, NETLINE, and PROCESS entities and the counters added specifically for ServerNet cluster support, consult the *Measure Reference Manual*.

SCF Commands for SNETMON and the ServerNet Cluster Subsystem

This section describes the SCF commands that are supported specifically for SNETMON and the ServerNet cluster (SCL) subsystem. For a complete description of SNETMON, see [Appendix A, ServerNet Cluster Software](#).

For information on starting SNETMON, see [Starting the ServerNet Cluster Monitor Process \(SNETMON\) on page 2-5](#). For information on adding SNETMON to the configuration database, see the *ServerNet Cluster 6780 Planning and Installation Guide*.

Note. Commands that are generally supported by SCF, such as the ASSUME, ENV, and TRACE commands, are documented in the *SCF Reference Manual for G-Series RVUs*.

Kernel subsystem SCF commands such as ABORT, ADD, and START for managing generic (system managed) processes (such as the ServerNet cluster monitor process, represented as a PROCESS object) are documented in the *SCF Reference Manual for the Kernel Subsystem*.

[Table 4-1](#) lists SCF objects and commands for SNETMON and the ServerNet cluster subsystem.

Table 4-1. ServerNet Cluster SCF Objects and Commands

Command	PROCESS Object	SUBNET Object	SUBSYS Object	Sensitive Command?	Page
ALTER			X	Yes	4-5
INFO			X	No	4-7
PRIMARY	X			Yes	4-9
START			X	Yes	4-11
STATUS		X	X	No	4-13
STOP			X	Yes	4-27
VERSION	X	X	X	No	4-29

SCF Objects for ServerNet Cluster

These SCF objects are supported for SNETMON and the ServerNet cluster (SCL) subsystem:

PROCESS	Use this object to issue commands for SNETMON (\$ZZSCL).
SUBNET	Use this object to gather information about connections within the ServerNet cluster subsystem (\$ZZSCL).
SUBSYS	Use this object to issue commands for the ServerNet cluster subsystem itself (\$ZZSCL).

Sensitive and Nonsensitive Commands

Sensitive SCF commands can have detrimental effects if improperly used. A sensitive command can be issued only by:

- The super ID
- The owner of the subsystem
- A member of the group of the subsystem owner

When used in conjunction with the security features of the system services, SCF provides effective access control for sensitive commands. Commands that request information or status but do not affect operation are called nonsensitive commands and are available to all users.

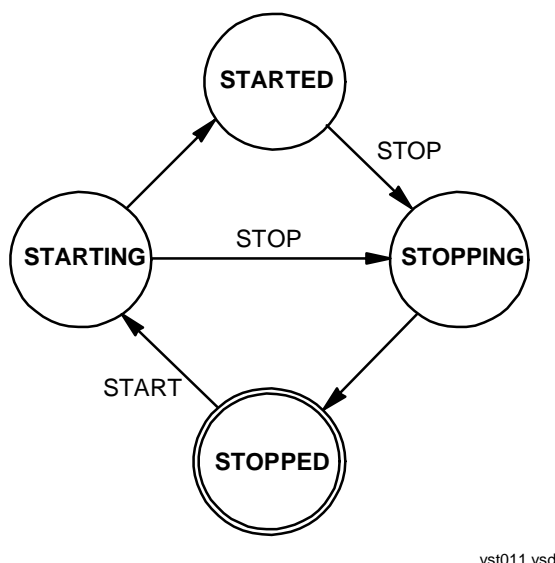
Summary States for the SCL SUBSYS Object

The ServerNet cluster (SCL) subsystem state is maintained by the ServerNet cluster monitor process (SNETMON). There is no aggregate ServerNet cluster subsystem state. Each ServerNet cluster monitor process maintains the state of objects relevant to the local system and its connection to the ServerNet cluster. [Table 4-2](#) lists the summary states for the SUBSYS object supported by the SCL subsystem.

Table 4-2. SCL SUBSYS Object Summary States

Summary State	Description
STARTING	The ServerNet cluster subsystem is attempting to establish ServerNet connectivity with the other nodes in the ServerNet cluster.
STARTED	<p>The STARTING phase is complete. For all ServerNet nodes, either connectivity has been established, or the attempt failed. It is possible to be in the STARTED state with no connectivity.</p> <p>When the ServerNet cluster subsystem moves to the STARTED state, it automatically detects all other nodes in the ServerNet cluster and establishes connections with those that have a ServerNet cluster monitor process in the STARTED or STARTING states.</p>
STOPPING	Connectivity is in the process of being brought down.
STOPPED	<p>The STOPPING phase is complete. There is no ServerNet cluster connectivity. STOPPED is also the initial state of the ServerNet cluster monitor process.</p> <p>When the ServerNet cluster subsystem is running but in a STOPPED summary state, it responds to SCF requests and status queries from local Expand-over-ServerNet line-handler processes. ServerNet connections with remote processors remain disabled, and discovery requests from remote ServerNet cluster monitor processes are not accepted. Status or statistics for remote connections are not available because these connections do not exist. However, statistics for the local nodes are provided.</p>

[Figure 4-1](#) illustrates the state transitions and the commands that trigger them.

Figure 4-1. ServerNet Cluster Subsystem States

STARTSTATE Attribute for the ServerNet Cluster Subsystem

The start state configuration (STARTSTATE attribute) of the SCL subsystem SUBSYS object controls the way in which the ServerNet cluster monitor process joins the system to the ServerNet cluster.

The ServerNet cluster monitor process (SNETMON) is usually launched automatically by the \$ZPM persistence manager as soon as any of the processors configured for the ServerNet cluster monitor process are reloaded (assuming the ServerNet cluster monitor process is configured with the STARTMODE attribute set to SYSTEM).

Note. Do not confuse the PROCESS object STARTMODE attribute with the SUBSYS object STARTSTATE attribute. The STARTMODE attribute controls the way the \$ZPM persistence manager launches the ServerNet cluster monitor process. (See the ADD PROCESS command description in the *SCF Reference Manual for the Kernel Subsystem*.)

Once the ServerNet cluster monitor process is started, it checks the SUBSYS object start state (STARTSTATE attribute) to determine whether to automatically bring the ServerNet cluster subsystem to the STARTED logical state. Even though the ServerNet cluster monitor process is running, the system does not join the ServerNet cluster until the ServerNet cluster subsystem is in the STARTED logical state.

To set the STARTSTATE attribute, use the ALTER SUBSYS command. (See the [ALTER SUBSYS Command](#) on page 4-5.)

If STARTSTATE

is set to . . .

Then

STARTED

The ServerNet cluster subsystem automatically moves into the STARTED logical state and joins the system to the ServerNet cluster.

STOPPED

The ServerNet cluster subsystem waits for a START SUBSYS command before moving into the STARTED logical state and joining the system to the ServerNet cluster.

ALTER SUBSYS Command

The ALTER SUBSYS command modifies the value of the STARTSTATE and STATSEVENT attributes for the ServerNet cluster subsystem. You can issue the ALTER SUBSYS command without stopping the ServerNet cluster subsystem. ALTER SUBSYS is a sensitive command.

The ALTER SUBSYS command syntax is:

```
ALTER [ / OUT file-spec / ] SUBSYS $ZZSCL { , attribute-spec }
```

OUT file-spec

causes any SCF output generated for this command to be directed to the specified file.

attribute-spec

specifies the attributes to be modified and the corresponding values to be assigned. It is one of these attribute name and value combinations:

STARTSTATE [STARTED | STOPPED]

The STARTSTATE attribute specifies the start state of the ServerNet cluster subsystem when the system is loaded.

STARTED

specifies that the ServerNet cluster subsystem automatically moves into the STARTED logical state when the system is loaded and joins the system to the ServerNet cluster.

STOPPED

The ServerNet cluster subsystem must be manually moved into the logical STARTED state using the SCF START SUBSYS command.

STATSEVENT [ON | OFF | LOCALONLY]

The STATSEVENT attribute specifies whether ServerNet cluster statistics are generated as EMS events (SCL event 1200).

Statistical counters in all local processors for all nodes are reset at one-hour intervals even if statistics events are not generated. If statistics events are specified, statistics are generated at the end of each one hour interval.

ON

specifies that statistics events are to be generated by each local processor for every node in the cluster known to the local node, including the local node itself.

OFF

specifies that processors do not generate statistics events.

LOCALONLY

specifies that statistics events are to be generated by each local processor for the local node only.

Considerations

- The STARTSTATE attribute is consulted whenever the ServerNet cluster subsystem monitor process (SNETMON) is started or restarted. The subsystem enters the last state set by an operator command (including the implied operator command at system load from the STARTSTATE attribute).
- If the value of the STATSEVENT attribute is changed, the new value takes effect at the beginning of the next hourly interval.
- The STATSEVENT setting stays in effect when the ServerNet cluster subsystem or the SNETMON process is started or restarted, even as a result of a system load.
- The STATSEVENT attribute cannot be used if the SNETMON version is earlier than T0294AAL.
- To generate statistics events on demand, issue the Generate ServerNet Statistics command in the OSM Service Connection. The statistics generated by this command reflect the values of the statistical counters at the time the command is issued. Even if this command is issued, the counters on all processors in all nodes are still reset hourly and hourly statistical events are still generated, if specified.

Example

This command alters the STARTSTATE attribute for the ServerNet cluster subsystem. The next time the system is loaded, the ServerNet cluster subsystem must wait for a

START SUBSYS command before moving into the STARTED state and joining the system to the ServerNet cluster:

```
> ALTER SUBSYS $ZZSCL, STARTSTATE STOPPED
```

This command alters the STATSEVENT attribute for the ServerNet cluster subsystem. As a result, at the end of subsequent one-hour intervals, each processor will generate a statistics EMS event for the local node only:

```
> ALTER SUBSYS $ZZSCL, STATSEVENT LOCALONLY
```

INFO Command

The INFO command returns the current values for the SNETMON process configuration. INFO is a nonsensitive command.

The INFO command syntax is:

```
INFO [ / OUT file-spec / ] SUBSYS $ZZSCL [ , DETAIL ]
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

DETAIL

INFO SUBSYS, DETAIL show the same information as INFO SUBSYS.

Example

This command displays the current configuration for the ServerNet cluster monitor process:

```
> INFO SUBSYS $ZZSCL
Servernet Cluster - Info SUBSYS \SYS.$ZZSCL
Start state.....  STARTED
Command state...  STOPPED
Command time....  06 Jul 2003, 16:20:50.703
Stats event.....  LOCALONLY
```

The INFO SUBSYS command returns these fields:

Start state

shows the current value of the STARTSTATE attribute for the ServerNet cluster subsystem. Possible values are:

- | | |
|---------|---|
| STARTED | The ServerNet cluster subsystem is configured to move into the STARTED state automatically and join the system to the ServerNet cluster after a system load. |
| STOPPED | The ServerNet cluster subsystem is configured to wait for a START SUBSYS command after a system load before moving into the STARTED state and joining the system to the ServerNet cluster. This setting is the default. |

Command state

shows the state for the ServerNet cluster subsystem that was last set by a START SUBSYS or STOP SUBSYS operator command. This field is meaningful only if the Command time field is later than the system load time, for example, if the operator command was issued since the last system load. Possible values are:

- | | |
|---------|--|
| STARTED | The ServerNet cluster subsystem automatically joins the system to the ServerNet cluster in the event of a restart (if the command time is later than the system load time). If the ServerNet cluster is already in a joined state, it remains joined to the system with no disruption in connectivity. |
| STOPPED | The ServerNet cluster subsystem automatically disconnects the system from the cluster in the event of a restart (if the command time is later than the system load time). This approach ensures that the system is properly disconnected from the ServerNet cluster. |

Command time

shows the time that the state of the ServerNet cluster subsystem was last set by a START SUBSYS or STOP SUBSYS command.

Stats event

shows the current value of the STATSEVENT attribute for the ServerNet cluster subsystem. Possible values are:

ON	The ServerNet cluster subsystem is configured so that statistics events are generated by each local processor for every node in the cluster known to the local node, including the local node itself. This value is the default.
OFF	The ServerNet cluster subsystem is configured so that processors do not generate statistics events.
LOCALONLY	The ServerNet cluster subsystem is configured so that statistics events are generated by each local processor for the local node only.
n/a	This value indicates that the SNETMON process does not support configuration of statistics events generation. In this case, statistical events are generated as if the STATSEVENT attribute is set to ON.

PRIMARY Command

The PRIMARY PROCESS command is a sensitive command. It causes a processor switch, where the backup processor becomes the primary processor and the primary processor becomes the backup processor.

The PRIMARY command syntax for the ServerNet cluster monitor process is:

```
PRIMARY [ / OUT file-spec / ] PROCESS $ZZSCL [ , processor ]
```

OUT file-spec

causes any SCF output generated for this command to be directed to the specified file.

processor

is the processor number of the current backup processor for the ServerNet cluster monitor process.

Consideration

Wild cards are not supported for the PRIMARY PROCESS command.

Example

This command causes the previously configured backup processor for the ServerNet cluster monitor process (processor 3) to become the primary processor:

```
> PRIMARY PROCESS $ZZSCL, 3
```

START Command

The START command moves the ServerNet cluster subsystem into the logical STARTED state and joins the system to the ServerNet cluster. START is a sensitive command.

The START command syntax is:

```
START [ /OUT file-spec / ] SUBSYS $ZZSCL
```

OUT file-spec

causes any SCF output generated for this command to be directed to the specified file.

Considerations

- If the START SUBSYS command is entered correctly, an EMS message reports the command, the time the command was executed, the terminal from which the command was entered, and the group and user numbers of the user issuing the command.
- ServerNet cluster startup is a two-tiered process:
 1. The ServerNet cluster monitor process has to be started (by the \$ZPM persistence manager or with an SCF START PROCESS command).
 2. The ServerNet cluster monitor process moves ServerNet cluster services into the STARTED state and joins the system to the ServerNet cluster.

When the ServerNet cluster monitor process is launched, it enters its default service state (STOPPED) and then checks the SUBSYS object STARTSTATE configuration to determine whether to automatically proceed toward the STARTED logical state.

If the configured STARTSTATE is STOPPED, the ServerNet cluster monitor process must wait for a START SUBSYS command before proceeding to start ServerNet cluster services.

Once ServerNet cluster services on the local system have been started, the ServerNet cluster monitor process establishes ServerNet connections with all other systems in the ServerNet cluster that are in the STARTED or STARTING states and moves the subsystem to the STARTED state.

If the Expand-over-ServerNet line-handler processes are configured and are in the STARTED state, Expand connectivity is established with the other systems in the ServerNet cluster.

When the START SUBSYS is completed:

- The subsystem state is STARTED.

- The ServerNet cluster monitor process has a list of all systems known to be in the ServerNet cluster.
- ServerNet connections are established with each system.

If ServerNet connection attempts fail or if successful connections subsequently fail, periodic attempts are made to establish or reestablish the connection. Failures and successful reconnections are logged to the event log. Failures to connect are logged as path or other failures. In addition, each ServerNet cluster subsystem state change (to STARTING and then to STARTED) is logged. If no other systems are discovered, that fact also is logged.

Example

This SCF command moves the ServerNet cluster subsystem into the logical STARTED state and joins the system to the ServerNet cluster:

```
> START SUBSYS $ZZSCL
```


STATUS SUBNET Command

The STATUS SUBNET command returns information about the state of the ServerNet cluster subsystem connections to other systems within the ServerNet cluster. STATUS is a nonsensitive command.

The STATUS SUBNET command syntax is:

```
STATUS [ / OUT file-spec / ] SUBNET $ZZSCL
      [ , DETAIL ]
      [ , LOCAL ]
      [ , NODE ServerNet node number ]
      [ , ACTIVE ]
      [ , SUMMARY ]
      [ , PROBLEMS ]
      [ , RANGE min node number - max node number ]
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

DETAIL

displays detailed status information on all internal and external ServerNet paths between processors for all nodes in the cluster.

LOCAL

displays detailed status information for the local ServerNet cluster subsystem only. Use of this option negates the specification of the DETAIL option.

NODE

displays detailed status information only for the node (local or remote) having *ServerNet node number*. Use of this option negates the specification of the DETAIL option.

ACTIVE

displays a summary table of all ServerNet cluster subsystem connections for currently active nodes only. If no options are specified for the command, ACTIVE is assumed.

SUMMARY

displays a summary table of all ServerNet cluster subsystem connections for all nodes at the beginning of the output, regardless of DETAIL, LOCAL, or NODE options.

PROBLEMS

if specified, automatically queries the SNETMON processes in all nodes and displays any connectivity problems. The PROBLEMS option provides a quick way to check connectivity problems without having to issue separate STATUS SUBNET commands for each node.

No other options can be specified with this option.

Remote passwords must be established for nodes to report problems.

RANGE

if specified, displays a summary table showing ServerNet connectivity status for ServerNet node numbers within the range of *min node number* and *max node number*.

The RANGE option can also be used in combination with the LOCAL and NODE options to specify additional nodes. In this case (and also when the RANGE option is used in combination with the DETAIL option), detailed ServerNet connectivity status for the specified nodes is displayed.

Considerations

- If the DETAIL, LOCAL, NODE, and ACTIVE parameters are not specified, a summary table of all ServerNet cluster subsystem connections appears. In this case, summary status for the relevant node(s) appear in order of ServerNet node numbers regardless of the order or the combination of the parameters specified.
- When no option is specified, a summary table of all active ServerNet cluster subsystem connections for currently active nodes is displayed. This is equivalent to STATUS SUBNET \$ZZSCL, ACTIVE.
- The summary option can be used with the DETAIL, LOCAL, or NODE options to display the summary table ahead of the detailed status on each specified ServerNet cluster subsystem connection.
- If detailed status information appears (a DETAIL, LOCAL, or NODE option was specified), the nodes known to the ServerNet cluster subsystem appear in numeric order regardless of the order requested.
- The NODE option can be specified as many times as desired to specify more than one particular node. It can also be used with the LOCAL and RANGE option.
- The RANGE option can be specified as many times as desired to specify more than one range of nodes. It can also be used with the LOCAL, NODE, and DETAIL options.
- The PROBLEMS option must be specified by itself.

STATUS SUBNET Command Example

This example shows the STATUS SUBNET \$ZZSCL command with no options specified:

```
> STATUS SUBNET $ZZSCL
```

Node	SysName	Num	SNETMON				Remote ServerNet			SNETMON	
			0<--CPU	States-->15	LocLH	RemLH	SCL	EXPAND	State,Cause		
1	RMT \SCQA35	35	1100,0000	0000,0000	UP	150	UP	CONN	CONN	.	.
2	RMT \SCQA40	40	1100,0000	0000,0000	UP	191	UP	CONN	CONN	.	.
3	RMT \SCQA33	33	1100,0000	0000,0000	UP	151	UP	CONN	CONN	.	.
4	RMT \SCQA36	36	1100,0000	0000,0000	UP	149	UP	CONN	CONN	.	.
5	RMT \SCQA39	39	1100,0000	0000,0000	UP	146	UP	CONN	CONN	.	.
6	RMT \SCQA38	38	1100,0000	0000,0000	UP	147	UP	CONN	CONN	.	.
7	LCL \SCQA34	34	1100,0000	0000,0000	.	.	.	.	.	STRD	AUTO
8	RMT \SCQA37	37	1100,0000	0000,0000	UP	148	UP	CONN	CONN	.	.
17	RMT \CCQA12	56	1100,0000	0000,0000	UP	144	UP	CONN	CONN	.	.
18	RMT \SCQA32	132	1100,0000	0000,0000	UP	129	UP	CONN	CONN	.	.
19	RMT \CCQA07	63	1100,0000	0000,0000	UP	142	UP	CONN	CONN	.	.
20	RMT \SCQA29	129	1100,0000	0000,0000	UP	132	UP	CONN	CONN	.	.
21	RMT \CCQA09	61	1100,0000	0000,0000	UP	143	UP	CONN	CONN	.	.
22	RMT \SCQA28	128	1100,0000	0000,0000	UP	133	UP	CONN	CONN	.	.
23	RMT \SCQA31	131	1100,0000	0000,0000	UP	130	UP	CONN	CONN	.	.
24	RMT \SCQA30	130	1100,0000	0000,0000	UP	131	UP	CONN	CONN	.	.
25	RMT \SCQA25	125	1100,0000	0000,0000	UP	136	UP	CONN	CONN	.	.
26	RMT \SCQA27	127	1100,0000	0000,0000	UP	134	UP	CONN	CONN	.	.
27	RMT \SCQA24	124	xx00,0000	0000,0000	UP	137	UP	CONN	CONN	.	.
28	RMT \SCQA26	126	xx00,0000	0000,0000	UP	135	UP	CONN	CONN	.	.
29	RMT \SCQA23	123	1100,0000	0000,0000	UP	138	UP	CONN	CONN	.	.
30	RMT \SCQA20	254	1100,0000	0000,0000	UP	120	UP	CONN	CONN	.	.
31	RMT \SCQA22	122	xx00,0000	0000,0000	UP	139	UP	CONN	CONN	.	.
32	RMT \SCQA21	121	xx00,0000	0000,0000	UP	140	UP	CONN	CONN	.	.

These paragraphs explain the fields returned by the STATUS SUBNET summary table:

Node

is the ServerNet node number (1 through 96) of the local or remote system. (A ServerNet node number of 0 can appear if a switch is not connected).

LCL

indicates that the node is local. This ServerNet node's SNETMON is providing the information in the display.

RMT

indicates that the node is remote. Any ServerNet node other than the local node is remote.

SysName

is the system name of the ServerNet node.

Num

is the Expand node number of the ServerNet node.

SNETMON CPU States

provides an individual path state summary code for the connections between the local node and a particular processor of a particular ServerNet node. The path state codes are as follows:

Path State

Code	Description
0	The paths are down because the processor is down or the processor does not exist.
1	The paths and processor are up without errors.
P	The processor is up, but there are errors on both internal fabrics.
X	The processor is up, but there is an error on the internal X fabric.
Y	The processor is up, but there is an error on the internal Y fabric.
p	The processor is up, but there are errors on both external fabrics.
x	The processor is up, but there is an error on the external X fabric.
y	The processor is up, but there is an error on the external Y fabric.

Note. If errors are present on both the internal and external paths, only an internal path error is indicated. To obtain more detailed information, use the DETAIL, LOCAL, or NODE option.

Remote ServerNet

describes the status of a remote node's ServerNet connection to the local node, where:

LocLH

is the status (UP or DN) of the local Expand-over-ServerNet line and its LDEV number.

RemLH

is the status (UP or DN) of the remote Expand-over-ServerNet line.

SCL

is the status of Expand over ServerNet between the local and remote node. Possible values are CONN (connected) or NCONN (not connected).

EXPAND

indicates if the local node is connected (CONN) or not connected (NCONN) to a particular remote node using any Expand connection (even if multiple hops separate the two nodes).

SNETMON State,Cause

is the local SNETMON state and cause status, where the possible state codes for the ServerNet cluster subsystem are:

State Code	Description
STRG	Currently starting
STRD	Successfully started
STPG	Currently stopping
STPD	Stopped and not currently active

The possible cause codes are:

Cause Code	Description
UNKN	Unknown cause
PRTC	Protocol error registering with SANMAN
AUTO	Automatic startup
NNAR	NNA (Node Numbering Agent) reprogrammed
PWFL	Power failure
OPRQ	Operator request
HDWR	Hardware failure

STATUS SUBNET, PROBLEMS Command Example

This example shows the STATUS SUBNET \$ZZSCL command with the PROBLEMS option:

```
> STATUS SUBNET $ZZSCL, PROBLEMS
```

Node	SysName	Nodes With Connectivity Problems
------	---------	----------------------------------

```
-----
1)  \SCQA35  ( 27, 28, 31, 32 )
2)  \SCQA40  ( 27, 28, 31, 32 )
3)  \SCQA33  ( 27, 28, 31, 32 )
4)  \SCQA36  ( 27, 28, 31, 32 )
5)  \SCQA39  ( 27, 28, 31, 32 )
6)  \SCQA38  ( 27, 28, 31, 32 )
7)  \SCQA34  ( 27, 28, 31, 32 )
8)  \SCQA37  ( 27, 28, 31, 32 )
9)  \..... ( Node is not currently active )
10) \..... ( Node is not currently active )
11) \..... ( Node is not currently active )
12) \..... ( Node is not currently active )
13) \..... ( Node is not currently active )
14) \..... ( Node is not currently active )
15) \..... ( Node is not currently active )
16) \..... ( Node is not currently active )
17) \CCQA12  ( No connectivity problems detected )
18) \SCQA32  ( No connectivity problems detected )
19) \CCQA07  ( No connectivity problems detected )
20) \SCQA29  ( No connectivity problems detected )
21) \CCQA09  ( No connectivity problems detected )
22) \SCQA28  ( No connectivity problems detected )
23) \SCQA31  ( No connectivity problems detected )
24) \SCQA30  ( No connectivity problems detected )
25) \SCQA25  ( No connectivity problems detected )
27) \SCQA24  ( 01, 02, 03, 04, 05, 06, 07, 08 )
28) \SCQA26  ( 01, 02, 03, 04, 05, 06, 07, 08 )
29) \SCQA23  ( No connectivity problems detected )
30) \SCQA20  ( No connectivity problems detected )
31) \SCQA22  ( 01, 02, 03, 04, 05, 06, 07, 08 )
32) \SCQA21  ( 01, 02, 03, 04, 05, 06, 07, 08 )
33) \..... ( Node is not currently active )
34) \..... ( Node is not currently active )
35) \..... ( Node is not currently active )
.      .      .      .      .
.      .      .      .      .
.      .      .      .      .
95) \..... ( Node is not currently active )
96) \..... ( Node is not currently active )
-----
```

These paragraphs explain the fields returned by the STATUS SUBNET, PROBLEMS summary:

Node

is the ServerNet node number of the system in the cluster.

SysName

is the Expand system name of the ServerNet node.

Nodes With Connectivity Problems

lists ServerNet node numbers of the nodes with which *SysName* is having connectivity problems.

If there are no connectivity problems between *SysName* and the other nodes, “No connectivity problems” detected appears in the display.

Other information, such as error messages, might appear in this field.

STATUS SUBNET, RANGE Command Example

This example shows the STATUS SUBNET \$ZZSCL command with the RANGE option:

```
> STATUS SUBNET $ZZSCL, RANGE 1-24
```

Node	SysName	Num	SNETMON				Remote ServerNet			SNETMON	
			0<--CPU	States-->15	LocLH	RemLH	SCL	EXPAND	State,Cause		
1	RMT \SCQA35	35	1100,0000,0000,0000	UP	150	UP	CONN	CONN	. . . . .	
2	RMT \SCQA40	40	1100,0000,0000,0000	UP	191	UP	CONN	CONN	. . . . .	
3	RMT \SCQA33	33	1100,0000,0000,0000	UP	151	UP	CONN	CONN	. . . . .	
4	RMT \SCQA36	36	1100,0000,0000,0000	UP	149	UP	CONN	CONN	. . . . .	
5	RMT \SCQA39	39	1100,0000,0000,0000	UP	146	UP	CONN	CONN	. . . . .	
6	RMT \SCQA38	38	1100,0000,0000,0000	UP	147	UP	CONN	CONN	. . . . .	
7	LCL \SCQA34	34	1100,0000,0000,0000	.	.	.	.	.	STRD,AUTO		
8	RMT \SCQA37	37	1100,0000,0000,0000	UP	148	UP	CONN	CONN	. . . . .	
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	RMT \CCQA12	56	1100,0000,0000,0000	UP	144	UP	CONN	CONN	. . . . .	
18	RMT \SCQA32	132	1100,0000,0000,0000	UP	129	UP	CONN	CONN	. . . . .	
19	RMT \CCQA07	63	1100,0000,0000,0000	UP	142	UP	CONN	CONN	. . . . .	
20	RMT \SCQA29	129	1100,0000,0000,0000	UP	132	UP	CONN	CONN	. . . . .	
21	RMT \CCQA09	61	1100,0000,0000,0000	UP	143	UP	CONN	CONN	. . . . .	
22	RMT \SCQA28	128	1100,0000,0000,0000	UP	133	UP	CONN	CONN	. . . . .	
23	RMT \SCQA31	131	1100,0000,0000,0000	UP	130	UP	CONN	CONN	. . . . .	
24	RMT \SCQA30	130	1100,0000,0000,0000	UP	131	UP	CONN	CONN	. . . . .	

STATUS SUBNET, DETAIL Command Example

This example shows a partial display of the STATUS SUBNET \$ZZSCL, command with the DETAIL option.

The command displays a series of tables containing status codes for paths between source and destination processors. For each node, six tables are displayed: two for the internal (X and Y) fabrics, two for the external (X and Y) fabric outbound paths, and two for external (X and Y) fabric inbound paths.

In this example, the output for only one ServerNet node (number 14) is shown. This structure of six tables is repeated for each active node in the cluster:

```
> STATUS SUBNET $ZZSCL, DETAIL
```

```
Remote Node -- ServerNet Node Number: 14
System Name: \STAR2   Expand Node Number: 212
Remote Processors Up (via EXPAND): ( 0 1 2 3 )
```

```
Local LH Ldev Number: 122   Local LH Name: $SC212   Local LH Status: UP
Remote LH Status: UP   SNETMON Local/Remote Connection Status: CONNECTED
```

Internal Path States For X Fabric:																1 Unknown state	
DST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	2 No data for path
SRC																	3 No remote path data
00	37	37	37	37	5	5	5	5	5	5	5	5	5	5	5	5	4 Source CPU down
01	37	37	37	37	5	5	5	5	5	5	5	5	5	5	5	5	5 Destination CPU down
02	37	37	37	37	5	5	5	5	5	5	5	5	5	5	5	5	6 Src strng SNet not allc
03	37	37	37	37	5	5	5	5	5	5	5	5	5	5	5	5	7 Src strng SNet allc
04	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	8 Src brought down conn
05	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	9 Dst strng SNet not allc
06	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	10 Dst strng SNet allc
07	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	11 Dst brought down conn
08	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	12 Hrd dwn sequence errors
09	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	13 Hrd dwn barrier NACK
10	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	14 Hrd dwn transfer NACK
11	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	15 Hrd dwn barrier timeout
12	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	16 Hrd dwn conn state bad
13	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	17 Hrd dwn src CPU died
14	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	18 Hrd dwn max BTE timeouts
15	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	19 Hrd dwn pwr on interrupt
Internal Path States For Y Fabric:																21 Hrd dwn fabric auto up	
DST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	22 Hrd dwn unknown reason
SRC																	23 Sft dwn barrier success
00	37	37	37	37	5	5	5	5	5	5	5	5	5	5	5	5	24 Sft dwn max BTE timeouts
01	37	37	37	37	5	5	5	5	5	5	5	5	5	5	5	5	25 Sft dwn unknown reason
02	37	37	37	37	5	5	5	5	5	5	5	5	5	5	5	5	26 Sft dwn max rival tries
03	37	37	37	37	5	5	5	5	5	5	5	5	5	5	5	5	27 Downed by operator cmd
04	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	28 Src fab dwnd oper cmd
05	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	29 Src fab dwnd interrupt
06	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	30 Src fab dwnd unkn cause
07	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	31 Dst fab dwnd oper cmd
08	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	32 Dst fab dwnd interrupt
09	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	33 Dst fab dwnd unkn cause
10	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	34 Path up other path died
11	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	35 Path up operator command
12	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	36 Path up probe success
13	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	37 Path up CPU brought up
14	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	38 Path up unknown cause
15	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
External Path States For X Fabric (OUT):																1 Unknown state	
DST	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	2 No data for path
SRC																	3 No remote path data
00	36	36	36	36	5	5	5	5	5	5	5	5	5	5	5	5	4 Source CPU down
01	36	36	36	36	5	5	5	5	5	5	5	5	5	5	5	5	5 Destination CPU down
02	36	36	36	36	5	5	5	5	5	5	5	5	5	5	5	5	6 Src strng SNet not allc
03	36	36	36	36	5	5	5	5	5	5	5	5	5	5	5	5	7 Src strng SNet allc

External Path States For Y Fabric (IN):																	21	Hrd	dwn	fabric	auto	up
DST SRC	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	22	Hrd	dwn	unknown	reason	
00	36	36	36	36	5	5	5	5	5	5	5	5	5	5	5	5	23	Sft	dwn	barrier	success	
01	36	36	36	36	5	5	5	5	5	5	5	5	5	5	5	5	24	Sft	dwn	max	BTE	timeouts
02	36	36	36	36	5	5	5	5	5	5	5	5	5	5	5	5	25	Sft	dwn	unknown	reason	
03	36	36	36	36	5	5	5	5	5	5	5	5	5	5	5	5	26	Sft	dwn	max	rvival	tries
04	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	27	Downed	by	operator	cmd	
05	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	28	Src	fab	dwnd	oper	cmd
06	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	29	Src	fab	dwnd	interrupt	
07	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	30	Src	fab	dwnd	unkn	cause
08	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	31	Dst	fab	dwnd	oper	cmd
09	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	32	Dst	fab	dwnd	interrupt	
10	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	33	Dst	fab	dwnd	unkn	cause
11	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	34	Path	up	other	path	died
12	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	35	Path	up	operator	command	
13	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	36	Path	up	probe	success	
14	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	37	Path	up	CPU	brought	up
15	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	38	Path	up	unknown	cause	

The STATUS SUBNET, DETAIL command returns these fields:

DST

is the destination processor (00 through 15) for ServerNet packets originating from processors listed in the left column of the table.

SRC

is the source processor (00 through 15) of ServerNet packets intended for processors listed in the top row of the table.

The numeric values in the command output indicate the state of the paths between the source and destination processors. [Table 4-3](#) describes each of the path state values.

Table 4-3. Path State Values Returned by the STATUS SUBNET, DETAIL Command (page 1 of 3)

No.	Path State Value	Meaning
1	Unknown state	The state is unknown.
2	No data for path	The node is not known by the local ServerNet cluster subsystem.
3	No remote path data	The state of the processors in the node is not known by the local ServerNet cluster subsystem.
4	Source CPU down	The source processor is down. Reload the processor if it is installed in the source node.
5	Destination CPU down	The destination processor is down. Reload the processor if it is installed in the destination node
6	Src strtn g SNet not allc	The source processor is starting direct ServerNet connectivity along the path but has not yet allocated the necessary ServerNet resources.
7	Src strtn g SNet allc	The source processor is starting direct ServerNet connectivity along the path and has already allocated the necessary ServerNet resources.
8	Src brought down conn	The source processor brought down direct ServerNet connectivity along the path because it believes the destination processor is down or the destination node is unreachable via ServerNet.
9	Dst strtn g SNet not allc	The destination processor is starting direct ServerNet connectivity along the path but has not yet allocated the necessary ServerNet resources.
10	Dst strtn g SNet allc	The destination processor is starting direct ServerNet connectivity along the path and has already allocated the necessary ServerNet resources.

Table 4-3. Path State Values Returned by the STATUS SUBNET, DETAIL Command (page 2 of 3)

No.	Path State Value	Meaning
11	Dst brought down conn	The destination processor brought down direct ServerNet connectivity along the path because it believes the source processor is down or the source node is unreachable via ServerNet.
12	Hrd dwn sequence errors	The path is in hard down state because the source processor detected unrecoverable sequence errors along the path.
13	Hrd dwn barrier NACK	The path is in hard down state because a ServerNet barrier packet sent by the source processor along the path was not acknowledged.
14	Hrd dwn transfer NACK	The path is in hard down state because a ServerNet data packet sent by the source processor along the path was not acknowledged.
15	Hrd dwn barrier timeout	The path is in hard down state because a ServerNet barrier packet sent by the source processor along the path timed out.
16	Hrd dwn conn state bad	The path is in hard down state because of an inconsistency in ServerNet connectivity states between the source processor and its local ServerNet cluster subsystem.
17	Hrd dwn src CPU died	The path is in hard down state because the source processor is down.
18	Hrd dwn max BTE timeouts	The path is in hard down state because the source processor detected more than 40 ServerNet block transfer engine (BTE) data packet timeouts along the path.
19	Hrd dwn pwr on interrupt	The path is in hard down state because the source processor received a power-on interrupt, which indicates that the source node had a power outage.
20	Hrd dwn node left clustr	The path is in hard down state because the node that contains the source processor has left the cluster.
21	Hrd dwn fabric auto up	The path is in hard down state because the source processor automatically brought up access to a ServerNet fabric but has not yet validated that the path is usable.
22	Hrd dwn unknown reason	The path is hard down for an unknown reason.
23	Sft dwn barrier success	The path was upgraded from hard down to soft down state after the source processor successfully sent a ServerNet barrier packet along the path.
24	Sft dwn max BTE timeouts	The path was downgraded from good to soft down state because the source processor detected more than 20 ServerNet block transfer engine (BTE) data packet timeouts along the path.

Table 4-3. Path State Values Returned by the STATUS SUBNET, DETAIL Command (page 3 of 3)

No.	Path State Value	Meaning
25	Sft dwn unknown reason	The path is in soft down state for an unknown reason.
26	Sft dwn max rvival tries	The path is in hard down state because it failed and was automatically revived more than 10 times in the last 1-hour interval. Due to excessive failed revivals, automatic path recovery is now disabled for this path.
27	Downed by operator cmd	The path is down because an operator command brought down the path at the source processor.
28	Src fab dwnd oper cmd	The path is down because an operator command brought down access to a ServerNet fabric at the source processor.
29	Src fab dwnd interrupt	The path is down because the source processor received a hardware interrupt indicating that access to a ServerNet fabric is down.
30	Src fab dwnd unkn cause	The path is down because the source processor lost access to a ServerNet fabric for an unknown reason.
31	Dst fab dwnd oper cmd	The path is down because an operator command brought down access to a ServerNet fabric at the destination processor.
32	Dst fab dwnd interrupt	The path is down because the destination processor received a hardware interrupt indicating that access to a ServerNet fabric is down.
33	Dst fab dwnd unkn cause	The path is down because the destination processor lost access to a ServerNet fabric for an unknown reason.
34	Path up other path died	The source processor upgraded the path from soft or operator down to good state because the path along the other fabric failed.
35	Path up operator command	The path is up because an operator command brought up the path at the source processor.
36	Path up probe success	The path was upgraded from soft down to good state after the source processor successfully tested the path with automatic path recovery probe messages.
37	Path up CPU brought up	The path is up because the source processor learned that the destination processor was up and available for direct ServerNet connectivity.
38	Path up unknown cause	The path is up for an unknown reason.

If Path State Problems Are Indicated

If the output of the STATUS SUBNET, DETAIL command indicates path-state problems, see [Methods for Repairing ServerNet Connectivity Problems](#) on page 3-18.

You can also use the OSM Service Connection to investigate path-related problems. If an alarm appears on a component of the path, perform any associated repair actions. For details, see [Using OSM Alarms](#) on page 3-11.

If these actions do not solve the path problem, contact your service provider.

About IPC Paths and Connections

All processors in a ServerNet cluster are connected over a pair of physical ServerNet X and Y fabrics. The fabric at a processor is said to be up if the processor can communicate over that fabric. Otherwise it is considered down.

A path is a unidirectional ServerNet communication conduit between a pair of processors over one ServerNet fabric. A path is defined as a source processor, a fabric, and a destination processor, in that order. Each processor in the ServerNet cluster has a pair of paths, X and Y, to every other processor in the cluster. The other processor could be in the same system or in another system. The definition of a path includes a sense of direction. Between two processors A and B, there are four paths:

- Path X from A to B (maintained by processor A)
- Path Y from A to B (maintained by processor A)
- Path X from B to A (maintained by processor B)
- Path Y from B to A (maintained by processor B)

A message system connection between two processors is a logical bidirectional ServerNet communication conduit that contains these four paths. The message system connection between processors A and B can be up only if there is direct ServerNet connectivity between the processors in both directions. That is, at least one of the paths from A to B must be up, and at least one of the paths from B to A must be up.

Paths between processors exist in various states for a number of reasons. For example, processor A might have put its X path to processor B in a hard down state due to a barrier timeout. However, processor B might not have put its X path to processor A in a down state because it has not received any errors on it. Consequently, the state of a path from A to B is not the same as the state of the path from B to A.

An internal path is a path between a pair of processors within the same system. An external path is a path between a local and a remote processor.

STATUS SUBSYS Command

The STATUS SUBSYS command returns information about the state of the ServerNet cluster subsystem. STATUS SUBSYS is a nonsensitive command.

The ServerNet cluster subsystem state is maintained by the ServerNet cluster monitor process. There is no aggregate ServerNet cluster subsystem state. Instead, each ServerNet cluster monitor process maintains the state of objects relevant to the local system and its connection to the ServerNet cluster.

The STATUS command syntax is:

```
STATUS [/OUT file-spec /] { SUBSYS } $ZZSCL [, DETAIL]
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

DETAIL

Currently, STATUS SUBSYS and STATUS SUBSYS, DETAIL show the same information.

STATUS SUBSYS Command Example

This example displays the current logical state of the ServerNet cluster subsystem:

```
-> STATUS SUBSYS $ZZSCL
Servernet Cluster - Status SUBSYS \SYS.$ZZSCL
State.....STARTED
```

where

State

is STARTING, STARTED, STOPPING, or STOPPED. For additional information, see [Summary States for the SCL SUBSYS Object](#) on page 4-2.

STOP Command

The STOP command terminates access to the ServerNet cluster subsystem in an orderly manner. It stops ServerNet cluster services on the local system, terminates ServerNet connections with other systems in the ServerNet cluster, and moves the subsystem to the STOPPED state.

Note. The ServerNet cluster monitor process (SNETMON) itself does not stop. It remains running in the STARTED logical state.

STOP is a sensitive command.

The STOP command syntax is:

<code>STOP [/ OUT <i>file-spec</i> /] SUBSYS \$ZZSCL [, FORCED]</code>
--

OUT file-spec

causes any SCF output generated for this command to be directed to the specified file.

FORCED

Currently, there is no difference between STOP SUBSYS and STOP SUBSYS, FORCED.

Considerations

- If the STOP SUBSYS command is entered correctly, the ServerNet cluster monitor process generates an EMS message that reports the command, the time it was executed, the terminal from which the command was entered, and the group and user numbers of the user issuing the command.
- Terminating access from the local system to the ServerNet cluster proceeds as follows:
 1. The ServerNet cluster monitor process sets the ServerNet cluster subsystem state to STOPPING and logs the state change.
 2. The ServerNet cluster monitor process informs each remote ServerNet cluster monitor process that it is stopping.
 3. The ServerNet cluster monitor process instructs each local processor to terminate ServerNet connectivity.
 4. When the processors have completed, this ServerNet cluster monitor process moves the subsystem to the STOPPED state and logs the change.
 5. The ServerNet cluster monitor process itself does not stop. It remains an active process in the STARTED logical state.

6. Only the subsystem state changes are logged. The individual path state changes are not logged.
7. On remote systems, when the ServerNet cluster monitor processes are notified of the STOP, they instruct their local processors to terminate ServerNet connectivity with the stopping system. These remote ServerNet cluster monitor processes then log the node disconnection to the event log.

Example

This SCF command stops ServerNet cluster services on the local system, terminates ServerNet connections with other systems in the cluster, and moves the subsystem to the STOPPED state:

```
> STOP SUBSYS $ZZSCL
```


VERSION Command

The VERSION command displays version information about the ServerNet cluster monitor process. VERSION is a nonsensitive command.

The VERSION command syntax is:

```
VERSION [ / OUT file-spec / ] { PROCESS | SUBNET | SUBSYS }  
$ZZSCL [ , DETAIL ]
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

DETAIL

designates that complete version information is returned. If DETAIL is omitted, a single line of version information is returned.

Examples

This SCF command displays the ServerNet cluster product name, product number, and RVU date:

```
> VERSION SUBSYS $ZZSCL  
VERSION SUBSYS \SYS.$ZZSCL: SCL - T0294G08 - (11AUG03) - (07JUL03) - (AAL)
```

This SCF command shows the information returned by the VERSION, DETAIL command:

```
> VERSION SUBSYS $ZZSCL, DETAIL  
Detailed VERSION SUBSYS \SYS.$ZZSCL  
SYSTEM \SYS  
SCL - T0294G08 - (11AUG03) - (07JUL03) - (AAL)  
GUARDIAN - T9050 - (Q06)  
SCF KERNEL - T9082G02 - (05AUG03) (02JUL03)  
SCL PM - T0294G08 - (11AUG03) - (07JUL03) - (AAL)
```

These descriptions explain the fields returned by the VERSION and VERSION, DETAIL commands:

SCL - T0294G08 - (01JUN03) - (28APR03) - (AAK)

identifies the version of the ServerNet cluster monitor process, the RVU date (01JUN03), the compile date (28APR03), and the software product revision (SPR) identifier (AAK).

GUARDIAN - T9050 - (Q06)

identifies the product version of the NonStop Kernel operating system.

SCF KERNEL - T9082G02 - (14JAN02) (03JAN02)

identifies the product version of the SCF Kernel (T9082G02), the RVU date (14JAN02), and the compile date (03JAN02).

SCL PM - T0294G08 - (01JUN03) - (28APR03) - (AAK)

identifies the version of the SCF product module (T0294G08), the RVU date (01JUN03), the compile date (28APR03), and the software product revision (SPR) identifier (AAK).

SCF Commands for the External ServerNet SAN Manager Subsystem

This section describes the SCF commands for the external ServerNet system area network (SAN) manager subsystem (SMN). The SMN subsystem is used to manage the external ServerNet SAN manager process (SANMAN). For a complete description of SANMAN, see [Appendix A, ServerNet Cluster Software](#).

For information on starting SANMAN, see [Starting the External ServerNet SAN Manager Process \(SANMAN\)](#) on page 2-4. For information on adding SANMAN to the configuration database, see the *ServerNet Cluster 6780 Planning and Installation Guide*.

Note. Commands that are generally supported by SCF, such as the ASSUME, ENV, and TRACE commands, are documented in the *SCF Reference Manual for G-Series RVUs*. Kernel subsystem SCF commands such as ABORT, ADD, and START for managing generic (system-managed) processes (such as the ServerNet SAN manager process, represented as a PROCESS object) are documented in the *SCF Reference Manual for the Kernel Subsystem*.

[Table 5-1](#) lists the SCF commands for the SMN subsystem.

Table 5-1. SANMAN SCF Commands

Command	CONN Object	PROCESS Object	SWITCH Object	SUBSYS Object	Sensitive Command?	See page
ALTER			X	X	Yes	5-5
DUMP			X		Yes	5-8
INFO	X		X	X	No	5-15
LOAD			X		Yes	5-21
PRIMARY		X			Yes	5-24
RESET			X		Yes	5-25
STATUS	X		X		No	5-27
VERSION		X		X	No	5-49

SANMAN SCF Objects

These SCF objects are supported for SANMAN:

CONN	Use this object to gather information about external fabric connections to a cluster switch.
PROCESS	Use this object to issue commands for the external ServerNet SAN manager process.
SUBSYS	Use this object to control and display attributes that specify distances between zones . These attributes are relevant only in three-zone cluster topologies in which some zones are separated by distances greater than 5 kilometers, while other zones are separated by distances of 5 kilometers or less.
SWITCH	Use this object to issue commands for a cluster switch.

Note. A ServerNet cluster can contain one of two types of cluster switches. The latest cluster switch is the HP NonStop ServerNet Switch (model 6780), used in the layered topology. Examples in this section are based on the 6780 switch.

Sensitive and Nonsensitive Commands

Sensitive SCF commands can have detrimental effects if improperly used. A sensitive command can be issued only by a user with the super ID, the owner of the subsystem, or a member of the group of the subsystem owner. When used in conjunction with the security features of the system services, SCF provides effective access control for sensitive commands.

Commands that request information or status but do not affect operation are called nonsensitive commands and are available to all users.

ALTER SUBSYS Command

ALTER SUBSYS is a sensitive command. It allows you to change the values of SMN subsystem attributes, specifically the distance between nodes in a three-zone long-haul configuration. Changes take effect immediately.

The command syntax is:

```
ALTER [ /OUT file-spec / ] SUBSYS $ZZSMN { , attribute-spec }
```

OUT file-spec

causes any SCF output for this command to be directed to the specified file.

attribute-spec

contains one of the following attribute name and value combinations:

[, Z1Z2DIST { 1 - 15000 }]

[, Z1Z3DIST { 1 - 15000 }]

[, Z2Z3DIST { 1 - 15000 }]

Z1Z2DIST

Specifies the distance, in meters, between zone 1 and zone 2. This attribute is relevant only in three-zone 6780 ServerNet Cluster topologies in which the distances between zones is less than or equal to 5 km in some cases, but greater than 5 km in other cases. Currently, the supported distance range is 1 to 15000 meters.

Z1Z3DIST

Specifies the distance, in meters, between zone 1 and zone 3. This attribute is relevant only in three-zone 6780 ServerNet Cluster topologies in which the distances between zones is less than or equal to 5 km in some cases, but greater than 5 km in other cases. Currently, the supported distance range is 1 to 15000 meters.

Z2Z3DIST

Specifies the distance, in meters, between zone 2 and zone 3. This attribute is relevant only in three-zone 6780 ServerNet Cluster topologies in which the distances between zones is less than or equal to 5 km in some cases, but greater than 5 km in other cases. Currently, the supported distance range is 1 to 15000 meters.

Considerations:

- Wild cards are not applicable to the ALTER SUBSYS command.
- You may alter only one attribute at a time. To specify values for all three distance attributes, use three ALTER SUBSYS commands.
- The ALTER SUBSYS command is relevant only in three-zone 6780 ServerNet cluster topologies in which some zones are separated by distances greater than 5 kilometers, while other zones are separated by distances of 5 kilometers or less. In such topologies, ALTER SUBSYS commands must be issued on every node to configure the zone-to-zone distances attributes.
- Upon receiving an ALTER SUBSYS command, the node stores the specified zone-to-zone distance attribute in the External ServerNet SAN Manager configuration record, which is kept in the System Configuration Database.
- If you do not specify the distance between nodes, the subsystem infers the distance from the configuration loaded on the cluster switches.

ALTER SUBSYS Command Examples

The following command specifies that the distance between zone 1 and zone 2 is 300 meters:

```
-> ALTER SUBSYS $ZZSMN, Z1Z2DIST 300
```

ALTER SWITCH Command

ALTER SWITCH is a sensitive command. It allows you to:

- Assign or change a locator string for the cluster switch.
- Make the LEDs on the switch blink or stop blinking.
- Specify the fabric setting for 6770 switches.

The ALTER SWITCH command syntax is:

```
ALTER [ / OUT file-spec / ] SWITCH $ZZSMN
{ , FABRIC { X | Y } | , NEAREST { X | Y } }
{ , FABRIC { X | Y } , ZONE znum , LAYER lnum }

{ , BLINK { ALL | FAULTLEDS | NONE } }
{ , LOCATOR string }
{ , FABRICSETTING { X | Y | NONE } }
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

FABRIC { X | Y } | NEAREST { X | Y }

specifies the external ServerNet fabric of the local cluster switch you want to alter. NEAREST and FABRIC are synonymous in this case, and either can be used. The local switch is the one directly connected to the node where you issue this command.

FABRIC { X | Y } , ZONE *znum* , LAYER *lnum*

is a string of identifiers used to specify the switch you want to alter. Used only in a ServerNet cluster built with 6780 switches.

FABRIC { X | Y } specifies the external ServerNet fabric.

ZONE *znum* specifies the cluster switch zone. *znum* must be in the range 1 through 3.

LAYER *lnum* specifies the cluster switch layer. *lnum* must be in the range 1 through 4.

```
BLINK { ALL | FAULTLEDS | NONE }
```

causes LEDs on the specified switch to blink as follows:

ALL	For 6770 switches, causes all switch port LEDs to blink. For 6780 switches, causes the fault LEDs on all CRUs to blink.
FAULTLEDS	Causes the fault LEDs for all CRUs on the 6780 switch to blink. FAULTLEDS is synonymous with ALL, but can only be used with a 6780 switch.
NONE	Stops all LEDs from blinking and restores the normal operating state of the LED.

For the location of the LEDs on the 6780 switch, see [Figure 3-8](#) on page 3-27.

```
LOCATOR string
```

is an identifier string of ASCII characters that can be used to describe or help locate the cluster switch. For 6770 switches, the string is limited to 32 characters. For 6780 switches, the string is limited to 64 characters.

```
FABRICSETTING
```

specifies the fabric LED setting for 6770 switches. Must be one of: `x`, `y`, or `NONE`. Not valid for 6780 switches.

Considerations

- The ALTER command is a sensitive command and can be used only by a super-group user (255, *n*) ID.
- Wild cards are not supported for the ALTER SWITCH command.
- Only one attribute specification (LOCATOR, BLINK, or FABRICSETTING) can be specified in a single ALTER SWITCH command.

ALTER SWITCH Command Examples

This example sets the locator string for the cluster switch in zone 2, layer 3 of the external Servernet Y fabric to a new value:

```
> ALTER SWITCH $ZZSMN, FABRIC Y, ZONE 2, LAYER 3, LOCATOR  
"Building 3, Room 1346"
```

If the command is successful, SCF displays:

The ServerNet switch locator string has been altered.

This example blinks the LEDs on a 6780 switch in zone 3, layer 4 on the external ServerNet X fabric:

```
> ALTER SWITCH $ZZSMN, FABRIC X, ZONE 3, LAYER 4, BLINK ALL
```

If the command is successful, SCF displays:

```
The ServerNet switch blink setting has been altered.
```

DUMP SWITCH Command

The DUMP SWITCH command copies a memory image from a 6780 switch to a specified file on the local system.

The DUMP SWITCH command syntax is:

```
DUMP [ / OUT file-spec / ] SWITCH $ZZSMN
{ , FABRIC { X | Y } | , NEAREST { X | Y } }
{ , FABRIC { X | Y } , ZONE znum , LAYER lnum }
, TO filename
{ , SAVED | , ONLINE [ , FORCED ] }
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

FABRIC { X | Y } | NEAREST { X | Y }

specifies the external ServerNet fabric of the local cluster switch from which you want to copy a memory image. NEAREST and FABRIC are synonymous in this case, and either can be used. The local switch is the one directly connected to the node where you issue this command.

FABRIC { X | Y } , ZONE *znum* , LAYER *lnum*

is a string of identifiers used to specify the switch from which you want to copy a memory image.

FABRIC { X | Y } specifies the external ServerNet fabric.

ZONE *znum* specifies the cluster switch zone. *znum* must be in the range 1 through 3.

LAYER *lnum* specifies the cluster switch layer. *lnum* must be in the range 1 through 4.

TO *filename*

specifies the file to receive the memory image. *filename* must be a file on the local system.

SAVED

specifies that the memory image saved by firmware (as a result of a runtime error) be collected.

ONLINE

specifies that the current memory image be collected. This is the default value.

FORCED

specifies that the current memory image be collected even if an image saved by firmware (as a result of a runtime error) has not been collected.

Considerations

- The DUMP SWITCH command is a sensitive command and can be used only by a super-group user (255, *n*) ID.
- The DUMP SWITCH command is not valid for a 6770 switch.
- Wild cards are not supported for the DUMP SWITCH command.
- The specified dump file must be located on the local system.

DUMP SWITCH Command Examples

This example copies the current memory image from the switch on the Y fabric in zone 2, layer 3, to the file `swdump1`:

```
> DUMP SWITCH $ZZSMN, FABRIC Y, ZONE 2, LAYER 3, TO swdump1, ONLINE
```

This example copies the memory image saved by firmware from the local switch on the X fabric to the file `swdump2`:

```
> DUMP SWITCH $ZZSMN, NEAREST X, TO swdump2, SAVED
```

INFO CONNECTION Command

The INFO CONNECTION command obtains information about the external ServerNet fabric connection to the nearest cluster switch. Unless specified otherwise, information appears for both fabrics. This information is returned by the external ServerNet SAN manager process (\$ZZSMN). INFO is a nonsensitive command.

The INFO command syntax is:

```
INFO [ / OUT file-spec / ] CONN[ECTION] $ZZSMN
      [ , FABRIC { X | Y } | , ONLY { X | Y } ]
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

FABRIC { X | Y } | ONLY { X | Y }

causes information for only the specified fabric (X or Y) to appear. ONLY and FABRIC are synonymous in this case, and either can be used.

INFO CONNECTION Command Example

This example shows the INFO CONNECTION \$ZZSMN command:

```
> INFO CONN $ZZSMN
```

INFO CONNECTION	X Fabric	Y Fabric
Response Status	ok	ok
Rsp Status Detail	No Status Detail	No Status Detail
Switch Type	Model 6780	Model 6780
MSEB	Port Configuration	Port Configuration
Port	6	6
PIC Type	NNA	NNA
NNA Version	22	22
Node Number Mask	0x000ff000	0x000ff000
Node Routing ID	0x00094000	0x00094000
SvNet Node Number	19	19
ServerNet Switch	Port Configuration	Port Configuration
CRU Slot	7	7
CRU Port	1	1
PIC Type	Dual SMF	Dual SMF
Transceiver	9/125u SMF	9/125u SMF
Desired Port State	n/a	n/a
Neighbor ID Check	Query No Resp Expected	Query No Resp Expected
Node Number Mask	0x000ff000	0x000ff000
Node Routing ID	0x00094000	0x00094000
SvNet Node Number	19	19

In this example:

Reponse Status

is the general condition of the connection. For a list of possible values, see [Response Status Enumeration](#) on page 5-53.

Rsp Status Detail

is the specific condition of the connection. For a list of possible values, see [Response Status Detail Enumeration](#) on page 5-53.

Switch Type

indicates the type of switch on the fabric. Possible values are Model 6780 and Model 6770. The 6780 switch is used in a layered topology. The 6770 switch is used in the star topologies.

Port

is the connector location on the MSEB to which the fiber-optic ServerNet cable is attached. The only valid port number on the MSEB is port 6.

PIC Type (MSEB)

is the type of plug-in card (PIC) used in the MSEB.

NNA Version

indicates the version of the Node Numbering Agent on the MSEB.

Node Number Mask

is a bit-mask indicating which bits of the node routing ID are valid.

Node Routing ID

is the node number routing ID. For the MSEB, the ID is configured on the NNA PIC. For the cluster switch port, the ID is assigned by the external fabric.

SvNet Node Number

is a number that identifies a member system in a ServerNet cluster. The ServerNet node number is a simplified expression of the node-routing ID that determines the node to which a ServerNet packet is routed.

On a 6780 switch, the ServerNet node number is assigned based on the PIC slot and transceiver port number to which the node is connected. On a 6770 switch, the ServerNet node number is assigned based on the switch port to which the node is connected.

CRU Slot

is the slot number of the switch PIC that contains the port for this node connection. Valid Switch PIC slot numbers for node connections are 6, 7, 8, and 9.

CRU Port

is the port number (on the switch PIC) used for this node connection. Valid port numbers are 1 or 2.

PIC Type (switch)

is the type of switch PIC used for this node connection.

Transceiver

identifies the type of transceiver used for the switch-to-node port.

Desired Port State

indicates whether transmit and receive are to be enabled. This attribute is valid only for 6770 switches. Valid states are:

TX/RX Dsbld

indicates that transmit and receive are to be disabled. This value applies only to the 6770 switch.

TX/RX Enbld

indicates that transmit and receive are to be enabled. This value applies only to the 6770 switch.

TX/RX Auto

indicates that no low-level neighbor checks are run. The port can still enable or disable ServerNet traffic. This value applies only to the 6770 switch.

UNKNOWN

indicates that the desired port state is not known.

n/a

indicates that this field does not apply to 6780 switches.

Neighbor ID Check

indicates the type of checks to be performed to enable the port. The type of neighbor check depends on the type of port. For possible values, see [Table 5-2, Neighbor Checks](#).

Table 5-2. Neighbor Checks

Type of Neighbor Check	Description
No Query Assume Pass	Performs no query of neighbor, assumes it passes, and enables the port
No Query Assume Fail	Performs no query of neighbor and assumes it fails. Disables port by default.
Query Ignore Result	Queries neighbor, ignores the result
Query Must Pass To Enable Port	Queries neighbor and enables port only if it passes
Query No Resp Expected	Queries neighbor, expecting no response. Used for node ports.

INFO SUBSYS Command

The INFO SUBSYS command displays values of configuration attributes for the SMN subsystem. These values, stored in the System Configuration Database, specify the distances between zones. You can use the ALTER SUBSYS command to alter the values.

The INFO command syntax is:

```
INFO [ /OUT file-spec / ] SUBSYS $ZZSMN [ , DETAIL ]
```

OUT file-spec

causes any SCF output generated for this command to be directed to the specified file.

DETAIL

is acceptable in the syntax for this command but in this case does not cause additional information to be displayed .

Considerations

- Currently, INFO SUBSYS and INFO SUBSYS, DETAIL show the same information: the time of the last ALTER SUBSYS command, and the distances between zones in a three-zone long-haul configuration.

INFO SUBSYS Command Example

```
-> INFO SUBSYS $ZZSMN  
  
SanMan - Info SUBSYS \YUMA.$ZZSMN  
  
Command time.... 18 Aug 2005, 8:36:39.377  
  
Zone 1 to zone 2 distance..... 8000 meters  
  
Zone 1 to zone 3 distance..... 10000 meters  
  
Zone 2 to zone 3 distance..... AUTO
```

In this display:

Command time

shows most recent date and time when one of the zone-to-zone distance attributes (Z1Z2DIST, Z1Z3DIST or Z2Z3DIST) was last set by an ALTER SUBSYS \$ZZSMN command.

Zone 1 to zone 2 distance

shows the current distance value of the Z1Z2DIST attribute, in meters. A value of AUTO signifies that the distance was not set in SCF but inferred by default from the configuration loaded on the cluster switches.

Zone 1 to zone 3 distance

shows the current distance value of the Z1Z3DIST attribute, in meters. A value of AUTO signifies that the distance was not set in SCF but inferred by default from the configuration loaded on the cluster switches.

Zone 2 to zone 3 distance

shows the current distance value of the Z2Z3DIST attribute, in meters. A value of AUTO signifies that the distance was not set in SCF but inferred by default from the configuration loaded on the cluster switches.

INFO SWITCH Command

The INFO SWITCH command obtains information about a specific cluster switch. Unless specified otherwise, information is displayed for the X and Y switches. This information is returned by the external ServerNet SAN manager process (\$ZZSMN). INFO is a nonsensitive command.

The INFO command syntax is:

```
INFO [ / OUT file-spec / ] SWITCH $ZZSMN

[ , FABRIC { X | Y } | , ONLY { X | Y } ]
[ [ , FABRIC { X | Y } ] , ZONE znum , LAYER lnum ]
[ , ZONE znum , LAYER lnum ]

[ , [ CRU cnum ]
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

FABRIC { X | Y } | ONLY { X | Y }

specifies that information for only the local switch on the specified fabric (X or Y) be displayed. ONLY and FABRIC are synonymous in this case, and either can be used. The local switch is the one directly connected to the node where you issue this command.

[FABRIC { X | Y } ,] ZONE *znum* , LAYER *lnum*

a string of identifiers that specifies the switch in a layered topology for which you want information. The layered topology uses only 6780 switches.

FABRIC { X | Y }

specifies the external ServerNet fabric.

ZONE *znum*

specifies the cluster switch zone. *znum* must be in the range 1 through 3.

LAYER *lnum*

specifies the cluster switch layer. *lnum* must be in the range 1 through 4.

CRU *cnum*

specifies the CRU in a particular slot within a specified 6780 switch. If this optional parameter is specified, only information for the CRU in the specified slot is displayed. *cnum* must be in the range 1 through 18. [Table 5-3](#) lists the types of CRUs in the slots of a 6780 switch.

Table 5-3. CRU Slots for the 6780 Switch

Slot Number	CRU Type
1	Maintenance PIC
2,3	Dual SMF or Quad MMF. (Used for zone-to-zone connections.)
4,5,10	Router Interconnect
6,7,8,9	Dual SMF. (Used for switch-to-node connections.)
11,12,13	Quad MMF. (Used for layer-to-layer connections.)
14	Switch logic board
15 and 18	Switch power supplies
16 and 17	Switch fans

Considerations

- Wild cards are not supported
- The output of the INFO SWITCH command varies depending on the model of switch.
- When the X and Y switches are different models, you must specify only one of the switches. To get information on both switches, issue one command for each fabric. This situation occurs only during a migration to the layered topology.
- In addition to the values described in the INFO command displays, you might see values of N/A or UNKNOWN. In general, a value of N/A means that a value is not applicable or not expected for the field. A value of UNKNOWN means that a value is expected but cannot be obtained for some reason.
- VPROC strings that identify the versions of firmware, FPGA, and configuration are truncated in the INFO SWITCH display. To see the full VPROC string, use the OSM Service Connection.

INFO SWITCH Command Example

This example shows the INFO SWITCH \$ZZSMN command:

```
INFO SWITCH $ZZSMN
```

Response Status Rsp Status Detail	ok No Status Detail	ok No Status Detail
ServerNet Switch	Switch Information	Switch Information
Switch Type	Model 6780	Model 6780
Switch Zone	1	1
Switch Layer	2	2
Group Number	1010	1011
Module Number	2	2
Switch Locator	Room 211, East Wall	Room 211, South Wall
Packetizer Type	ServerNet II	ServerNet II

Packetizer SvNetID	0x000fc400	0x000fc400
Router Instances	1-5	1-5
Router ASIC Type	Router 2	Router 2
Switch Poll Intrvl	49 seconds	49 seconds
Load Num Selector	9612	9712
Prev Num Selector	9612	9712
Curr Num Selector	9612	9712
Globally Unique ID	0x000008008e047f52	0x000008008e037f48
Firmware Revision	5_20	5_20
Firmware VPROC	T2789A01^30AUG2003^13AUG2	T2789A01^30AUG2003^13AUG2
Image A VPROC	T2789A01^30AUG2003^13AUG2	T2789A01^30AUG2003^13AUG2
Image B VPROC	T2789A01^30AUG2003^13AUG2	T2789A01^30AUG2003^13AUG2
FPGA Version ID	8_00	8_00
FPGA VPROC	T2819A01^30AUG2003^23JUN2	T2819A01^30AUG2003^23JUN2
Image A VPROC	T2819A01^30AUG2003^23JUN2	T2819A01^30AUG2003^23JUN2
Image B VPROC	T2819A01^30AUG2003^23JUN2	T2819A01^30AUG2003^23JUN2
Config Version ID	S3C0	S3C0
Config Revision	4_05	4_05
Config HDI	0x00000005	0x00000005
Config Tag	9612	9712
Config VPROC	T2790A01^30AUG2003^24JUL2	T2790A01^30AUG2003^24JUL2
Image A VPROC	T2790A01^30AUG2003^24JUL2	T2790A01^30AUG2003^24JUL2
Image B VPROC	T2790A01^30AUG2003^24JUL2	T2790A01^30AUG2003^24JUL2
Switch CRUs	CRU Type	CRU Type
CRU Slot (01)	Maintenance	Maintenance
CRU Slot (02)	Dual SMF	Dual SMF
CRU Slot (03)	Dual SMF	Dual SMF
CRU Slot (04)	Rtr InterConn	Rtr InterConn
CRU Slot (05)	Rtr InterConn	Rtr InterConn
CRU Slot (06)	Dual SMF	Dual SMF
CRU Slot (07)	Dual SMF	Dual SMF
CRU Slot (08)	Dual SMF	Dual SMF
CRU Slot (09)	Dual SMF	Dual SMF
CRU Slot (10)	Rtr InterConn	Rtr InterConn
CRU Slot (11)	Quad MMF	Quad MMF
CRU Slot (12)	Quad MMF	Quad MMF
CRU Slot (13)	Quad MMF	Quad MMF
CRU Slot (14)	Logic Board	Logic Board
CRU Slot (15)	Power Supply	Power Supply
CRU Slot (16)	Fan	Fan
CRU Slot (17)	Fan	Fan
CRU Slot (18)	Power Supply	Power Supply

In this example:

Response Status

is the general condition of the connection. For a list of possible values, see [Response Status Enumeration](#) on page 5-53.

Rsp Status Detail

is the specific condition of the connection. For a list of possible values, see [Response Status Detail Enumeration](#) on page 5-53.

`Switch Type`

indicates the type of switch on the fabric. The 6780 switch is used in the layered topology.

`Switch Zone`

is the zone within the layered topology where the switch is located. Possible values are 1, 2, or 3.

`Switch Layer`

is the layer within the switch zone. Possible values are 1, 2, 3, or 4. The switch layer is equivalent to the switch module number, and the two values should match.

`Group Number`

is the switch group number.

`Module Number`

is the switch module number. The switch module is equivalent to the switch layer, and the two values should match.

`Switch Locator`

is a string of ASCII characters that is used to describe or help locate the cluster switch. For 6780 switches, the maximum length is 64 characters. For 6770 switches, the maximum length is 32 characters.

`Packetizer type`

is the packetizer type of the switch as defined in Tnet Services. For a 6780 switch, the packetizer type is ServerNet II.

`Packetizer SvNet ID`

is the packetizer ServerNet ID for this switch.

`Router Instances`

is a router instance number. Possible values are in the range 1 through 5.

`Router ASIC type`

is the type of Router ASIC. For a 6780 switch, the ASIC type is `Router 2`.

`Switch Poll Intrvl`

is the interval in which SANMAN polls the cluster switch for status. The polling interval depends on the version of SANMAN that is running on your system and the state of the link. If a problem occurs with the link, the switch is polled more often until the link is repaired.

Load Num Selector

represents a supported configuration image that is loaded in the 6780 switch based on the numeric selector setting when the switch was reset. Each switch in a layered topology has a unique 4-digit numeric selector setting. For a list of possible numeric selector settings, see [Table 3-5](#) on page 3-29.

Prev Num Selector

is the previous value of the numeric selector.

Curr Num Selector

is the current value of the numeric selector. If this value is not the same as the Load Num Selector, it will be used the next time the switch is hard reset.

Globally Unique ID

is a unique character string used to identify the cluster switch. The GUID is stored in nonvolatile memory (SEEPROM) on the cluster switch at the time of manufacture. The GUID is not visible on the exterior of the switch.

Firmware Revision

is the version of firmware running on the cluster switch.

Firmware VPROC

is the VPROC string for the version of firmware running on the cluster switch. The VPROC string is truncated in this display. To see the full VPROC string, use the OSM Service Connection.

Image A VPROC (firmware)

is the VPROC string for the version of firmware stored in image A on the cluster switch.

Image B VPROC (firmware)

is the VPROC string for the version of firmware stored in image B on the cluster switch.

FPGA Version ID

is the version of the field programmable gate array (FPGA) running on the cluster switch.

FPGA VPROC

is the VPROC string for the version of the FPGA running on the cluster switch. The VPROC string is truncated in this display. To see the full VPROC string, use the OSM Service Connection.

Image A VPROC (FPGA)

is the VPROC string for the version of the FPGA stored in image A on the cluster switch.

Image B VPROC (FPGA)

is the VPROC string for the version of the FPGA stored in image B on the cluster switch.

Config Version ID

is the version of the configuration running on the cluster switch.

Config Revision

is the switch configuration revision, where the upper two bytes reflect the major revision and the lower two bytes represent the minor revision.

Config HDI

is the hardware data identifier (HDI) for the switch 3 configuration file.

Config Tag

is a numeric representation of the configuration tag stored on the cluster switch. The configuration tag varies depending on the ServerNet cluster topology and the location of the switch within it.

Config VPROC

is the VPROC string for the version of the configuration running on the cluster switch. The VPROC string is truncated in this display. To see the full VPROC string, use the OSM Service Connection.

Image A VPROC (configuration)

is the VPROC string for the version of the configuration stored in image A on the cluster switch.

Image B VPROC (configuration)

is the VPROC string for the version of the configuration stored in image B on the cluster switch.

CRU Slot (nn)

indicates the types of CRUs installed in slots 01 through 18 of the 6780 switch. For a listing of the CRU types for the 6780 switch, see [Table 5-3, CRU Slots for the 6780 Switch](#), on page 5-16.

If there is no CRU installed in the slot, ABSENT appears.

If the wrong CRU is installed in the slot, WRONG TYPE appears.

LOAD SWITCH Command

The LOAD SWITCH command is a sensitive command. It allows you to download a configuration, firmware, or [field-programmable gate array \(FPGA\)](#) file from the server to the cluster switch.

Note. The LOAD command is intended for service providers only. To load firmware, configuration, or FPGA for a cluster switch, use the OSM Service Connection.

The LOAD command syntax is:

```
LOAD [ / OUT file-spec / ] SWITCH $ZZSMN
{
  , FABRIC { X | Y } | , NEAREST { X | Y }
  , FABRIC { X | Y } , ZONE znum , LAYER lnum
}
{
  , CONFIG file
  , CONFIG file, POSITION id, TOPOLOGY topo-id
  , FIRMWARE file
  , FPGA file
}
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

FABRIC { X | Y } | NEAREST { X | Y }

specifies the external ServerNet fabric of the local cluster switch you want to load. NEAREST and FABRIC are synonymous in this case, and either can be used. The local switch is the one directly connected to the node where you issue this command.

FABRIC { X | Y } , ZONE *znum* , LAYER *lnum*

is a string of identifiers used to specify the cluster switch you want to load. Used only in a ServerNet cluster built with 6780 switches.

FABRIC { X | Y } specifies the external ServerNet fabric.

ZONE *znum* specifies the cluster switch zone. *znum* must be in the range 1 through 3.

LAYER *lnum* specifies the cluster switch layer. *lnum* must be in the range 1 through 4.

CONFIG *file*

specifies the name of the configuration file to be downloaded. The file name should be specified in the standard file system external format. The file must be located on the local system. This form is valid only for 6780 switches in a layered topology.

CONFIG *file*, POSITION *id*, TOPOLOGY *topo-id*

specifies the configuration file, position, and topology to be configured for a 6770 switch in one of the star topologies.

CONFIG *file*

specifies the name of the configuration file to be downloaded, specified in the standard file system external format. The file must be located on the local system.

POSITION *id*

specifies the position (1, 2 or 3) of the cluster switch on the external fabric.

TOPOLOGY *topo-id*

specifies the topology of the cluster. If the cluster uses either the [split-star topology](#) or the [star topology](#), specify 16NODES. If the cluster uses the [tri-star topology](#), specify 24NODES.

FIRMWARE *file*

indicates the name of the firmware file to be downloaded, specified in the standard file-system external format. The file must be located on the local system.

FPGA *file*

indicates the name of the FPGA file to be downloaded. The file name should be specified in the standard file-system external format. The file must be located on the local system. Valid only for 6780 switches.

Considerations

- The LOAD command is a sensitive command and can be used only by a super-group user (255, *n*) ID. The command requires confirmation by the user, so it must be entered interactively.
- For fault tolerance, a cluster switch contains two images of firmware, configuration, or FPGA. The LOAD SWITCH command automatically loads two images to a 6780 switch. However, to load two images to a 6770 switch, you must repeat the LOAD SWITCH command each time you download firmware or configuration.
- Only one attribute specification (FIRMWARE, CONFIG, or FPGA) can be specified in a single LOAD SWITCH command.
- You must perform a soft reset of the cluster switch after a firmware download. For details, see the *NonStop S-Series Service Provider Supplement*.
- You must perform a hard reset of the 6770 switch after a configuration download.
- In some cases, you must perform a hard reset of the 6780 switch after a configuration download. Use the SCF STATUS SWITCH \$ZZSMN command to

check the value of the Hardware Data ID attribute. If the value is MISMATCH, perform a hard reset. If the value is match, perform a soft reset.

- Wild cards are not supported for the LOAD SWITCH command.
- You must perform a hard reset of the 6780 switch after an FPGA download.

LOAD SWITCH Command Examples

This example downloads the firmware file \$SYSTEM.SYS05.M2789 to the 6780 switch on the external ServerNet Y fabric in zone 3, layer 2:

```
> LOAD SWITCH $ZZSMN, FABRIC Y, ZONE 3, LAYER 2, FIRMWARE $SYSTEM.SYS05.M2789
```

This command should only be issued by Hewlett-Packard trained support personnel. Executing this command will load a new firmware image on the switch. Before executing this command, be sure to read the instructions for switch firmware download in the NonStop S-series Service Provider Supplement.

Do you wish to continue with this command (Y/[N])?y

If the command is successful, SCF displays:

The switch has received the firmware file which will be put into use after the next SOFT RESET command.

This example downloads the configuration file \$SYSTEM.SYS05.C2790 to the 6780 switch on the external ServerNet Y fabric in zone 3, layer 2:

```
> LOAD SWITCH $ZZSMN, FABRIC Y, ZONE 3, LAYER 2, CONFIG $SYSTEM.SYS05.C2790
```

This command should only be issued by Hewlett-Packard trained support personnel. Executing this command will load a new configuration image on the switch. Before executing this command, be sure to read the instructions for switch configuration download in the NonStop S-series Service Provider Supplement.

Do you wish to continue with this command (Y/[N])?y

If the command is successful, SCF displays:

The switch has received the configuration file which will be put into use after the next HARD RESET command. A SOFT RESET may be used instead if the "Hardware Data ID" field in the STATUS SWITCH display indicates "match".

This example downloads the FPGA file \$SYSTEM.SYS05.LBC2819 to the switch on the external ServerNet Y fabric in zone 3, layer 2:

```
> LOAD SWITCH $ZZSMN, FABRIC Y, ZONE 3, LAYER 2, FPGA $SYSTEM.SYS05.LBC2819
```

This command should only be issued by Hewlett-Packard trained support personnel. Executing this command will load a new FPGA image on the switch. Before executing this command, be sure to read the instructions for switch FPGA download in the NonStop S-series Service Provider Supplement.

Do you wish to continue with this command (Y/[N])?y

If the command is successful, SCF displays:

The switch has received the FPGA file which will be put into use after the next HARD RESET command.

PRIMARY PROCESS Command

The PRIMARY PROCESS command is a sensitive command. It causes a processor switch, where the backup processor becomes the primary processor, and the primary processor becomes the backup processor. It does not cause the ServerNet SAN manager process to stop running.

The PRIMARY command syntax for ServerNet SAN manager process is:

```
PRIMARY [ / OUT file-spec / ] PROCESS $ZZSMN [ , processor ]
```

OUT file-spec

causes any SCF output generated for this command to be directed to the specified file.

processor

is the processor number of the current backup processor for the ServerNet SAN manager process. If omitted, the current backup processor is assumed.

Considerations

- Wild cards are not supported for the PRIMARY PROCESS command.
- If the specified processor is not the processor of the backup process, the PRIMARY command is rejected.
- If the specified processor is the processor of the primary process, no change occurs.

PRIMARY PROCESS Command Example

This command causes the previously configured backup processor for the ServerNet SAN manager process (processor 3) to become the primary processor:

```
> PRIMARY PROCESS $ZZSMN, 3
```

RESET SWITCH Command

The RESET SWITCH command is a sensitive command. It allows you to perform a hard or soft reset of a cluster switch.

The RESET command syntax is:

```
RESET [ / OUT file-spec / ] SWITCH $ZZSMN
{ , FABRIC { X | Y } | , NEAREST { X | Y } }
{ , FABRIC { X | Y } , ZONE znum , LAYER lnum }
{ HARD | SOFT }
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

FABRIC { X | Y } | , NEAREST { X | Y }

specifies the external ServerNet fabric of the local cluster switch you want to reset. NEAREST and FABRIC are synonymous in this case, and either can be used. The local switch is the one directly connected to the node where you issue this command.

FABRIC { X | Y } , ZONE *znum* , LAYER *lnum*

is a string of identifiers used to specify the cluster switch you want to reset. It is used only in a ServerNet cluster built with 6780 switches.

FABRIC { X | Y } specifies the external ServerNet fabric.

ZONE *znum* specifies the cluster switch zone. *znum* must be in the range 1 through 3.

LAYER *lnum* specifies the cluster switch layer. *lnum* must be in the range 1 through 4.

HARD | SOFT

designates the type of reset.

Hard Reset Reinitializes the router within the switch, temporarily disrupting the routing of ServerNet packets through the switch.

Soft Reset Restarts the firmware on the switch but does not interfere with ServerNet pass-through data traffic.

Considerations

- The RESET command is a sensitive command and can be used only by a super-group user (255, *n*) ID.
- Wild cards are not supported for the RESET command.

RESET SWITCH Command Examples

This example performs a hard reset of the cluster switch in zone 2, layer 1 of the external ServerNet X fabric:

```
> RESET SWITCH $ZZSMN, FABRIC X, ZONE 2, LAYER 1, HARD
```

This command should only be issued by Hewlett-Packard trained support personnel. Executing this command will force the switch into a hard reset, which is functionally equivalent to a power-on reset. Before executing this command, be sure that interprocessor connectivity is up for all nodes through the other external ServerNet fabric. Note that the switch that is hard reset will temporarily not be able to respond to further operational commands.

```
Do you wish to continue with this command? (Y / [N]) Y
```

The ServerNet switch has been hard reset. To determine when the hard reset has been completed and the switch is ready for further operational commands, use the STATUS SWITCH command which will indicate if the switch is responding. Use the STATUS SUBNET (\$ZZSCL) command to determine if interprocessor connectivity through the switch has returned.

STATUS CONNECTION Command

The STATUS CONNECTION command obtains status information for the external ServerNet fabric connections between the MSEB of the local node and the switch port. This information is returned by the external ServerNet SAN manager process (\$ZZSMN). STATUS CONNECTION is a nonsensitive command.

The STATUS CONNECTION command syntax is:

```
STATUS [ / OUT file-spec / ] CONN[ECTION] $ZZSMN  
[ , FABRIC { X | Y } | , ONLY { X | Y } ]  
[ , NNA ]
```

OUT file-spec

causes any SCF output generated for this command to be directed to the specified file.

FABRIC { X | Y } | ONLY { X | Y }

specifies that status information for only the specified fabric (X or Y) appears. ONLY and FABRIC are synonymous in this case, and either can be used.

NNA

causes the STATUS CONNECTION command to display only the status of the Node-Numbering Agent (NNA) registers instead of the status of the MSEB and switch ports.

Considerations

- Wild cards are not supported for this command.
- The STATUS CONNECTION command displays information for both external ServerNet fabrics unless specified otherwise.
- As a troubleshooting aid, unfavorable status values appear in all uppercase letters. Favorable status values appear in all lowercase letters. For example, DISABLED is an unfavorable state, and enabled is a favorable state.
- In addition to the values described in the STATUS command displays, you might see values of N/A or UNKNOWN. In general, a value of N/A means that a value is not applicable or not expected for the field. A value of UNKNOWN means that a value is expected but cannot be obtained for some reason.

STATUS CONNECTION Command Example

This example shows the STATUS CONNECTION \$ZZSMN command:

```
-> scf status conn $zzsmn
```

Response Status	ok	ok
Rsp Status Detail	No Status Detail	No Status Detail
Fabric Access	No Error	No Error
MSEB	Port Status	Port Status
Port	6	6
Link Speed	125 MB/S	125 MB/S
Optical Signal	present	present
Port Status	link alive	link alive
Link Level Rx	enabled	enabled
Link Level Tx	enabled	enabled
Packet Level Rx	enabled	enabled
Packet Level Tx	enabled	enabled
NNA Prog State	enabled	enabled
Node Number Mask	0x000ff000	0x000ff000
Node Routing ID	0x00094000	0x00094000
ServerNet Switch	Port Status	Port Status
CRU Slot	7	7
CRU Port	1	1
Transceiver Enabled	yes	yes
Transceiver Status	ok	ok
LED State	on	on
Link Speed	125 MB/S	125 MB/S
Optical Signal	present	present
Port Status	enabled	enabled
Node Number Mask	0x000ff000	0x000ff000
Node Routing ID	0x00094000	0x00094000
SvNet Node Number	19	19

In this example:

Response Status

is the general condition of the connection. For a list of possible values, see [Response Status Enumeration](#) on page 5-53.

Rsp Status Detail

is the specific condition of the connection. For a list of possible values, see [Response Status Detail Enumeration](#) on page 5-53.

Fabric Access

indicates the status of the external fabric connections. Possible values are:

- No Error
- MSEB MISSING
- LINK DEAD
- NO RESPONSE
- PROCESSOR FABRIC DOWN
- CRU TYPE NOT MSEB

- NO NNA PIC
- WRONG FABRIC
- BAD SWITCH PORT NUMBER
- BAD SCB LOADED
- BAD SWITCH PIC TYPE
- BAD SWITCH GUID
- NODE NUMBER MISMATCH
- NNA VERIFY FAIL
- SP I/O LIBRARY CALL ERROR
- SYSTEM POWER UP
- NO MSEB CONFIG RECORD
- BAD MSEB CONFIG RECORD
- MSEB CONFIG FETCH ERROR
- INTERNAL SYS FABRIC DOWN
- BOTH LEDS SET
- TNET INITIALIZATION ERROR
- INVALID FABRIC PARAMETER
- TOO MANY SWITCHES
- BAD PACKETIZER
- CONFIGURATIONS INVALID
- READ PTR DIRECTORY ERROR
- WRONG CONFIG VERSION ID
- BAD NODE ID BIT MASK
- BAD NODE ROUTING ID
- INVALID PTR DIRECTORY ADDR
- INVALID BARRIER ADDRESS
- INVALID PACKETIZER SNET ID
- INVALID SERVERNET SPEED
- SWITCH OBJECT NOT FOUND
- BAD RDMA SWITCH STATE
- LINK BUNDLE ALREADY IN USE
- SMC RETURN NO SPACE
- SMC RETURN ERROR
- BAD NUMERIC SELECTOR VALUE
- INVALID FIRMWARE RESPONSE

Port

is the connector location on the MSEB to which the fiber-optic ServerNet cable is attached. The only valid port number on the MSEB is port 6.

Link Speed

is the speed of the link in megabytes per second.

Optical Signal

indicates whether an optical signal is present or LOST.

Port Status

indicates the status of the MSEB or switch port. Possible values for the MSEB are:

- link alive
- LINK DEAD
- RESET
- LA, DISABLED
- UNINSTALLED

Possible values for the switch port are listed in [Table 5-4, Router Status Codes](#).

Link Lvl Rx

indicates whether Link Receive is enabled. Possible values are enabled or DISABLED.

Link Lvl Tx

indicates whether Link Transmit is enabled. Possible values are enabled or DISABLED.

Pckt Level Rx

indicates whether Packet Receive is enabled. Possible values are enabled or DISABLED.

Pckt Level Tx

indicates whether Packet Transmit is enabled. Possible values are enabled or DISABLED.

NNA Prog State

indicates the programming state of the NNA PIC on the MSEB. Possible values are enabled, DISABLED, RESET, ENABLED FOR IBC ONLY, and CONFIG ERR.

Node Number Mask

is a bit-mask indicating which bits of the node routing ID are valid.

Node Routing ID

is the node number routing ID. For the MSEB, the ID is configured on the NNA PIC. For the cluster switch port, the ID is assigned by the external fabric.

CRU Slot

is the slot number of the switch PIC that contains the port for this node connection. Valid switch PIC slot numbers for node connections are 6, 7, 8, and 9.

CRU Port

is the transceiver port number (on the switch PIC) used for this node connection.
Valid port numbers are 1 or 2.

Transceiver Enabled

indicates whether the transceiver port for this connection is enabled

Transceiver Status

indicates the state of the transceiver port for this connection.

LED State

indicates whether the transceiver port link-alive LED is on.

SvNet Node Number

is a number in the range 1 through 96 that identifies a member system in a ServerNet cluster. The ServerNet node number is a simplified expression of the node-routing ID that determines the node to which a ServerNet packet is routed.

On a 6780 switch, the ServerNet node number is assigned based on the PIC slot and transceiver port number to which the node is connected. On a 6770 switch, the ServerNet node number is assigned based on the switch port to which the node is connected.

STATUS CONNECTION, NNA Command Example

This example shows the STATUS CONNECTION command with the NNA option:

```
> SCF STATUS CONN $ZZSMN, NNA
```

STATUS CONNECTION	X Fabric		Y Fabric	
Response Status	ok		ok	
Rsp Status Detail	No Status Detail		No Status Detail	
NNA Registers	Outbound	Inbound	Outbound	Inbound
Data Replacement	0x00940000	0x00e00000	0x00940000	0x00e00000
Mux Control	0x00ff0000	0x00ff0000	0x00ff0000	0x00ff0000
Mode Control	0x0000000a	0x0000000d	0x0000000a	0x0000000d
Busy Scaler	0x00000080	0x00000080	0x00000080	0x00000080
Ready Scaler	0x00000001	0x00000001	0x00000001	0x00000001
High Threshold	0x00000006	0x00000006	0x00000006	0x00000006
Low Threshold	0x00000001	0x00000001	0x00000001	0x00000001
Accumulator	0x00000000	0x00000000	0x00000000	0x00000000
DID Check Error	yes	no	yes	no
CRC Error	no	no	no	no
Optical Signal	present	present	present	present
Shutdown Occurred	no	no	no	no
Force Idling	no	no	no	no
Busy Limit	no	no	no	no

In this example:

Response Status

is the general condition of the connection. For a list of possible values, see [Response Status Enumeration](#) on page 5-53.

Rsp Status Detail

is the specific condition of the connection. For a list of possible values, see [Response Status Detail Enumeration](#) on page 5-53.

Data Replacement

shows the contents of the NNA data replacement registers (outbound and inbound) containing the information used to convert either a local ID to a virtual cluster ID or a virtual cluster ID to a local ID.

Mux Control

shows the contents of the MUX control registers (outbound and inbound) that are used to select Destination ServerNet ID (DID) replacement data or Source ServerNet ID (SID) replacement data.

Mode Control

shows the contents of the NNA mode control registers (outbound and inbound) that are used to select the NNA mode of operation (pass-through, clock-checking, or conversion).

Busy Scaler

shows the contents of the NNA busy scaler registers (outbound and inbound) for both external fabrics. The busy scaler registers contain data used to scale the busy symbol counting mechanism.

Ready Scaler

shows the contents of the NNA ready scaler registers (outbound and inbound) for both external fabrics. The ready scaler registers contain data used to scale the ready symbol counting mechanism.

High Threshold

shows the contents of the NNA high threshold registers (outbound and inbound) for both external fabrics. The high threshold registers are used to set the upper limit for comparison to the accumulator contents.

Low Threshold

shows the contents of the NNA low threshold registers (outbound and inbound) for both external fabrics. The low threshold registers are used to set the lower limit for comparison to the accumulator contents.

Accumulator

shows the contents of the NNA accumulators (outbound and inbound) for both external fabrics.

DID Check Error

indicates whether a Destination ServerNet ID check error occurred. Possible values are YES and no.

CRC Error

indicates whether a Cyclic Redundancy Check error occurred. Possible values are YES and no.

Optical Signal

indicates whether an optical signal is present.

Shutdown Occurred

indicates whether a shutdown occurred. Possible values are YES and no.

Force Idling

indicates whether force idling is occurring. Possible values are YES and no.

Busy Limit

indicates whether a busy limit error occurred. Possible values are YES and no.

STATUS SWITCH Command

The STATUS SWITCH command obtains status information for the cluster switches. This information is returned by the external ServerNet SAN manager process (\$ZZSMN). STATUS SWITCH is a nonsensitive command.

The STATUS SWITCH command syntax is:

```
STATUS [ / OUT file-spec / ] SWITCH $ZZSMN

[ , FABRIC { X | Y } | , ONLY { X | Y } ]
[ [ , FABRIC { X | Y } ] , ZONE znum , LAYER lnum ]

[ , CRU cnum ]
[ , ROUTER ]
[ , ROUTER rnum , [ PORT pnum ] ]
[ , SWITCHPORTS ]
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

FABRIC { X | Y } | ONLY { X | Y }

displays information for only the local switch on the specified fabric. ONLY and FABRIC are synonymous in this case, and either can be used. The local switch is the one directly connected to the node where you issue this command.

[FABRIC { X | Y } ,] ZONE *znum* , LAYER *lnum*

a string of identifiers, used to specify the cluster switch for which you want status information. It is used only in a ServerNet cluster built with 6780 switches.

FABRIC { X | Y } specifies the external ServerNet fabric.

ZONE *znum* specifies the cluster switch zone. *znum* must be in the range 1 through 3.

LAYER *lnum* specifies the cluster switch layer. *lnum* must be in the range 1 through 4.

CRU *cnum*

specifies a CRU slot number within a specified 6780 switch. If this optional parameter is specified, only status information for the CRU in the specified slot is displayed. *cnum* must be in the range 1 to 18. [Table 5-3](#) lists the types of CRUs in the slots of a 6780 switch.

ROUTER

specifies that router register data be displayed. This option is valid only for 6770 switches.

ROUTER *rnum*, [PORT *pnum*]

specifies that router register and neighbor data be displayed. *rnum* must be in the range 1 through 5. Specifying the optional PORT parameter limits the display to the specified router port. *pnum* must be in the range 0 through 11. This option is valid only for 6780 switches.

Note. The PORT option is intended for software debugging and can typically display values that are no longer valid. For example, if a switch is disconnected, a value of INVALID CONFIG TAG might still appear although it is no longer meaningful.

SWITCHPORTS

specifies that status for the switch ports be displayed. This option is valid only for 6780 switches.

Considerations

- Wild cards are not supported for this command.
- The output of this command differs depending on the model of switch.
- When the X and Y switches are different models, a fabric must be specified. To get information on both switches, issue one command for each fabric. This situation occurs only during a migration to the layered topology.
- As a troubleshooting aid, unfavorable status values appear in all uppercase letters. Favorable status values appear in all lowercase letters. For example, CRC ERROR is an unfavorable state, and ok is a favorable state.
- In addition to the values described in the STATUS command displays, you might see values of N/A or UNKNOWN. In general, a value of N/A means that a value is not applicable or not expected for the field. A value of UNKNOWN means that a value is expected but cannot be obtained for some reason.

STATUS SWITCH Command Example

This example shows the STATUS SWITCH \$ZZSMN command:

> SCF STATUS SWITCH \$ZZSMN

STATUS SWITCH		X Fabric					Y Fabric				
Response Status		ok					ok				
Rsp Status Detail		No Status Detail					No Status Detail				
Switch Type		Model 6780					Model 6780				
Switch Zone		1					1				
Switch Layer		2					2				
Firmware State		active					active				
RTC Battery		ok					ok				
Last Reset Type		Hard Reset Command					PON Reset				
Last Hard Reset		06/03/2003 15:55:56 GMT					05/21/2003 18:42:20 GMT				
Last Soft Reset											
Soft Reset SrcSNID											
Hardware Data ID		match					match				
Firmware Exception											
Firmware Image A		ok					ok				
Firmware Image B		ok					ok				
FPGA Image A		ok					ok				
FPGA Image B		ok					ok				
Config Image A		ok					ok				
Config Image B		ok					ok				
Logic Board Temp		49 Centigrade					48 Centigrade				
Power	Slot	Status					Status				
Power	(15)	ok					ok				
Power	(18)	ok					ok				
Fan	(16)	ok					ok				
Fan	(17)	ok					ok				
DC 3.0	(14)	ok					ok				
DC 2.5	(14)	ok					ok				
Router Status		Rtr1	Rtr2	Rtr3	Rtr4	Rtr5	Rtr1	Rtr2	Rtr3	Rtr4	Rtr5
Router Port (00)		WNBR	en	LOS	CABS	en	en	en	LOS	LOS	en
Router Port (01)		LOS	LOS	LOS	CABS	en	LOS	LOS	LOS	LOS	en
Router Port (02)		nu	nu	nu	nu	en	nu	nu	nu	nu	en
Router Port (03)		nu	nu	nu	nu	en	nu	nu	nu	nu	en
Router Port (04)		en	en	en	en	en	en	en	en	en	en
Router Port (05)		en	en	en	en	en	en	en	en	en	NCIP
Router Port (06)		en	nu	en	en	en	en	nu	en	en	NCIP
Router Port (07)		en	en	en	en	en	en	en	en	en	NCIP
Router Port (08)		LOS	LOS	LOS	LOS	en	LOS	LOS	LOS	LOS	NCIP
Router Port (09)		LOS	LOS	LOS	LOS	en	LOS	LOS	LOS	LOS	en
Router Port (10)		en	en	en	en	en	en	en	en	en	en
Router Port (11)		en	en	en	en	en	en	en	en	en	en
Switch CRUs		CRU Type		State		F-LED	CRU Type		State		F-LED
CRU Slot	(01)	Maintenance		en		off	Maintenance		en		off
CRU Slot	(02)	Dual SMF		en		off	Dual SMF		en		off
CRU Slot	(03)	Dual SMF		en		off	Dual SMF		en		off
CRU Slot	(04)	Rtr InterConn		en		off	Rtr InterConn		en		off
CRU Slot	(05)	Rtr InterConn		en		off	Rtr InterConn		en		off

CRU Slot	(06)	Dual SMF	en	off	Dual SMF	en	off
CRU Slot	(07)	Dual SMF	en	off	Dual SMF	en	off
CRU Slot	(08)	Dual SMF	en	off	Dual SMF	en	off
CRU Slot	(09)	Quad SMF	AB	off	Dual SMF	en	off
CRU Slot	(10)	Rtr InterConn	en	off	Rtr InterConn	en	off
CRU Slot	(11)	Quad MMF	en	off	Quad MMF	en	off
CRU Slot	(12)	Quad MMF	en	off	Quad MMF	en	off
CRU Slot	(13)	Quad MMF	ER	ON	Quad MMF	en	off
CRU Slot	(14)	Logic Board	en	off	Logic Board	en	off
CRU Slot	(15)	Power Supply	en	off	Power Supply	en	off
CRU Slot	(16)	Fan	en	off	Fan	en	off
CRU Slot	(17)	Fan	en	off	Fan	en	off
CRU Slot	(18)	Power Supply	en	off	Power Supply	en	off

In this example:

Response Status

is the general condition of the connection. For a list of possible values, see [Response Status Enumeration](#) on page 5-53.

Rsp Status Detail

is the specific condition of the connection. For a list of possible values, see [Response Status Detail Enumeration](#) on page 5-53

Switch Type

is the type of switch as indicated by the switch model number. The output of the STATUS SWITCH command differs significantly depending on the type of switch. The 6780 switch is used in a layered topology.

Switch Zone

is the zone within the layered topology where the switch is located. Possible values are 1, 2, or 3.

Switch Layer

is the layer within the switch zone. Possible values are 1, 2, 3, or 4.

Firmware State

the state of the switch firmware. Possible values are active, INITIALIZING, UPDATING, and POWER ON SELF TEST.

RTC Battery

is the state of the battery in the real-time clock for this switch

Last Reset Type

indicates the type of the last reset command. Possible values are Hard Reset, Soft Reset, PON, or Front Panel Button Pressed.

Last Hard Rset

indicates the time (in Greenwich mean time) of the last hard reset command.

Last Soft Rset

indicates the time (in Greenwich mean time) of the last soft reset command.

Soft Reset SrcSNID

is the ServerNet ID of the client that issued a soft reset command if the last reset command was a soft reset.

Hardware Data ID

indicates whether the previous hardware data identifier (HDI) matches the loaded HDI after a soft reset.

Firmware Exception

indicates the last cause, if any, of a firmware exception that induced a soft reset.

Firmware Image A

indicates the condition of the firmware stored in Image A of the switch. Two images are stored for fault tolerance. Possible values are ok, CRC ERROR, and UNKNOWN.

Firmware Image B

indicates the condition of the firmware stored in Image B of the switch. Two images are stored for fault tolerance. Possible values are ok, CRC ERROR, and UNKNOWN.

FPGA Image A

indicates the condition of the Field-Programmable Gate Array (FPGA) stored in Image A of the switch. Two images are stored for fault tolerance. Possible values are ok, CRC ERROR, and UNKNOWN.

FPGA Image B

indicates the condition of the Field-Programmable Gate Array (FPGA) stored in Image B of the switch. Two images are stored for fault tolerance. Possible values are ok, CRC ERROR, and UNKNOWN.

Config Image A

indicates the condition of the configuration stored in Image A of the switch. Two images are stored for fault tolerance. Possible values are ok, CRC ERROR, and UNKNOWN.

Config Image B

indicates the condition of the configuration stored in Image B of the switch. Two images are stored for fault tolerance. Possible values are ok, CRC ERROR, and UNKNOWN.

Logic Board Temp

indicates the temperature (in degrees centigrade) of the switch logic board.

Power (nn)

indicates the status for the switch power supply in slot *nn*. Possible values are:

- ok
- POWER SUPPLY ABSENT
- AC OR POWER SUPPLY FAILED
- MARGINAL POWER SUPPLY.

A value of MARGINAL POWER SUPPLY indicates that the power supply cannot ride through 1/2 cycle dropouts and should be replaced.

Fan (nn)

indicates the condition of the switch fan in slot *nn*. Switch fans are located in slots 16 and 17. Possible values are ok, FAILED, or UNKNOWN.

DC 3.0 (14)

indicates the state of the 3.0 volt DC power source on the switch logic board (CRU 14). Possible values are ok, FAILED, or UNKNOWN.

DC 2.5 (14)

indicates the state of the 2.5 volt DC power source on the switch logic board (CRU 14). Possible values are ok, FAILED, or UNKNOWN.

Router Status

lists the status for each of the 12 router ports (00 through 11) on the 5 routers (Rtr1 through Rtr5). For possible values, see [Table 5-4, Router Status Codes](#).

CRU Slot (nn)

lists these details for the switch CRU in slot *nn*:

CRU Type

is the type of switch CRU in slot *nn*. For more information, see [Table 5-3, CRU Slots for the 6780 Switch](#).

If there is no CRU installed in the slot, ABSENT appears.

If the wrong CRU is installed in the slot, WRONG TYPE appears.

State

is the state of the switch CRU in slot *nn*. Possible values are:

DS Disabled

ER Error

en Enabled

F-LED

is the state of the fault LED on the switch CRU in slot *nn*. Possible values are BL (blinking), ON, and off.

If there are transceiver problems, SEE CRU STAT appears across the State and F-LED columns. Use the CRU option of the STATUS SWITCH command to get more information.

Table 5-4. Router Status Codes

CABS	CRU absent
ICTG	Invalid configuration tag
ICVI	Invalid configuration version ID
INBR	Invalid neighbor
ISCR	Invalid switch configuration revision
LADS	Link alive, disabled
LOS	Lost optical signal
MPNK	Manage port command naked
MPNR	No response to manage port command
NCIP	Neighbor check in progress
NOLA	No link alive
RSET	Reset
TABS	Transceiver absent
UNGD	Unmatched GUID
UNKN	Unknown
UNSP	Unmatched slot, port number, or both
WNBR	Neighbor Check OK. Waiting on neighbor
en	enabled

STATUS SWITCH, ONLY, CRU Command Example

This example shows the STATUS SWITCH command with the ONLY and CRU options:

```
> SCF STATUS SWITCH $ZZSMN, ONLY X, CRU 6
```

STATUS SWITCH		X Fabric	Y Fabric
Response Status	ok		
Rsp Status Detail	No Status Detail		
Switch Type	Model 6780		
Switch Zone	1		
Switch Layer	2		
CRU Slot	6		
CRU Type	Dual SMF		
CRU State	enabled		
CRU Fault LED	off		
Transceiver 1	9/125u SMF		
Transceiver Enabled	yes		
Transceiver Status	ok		
Link Alive LED	on		
Optical Signal	present		
Transceiver 2	9/125u SMF		
Transceiver Enabled	yes		
Transceiver Status	ok		
Link Alive LED	OFF		
Optical Signal	LOST		

In this example:

Response Status

is the general condition of the connection. For a list of possible values, see [Response Status Enumeration](#) on page 5-53.

Rsp Status Detail

is the specific condition of the connection. For a list of possible values, see [Response Status Detail Enumeration](#) on page 5-53

Switch Type

is the type of switch as indicated by the switch model number.

Switch Zone

is the zone within the layered topology where the switch is located. Possible values are 1, 2, or 3.

Switch Layer

is the layer within the switch zone. Possible values are 1, 2, 3, or 4.

CRU Slot

is the slot number of the specified CRU.

`CRU Type`

is the type of CRU located in the specified slot.

`CRU State`

is the state of the specified CRU. Possible values are enabled, DISABLED, ABSENT, and ERROR.

`CRU Fault LED`

indicates whether the fault LED for the specified CRU is on.

`Transceiver n`

is the type of transceiver in port *n* of the specified CRU.

`Transceiver Enabled`

indicates whether the transceiver in port *n* of the specified CRU is enabled.

`Transceiver Status`

indicates the status of the transceiver in port *n* of the specified CRU.

`Link Alive LED`

indicates whether the link-alive LED for the transceiver in port *n* of the specified CRU is on.

`Optical Signal`

indicates whether an optical signal is present.

STATUS SWITCH, ROUTER Command Example

This example shows the STATUS SWITCH command with the ROUTER option:

```
> STATUS SWITCH $ZZSMN, ROUTER 2
```

STATUS SWITCH		X Fabric					Y Fabric				
Response Status		ok					ok				
Rsp Status Detail		No Status Detail					No Status Detail				
Switch Type		Model 6780					Model 6780				
Switch Zone		1					1				
Switch Layer		2					2				
Router Instance		2					2				
Port Data		Router Port CRU					Router Port CRU				
		Type	Speed	Inrpt	Stat	S,P	Type	Speed	Inrpt	Stat	S,P
Router Port (00)		ext	125	idle	en	7,1	ext	125	idle	en	7,1
Router Port (01)		ext	125	idle	LOS	7,2	ext	125	idle	LOS	7,2
Router Port (02)		nu					nu				
Router Port (03)		nu					nu				
Router Port (04)		ric	125	idle	en	5	ric	125	idle	en	5
Router Port (05)		ric	125	idle	en	4	ric	125	idle	en	4
Router Port (06)		nu					nu				
Router Port (07)		ext	125	idle	en	11,4	ext	125	idle	en	11,4
Router Port (08)		ext	125	idle	TABS	12,1	ext	125	idle	LOS	12,1
Router Port (09)		ext	125	idle	LOS	13,2	ext	125	idle	LOS	13,2
Router Port (10)		ric	125	idle	en		ric	125	idle	en	
Router Port (11)		ric	125	idle	en		ric	125	idle	en	
Port Neighbor Data		Connected Zone/Layer Ports					Connected Zone/Layer Ports				
Router Port		7					7				
Firmware Revision		5_05					5_05				
Numeric Selector		9611					9711				
Neighbor Check		Query Must Pass					Query Must Pass				
Expt|Recv CRU S,P		11,4		11,4			11,4		11,4		
Expt|Recv Conf Ver		S3C0		S3C0			S3C0		S3C0		
Expt|Recv Conf Tag		9611		9611			9711		9711		
Expt|Recv Conf Rev		4_01		4_01			4_01		4_01		
Expected GUID		0x000008008e047f55					0x000008008e04b3f4				
Received GUID		0x000008008e047f55					0x000008008e04b3f4				

In this example:

Response Status

is the general condition of the connection. For a list of possible values, see [Response Status Enumeration](#) on page 5-53.

Rsp Status Detail

is the specific condition of the connection. For a list of possible values, see [Response Status Detail Enumeration](#) on page 5-53

Switch Type

is the type of switch as indicated by the switch model number.

Switch Zone

is the zone where the switch is located within the layered topology. Possible values are 1, 2, or 3.

Switch Layer

is the layer the switch occupies within the switch zone. Possible values are 1, 2, 3, or 4.

Router Instance

is the router instance number. Possible values are in the range 1 through 5.

Router Port (nn)

lists detailed information for each router port (00 through 11) on the specified router. Details appear in five columns:

Type

is the type of router port connection. Possible values are:

- | | |
|-----|--|
| ext | External port. The router port connects to an external transceiver port on a switch PIC (for a zone, layer, or node connection). |
| nu | Not used. |
| pkt | Packetizer port. |
| ric | Router interconnect. The router port connects to another router on the logic board or to a router interconnect PIC. There is no external connection. |

Speed

is the link speed (in MB/Sec) of the port. Possible values are 50 and 125.

Inrt

is the inport routing status. Possible values are:

- | | |
|------|--|
| ebxx | Externally blocked, where xx is the router port number |
| IBxx | Internally blocked, where xx is the router port number |
| idle | Port is idle |
| nbxx | Not blocked, where xx is the router port number |

Stat

is the status of the router port. For possible values, see [Table 5-4, Router Status Codes](#).

CRU S,P

is the slot number (S) and port number (P) of the switch PIC to which the router port is connected. For a router interconnect PIC, only the slot number appears because it has no ports.

Port Neighbor Data

contains information about the neighbor port, if it is a connected external port. The Port Neighbor Data section of the display appears multiple times if there are multiple zones and layers in the cluster. The neighbor port information includes:

Router Port

is the neighbor router port number.

Firmware Revision

is the version of firmware loaded on the 6780 switch

Numeric Selector

is the numeric selector setting of the 6780 switch

Neighbor Check

is the type of neighbor check to be performed to enable the port. For possible values, see [Table 5-2, Neighbor Checks](#).

Expt|Recv CRU S,P

is the expected and received values for the CRU slot (S) and port (P) numbers of the neighbor. The first column contains the expected values, and the second column contains the actual values received.

Expt|Recv Conf Ver

is the expected and received version of the neighbor configuration. The first column contains the expected configuration version, and the second column contains the actual configuration version received.

Expt|Recv Conf Tag

is the expected and received configuration tag of the neighbor. The first column contains the expected configuration tag, and the second column contains the actual configuration tag.

Expt|Recv Conf Rev

is the expected and received configuration revision of the neighbor. The first column contains the expected configuration revision, and the second column contains the actual configuration revision received.

Expected GUID

is the expected [Globally Unique ID](#) of the neighbor switch.

Received GUID

is the [Globally Unique ID](#) received from the neighbor switch.

STATUS SWITCH, SWITCHPORTS Command Example

This example shows the STATUS SWITCH command with the SWITCHPORTS option:

```
> STATUS SWITCH $ZZSMN, SWITCHPORTS
```

STATUS SWITCH				X Fabric						Y Fabric					
Response Status				ok						ok					
Rsp Status Detail				No Status Detail						No Status Detail					
Switch Type				Model 6780						Model 6780					
Switch Zone				1						1					
Switch Layer				2						2					
CRU	CRU	Connects		Transceiver				Router		Transceiver				Router	
Slot	Port	To		En	Stat	LED	OS	I,P	Stat	En	Stat	LED	OS	I,P	Stat
2	1	Zone	2	en	ok	on	pr	5,6	en	en	ok	on	pr	5,6	NCIP
	2		2	en	ok	on	pr	5,7	en	en	ok	on	pr	5,7	NCIP
3	1		2	en	ok	on	pr	5,8	en	en	ok	on	pr	5,8	NCIP
	2		2	en	ok	on	pr	5,5	en	en	ok	on	pr	5,5	NCIP
6	1	Node	17	en	ok	on	pr	1,0	WMPC	en	ok	on	pr	1,0	en
	2		18	en	ok	OF	LOS	1,1	LOS	en	ok	OF	LOS	1,1	LOS
7	1		19	en	ok	on	pr	2,0	en	en	ok	on	pr	2,0	en
	2		20	en	ok	OF	LOS	2,1	LOS	en	ok	OF	LOS	2,1	LOS
8	1		21	en	ok	OF	LOS	3,0	LOS	en	ok	OF	LOS	3,0	LOS
	2		22	en	ok	OF	LOS	3,1	LOS	en	ok	OF	LOS	3,1	LOS
9	1		23	BAD	CRU	STATUS		4,0	CABS	en	ok	OF	LOS	4,0	LOS
	2		24	BAD	CRU	STATUS		4,1	CABS	en	ok	OF	LOS	4,1	LOS
11	1	Layer	1	en	ok	on	pr	3,7	en	en	ok	on	pr	3,7	en
	2		1	en	ok	on	pr	4,7	en	en	ok	on	pr	4,7	en
	3		1	en	ok	on	pr	1,7	en	en	ok	on	pr	1,7	en
	4		1	en	ok	on	pr	2,7	en	en	ok	on	pr	2,7	en
12	1		4	en	FAULT	OF	LOS	2,8	TABS	en	ok	OF	LOS	2,8	LOS
	2		4	en	ok	OF	LOS	1,8	LOS	en	ok	OF	LOS	1,8	LOS
	3		4	ABSENT				4,8	TABS	en	ok	OF	LOS	4,8	LOS
	4		4	en	ok	OF	LOS	3,8	LOS	en	ok	OF	LOS	3,8	LOS
13	1		3	en	ok	OF	LOS	1,9	LOS	en	ok	OF	LOS	1,9	LOS
	2		3	en	ok	OF	LOS	2,9	LOS	en	ok	OF	LOS	2,9	LOS
	3		3	en	ok	OF	LOS	3,9	LOS	en	ok	OF	LOS	3,9	LOS
	4		3	en	ok	OF	LOS	4,9	LOS	en	ok	OF	LOS	4,9	LOS

In this example:

Response Status

is the general condition of the connection. For a list of possible values, see [Response Status Enumeration](#) on page 5-53.

Rsp Status Detail

is the specific condition of the connection. For a list of possible values, see [Response Status Detail Enumeration](#) on page 5-53

Switch Type

is the type of switch as indicated by the switch model number. The SWITCHPORTS option is valid only for 6780 switches.

Switch Zone

is the zone within the layered topology where the switch is located. Possible values are 1, 2, or 3.

Switch Layer

is the layer within the switch zone. Possible values are 1, 2, 3, or 4.

CRU Slot

is the slot number of the switch PIC CRU that contains the ports shown in the second column. CRUs in slots 2 and 3 contain the ports used for zone connections. CRUs in slots 6 through 9 contain the ports used for node connections. CRUs in slots 11 through 13 contain the ports used for layer connections. For more details, see [Table 5-3](#) on page 5-16.

CRU Port

is the port number on the switch CRU Slot shown in the first column.

Connects To

indicates where the CRU port should connect. The connection is to a specific zone, node, or layer number.

If the router port status is `en` (enabled), this value indicates where the port is actually connected. However, if the port is not enabled, use the `STATUS SWITCH $ZZSMN, router n` command and check the neighbor information to determine where the port is actually connected

Transceiver

describes the status of the transceiver in the specific CRU port. These four columns contain status information for the transceiver:

En

indicates whether the transceiver is enabled. Possible values are `en` (enabled) and `DS` (disabled).

Stat

indicates the status of the transceiver. Possible values are ok and FAULT.

LED

indicates the state of the transceiver LED. Possible values are on, OF (off), and BL (blinking).

OS

indicates the state of the optical signal for the transceiver. Possible values are pr (present) and LOS (lost optical signal).

A value of BAD CRU STATUS across all four columns indicates that the CRU has an error or is disabled. Other values that can appear in place of the four columns are CRU ABSENT, WRONG CRU TYPE, and TRANSCVR ABSENT. Issue the STATUS SWITCH command with the CRU option to get more detailed information.

Router

I, P

indicates the router instance (*I*) and router port (*P*). Router instance is in the range 1 through 5. Router port is in the range 00 through 11.

Stat

is the status of the indicated router. For possible values, see [Table 5-4, Router Status Codes](#).

VERSION PROCESS Command

The VERSION PROCESS command displays release version update (RVU) and software product revision (SPR) information about the ServerNet SAN manager process. VERSION is a nonsensitive command.

The VERSION command syntax is:

```
VERSION [ / OUT file-spec / ] PROCESS $ZZSMN [ , DETAIL ]
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

DETAIL

designates that complete RVU and SPR information be returned. If DETAIL is omitted, a single line of version information is returned.

Considerations

The VERSION PROCESS command, the VERSION SUBSYS command, and the VERSION command without an object type (for example the command VERSION \$ZZSMN) all display exactly the same information.

VERSION PROCESS Command Examples

This example displays the ServerNet SAN manager RVU and SPR information. The exact format of the output depends on the product modules involved.

```
> VERSION PROCESS $ZZSMN
VERSION PROCESS \SYS.$ZZSMN: SMN - T0502G08 - (11AUG03) - (28MAR03) - (AAL)
```

This example shows the information returned by the VERSION, DETAIL command:

```
> VERSION PROCESS $ZZSMN, DETAIL
```

```
Detailed VERSION PROCESS \SYS.$ZZSMN
SYSTEM \SYS
  SMN - T0502G08 - (11AUG03) - (28MAR03) - (AAL)
  GUARDIAN - T9050 - (Q06)
  SCF KERNEL - T9082G02 - (30APR03) (29JAN02)
  SMN PM - T0502G08 - (11AUG03) - (28APR03) - (AAL)
```

These descriptions explain the fields returned by the VERSION and VERSION, DETAIL commands:

```
SMN - T0502G08 - (11AUG03) - (28MAR03) - (AAL)
```

identifies the ServerNet SAN manager product name, product number and RVU, RVU date, compile date, and SPR identifier.

GUARDIAN - T9050 - (Q06)

identifies the SPR of the NonStop Kernel operating system.

SCF KERNEL - T9082G02 - (30APR03) (29JAN02)

identifies the product number and product version of the SCF Kernel, the RVU date, and the compile date.

SMN PM - T0502G08 - (11AUG03) - (28APR03) - (AAL)

identifies the product number and product version of the SCF product module, the RVU date, the compile date, and the SPR identifier.

VERSION SUBSYS Command

The VERSION SUBSYS command displays release version update (RVU) and software product revision (SPR) information about the ServerNet SAN manager process. VERSION is a nonsensitive command.

The VERSION command syntax is:

```
VERSION [ / OUT file-spec / ] SUBSYS $ZZSMN [ , DETAIL ]
```

OUT *file-spec*

causes any SCF output generated for this command to be directed to the specified file.

DETAIL

designates that complete RVU and SPR information be returned. If DETAIL is omitted, a single line of version information is returned.

Considerations

The VERSION PROCESS command, the VERSION SUBSYS command, and the VERSION command without an object type (for example the command VERSION \$ZZSMN) all display exactly the same information.

VERSION SUBSYS Command Examples

This example displays the ServerNet SAN manager RVU and SPR information. The exact format of the output depends on the product modules involved.

```
> VERSION SUBSYS $ZZSMN
VERSION SUBSYS \ANVIL.$ZZSMN: SMN - T0502G08 - (15NOV05) - (11OCT05) - (AAQ)
```

This example shows the information returned by the VERSION, DETAIL command:

```
> VERSION PROCESS $ZZSMN, DETAIL
Detailed VERSION SUBSYS \ANVIL.$ZZSMN
SYSTEM \ANVIL
  SMN - T0502G08 - (15NOV05) - (11OCT05) - (AAQ)
  GUARDIAN - T9050 - (Q06)
  SCF KERNEL - T9082G02 - (17DEC04) (30NOV04)
  SMN PM - T0502G08 - (15NOV05) - (11OCT05) - (AAQ)
```

These descriptions explain the fields returned by the VERSION and VERSION, DETAIL commands:

```
SMN - T0502G08 - (15NOV05) - (11OCT05) - (AAQ)
```

identifies the ServerNet SAN manager product name, product number and RVU, RVU date, compile date, and SPR identifier.

GUARDIAN - T9050 - (Q06)

identifies the SPR of the NonStop Kernel operating system.

SCF KERNEL - T9082G02 - (17DEC04) (30NOV04)

identifies the product number and product version of the SCF Kernel, the RVU date, and the compile date.

SMN PM - T0502G08 - (15NOV05) - (11OCT05) - (AAQ)

identifies the product number and product version of the SCF product module, the RVU date, the compile date, and the SPR identifier.

Response Status Enumeration

This list contains the values that might appear in the Response Status field of the INFO CONNECTION, INFO SWITCH, STATUS CONNECTION, and STATUS SWITCH command displays:

- ok
- LOW RESOURCES
- INVALID PARAMETER
- NO RESPONSE
- NEGATIVE ACKNOWLEDGMENT
- PARTIAL RESPONSE
- ABORT DUE TO POWER FAIL
- FILE DOWNLOAD FAILED
- OWNERSHIP ERROR
- NOT SUPPORTED
- CRC ERROR
- SWITCH OBJECT NOT FOUND
- BAD RDMA SWITCH STATE
- NO POINTER DIRECTORY
- INTERNAL BUFFER TOO SMALL
- SANMAN STILL INITIALIZING
- SWITCH DUMP FAILED

Response Status Detail Enumeration

This list contains the values that might appear in the Rsp Status Detail field of the INFO CONNECTION, INFO SWITCH, STATUS CONNECTION, and STATUS SWITCH commands:

- No Status Detail Error
- No Status Detail
- MSEB MISSING
- LINK DEAD
- PROCESSOR FABRIC DOWN
- CRU TYPE NOT MSEB
- BAD SCB LOADED
- NO NNA PIC
- NO MSEB CONFIG RECORD
- BAD MSEB CONFIG RECORD
- MSEB CONFIG FETCH ERROR
- SP I/O LIBRARY CALL ERROR
- INTERNAL SYS FABRIC DOWN
- NNA VERIFY FAILURE
- POWER UP
- TNET INITIALIZATION ERROR
- INVALID FABRIC PARAMETER

- TOO MANY SWITCHES
- MEMORY ALLOCATION FAILURE
- FILE NAME CONVERSION ERR
- FILE OPEN ERROR
- BAD FILE CODE
- FILE READ ERROR
- BAD FILE HEADER SIZE
- EMPTY FILE
- BAD FILE TYPE
- FILE POSITION CALL FAILED
- BAD READ SIZE
- BAD DIRECTORY COUNT
- NO MODULE
- BAD DOWNLOAD BLOCK COUNT
- BAD ATTRIBUTE LENGTH
- WRONG SUBSYSTEM ID
- WRONG ATTRIBUTE TYPE
- WRONG SWITCH POSITION ID
- BAD DSA COUNT
- BAD DOMA OFFSET
- BAD DOWNLOAD CODE OFFSET
- MULTIPLE BAD OFFSETS
- BAD DOWNLOAD BLOCK SIZE
- BAD DSA LENGTH
- CONFIG TAG NOT FOUND
- BAD SWITCH RESET REQ TYPE
- IMAGE FILE NOT LOCAL
- BAD EXPAND NODE NUMBER
- BAD FABRIC ID SETTING
- BAD SWITCH TAG
- BAD CONFIGURATION VERSION
- BAD NUMERIC SELECTOR
- BOTH CONFIGS INVALID
- BAD PACKETIZER TYPE
- BAD NODENUMBER BIT MASK
- BAD NODE ROUTING ID
- READ PRT DIRECTORY ERROR
- LINK BUNDLE IN USE
- INVALID IBC-3 FORMAT
- BAD COMMAND VERSION
- BAD IBC VERSION
- UNSUPPORTED IBC-3 COMMAND
- WRITE IN PROGRESS
- INVALID SERVERNET SPEED
- ALREADY IN USE
- LED CONTROL FAILED
- SIZE EXCEEDS WRITE AREA

- INITIAL CRC CHECK FAILED
- FLASH IMAGE UPDATE FAILED
- SEEROM UPDATE FAILED
- BAD TYPE ID
- SEEROM BOUNDS ERROR
- BAD CRU SLOT
- BAD SEEROM INSTANCE
- BAD USER DATA CRC
- UNDEFINED BITS TO BLINK
- BAD LED STATE
- INVALID ASIC TYPE
- INVALID ASIC INSTANCE
- INVALID ASIC REG ADDRESS
- INVALID NUM OF REGISTERS
- TEST VALUE MISMATCH
- LOCK HIERARCHY VIOLATION
- BAD LOCK SELECT
- BAD RESET TYPE
- BAD MODE
- INVALID ZONE AND/OR LAYER
- SMC RETURN NO SPACE
- SMC RETURN ERROR
- WRONG FABRIC
- BAD SWITCH PORT NUMBER
- UNKNOWN NACK CODE
- SW FIRMWARE RESP TIMEOUT
- BAD SWITCH DATA BLOCK EYE
- XFER INTERRUPT TIMEOUT
- PROCESS BECAME BACKUP
- PROCESS IS STOPPING
- SERVERNET TRANSFER ERROR
- NACK LOCATOR CRC ERROR
- NACK LOCATOR LENGTH ERROR
- NACK LOCATOR UPDATE FAIL
- BAD DATA FROM SWITCH
- INVALID PACKETIZER SNID
- INVALID DIRECTORY ADDRESS
- INVALID BARRIER ADDRESS
- INVALID SERVERNET SPEED
- INVALID FIRMWARE RESPONSE
- SWITCH RESET
- FILE PURGE ERROR
- FILE CREATE ERROR
- FILE WRITE ERROR
- DUPLICATE CONFIGURATION TAG
- NODE NUMBER MISMATCH
- NO SAVED DUMP EXISTS

- NACK SAVED DUMP EXISTS
- NACK INVALID DUMP ACTION
- NACK INVALID DUMP OPTION
- FILE ALREADY EXISTS

This section describes the types of error messages generated by SCF and provides the cause, effect, and recovery information for the SCF error messages specific to the ServerNet cluster subsystem and the external system area network manager process (SANMAN).

This section includes these main topics:

Heading	Page
Types of SCF Error Messages	6-1
ServerNet Cluster (SCL) Error Messages	6-2
SANMAN (SMN) Error Messages	6-8
If You Have to Call Your Service Provider	6-20

Types of SCF Error Messages

Command Parsing Error Messages

Command parsing error messages are generated when a command is being broken down into its component parts. These error messages have no associated error number and are generally self-explanatory. For example:

```
Expecting an existing SCF supported object name
Expecting an SCF command or a program file
```

Numbered Error Messages That SCF Generates

SCF generates numbered error messages that begin at 20000. For example:

```
SCF E20211 Invalid object type
```

Common Error Messages

SCF provides a pool of error messages, called common errors, that can be used by all subsystems. These errors always have negative error numbers. Each error message is preceded by the name of the subsystem in which the error is encountered and a character type code (E for critical or W for noncritical). For example:

```
SCL E-00005 Command is not supported by this subsystem
```

SCL Subsystem-Specific Error Messages

Error messages specific to the ServerNet cluster subsystem are generated by and pertain solely to the ServerNet cluster subsystem. These errors always have positive error numbers.

Like common errors, subsystem-specific error messages are divided into two classes—critical and noncritical:

- Critical messages can be serious, such as the notification of software errors for which there is no automatic recovery. Critical messages are preceded by an *E*.
- Noncritical messages are generally informational. Noncritical messages are preceded by a *W*.

SCF Error Message Help

To request help for any SCF error message, type:

```
-> HELP subsystem error-number
```

For example, if these messages appear on your terminal:

```
SCL E00003 Internal error. Case value out of range.  
SMN E00006 Processor switch failed.  
SCF E20211 Invalid object type
```

To display additional information:

```
-> HELP SCL 3  
-> HELP SMN 6  
-> HELP SCF 20211
```

ServerNet Cluster (SCL) Error Messages

The ServerNet cluster subsystem SCF error messages are listed in numeric order.

SCL Error 00001

```
SCL E00001 Internal error: Result code num returned from  
sysproc.
```

num

is the result code.

sysproc

is the name of the system procedure.

Cause. An internal error was caused by an unexpected return code from a system procedure.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Contact your service provider and retain a copy of the SCF, SCP, OSIMAGE, and CONFLIST files. (See [If You Have to Call Your Service Provider](#) on page 6-20.)

SCL Error 00002

```
SCL E00002 Duplicate attribute
```

Cause. You specified the same attribute more than once in the command.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Remove the duplicate attribute and reissue the command.

SCL Error 00003

```
SCL E00003 Internal error. Case value out of range.
```

Cause. An invalid case value was generated with no associated case label.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Contact your service provider and retain a copy of the SCF, SCP, OSIMAGE, and CONFLIST files. (See [If You Have to Call Your Service Provider](#) on page 6-20.)

SCL Error 00004

```
SCL E00004 Invalid MsgMon process qualifier, expected ZIMnn.
```

Cause. The optional MSGMON qualifier was not formatted correctly. This qualifier applies only to the TRACE PROCESS \$ZZSCL command.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct the MSGMON qualifier and reissue the command. The syntax for the qualifier is *ZIMnn*, where *nn* is in the range 00 through 15.

SCL Error 00005

```
SCL E00005 Invalid MsgMon qualifier range.
```

Cause. The MSGMON qualifier contains a numerical value representing the processor of a MSGMON process. This number is larger than 15.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct the MSGMON qualifier and reissue the command.

SCL Error 00006

```
SCL E00006 Not supported by the down-version system
(version).
```

Cause. The command was rejected by the ServerNet cluster monitor process (\$ZZSCL) because the information requested by the command is for an earlier product version.

Effect. The command is not executed. SCF waits for the next command.

Recovery. It is not possible to request information from a system running an incompatible product version of SCF. Contact your service provider to resolve the product version mismatch. (See [If You Have to Call Your Service Provider](#) on page 6-20).

SCL Error 00007

```
SCL E00007 Failure in service function. error: err-num,
```

err-num

is the error number returned from an internal procedure.

Cause. An unexpected error was returned from an internal procedure that was called by the ServerNet cluster monitor process (\$ZZSCL). For information on file-system errors, see the *Guardian Procedure Errors and Messages Manual*.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Consult the documentation on the returned file-system error to determine what to do next. Check the event logs for more information pertaining to the problem.

SCL Error 00008

```
SCL E00008 Unexpected error returned from $ZCNF, error err-
num, error detail: filesystem-err.
```

err-num

is the error number returned from the Configuration Manager process \$ZCNF.

filesystem-err

is the Guardian file-system error number. For information on file-system errors, see the *Guardian Procedure Errors and Messages Manual*.

Cause. An unexpected error was returned from the \$ZCNF process. The system configuration database might be corrupted.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Verify the database record using the SCF INFO command. If necessary, reload the system using a saved version of the system configuration database. If the problem persists, contact your service provider. (See [If You Have to Call Your Service Provider](#) on page 6-20.)

SCL Error 00009

```
SCL E00009 Processor switch failed, reason-text.
```

reason-text

is a text string that describes the reason the processor switch failed.

Cause. A processor switch was not performed. The process pair continues to execute in the current processors.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Verify the processors used by the ServerNet cluster monitor process. Retry the command if necessary.

SCL Error 00010

```
SCL E00010 MsgMon process does not exist.
```

Cause. The MSGMON process does not exist. The probable cause is that the processor hosting the MSGMON process is not running.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Check that the processor hosting the MSGMON process is loaded. Then reissue the command.

SCL Error 00011

```
SCL E00011 Subsystem start failure.
```

Cause. The ServerNet cluster subsystem failed to initiate START processing.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Check that ServerNet cables are connected from the node to the ServerNet II Switch. The subsystem cannot be started until the cables are connected and the external system area network (SAN) manager process (SANMAN) has communicated with the ServerNet II Switch. Check the event logs for error messages. Once you have resolved any problems, reissue the command.

SCL Error 00012

```
SCL E00012 Subsystem shutdown failure.
```

Cause. The subsystem failed to initiate shutdown processing.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Check the event logs for error messages. Once you have resolved any problems, reissue the command.

SCL Error 00013

```
SCL E00013 Trace command error. reason-text. error-code.
```

reason-text

is a text string that describes the reason the processor switch failed.

error-code

is the error code.

Cause. The subsystem failed to execute the TRACE PROCESS command.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct the command and reissue it. You can also check the event logs for additional error messages.

SCL Error 00014

```
SCL E00014 PROBLEMS attribute must be specified without any  
other attributes.
```

Cause. One or more attributes, such as DETAIL, were specified with the PROBLEMS option.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Reissue the command without the PROBLEMS attribute or make PROBLEMS the only attribute specified in the command.

SCL Error 00015

SCL E00015 BACKUP attribute is not allowed when tracing MSGMON.

Cause. A TRACE operation of a MSGMON process specified the BACKUP option, which is not allowed.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Reissue the command without the BACKUP attribute.

SANMAN (SMN) Error Messages

The ServerNet SAN Manager subsystem SCF error messages are listed in numeric order.

SMN Error 00001

```
SMN E00001 Internal error: Result code num returned from  
sysproc.
```

num

is the result code.

sysproc

is the name of the system procedure.

Cause. An internal error was caused by an unexpected return code from a system procedure.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Contact your service provider. (See [If You Have to Call Your Service Provider](#) on page 6-20.)

SMN Error 00002

```
SMN E00002 Duplicate attribute.
```

Cause. You entered the same attribute more than once in the command.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Remove the duplicate attribute and reissue the command.

SMN Error 00003

```
SMN E00003 Internal error. Case value out of range.
```

Cause. An invalid case value was generated with no associated case label.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Contact your service provider. (See [If You Have to Call Your Service Provider](#) on page 6-20.)

SMN Error 00004

```
SMN E00004 Not supported by the down revision SANMAN; SPI  
version version-num
```

Cause. The command was rejected by the external ServerNet SAN manager process (\$ZZSMN) because the information requested by the command is for an earlier product version.

Effect. The command is not executed. SCF waits for the next command.

Recovery. You cannot request information from a system running an incompatible version of SCF. Contact your service provider to resolve the version mismatch. (See [If You Have to Call Your Service Provider](#) on page 6-20.)

SMN Error 00005

```
SMN E00005 Failure in service function. error: err-num.
```

err-num

is the error number returned from an internal procedure.

Cause. An unexpected error was returned from an internal procedure that was called by the external ServerNet SAN manager process (\$ZZSMN). For information on file-system errors, see the *Guardian Procedure Errors and Messages Manual*.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Consult the documentation on the returned file-system error to determine what to do next. Check the event logs for more information pertaining to the problem.

SMN Error 00006

```
SMN E00006 Processor switch failed.
```

Cause. The processor switch was not performed. Possibly a nonexistent or halted processor was specified as the primary processor.

Effect. The command is not executed. The process pair continues to execute in the current processors. SCF waits for the next command.

Recovery. Verify the processors in use by the external ServerNet SAN manager process pair.

SMN Error 00007

```
SMN E00007 Trace command error. reason-text. error-code
```

reason-text

is a text string that describes the reason the processor switch failed.

error-code

is the error code.

Cause. The subsystem could not execute the TRACE PROCESS command.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Retype the command, making sure you type it correctly.

SMN Error 00008

```
SMN E00008 Error returned from the external ServerNet SAN  
manager.
```

Cause. An unexpected error was returned from the external ServerNet SAN manager process (\$ZZSMN) during the processing of a command.

This error is often preceded by one or two lines of additional text providing more specific information about the error. For example:

```
***ERROR:           Invalid Parameter  
***ERROR DETAIL: Bad Fabric ID Setting
```

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct the cause of the error and then reissue the command.

SMN Error 00009

```
SMN E00009 Unexpected error from $ZCNF, error: err-num,  
error detail: filesys-err.
```

err-num

is the error number returned from the Configuration Manager process \$ZCNF.

filesys-err

is the Guardian file-system error number. For information on file-system errors, see the *Guardian Procedure Errors and Messages Manual*.

Cause. An unexpected error was returned from the \$ZCNF process. The system configuration database might be corrupted.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Verify the database record using the SCF INFO SUBSYS command. Also, check the EMS log for an occurrence of SMN event 4224. If necessary, reload the system using a saved version of the system configuration database. If the problem persists, contact your service provider. (See [If You Have to Call Your Service Provider](#) on page 6-20.)

SMN Error 00030

```
SMN E00030 SANMAN SCF PM internal error at line line-num
```

Cause. Unknown:

Effect. Unknown; SCF waits for the next command.

Cause. Contact your service provider and retain a log of a VERSION PROCESS \$ZZSMN, DETAIL command.

SMN Error 00031

```
SMN 00031 The model of neither the X or Y switch can be  
determined.
```

Cause. A switch failure occurred, or a switch is not present.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct the switch problem and reissue the command.

SMN Error 00032

```
SMN 00032 The type of the specified switch can not be  
determined.
```

Cause. A switch failure occurred, or a switch is not present.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct the switch problem and reissue the command.

SMN Error 00033

```
SMN 00033 The X and Y switch types are not the same.
```

Cause. The X and Y switch types do not match.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Reissue the command first specifying the X switch and then again specifying the Y switch.

SMN Error 00034

```
SMN E00034 This command can only be executed interactively.
```

Cause. A sensitive command was executed noninteractively (that is, with a command file).

Effect. The command is not executed. SCF waits for the next command.

Recovery. Reissue the command from an interactive SCF session.

SMN Error 00035

```
SMN E00035 Incorrect ALTER SWITCH attributes
```

Cause. The command specified no attribute or more than one attribute to modify. Refer to the help text for ALTER SWITCH.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00036

```
SMN E00036 CRU attribute is not allowed for the specified switch
```

Cause. The command specified a CRU attribute, but the specified switch type does not support the CRU attribute.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00037

```
SMN E00037 Fabric is incorrectly specified.
```

Cause. The command incorrectly specified the fabric.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00038

```
SMN E00038 FABRICSETTING attribute is not allowed for the  
specified switch.
```

Cause. The command specified a FABRICSETTING attribute, but the specified switch does not support the FABRICSETTING attribute.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00039

```
SMN E00039 An FPGA file can not be downloaded to the  
specified switch.
```

Cause. The command specified an FPGA file, but the switch specified does not support loading an FPGA file.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00040

```
SMN E00040 No file to download was specified or more than one  
was specified.
```

Cause. The command did not specify a file to download or it specified more than one file.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00041

```
SMN E00041 Switch not specified or switch incorrectly  
specified.
```

Cause. The command was issued with either no switch specifier or an incorrect switch specifier.

Cause. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command. The FABRIC, ZONE, LAYER specification can be used only for switches in a layered topology.

SMN Error 00042

```
SMN E00042 Switch incorrectly specified.
```

Cause. The command was issued with an incorrect switch specifier.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command. The FABRIC, ZONE, LAYER specification can be used only for switches in a layered topology.

SMN Error 00043

```
SMN E00043 POSITION attribute is not allowed for the  
specified switch.
```

Cause. The command specified a POSITION attribute, but the specified switch does not support the POSITION attribute.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00044

```
SMN E00044 PORT attribute is not allowed for the specified  
switch.
```

Cause. The command specified a PORT attribute, but the specified switch does not support the PORT attribute.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00045

```
SMN E00045 SWITCHPORTS attribute is not allowed for the  
specified switch.
```

Cause. The command specified a SWITCHPORTS attribute, but the specified switch does not support the SWITCHPORTS attribute.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00046

SMN E00046 TOPOLOGY attribute is not allowed for the specified switch.

Cause. The command specified a TOPOLOGY attribute, but the specified switch does not support the TOPOLOGY attribute.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00047

SMN E00047 HARD or SOFT must be specified.

Cause. Neither HARD nor SOFT was specified in the command.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00048

SMN E00048 Incorrect combination of STATUS SWITCH attributes.

Cause. The command specified an incorrect combination of STATUS switch attributes. Refer to the help text for STATUS SWITCH.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00049

SMN E00049 The specified switch does not support the DUMP command.

Cause. The command specified a switch that does not support the DUMP command.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command. Refer to the help text for DUMP SWITCH. 6770 switches do not support the DUMP SWITCH command.

SMN Error 00050

```
SMN E0050 Incorrect combination of DUMP SWITCH attributes.
```

Cause. The command specified an incorrect combination of DUMP SWITCH attributes.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command. Refer to the help text for STATUS SWITCH.

SMN Error 00051

```
SMN E0051 FAULTLEDS attribute is not allowed for the  
specified switch
```

Cause. The command specified FAULTLEDS, but the specified switch does not support the FAULTLEDS option.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00057

```
SMN E0057 ALTER SUBSYS attribute is invalid
```

Cause. The command specified an attribute other than Z1Z2DIST, Z1Z3DIST, or Z2Z3DIST.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00058

```
SMN E0058 The specified distance attribute is out of range
```

Cause. The command specified an invalid value for the Z1Z2DIST, Z1Z3DIST, or Z2Z3DIST attribute. The value must be in the range from 1 to 15000 (meters).

Effect. The command is not executed. SCF waits for the next command.

Recovery. Reissue the command, specifying a valid distance between zones.

SMN Error 00070

```
SMN E00070 LOCATOR string longer than 32 characters.
```

Cause. The LOCATOR string specified exceeds the 6770 switch limit of 32 characters.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00071

```
SMN E00071 Incorrect specification of model 6770 switch.
```

Cause. The command incorrectly specified a switch. Specify a model 6770 switch using either the NEAREST or FABRIC specifier.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00072

```
SMN E00072 Incorrect specification of model 6770 switch.
```

Cause. The command incorrectly specified a switch. Specify a model 6770 switch using either the FABRIC or ONLY specifier.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00073

```
SMN E00073 When loading a 6770 switch CONFIG file, POSITION  
is required.
```

Cause. No POSITION was specified when loading a 6770 switch CONFIG file.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00074

```
SMN E00074 POSITION 3 is only valid with TOPOLOGY 24NODES.
```

Cause. POSITION 3 and TOPOLOGY 16NODES were specified in the command.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00075

```
SMN E00075 ROUTER router-instance is not allowed for model  
6770 switches.
```

Cause. The command specified a *router-instance* value. To display ROUTER status from a 6770 switch, omit the *router-instance* value.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00076

```
SMN E00076 When loading a 6770 switch CONFIG file, TOPOLOGY  
is required.
```

Cause. No TOPOLOGY was specified when loading a 6770 switch CONFIG file.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00080

```
SMN E00080 LOCATOR string longer than 64 characters.
```

Cause. The LOCATOR string specified exceeds the 6780 switch limit of 64 characters.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00081

```
SMN E00081 ROUTER router-instance must be 1 to 5 for 6780  
switch.
```

Cause. When displaying router status from a 6780 switch, *router-instance* must be in the range 1 to 5.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

SMN Error 00082

SMN E00082 PORT <i>router-port-number</i> must be 0 to 11 for 6780 switch.
--

Cause. When displaying router port status from a 6780 switch, *router-port-number* must be in the range 0 to 11.

Effect. The command is not executed. SCF waits for the next command.

Recovery. Correct and reissue the command.

If You Have to Call Your Service Provider

If the recovery for an error message indicates you should contact your service provider, be prepared to supply the following information. (If the error caused SCF to terminate, reenter SCF.)

1. Enter a LOG command to collect the following displays into a single file. For example:

```
-> LOG PROBLEM !
```

2. Enter a LISTPM command to collect information about the product versions of the SCF components, a list of the product modules on your system, and information about any product modules running when the error occurred. For example:

```
-> LISTPM
```

3. Enter a VERSION PROCESS, DETAIL command for any process you suspect could be related to the error. For example:

```
-> VERSION PROCESS process , DETAIL
```

4. Enter an ENV command to collect information about the SCF environment that was present when the error occurred. For example:

```
-> ENV
```

If the error caused SCF to terminate, respecify any environmental characteristics that were present when the error occurred.

5. Enter these commands to capture the contents of the SPI buffer:

```
-> DETAIL CMDBUFFER, ON
```

```
-> DETAIL RSPBUFFER, ON
```

6. Reproduce the sequence of commands that produced the SCF error.

A ServerNet Cluster Software

This section describes the software components of a ServerNet cluster including:

[NonStop Kernel Message System](#) on page A-1

[MSGMON](#) on page A-2

[SANMAN Subsystem](#) on page A-2

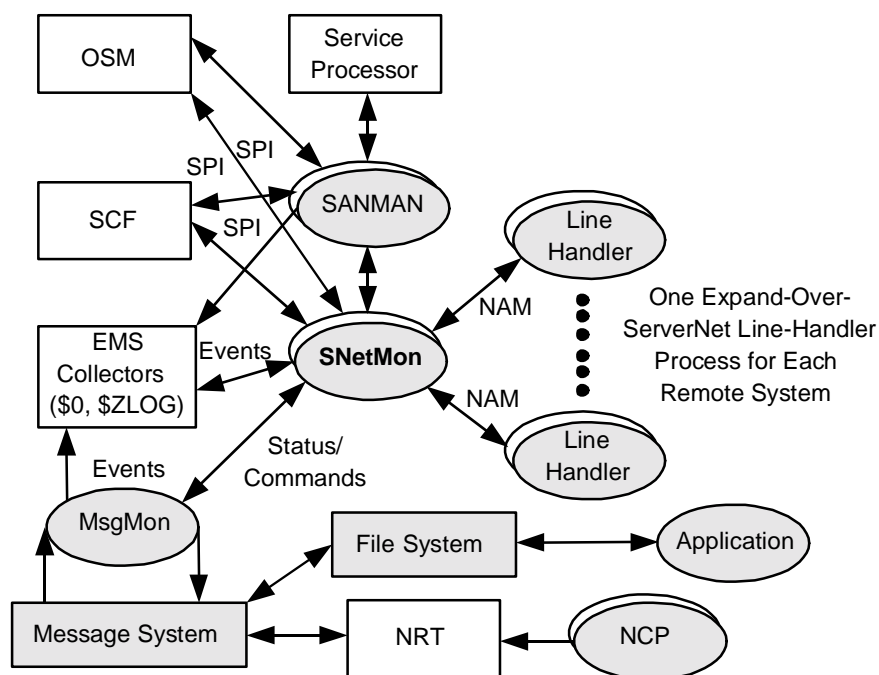
[ServerNet Cluster Subsystem](#) on page A-3

[SNETMON](#) on page A-3

[Expand-Over-ServerNet Line-Handler Processes](#) on page A-5

[Figure A-1](#) is a logical diagram that shows the interaction of ServerNet cluster processes.

Figure A-1. ServerNet Cluster Logical Diagram



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NonStop Kernel Message System

The NonStop Kernel message system provides the set of privileged application program interfaces (APIs) for interprocessor communication between processes residing on the same or on different nodes. The message system allows interprocessor communication between distinct nodes over the external ServerNet fabrics.

MSGMON

MSGMON is a monitor process that resides in each processor of a server and executes functions required by the message system. It handles communications between SNETMON and individual processors.

MSGMON was created to relieve the system monitor subsystem from being involved in ServerNet cluster duties. It is a helper for SNETMON.

MSGMON is a persistent process but not a process pair. Once it is started, it terminates only in the event of an internal failure or a termination message from the \$ZPM persistence manager. Once created, MSGMON is started by the \$ZPM persistence manager (and restarted as necessary). MSGMON can be stopped with an SCF ABORT PROCESS command or as a result of an internal failure.

This list shows the details for the MSGMON process:

Abbreviation	MSGMON
Description	Message monitor process
Subsystem Name	Not applicable
Subsystem Acronym	Not applicable
Subsystem Number	Not applicable
Recommended Generic Process Name	\$ZZKRN.#MSGMON
Process Name or Process Pair Name	\$ZIM _{nn} , where <i>nn</i> is a processor number
Product Number	Included in T0294
Program File Name	\$SYSTEM.SYS _{nn} .MSGMON

SANMAN Subsystem

The external system area network (SANMAN) subsystem enables control of the external ServerNet fabrics.

The SANMAN process in each ServerNet node provides the services needed to manage the external ServerNet fabrics and the cluster switches. Every SANMAN process has equal rights to manage the external fabrics. Each SANMAN process:

- Manages each node's access to the external ServerNet fabrics.
- Initializes, monitors, configures, and controls the switches.
- Polls the switches at regular intervals.
- Communicates with other processes or objects that require information from or about the external fabrics. These processes or objects can include OSM, SNETMON, and SCF.

The External System Area Network Manager is a process pair that runs in every NonStop S-series server connected to a ServerNet cluster. SANMAN can be run in any processor.

This list shows the details for the SANMAN process:

Abbreviation	SANMAN
Description	External system area network manager process
Subsystem Name	SMN
Subsystem Acronym	ZSMN
Subsystem Number	237
Recommended Generic Process Name	\$ZZKRN.#ZZSMN
Process Name or Process Pair Name	\$ZZSMN
Product Number	T0502
Program File Name	\$SYSTEM.SYS _{nn} .SANMAN

ServerNet Cluster Subsystem

The ServerNet cluster subsystem is the system configuration environment that enables ServerNet communication between processors in different nodes of a ServerNet cluster.

SNETMON

SNETMON is the Subsystem Programmatic Interface (SPI) server for ServerNet cluster subsystem-management commands. SNETMON:

- Supports the Expand-over-ServerNet line handlers using the Network Access Method (NAM) protocol.
- Manages the state of the ServerNet cluster subsystem.

ServerNet cluster subsystem state changes are logged to \$ZLOG as event ZCOM-EVT-SUMSTATE-CHG. The SNETMONs on each node have a peer-to-peer relationship with each other. Each SNETMON maintains the state of objects relevant to the local node and its connection to the ServerNet cluster. SNETMON maintains state information about:

- The ServerNet cluster subsystem on each member node.
- Each individual ServerNet path from a processor on the local node to a processor on a remote node.
- The Expand-over-ServerNet line-handler processes. SNETMON recognizes the identities (logical devices [LDEVs]) of the line handlers that bind to it and their process state.

- Detects the presence of other systems in the ServerNet cluster and establishes the ServerNet message-system connections.
- Monitors and responds to events that affect the message-system connections, such as processor failures, reloads, and path events.
- Receives path-event information from the individual processors in the node and translates this information into system-connection status information and EMS events.
- Responds to queries from OSM client applications using the Subsystem Programmatic Interface (SPI) protocol.
- Provides ServerNet status information to SNETMON clients.
- Keeps its backup process up to date.

This list shows the details for the SNETMON process:

Abbreviation	SNETMON
Description	ServerNet cluster monitor process
Subsystem Name	SCL
Subsystem Acronym	ZSCL
Subsystem Number	218
Recommended Generic Process Name	\$ZZKRN.#ZZSCL
Process Name or Process Pair Name	\$ZZSCL
Product Number	T0294
Program File Name	\$SYSTEM.SYS _{nn} .SNETMON

SNETMON Fault Tolerance

SNETMON is a fault-tolerant process pair. An SNETMON process pair exists on every node in a functioning ServerNet cluster. In the event of total failure of the SNETMON process, the \$ZPM persistence manager spawns a new SNETMON.

For fault tolerance, the SNETMON process pair can be configured to run on a list of processors. For example, in systems having eight processors, HP recommends that you configure SNETMON to run in the following CPU list: 2, 5, 6, 3, 7, 4. Refer to the *ServerNet Cluster 6780 Planning and Installation Guide* for more information.

The \$ZPM persistence manager starts the primary SNETMON process on the first processor in the list (processor 2), and the primary chooses the next processor in the list (processor 5) to start the backup. A failure in the primary processor (processor 2) causes a takeover. Processor 5 then becomes the primary, and a new backup SNETMON is created in the next processor in the list (processor 6). In this way, SNETMON can survive a variety of outages.

SNETMON Interaction With the Expand Line-Handler Processes

SNETMON interacts with the Expand line-handler processes using the NAM protocol to:

- Enable Expand line-handler processes to synchronize with each other during startup.
- Enable detection that the remote Expand line-handler process is down.
- Inform the appropriate local line-handler process when the ServerNet cluster connection to a remote node goes down.

Expand-Over-ServerNet Line-Handler Processes

The Expand subsystem is the networking software that connects NonStop S-series servers and other NonStop servers. It extends the operation of the fault-tolerant NonStop Kernel operating system to dispersed nodes. Expand-over-ServerNet is a communications medium for the Network Access Method (NAM). For more details on the Expand subsystem, see the *Expand Configuration and Management Manual*.

The Expand-over-ServerNet line-handler processes manage security-related messages and forward packets outside the ServerNet cluster. Secure message-system traffic between processes on different ServerNet nodes travels through the Expand-over-ServerNet line handlers and through the local message system between the communicating processes and the line handlers. Nonsecure message-system traffic flows directly between processors through the intersystem message-system ServerNet connections as directed by the Network Routing Table (NRT) under the control of Expand.

Expand-over-ServerNet lines are configured using the WAN subsystem.

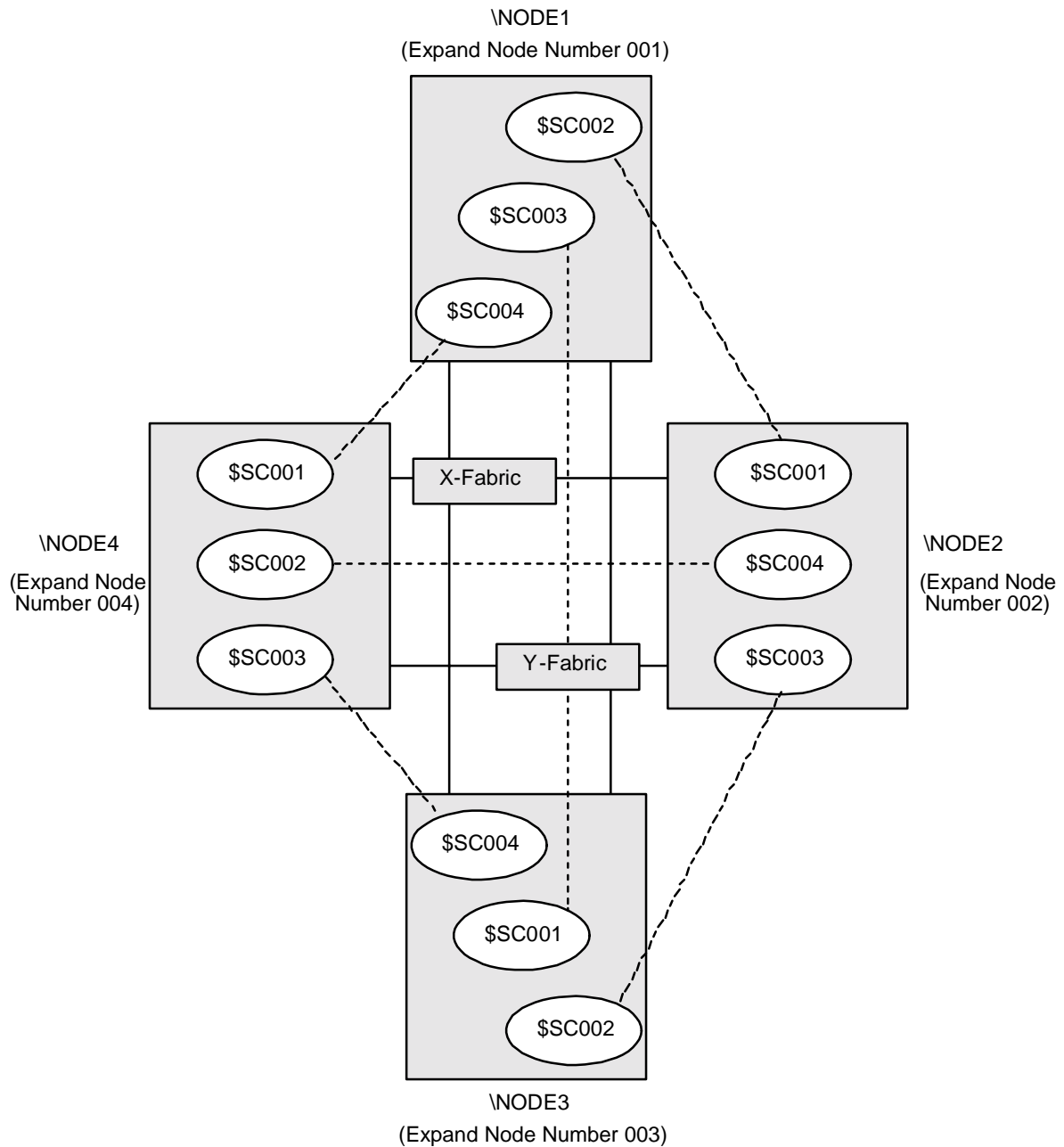
Note. Other messages, such as incoming and outgoing data, usually bypass the Expand-over-ServerNet line-handler process and are handled directly by the ServerNet X fabric and Y fabric and the message system. This behavior is known as Expand bypass mode.

Like the Expand-over-FOX line-handler process, each Expand-over-ServerNet line-handler process can support only a single line and a single neighbor node. So the Expand-over-FOX line-handler process and the Expand-over-ServerNet line-handler process are always separate processes with different logical devices (LDEVs).

This list summarizes information about the line-handler process:

Description	Expand-over-ServerNet line-handler process
Type	63
Subtype	4
Profile	PEXPSSN
ASSOCIATEDEV	\$ZZSCL (SNETMON)
Default	

[Figure A-2](#) shows the Expand-over-ServerNet line-handler processes for a four-node ServerNet cluster. The line-handler processes must follow the naming convention used by the Add Node to ServerNet Cluster action in the OSM Service Connection.

Figure A-2. Line-Handler Processes in a Four-Node Cluster

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Cable Connections in a Layered Topology

This appendix lists the cable connections between cluster switches in a layered topology. For more detail on cabling, see the *ServerNet Cluster 6780 Planning and Installation Guide*.

- Connections between the layers within a zone appear in [Table B-1](#).
- Connections between two zones appear in [Table B-2](#) and [Table B-3](#).
- Connections for three zones appear in [Table B-4](#) and [Table B-5](#).

Handling Fiber-Optic Cables

△ **Caution.** When connecting the cables:

- Handle the fiber-optic cables gently. Do not step on a fiber-optic cable or place a heavy object on top of a fiber-optic cable.
 - If the cable must be installed with a bend, make sure the bend radius is not smaller than 16 inches (3-4 mm).
-

Labeling Cables

If you need to replace a cable between switches, be sure to clearly label it to identify its connection.

On each label, include the fabric, zone, and layer of the switch, and the slot number, and port number the cable will be connected to. For example: switch X12, slot 12, port 1 one end of the cable and switch X14, slot 12, port 1 on the other end.

Connections Between Layers

Each layer cable connects to another switch in the same fabric and group with the same PIC slot and port number. Table 6-1 shows the connections for zone 1. Connections between layers are similar for zones 2 and 3.

Table B-1. Layer Cable Connections (Zone 1)

√	Switch	PIC Slot	Port	Connects to Switch	PIC Slot	Port
<input type="checkbox"/>	X11/Y11	11	1	X12/Y12	11	1
<input type="checkbox"/>	X11/Y11	11	2	X12/Y12	11	2
<input type="checkbox"/>	X11/Y11	11	3	X12/Y12	11	3
<input type="checkbox"/>	X11/Y11	11	4	X12/Y12	11	4
<input type="checkbox"/>	X11/Y11	12	1	X13/Y13	12	1
<input type="checkbox"/>	X11/Y11	12	2	X13/Y13	12	2
<input type="checkbox"/>	X11/Y11	12	3	X13/Y13	12	3
<input type="checkbox"/>	X11/Y11	12	4	X13/Y13	12	4
<input type="checkbox"/>	X11/Y11	13	1	X14/Y14	13	1
<input type="checkbox"/>	X11/Y11	13	2	X14/Y14	13	2
<input type="checkbox"/>	X11/Y11	13	3	X14/Y14	13	3
<input type="checkbox"/>	X11/Y11	13	4	X14/Y14	13	4
<input type="checkbox"/>	X12/Y12	12	1	X14/Y14	12	1
<input type="checkbox"/>	X12/Y12	12	2	X14/Y14	12	2
<input type="checkbox"/>	X12/Y12	12	3	X14/Y14	12	3
<input type="checkbox"/>	X12/Y12	12	4	X14/Y14	12	4
<input type="checkbox"/>	X12/Y12	13	1	X13/Y13	13	1
<input type="checkbox"/>	X12/Y12	13	2	X13/Y13	13	2
<input type="checkbox"/>	X12/Y12	13	3	X13/Y13	13	3
<input type="checkbox"/>	X12/Y12	13	4	X13/Y13	13	4
<input type="checkbox"/>	X13/Y13	11	1	X14/Y14	11	1
<input type="checkbox"/>	X13/Y13	11	2	X14/Y14	11	2
<input type="checkbox"/>	X13/Y13	11	3	X14/Y14	11	3
<input type="checkbox"/>	X13/Y13	11	4	X14/Y14	11	4

Connections Between Two Zones

[Table B-2](#) and [Table B-3](#) list the X-fabric and Y-fabric connections between zones in a two-zone cluster.

Table B-2. X Fabric Connections Between Two Zones

✓	Switch	PIC Slot	Port	Connects to ...		
				Switch	PIC Slot	Port
<input type="checkbox"/>	X11	2	1	X21	2	2
<input type="checkbox"/>	X11	2	2	X21	2	1
<input type="checkbox"/>	X11	3	1	X21	3	2
<input type="checkbox"/>	X11	3	2	X21	3	1
<input type="checkbox"/>	X12	2	1	X22	2	2
<input type="checkbox"/>	X12	2	2	X22	2	1
<input type="checkbox"/>	X12	3	1	X22	3	2
<input type="checkbox"/>	X12	3	2	X22	3	1
<input type="checkbox"/>	X13	2	1	X23	2	2
<input type="checkbox"/>	X13	2	2	X23	2	1
<input type="checkbox"/>	X13	3	1	X23	3	2
<input type="checkbox"/>	X13	3	2	X23	3	1
<input type="checkbox"/>	X14	2	1	X24	2	2
<input type="checkbox"/>	X14	2	2	X24	2	1
<input type="checkbox"/>	X14	3	1	X24	3	2
<input type="checkbox"/>	X14	3	2	X24	3	1

eft

Table B-3. Y Fabric Connections Between Two Zones

✓				Connects to ...		
	Switch	PIC Slot	Port	Switch	PIC Slot	Port
<input type="checkbox"/>	Y11	2	1	Y21	2	2
<input type="checkbox"/>	Y11	2	2	Y21	2	1
<input type="checkbox"/>	Y11	3	1	Y21	3	2
<input type="checkbox"/>	Y11	3	2	Y21	3	1
<input type="checkbox"/>	Y12	2	1	Y22	2	2
<input type="checkbox"/>	Y12	2	2	Y22	2	1
<input type="checkbox"/>	Y12	3	1	Y22	3	2
<input type="checkbox"/>	Y12	3	2	Y22	3	1
<input type="checkbox"/>	Y13	2	1	Y23	2	2
<input type="checkbox"/>	Y13	2	2	Y23	2	1
<input type="checkbox"/>	Y13	3	1	Y23	3	2
<input type="checkbox"/>	Y13	3	2	Y23	3	1
<input type="checkbox"/>	Y14	2	1	Y24	2	2
<input type="checkbox"/>	Y14	2	2	Y24	2	1
<input type="checkbox"/>	Y14	3	1	Y24	3	2
<input type="checkbox"/>	Y14	3	2	Y24	3	1

Connections For Three Zones

[Table B-4](#) and [Table B-5](#) list the X-fabric and Y-fabric connections between zones in a three-zone cluster.

Table B-4. X Fabric Connections for a Three-Zone ServerNet Cluster

✓	Switch	PIC Slot	Port	Connects to ...		
				Switch	PIC Slot	Port
<input type="checkbox"/>	X11	2	1	X21	2	2
<input type="checkbox"/>	X11	3	1	X21	3	2
<input type="checkbox"/>	X11	2	2	X31	2	1
<input type="checkbox"/>	X11	3	2	X31	3	1
<input type="checkbox"/>	X12	2	1	X22	2	2
<input type="checkbox"/>	X12	3	1	X22	3	2
<input type="checkbox"/>	X12	2	2	X32	2	1
<input type="checkbox"/>	X12	3	2	X32	3	1
<input type="checkbox"/>	X13	2	1	X23	2	2
<input type="checkbox"/>	X13	3	1	X23	3	2
<input type="checkbox"/>	X13	2	2	X33	2	1
<input type="checkbox"/>	X13	3	2	X33	3	1
<input type="checkbox"/>	X14	2	1	X24	2	2
<input type="checkbox"/>	X14	3	1	X24	3	2
<input type="checkbox"/>	X14	2	2	X34	2	1
<input type="checkbox"/>	X14	3	2	X34	3	1
<input type="checkbox"/>	X21	2	1	X31	2	2
<input type="checkbox"/>	X21	3	1	X31	3	2
<input type="checkbox"/>	X22	2	1	X32	2	2
<input type="checkbox"/>	X22	3	1	X32	3	2
<input type="checkbox"/>	X23	2	1	X33	2	2
<input type="checkbox"/>	X23	3	1	X33	3	2
<input type="checkbox"/>	X24	2	1	X34	2	2
<input type="checkbox"/>	X24	3	1	X34	3	2

Table B-5. Y Fabric Connections for a Three-Zone ServerNet Cluster

✓	Switch	PIC Slot	Port	Connects to ...		
				Switch	PIC Slot	Port
<input type="checkbox"/>	Y11	2	1	Y21	2	2
<input type="checkbox"/>	Y11	3	1	Y21	3	2
<input type="checkbox"/>	Y11	2	2	Y31	2	1
<input type="checkbox"/>	Y11	3	2	Y31	3	1
<input type="checkbox"/>	Y12	2	1	Y22	2	2
<input type="checkbox"/>	Y12	3	1	Y22	3	2
<input type="checkbox"/>	Y12	2	2	Y32	2	1
<input type="checkbox"/>	Y12	3	2	Y32	3	1
<input type="checkbox"/>	Y13	2	1	Y23	2	2
<input type="checkbox"/>	Y13	3	1	Y23	3	2
<input type="checkbox"/>	Y13	2	2	Y33	2	1
<input type="checkbox"/>	Y13	3	2	Y33	3	1
<input type="checkbox"/>	Y14	2	1	Y24	2	2
<input type="checkbox"/>	Y14	3	1	Y24	3	2
<input type="checkbox"/>	Y14	2	2	Y34	2	1
<input type="checkbox"/>	Y14	3	2	Y34	3	1
<input type="checkbox"/>	Y21	2	1	Y31	2	2
<input type="checkbox"/>	Y21	3	1	Y31	3	2
<input type="checkbox"/>	Y22	2	1	Y32	2	2
<input type="checkbox"/>	Y22	3	1	Y32	3	2
<input type="checkbox"/>	Y23	2	1	Y33	2	2
<input type="checkbox"/>	Y23	3	1	Y33	3	2
<input type="checkbox"/>	Y24	2	1	Y34	2	2
<input type="checkbox"/>	Y24	3	1	Y34	3	2

C Part Numbers

Use this appendix to check the part numbers for hardware associated with a ServerNet Cluster. The service classification for all components is CRU-3. For more information about service categories, refer to the CSSI Web (**Start>Programs>HP CSSI Web>CSSI Web**)

[Switch Rack](#)

[Switch](#)

[Switch Components](#)

[Uninterruptible Power Supply \(UPS\)](#)

[Power Distribution Unit \(PDU\)](#)

[Power Cords](#)

[Power Cords for Connecting a 6780 Switch to a PDU or UPS](#)

[Power Cords for Connecting a 6780 Switch Directly to an External Power Source](#)

[Fiber-Optic Cables](#)

[ESD Protection Kit](#)

[Modular ServerNet Expansion Board \(MSEB\)](#)

Switch Rack

Part Number	Description
527136	HP 10642 Rack

Switch

Part Number	Description
524392	HP NonStop ServerNet Switch (model 6780), including: <ul style="list-style-type: none">● Rack mount kit● Cable management assembly● 6780 HP ServerNet Switch bezel
524393	HP NonStop ServerNet Switch
524939	HP NonStop ServerNet Switch bezel
526272	Rack mount kit, including: <ul style="list-style-type: none">● Rails: left front, left rear right front, and right rear● 10 Torx screws, M6● 4 black nylon ties
526272	Cable management assembly, including: <ul style="list-style-type: none">● Cable management assembly● Cable labels for fiber-optic cables● 4 black nylon ties

Switch Components

Part Number	Description	Slot
523978	Logic board	14
523793	Fan	16 and 17
523808	Power Supply	15 and 18
524986	Blank PIC	1 through 13
523811	Maintenance PIC	1
523810	Router interconnect PIC	4, 5, and 10
523809	Quad Multimode (MMF) fiber PIC Zone or Layer	2 and 3, 11 through 13
524984	Dual Single-mode fiber (SMF) PIC Zone or Node, ports 1 and 2 populated	2 and 3, 6 through 9

Uninterruptible Power Supply (UPS)

Part Number	Description	Voltage	VA	Area
527133	R3000XR UPS NEMA L6-20P	208 User selectable for 200, 208, 220, 230, 240V through the front panel	3000	North America
527294	R3000XR UPS High NEMA L6-20P	200 User selectable for 200, 208, 220, 230, 240V through the front panel	3000	Japan
527295	R3000XR UPS IEC 309	230 User selectable for 208, 220, 230, 240V through the front panel	3000	International
527134	R3000XR Extended run-time module (ERM)	Not applicable	3000	All areas North America/ Asia/Europe

Power Distribution Unit (PDU)

Part Number	Description	Voltage	Amps	Area
527135	PDU Attached input power cord NEMA L6-30P	HV	24	North America Asia
527296	Attached input power cord IEC 309	HV	32	International

Power Cords

Power Cords for Connecting a 6780 Switch to a PDU or UPS

Part Number	Length	Description	Voltage	Amps	Area
527182	4.5 feet	IEC-IEC connector Switch-to-UPS or PDU	250	10	All
527183	10 feet	IEC-IEC connector Switch-to-UPS or PDU	250	10	All

Power Cords for Connecting a 6780 Switch Directly to an External Power Source

Part Number	Length	Description	Voltage	Amps	Area
T24242	2.77 meters (9 feet)	C13 receptacle	125	10	North America
522835	2.5 meters (8 feet 2 inches)	L5-15P connector C13 receptacle	125	15	North America
522836	2.5 meters (8 feet 2 inches)	L6-15P connector C13 receptacle	250	15	North America
T21747	9.1 feet	18AWG C13 receptacle	250	10	North America
U39146	2.5 meters (8 feet 2 inches)	18AWG SPCL C13 receptacle	125	10	North America
T32341	15 feet	18AWG C13 receptacle	125	10	North America
429666	2.5 meters (8 feet 2 inches)	IRAM (government requirement) C13 receptacle	250	10	Argentina
522890	2.5 meters (8 feet 2 inches)	Commission for conformity certification of electrical equipment (CCEE) C13 receptacle	250	10	China
T24493	6.7 feet	SHLD SVT IEC 18AWG C13 receptacle	125	10	North America
T24490	2.5 meters	C13 receptacle	250	10	Continental Europe

Part Number	Length	Description	Voltage	Amps	Area
T32342	4.5 meters	C13 receptacle	250	10	Continental Europe
T24495	2.5 meters	C13 receptacle	250	10	Denmark
T65383	4.5 meters	C13 receptacle	250	10	Denmark
T24494	2.5 meters	C13 receptacle	250	10	Italy
T65382	4.5 meters	C13 receptacle	250	10	Italy
T24493	2.5 meters	C13 receptacle	250	10	Switzerland
T65381	4.5 meters	C13 receptacle	250	10	Switzerland
U37883	2.5 meters (8 feet 2 inches)	C13 receptacle	250	10	India South Africa
T24491	2.5 meters (8 feet 2 inches)	C13 receptacle	250	10	Australia
T65379	4.5 meters	C13 receptacle	250	10	Australia
T24492	2.5 meters	C13 receptacle	250	10	Britain
T65380	4.5 meters	C13 receptacle	250	10	Britain

Fiber-Optic Cables

Table C-1. Duplex SMF With LC to SC Connectors for Node Connections

Part Number	Length	Description
522748	10 meters (32.8 feet)	Riser-rated
526082	40 meters (131 feet)	Ruggedized plenum-rated
526083	80 meters (262.5 feet)	Ruggedized plenum-rated

Table C-2. Duplex MMF With LC to LC Connectors for Layer or Zone Connections

Part Number	Length	Description
522745	2 meters (6.6 feet)	Riser-rated
522517	10 meters (32.8 feet)	Riser-rated

ESD Protection Kit

Part Number	Description
T99247-A00	Electrostatic discharge (ESD) kit

Modular ServerNet Expansion Board (MSEB)

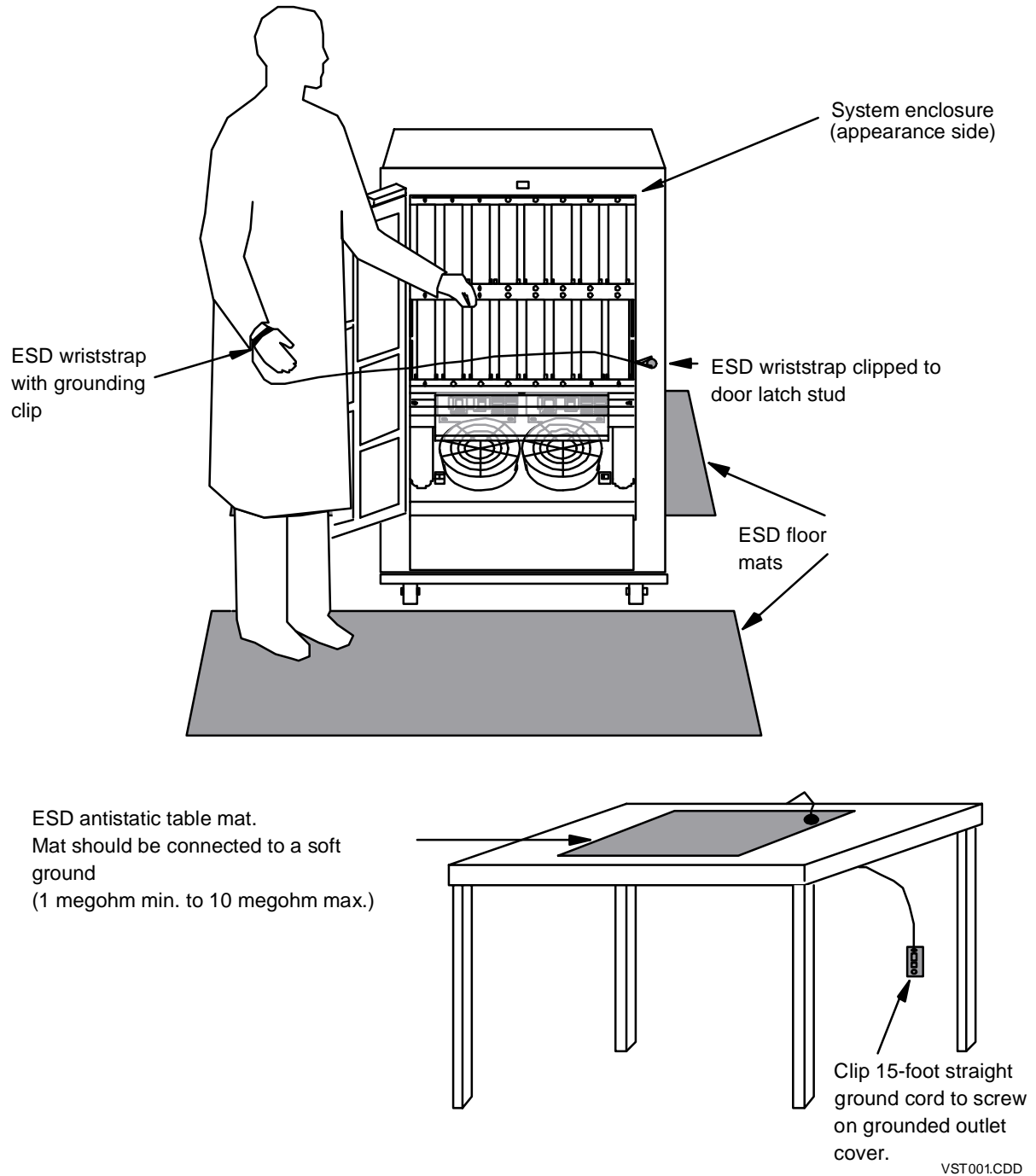
Part Number	Description
424991	Modular ServerNet Expansion Board
425105	ServerNet single-mode fiber NNA PIC

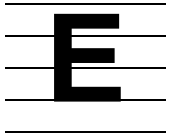
D ESD Information

Observe these ESD guidelines when servicing electronic components:

- Obtain an electrostatic discharge (ESD) protection kit and follow the directions that come with the kit. You can purchase an ESD kit from HP (T99247-A00) or from a local electronics store. Ensure that your ESD wriststrap has a built-in series resistor and that the kit includes an antistatic table mat.
- Before you unpack a replacement CRU, place the CRU package on the antistatic table mat and attach the grounding clip on your wriststrap to the mat.
- When you unpack the CRU, do not cut into the ESD protective bag surrounding the CRU. The protective bag protects the CRU and can be reused for storing a CRU.
- Before you move the CRU from the antistatic table mat, attach the grounding clip from your ESD wriststrap to any unpainted metal surface on the CRU frame.
- Before you bring a CRU in contact with a system enclosure, attach the grounding clip on your ESD wriststrap to any unpainted metal surface on the enclosure frame.
- When you remove a CRU from a system enclosure, first pull the CRU partly out of the slot and then attach the grounding clip on your ESD wriststrap to any unpainted metal surface on the CRU frame.
- Store CRUs that require ESD protection in ESD protective bags. [Figure B-1](#) on page B-2 shows how to use an ESD kit when servicing CRUs.

Figure D-1. Using ESD Protection When Servicing CRUs





Numeric Selector Settings for the Long-Distance Option

Specific numeric selector settings are reserved for the long-distance option of the layered topology. This option is available only if all required software components are installed. For a list of numeric selectors and other details about the long-distance option, see the *ServerNet Cluster 6780 Planning and Installation Guide* .



Safety and Compliance

Regulatory Compliance Statements

The following warning and regulatory compliance statements apply to the products documented by this manual.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The use of shielded cables is required in order for this equipment to meet the FCC emission limits.

Any changes or modifications not expressly approved by Hewlett Packard Computer Corporation could void the user's authority to operate this equipment.

CISPR Compliance

This equipment complies with the requirements of CISPR 22 (EN 55 022) for Class A Information Technology Equipment (ITE). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Canadian Compliance

This class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Taiwan (BSMI) Compliance

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Japan (VCCI) Compliance

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case the user may be required to take corrective actions.



DECLARATION OF CONFORMITY

Supplier Name: **HP COMPUTER CORPORATION**

Supplier Address: **HP Computer Corporation,
NonStop Enterprise Division
10300 North Tantau Ave
Cupertino, CA 95014
USA**

Represented in the EU By:
Hewlett Packard Company
P.O. Box 81 02 44
81902 Munich
Germany

Declares under our sole responsibility that the following product

Product Name: **HP ServerNet Switch**
Product Model No: **HP 6780**

Conforms to the following normative European and International Standards.

Product Safety:	EN60950:2000	IEC 60950 3rd Edition
Electromagnetic Compatibility:	EN 55022:1998 EN 61000-3-2:1995 EN 61000-3-3:1995 EN 55024:1998	Radiated and Conducted Emission Harmonic Current Emission Voltage Fluctuation and Flicker EMC Immunity

Following the provisions of the normative European Council Directives:

EMC Directive 89/336/EEC (including amendments)
Low Voltage Directive 73/23/EEC (amended by 93/68/EEC)

Supplementary Information:

Safety: **Protection Class I, Pollution Degree II**
Emissions: **EMC Class A**
Year Assessed/First Production: **2002**

Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment at Hewlett Packard's compliance laboratories in Cupertino, California or at accredited laboratories accepted by European Union Notified and Competent Bodies.

Derek Smith
Manager, Hardware Product Assurance
NonStop Enterprise Division
Cupertino, California

Consumer Safety Statements

Customer Installation and Servicing of Equipment

The following statements pertain to safety issues regarding customer installation and servicing of equipment described in this manual.

Do not remove the covers of an HP ServerNet switch.

CAUTION: This unit has more than one power supply cord. Disconnect all power supply cords to completely remove power from this unit.

Attention: Cet appareil comporte plus d'un cordon d'alimentation. Débrancher tous les cordons d'alimentation afin de couper complètement l'alimentation de cet équipement.

Glossary

6770 Switch. See [HP NonStop Cluster Switch \(model 6770\)](#).

6780 Switch. See [HP NonStop ServerNet Switch \(model 6780\)](#).

action. An operation that can be performed on a selected resource.

adapter. See [ServerNet adapter](#).

alternate path. A path not enabled as the preferred path. An alternate path can become a primary path when a primary path is disabled. Contrast with [primary path](#).

appearance side. The side of a system enclosure that contains, behind a door, disk customer-replaceable units (CRUs) and power monitor and control unit (PMCU) CRUs. The appearance side is the side opposite the service side. System enclosures are typically arranged so that the appearance side is the most visible side. See also [service side](#).

application program interface (API). A set of functions or procedures that are called by an application program to communicate with other software components.

application-specific integrated circuit (ASIC). A custom-built integrated circuit (IC) used to perform highly specialized functions.

ASIC. See [application-specific integrated circuit \(ASIC\)](#).

attachment. A file that contains information that augments the information in an incident report.

attribute. (1) For the Subsystem Control Facility (SCF), a characteristic of an entity. For example, two attributes of a process might be its program file and its user ID. An attribute is sometimes called a modifier. (2) For the HP Open System Management (OSM) Interface, a data item associated with a resource. All attributes can be viewed, and some can be modified.

backplane. A board that has connectors, on one or both sides of the board, into which circuit board assemblies plug. Backplanes are located behind card cages.

backup processor. A processor running the NonStop Kernel operating system that communicates with the primary processor, allowing the processors to remain independent. A component failure in one processor has no effect on any other processor. Contrast with [primary processor](#).

base enclosure. An enclosure that is placed on the floor and can have other enclosures stacked on top of it. A base enclosure is installed on a frame base.

block. A grouping of one or more system enclosures that a NonStop S-series system recognizes and supports as one unit. A block can consist of either one processor

enclosure, one I/O enclosure, or one processor enclosure with one or more I/O enclosures attached.

boot. A synonym for load. Load is the preferred term used in this and other NonStop S-series system manuals. See [load](#).

cable channel. A cable management conduit that protects the cables that run between two system enclosures in a double-high stack. Each system enclosure has two cable channels running vertically on its service side: one on the left-hand side of the enclosure, and one on the right-hand side of the enclosure.

cable guidepost. A cable management rod that routes cables exiting the upper enclosure in a double-high stack to prevent the cables from hanging down in front of the customer-replaceable units (CRUs) in the base enclosure. A cable guidepost extends from the base of each cable channel.

cable support. A piece of cable management hardware that secures system cables. The cable support attaches to the service side of a system enclosure near the bottom of the enclosure. Cable ties for securing system cables are threaded through the cable support. The cable support also contains the group and module ID labels and the rear group service light-emitting diode (LED).

card cage. A structure made up of slots that hold components such as customer-replaceable units (CRUs) and ServerNet adapters.

carrier. (1) A sheet-metal structure that allows a single-high ServerNet adapter to be installed in a ServerNet adapter slot designed for a double-high ServerNet adapter.
(2) An electrical signal that carries data.

CE. Customer engineer. See [service provider](#).

central processing unit (CPU). Historically, the main data processing unit of a computer. A NonStop S-series system has multiple cooperating processors rather than a single CPU. See also [processor](#).

channel. An information route for data transmission. See also [ServerNet link](#).

checksum. A generic term, meaning to “add” together (although the definition of add need not be a normal arithmetic add) all of the data to produce a check word. See also [cyclic redundancy check \(CRC\)](#).

CIIN. A command file in the SYS_{nn} subvolume that is read and executed by the startup TACL process after system load if the CIIN file is specified in the CONFTEXT file.

client. A software process, hardware device, or combination of the two that requests services from a server. Often, the client is a process residing on a programmable workstation and is the part of an application that provides the user interface. The workstation client might also perform other portions of the application logic.

cluster. (1) A collection of servers, or nodes, that can function either independently or collectively as a processing unit. See also [ServerNet cluster](#). (2) A term used to describe a system in a [Fiber Optic Extension \(FOX\)](#) ring. More specifically, a FOX cluster is a collection of processors and I/O devices functioning as a logical group. In FOX nomenclature, the term is synonymous with system or node.

cluster number. A number that uniquely identifies a node in a [FOX](#) ring. This number can range from 1 through 14. See also [node number](#).

cluster switch. An assembly that routes ServerNet messages across an external fabric of a ServerNet cluster. See [HP NonStop Cluster Switch \(model 6770\)](#) and [HP NonStop ServerNet Switch \(model 6780\)](#).

cluster switch group. Within an external ServerNet fabric, all of the 6780 switches that belong to the same cluster switch zone. The cluster switches within a group are connected via four vertical tetrahedrons. A cluster switch group can consist of up to four 6780 switches. All of the cluster switches that form a cluster switch group typically are installed in the same [cluster switch rack](#). See also [cluster switch layer](#) and [cluster switch zone](#).

cluster switch layer. The topological cluster switch position within a [cluster switch group](#). Each cluster switch group consists of four layers, numbered 1 to 4 from bottom to top. A [cluster switch layer](#) is equivalent to a [cluster switch](#) and provides connections for up to eight ServerNet nodes. See also [cluster switch layer number](#).

cluster switch layer number. A number in the range 1 through 4 that identifies the position of a [cluster switch](#) within a cluster switch group. See also [cluster switch group](#).

cluster switch logic board. A circuit board that provides switching logic for the [HP NonStop ServerNet Switch \(model 6780\)](#). The logic board (LB) has a front panel for operator and maintenance functions.

cluster switch rack. A mechanical frame consisting of or based on a 19-inch rack that supports the hardware necessary for a [cluster switch group](#).

cluster switch zone. A pair of X-fabric and Y-fabric [cluster switch groups](#) and the ServerNet nodes connected to them. The zone always contains two cluster switch groups with the cluster switches on each fabric connected by intrazone cables. A cluster switch zone can support up to 32 nodes.

CME. See [correctable memory error \(CME\)](#).

cold load. A synonym for system load or load (in the case of single processor load). System load or load is the preferred term in this and other NonStop S-series system manuals. See [system image tape \(SIT\)](#) and [load](#).

command. A demand for action by or information from a subsystem or the operation demanded by an operator or application. A command is typically conveyed as an interprocess message from an application to a subsystem.

command file. An EDIT file that contains a series of commands and serves as a source of command input.

communications line. A two-way link consisting of processing equipment, I/O devices, protocol conventions, and cables that connect a computer to other computers.

communications subsystem. The combination of data communications hardware and software processes that function together as an integrated unit to provide services and access to wide and local area networks.

configuration. (1) The arrangement of enclosures, system components, and peripheral devices into a working unit. (2) The definition or alteration of characteristics of an object.

configuration planner. The person who manages system configuration changes and software configuration changes. This person modifies the system configuration database for system configuration changes and creates a new operating system image for software configuration changes.

connection. (1) The path between two protocol modules that provides reliable stream delivery service. (2) For the OSM software, the logical link established between the OSM software and the NonStop S-series system after a logon sequence has been performed. The two types of logical connections are service processor (SP)s and low-level links.

connector. See [port](#).

controller. See [ServerNet addressable controller \(SAC\)](#).

correctable memory error (CME). An error caused by incorrect data at a particular memory location. The cause of the error is such that the error is automatically corrected by the system. Contrast with [uncorrectable memory error \(UCME\)](#).

CPU. See [central processing unit \(CPU\)](#).

CRC. See [cyclic redundancy check \(CRC\)](#).

CRU. See [customer-replaceable unit \(CRU\)](#).

CUSTFILE. An EDIT file included on every site update tape (SUT) as \$SYSTEM.Annnnnnn.CUSTFILE, where *nnnnnnn* is the system serial number of the target system. The CUSTFILE contains information on the software products on the [SUT](#), their related files, and the destination and use of each file. HP customizes information in the CUSTFILE for each customer's system.

customer engineer (CE). See [service provider](#).

customer-replaceable unit (CRU). A unit that can be replaced in the field by customers or by qualified personnel trained by HP. CRUs are divided into the categories of Class 1,

Class 2, and Class 3 according to the risk of causing a system outage if the documented replacement procedure is not followed correctly and how much CRU-replacement training or experience is advisable. See also [field-replaceable unit \(FRU\)](#).

cyclic redundancy check (CRC). The most widely used error detection code for ensuring the integrity of transmitted data. The digits of the CRC are calculated by the sender for each block of data sent and recalculated by the receiver. It is a family of mathematical functions involving computing the quotient and remainder of a polynomial division. A CRC is a form of checksum. See also [checksum](#).

dedicated LAN. An Ethernet LAN for use only by OSM applications. This LAN connects system consoles with the Ethernet ports on the [processor multifunction \(PMF\) CRUs](#) in group 01 of a NonStop S-series server. A dedicated LAN supports NonStop S-series servers and system consoles but does not support any other types of servers or workstations. See also [public LAN](#).

destination ServerNet ID (DID). A field in the [ServerNet packet](#) header indicating the intended destination for the packet.

detailed report. A complete listing of status or configuration information provided by the Subsystem Control Facility (SCF) STATUS or INFO command when you use the DETAIL option. Contrast with [summary report](#)

dial-out point. A [system console](#) from which incident reports are sent to a service provider. Incident reports are sent only from the system consoles defined as the primary and backup dial-out points.

DID. See [destination ServerNet ID \(DID\)](#).

discovery. For the OSM package, the process of identifying the resources that exist on a NonStop S-series server.

disk drive. A device that stores and accesses data on a disk. The two types of disk drives are magnetic and optical. Random access to addressable locations on a magnetic disk is provided by magnetic read/write heads. Random access to addressable locations on an optical disk is provided by a low-intensity laser. Optical disk drives are not supported in G-series RVUs. See also [volume](#).

DNS. See [Domain Name System \(DNS\)](#).

DNS server. A server that resolves hostnames to Internet protocol (IP) address mapping queries. These queries originate either from client computers, which are known as resolvers, or from other Domain Name System (DNS) servers, which accounts for the distributed nature of DNS. See also [Domain Name System \(DNS\)](#) and [node](#).

domain. A set of objects over which control or ownership is maintained. Types of domains include power domains and service processor (SP) domains.

Domain Name System (DNS). A system that defines a hierarchical, yet distributed, database of information about hosts on a network. The network administrator configures the DNS with a list of hostnames and Internet protocol (IP) addresses, allowing users of workstations that are configured to query the DNS to specify remote systems by hostnames rather than by IP addresses. DNS domains should not be confused with Windows NT networking domains. See also [node](#) and [ping](#).

double-wide plug-in card (PIC). A large-form-factor [plug-in card \(PIC\)](#) that occupies two adjacent PIC slots within a customer-replaceable unit (CRU). See also [single-wide plug-in card \(PIC\)](#).

download. The process of transferring software from one location to another, where the transferring entity initiates the transfer.

downtime. Time during which a computer system is not capable of doing useful work because of a planned or unplanned outage. From the end user's perspective, downtime is any time a needed application is not available.

dual-ported. The capability of a ServerNet adapter or peripheral device to receive data and commands from two sources although only one source might have access at any particular moment.

E4SA. See [Ethernet 4 ServerNet adapter \(E4SA\)](#).

ECL. See [emitter-coupled logic \(ECL\)](#).

ECL ServerNet cable. A ServerNet cable that uses emitter-coupled logic (ECL). Prior to the introduction of the modular ServerNet expansion board (MSEB), ECL was the only ServerNet cable technology used by NonStop S-series servers. The MSEB supports connection of this cable using an ECL plug-in card. See also [emitter-coupled logic \(ECL\)](#).

electromagnetic interference (EMI). Forms of conducted or radiated interference that might appear in a facility as either normal or common-mode signals. The frequency of the interference can range from the kilohertz to gigahertz range. However, the most troublesome interference signals are usually found in the kilohertz to low megahertz range. At present, the terms electromagnetic interference and [radio frequency interference \(RFI\)](#) are usually used interchangeably.

electrostatic discharge (ESD) protection kit. A kit containing an antistatic mat and a wrist strap with a cable and clip. A service provider or customer wears the wrist strap while performing maintenance procedures inside an enclosure. The wrist strap and cable contain grounding wires so that when the clip is attached to a metal object, such as the enclosure, the person wearing the wrist strap is grounded, and any static electricity incurred during the procedure is discharged safely to the enclosure instead of to electrical components within the enclosure.

EMI. See [electromagnetic interference \(EMI\)](#).

emitter-coupled logic (ECL). A logic that expresses digital signals in differential negative voltage levels, from -8 volts to -1.8 volts. NonStop S-series servers containing ServerNet expansion boards (SEBs) use ECL cables. An ECL plug-in card (PIC) allows the modular SEB (MSEB) to use ECL ServerNet cables.

EMS. See [Event Management Service \(EMS\)](#).

EMS collector. An Event Management Service (EMS) process to which subsystems report events.

enclosure. Similar to a cabinet in NonStop K-series systems. An enclosure can contain components of a system or a peripheral. Base enclosures are placed on the floor and can have other enclosures stacked on top of them. Stackable enclosures can be placed on top of other enclosures. See also [system enclosure](#).

error number. For the Subsystem Programmatic Interface (SPI), a value that can be assigned to a return token, or to the last field of an error token, to identify an error that occurred. SPI defines a small set of error numbers, but most error numbers are defined by subsystems.

ESD kit. See [electrostatic discharge \(ESD\) protection kit](#).

Ethernet. A local area network (LAN) that uses the carrier sense multiple access with collision detection (CSMA/CD) access method on a bus topology and is the basis for the IEEE 802.3 standard.

Ethernet 4 ServerNet adapter (E4SA). A ServerNet adapter for Ethernet local area networks (LANs) that contains four Ethernet ports.

Ethernet hub. A multiport repeater typically supporting 10BaseT cabling. Most hubs are connectors for 8 or 12 cables. Also referred to as a concentrator.

Event Management Service (EMS). A Distributed Systems Management (DSM) product that provides event collection, event logging, and event distribution facilities. EMS provides different event descriptions for interactive and programmatic interfaces, lets an operator or an application select specific event-message data, and allows for flexible distribution of event messages within a system or network.

event message. Text intended for a system operator that describes a change in some condition in the system or network, whether minor or serious. The change of condition is called an event. Events can be operational errors, notifications of limits exceeded, requests for actions needed, and so on. See also [operator message](#).

Expand line-handler process. A process pair that handles incoming and outgoing Expand messages and packets. An Expand line-handler process handles direct links and also binds to other processes using the [Network Access Method \(NAM\)](#) interface to support Expand-over-X.25, Expand-over-FOX, Expand-over-ServerNet, Expand-over-TCP/IP, and Expand-over-SNA links. See also [Expand-over-ServerNet line-handler process \(Expand/SvNet\)](#).

Expand network. The NonStop Kernel operating system network that extends the concept of fault-tolerant operation to networks of geographically distributed NonStop systems. If the network is properly designed, communication paths are constantly available even if there is a single line failure or component failure.

Expand node. A system in an Expand network. See also [node](#).

Expand node number. A number in the range 0 through 254, sometimes referred to as the system number. The Expand node number is used to identify a node in an Expand network. Each Expand node number must be unique within the network. See also [ServerNet node number](#).

Expand-over-ServerNet line. The single [line](#) associated with an Expand-over-ServerNet line-handler process. An Expand-over-ServerNet line has the same name and logical device number as its Expand-over-ServerNet line-handler process. However, it does not have the same states as the line-handler process.

Expand-over-ServerNet line-handler process (Expand/SvNet). An Expand line-handler process that uses the NETNAM protocol to access the network access method (NAM) interface provided by the ServerNet monitor process, \$ZZSCL. The Expand-over-ServerNet line-handler process handles incoming and outgoing Expand messages. It also handles packets leaving the server and security-related messages going between systems within the cluster. Each node in a ServerNet cluster must be configured with an Expand-over-ServerNet line-handler process for each other node in the ServerNet cluster.

extensible input/output (XIO). A redesign of the NonStop Kernel operating system's I/O subsystem to enable it to extend itself in general ways to meet future requirements.

external fabric connection. The low-level ServerNet connection between a node and one of the external ServerNet fabrics. Each node has an X and a Y connection to the external fabrics.

external routing. The routing of packets over the external ServerNet fabrics—that is, between systems (or nodes) in a ServerNet cluster. See also [internal routing](#).

external ServerNet X or Y fabric. The X or Y fabric that links servers in a ServerNet cluster. See also [internal ServerNet X or Y fabric](#).

external system area network manager process (SANMAN). (1) A process that provides management access to the external ServerNet X and Y fabrics.

fabric. A complex set of interconnections through which there can be multiple and (to the user) unknown paths from point to point. The term fabric is used to refer to the X or Y portion of the ServerNet communications network; for example, the X fabric.

factory-installed operating system. The version of the operating system image that HP creates with a CONFTEXT file, OSIMAGE file, and configuration database that

matches your order. Your system is shipped with this version installed in the system subvolume \$SYSTEM.SYS00.

Fast Ethernet ServerNet adapter (FESA). A single-ported ServerNet adapter that supports 100-megabit per second (Mbps) and 10-Mbps Ethernet data transfer rates on a NonStop S-series server. The FESA installs directly into an existing Ethernet port, and one FESA is supported per system enclosure.

fault tolerance. The ability of a NonStop S-series system to continue processing despite the failure of any single software or hardware component within the system.

FESA. See [Fast Ethernet ServerNet adapter \(FESA\)](#).

Fiber Optic Extension (FOX). Refers to two products, FOX II and ServerNet/FX, which allow you to create high-speed (up to 4 megabytes/second) networks of as many as 14 systems connected by dual fiber-optic cables.

fiber-optic ServerNet cable. A ServerNet cable using a medium for data transmission that conveys light or images through glass or plastic fibers. Fiber-optic cables (light guides) are a direct replacement for conventional coaxial cable and wire pairs. NonStop S-series servers support two types of fiber-optic ServerNet cables: single-mode and multimode. See also [multimode fiber-optic \(MMF\) cable](#) and [single-mode fiber-optic \(SMF\) cable](#).

field-programmable gate array (FPGA). A programmable integrated circuit that can be customized to perform specific functions.

field-replaceable unit (FRU). A unit that can be replaced in the field only by qualified personnel trained by HP and cannot be replaced by customers. A unit is classified as a FRU because of safety hazards such as weight, size, sharp edges, or electrical potential; contractual agreements with suppliers; or national or international standards. See also [customer-replaceable unit \(CRU\)](#).

file name. A unique name for a file. File names for disk files normally have at least two parts (the disk name and the file name); an example of a file name on a PC is B:MYFILE. In the Guardian environment on a NonStop S-series system, disk file names include a disk volume name, a subvolume name, and a file identifier. An example of such a file name is \$DISK.SUBVOL.MYFILE. For files that are network accessible, the node name precedes the volume name: \NODE.\$DISK.SUBVOL.MYFILE.

file transfer protocol (FTP). A data communications protocol that is used for transferring files between systems.

filler panel. A blank faceplate that is installed in place of a ServerNet adapter to ensure proper ventilation within a system enclosure.

FIR. See [FRU information record \(FIR\)](#).

FIRINIT. A diagnostic task used to update the communications line interface processor (CLIP) FRU information record (FIR) that is kept in the ServerNet wide area network (SWAN) concentrator CLIP flash memory.

FIRMUP. A diagnostic task used to update the copy of the Portable Silicon Operating System (pSOS) system product embedded kernel that is kept in the [SWAN concentrator](#) communications line interface processor (CLIP) flash memory.

firmware. Code in memory that is necessary for the power-up initialization and communication with a host or device. The software for components of the ServerNet architecture (for example, an adapter) is called firmware. Some firmware for ServerNet components is downloaded when the system or component is loaded.

fixed process configuration. Use of the Subsystem Control Facility (SCF) to configure a generic process to always start in the first available processor (that is, to be fault tolerant).

flash PROM. A type of programmable read-only memory (PROM) that is electrically reprogrammable.

FOX. See [Fiber Optic Extension \(FOX\)](#).

FOX monitor process. The Fiber Optic Extension (FOX) monitor process for the ServerNet/FX adapter subsystem. The process name is \$ZZFOX.

FOX ring. The fiber-optic cabling that connects the FOX clusters. Also used to refer to the topology of a FOX network.

FOXMON. See [FOX monitor process](#).

FPGA. See [field-programmable gate array \(FPGA\)](#).

FRU. See [field-replaceable unit \(FRU\)](#).

FRU information record (FIR). A collection of information that every field-replaceable unit (FRU) carries with it, such as part number, revision, track ID, and media access control (MAC) address.

GB. See [gigabyte \(GB\)](#).

GCSC. See [Global Customer Support Center \(GCSC\)](#).

generic process. A process created and managed by the Kernel subsystem. Also known as a system-managed process. A common characteristic of a generic process is persistence. See also [persistence](#).

gigabyte (GB). A unit of measurement equal to 1,073,741,824 bytes (1024 megabytes). See also [kilobyte \(KB\)](#), [megabyte \(MB\)](#), and [terabyte \(TB\)](#).

Global Customer Support Center (GCSC). A support organization that provides telephone and remote diagnostic support for HP customers. The GCSCs are located all over the world.

globally unique ID (GUID). A unique, read-only number stored in nonvolatile memory (EEPROM) on a ServerNet II Switch at the time of manufacture. This number can be used programmatically to identify the switch.

graphical user interface (GUI). A user interface that offers point-and-click access to program functions.

group. The set of all objects accessible by a pair of service processors (SPs) located in the [processor multifunction \(PMF\) CRU](#). In a NonStop S-series server, there is one group in a [system enclosure](#).

GUI. See [graphical user interface \(GUI\)](#).

GUID. See [globally unique ID \(GUID\)](#).

guided procedure. A software tool that assists you in performing complex configuration or replacement tasks on a NonStop S-series server. Guided procedures are accessible from the Start menu on your system console. Examples include Replace SEB or MSEB, Configure ServerNet Node, and Replace IOMF.

hard reset. An action performed on a cluster switch that reinitializes the router-2 ASIC within the switch, disrupting the routing of ServerNet messages through the switch for several minutes. When the hard reset is finished, the paths are restored automatically.

hop count. The number of routers that form a route between a ServerNet source and ServerNet destination. Hop count is used to determine the best route. If two alternate routes have the same [time factor \(TF\)](#), the path with the lower hop count is the better route.

HP NonStop Cluster Switch (model 6770). The [cluster switch](#) used with star, split-star, and tri-star topologies. The 6770 switch consists of a ServerNet II Switch, an uninterruptible power supply (UPS), and AC transfer switch, and it can be packaged in a switch enclosure or in a 19-inch rack. See also [HP NonStop ServerNet Switch \(model 6780\)](#).

HP NonStop ServerNet Switch (model 6780). The [cluster switch](#) used in the layered topology. The 6780 switch consists of a switch logic board, a midplane, plug-in cards, power supplies, and fans. See also [HP NonStop Cluster Switch \(model 6770\)](#).

IBC. See [in-band control \(IBC\)](#).

IEEE 802.3 protocol. Institute of Electrical and Electronics Engineers (IEEE) standard defining the hardware layer and transport layer of (a variant of) Ethernet. The maximum segment length is 500 meters and the maximum total length is 2.5

kilometers. The maximum number of hosts is 1024. The maximum packet size is 1518 bytes.

in-band control (IBC). A symbol-based communications protocol for communicating management information across a ServerNet link without interfering with any application traffic in the network. In ServerNet II, IBC traffic is via standard ServerNet packets. ServerNet I used the Illegal Symbol variation of IBC. This technique uses a subset of the available symbols to convey control information from one node to another. The symbol subset chosen is from the group of symbols that are not for passing data; these symbols are usually considered illegal or unused.

incident report. A report sent by the OSM software to the OSM Notification Director. If remote notification (dial-out) is configured, the OSM Notification Director forwards incident reports to a service provider. The three types of incident reports are problem incident reports, periodic incident reports, and software configuration incident reports.

input/output process (IOP). A running program (part of the NonStop Kernel operating system) that manages the I/O functions for one or more ServerNet addressable controllers (SACs) of the same type.

internal routing. The routing of packets within a NonStop S-series server. See also [external routing](#).

internal ServerNet X or Y fabric. The X or Y fabric that links ServerNet devices within a NonStop S-series server. See also [external ServerNet X or Y fabric](#).

Internet protocol (IP). A data communications protocol that handles the routing of data through a network, which typically consists of many different subnetworks. IP is connectionless; it routes data from a source address to a destination address. See also [IP address](#).

interprocessor communication (IPC). The exchange of messages between processors in the same system or node.

I/O enclosure. A NonStop S-series system enclosure containing one module, which includes ServerNet adapters, disk drives, components related to the ServerNet fabrics, and components related to electrical power and cooling for the enclosure. An I/O enclosure is identical to a processor enclosure except that it contains [I/O multifunction \(IOMF\) CRUs](#) instead of [processor multifunction \(PMF\) CRUs](#).

IOMF CRU. See [I/O multifunction \(IOMF\) CRU](#).

I/O multifunction (IOMF) CRU. (1) A NonStop S-series customer-replaceable unit (CRU) that connects an I/O enclosure to a processor enclosure through a ServerNet cable and supplies power to the components within the IOMF CRU as well as redundantly to the disk drives, SCSI terminators, and ServerNet adapters in that enclosure. The IOMF CRU contains a power supply, a service processor (SP), a ServerNet router, an Ethernet controller, an external ServerNet port, and three SCSI ServerNet addressable

controllers (S-SACs) in a single unit. (2) A collective term for both IOMF CRUs and IOMF 2 CRUs when a distinction between the two types of CRUs is not required.

IOP. See [input/output process \(IOP\)](#).

IP. See [Internet protocol \(IP\)](#).

IP address. An address that identifies a specific host to the [Internet protocol \(IP\)](#). An IP address consists of two parts: a network address, which identifies the network, and a local address, which identifies a host within a network. A network address is concatenated with a host address to form the IP address and uniquely identify a host within a network. IP routes data between source and destination IP addresses.

IPC. See [interprocessor communication \(IPC\)](#).

KB. See [kilobyte \(KB\)](#).

Kernel subsystem. In G-series RVUs, the subsystem for configuration and management of the Subsystem Control Facility (SCF) subsystem managers that are [generic processes](#), some system attributes, and the ServerNet X and Y fabrics.

Kernel subsystem manager process. The generic process that starts and manages other generic processes, some system attributes, and the ServerNet X and Y fabrics in G-series RVUs. The \$ZZKRN Kernel subsystem manager process is started and managed by the \$ZPM persistence manager process. See also [generic process](#).

kilobyte (KB). A unit of measurement equal to 1024 bytes. See also [gigabyte \(GB\)](#), [megabyte \(MB\)](#), and [terabyte \(TB\)](#).

LAN. See [local area network \(LAN\)](#).

layered topology. The network topology for ServerNet clusters using the HP NonStop ServerNet Switch (model 6780). The layered topology can scale by adding cluster switch layers or zones. The layered topology supports up to four layers and three zones. See also [star topologies](#).

LIF. See [logical interface \(LIF\)](#).

line. The specific hardware path over which data is transmitted or received. A line can also have a process name associated with it that identifies an input/output process (IOP) or logical device associated with that specific hardware path.

line-handler process. See [Expand line-handler process](#) or [Expand-over-ServerNet line-handler process \(Expand/SvNet\)](#).

linker. The process or server that invokes the message system to deliver a message to some other process or server.

listener. The process or server that is notified by the message system that a message from some other process or server is being delivered.

load. (1) To transfer the NonStop Kernel operating system image or a program from disk into a computer's memory so that the operating system or program can run. (2) To insert a tape into a tape drive, which prepares it for a tape operation (read or write).

local area network (LAN). A network that is located in a small geographical area and whose communications technology provides a high-bandwidth, low-cost medium to which low-cost nodes can be connected. One or more LANs can be connected to the system such that the LAN users can access the system as if their workstations were connected directly to it. Contrast with [wide area network \(WAN\)](#).

local node. See [local system](#).

local processor. A processor in the same node as the ServerNet cluster monitor process (SNETMON) that is reporting status about the processor.

local system. From the perspective of a particular SNETMON, the system or node on which that SNETMON is running. From the perspective of an OSM operator, the system to which the operator is logged on. One of the characteristics of a local system is that it does not have active external ServerNet paths to itself. See also [remote node](#).

logic board. See [cluster switch logic board](#).

logical device name. The name assigned to an I/O process during its configuration. Other processes use the logical device name when issuing OPEN, READ, WRITEREAD, and CLOSE Guardian procedure calls to the I/O process.

logical device number. A number that identifies a particular I/O device in the system. Logical device numbers are assigned to physical I/O devices.

logical interface (LIF). A process that allows an application or another process to communicate with data communications hardware.

master service processor (MSP). A service processor (SP) that provides the basic service processor functions as well as centralized system functions such as a console port, a modem port for remote support functions, and system-load control. The enclosure containing processors 0 and 1 (group 01) contains a pair of MSPs.

MB. See [megabyte \(MB\)](#).

Measure. A tool used for monitoring the performance of NonStop S-series systems. Measure can be used to check the performance of a ServerNet cluster.

megabyte (MB). A unit of measurement equal to 1,048,576 bytes (1024 kilobytes). See also [gigabyte \(GB\)](#), [kilobyte \(KB\)](#), and [terabyte \(TB\)](#).

message monitor process (MSGMON). A helper process for [SNETMON](#) that runs in each processor on every node of a ServerNet cluster. MSGMON is started by [\\$ZPM](#) (the persistence manager process). It performs duties for SNETMON in those instances where SNETMON needs an agent in each system processor. In addition, MSGMON monitors the connections within the processor and reports changes back to SNETMON when required.

MFIOB. See [multifunction I/O board \(MFIOB\)](#).

mirrored disk or volume. A pair of identical disk drives that are used together as a single logical volume. One drive is considered primary, and the other is called the mirror. Each byte of data written to the primary drive is also written to the mirror drive. If the primary drive fails, the mirror drive can continue operations. See also [volume](#).

modular ServerNet expansion board (MSEB). A [ServerNet expansion board \(SEB\)](#) that uses plug-in cards (PICs) to provide a choice of connection media for routing ServerNet packets. See also [ServerNet expansion board \(SEB\)](#).

module. A set of components sharing a common interconnection, such as a backplane. A module is a subset of a [group](#), and it is usually contained in an [enclosure](#). In a NonStop S-series server, there is one module in a group.

MRouter. A [field-programmable gate array \(FPGA\)](#) or [application-specific integrated circuit \(ASIC\)](#) that is part of the serial maintenance bus (SMB) architecture. The MRouter distributes the SMB throughout a group.

(M)SEB. SEB or MSEB. See [ServerNet expansion board \(SEB\)](#) and [modular ServerNet expansion board \(MSEB\)](#).

MSEB. See [modular ServerNet expansion board \(MSEB\)](#).

MSEB CBB. See [MSEB common base board \(CBB\)](#).

MSEB common base board (CBB). In modular ServerNet expansion boards (MSEBs), the printed wiring assembly (PWA) into which plug-in cards (PICs) are installed.

MSEB port. A connector on modular ServerNet expansion boards (MSEBs) used for ServerNet links. An MSEB has four fixed serial-copper-based ports and six [plug-in card \(PIC\)](#) slots that accept a variety of connection media. See also [SEB port](#).

MSGMON. See [message monitor process \(MSGMON\)](#).

MSP. See [master service processor \(MSP\)](#).

multifunction I/O board (MFIOB). A ServerNet adapter that contains ServerNet addressable controllers (SACs) for SCSI and Ethernet; a [service processor \(SP\)](#); ServerNet links to the processor, to the two ServerNet adapter slots, and to one of the ServerNet expansion board (SEB) slots; and connections to the serial maintenance bus (SMB), which connects components within an enclosure to the service processor.

multilane link. A communication link between cluster switches that can consist of multiple ServerNet cables. Two-lane links and four-lane links are examples of multilane links.

multimode fiber-optic (MMF) cable. A fiber-optic cable that either allows more than one mode to propagate or supports propagation of more than one mode of a given wavelength. MMF cable typically supports shorter transmission distances than [single-mode fiber-optic \(SMF\) cable](#).

NAM. See [Network Access Method \(NAM\)](#).

\$NCP. See [network control process](#).

network. Two or more computer systems (nodes) connected so that they can exchange information and share resources. See also [Expand network](#), [wide area network \(WAN\)](#), and [local area network \(LAN\)](#).

Network Access Method (NAM). The interface through which an [Expand-over-ServerNet line-handler process \(Expand/SvNet\)](#) communicates with the [ServerNet cluster monitor process \(SNETMON\)](#).

network control process. A process pair, named \$NCP, that runs in each system of an Expand network. \$NCP is responsible for establishing and terminating system-to-system connections, maintaining network-related system tables (including the network routing table, NRT), calculating the most efficient way to transmit data to other systems in the network, monitoring and logging changes in the status of the network and its systems, informing \$NCPs at neighbor systems of changes in line or Expand line-handler process status, and aborting pending requests when all paths go down. See also [network routing table \(NRT\)](#).

network routing table (NRT). A table that resides in each processor in each system in a network. The NRT associates each destination system with the logical device (LDEV) number of the Expand line-handler process with the best-path route to use to send messages to that system. See also [network control process](#).

network topology. The physical layout of components that define a system, a local area network (LAN), or a wide area network (WAN).

NNA. See [node-numbering agent \(NNA\)](#).

node. (1) A uniquely identified computer system connected to one or more other computer systems in a network. See also [Expand node](#), [ServerNet node](#), and [system](#). (2) An endpoint in a ServerNet fabric, such as a processor or ServerNet addressable controller (SAC).

node number. A number used to identify a member system in a network. The node number is usually unique for each system in the network. See also [node](#), [ServerNet node number](#), and [Expand node number](#).

node-numbering agent (NNA). A field-programmable gate array ([FPGA](#)) contained within a single-mode fiber-optic plug-in card (PIC) that translates the node number for each ServerNet packet entering or exiting the external ServerNet fabrics.

node routing ID. See [ServerNet node routing ID](#).

nonsensitive command. A command that can be issued by any user or program that is allowed access to the subsystem—that is, a command on which the subsystem imposes no further security restrictions. For the Subsystem Control Facility (SCF), nonsensitive commands are those that cannot change the state or configuration of objects; most of them are information commands. Contrast with [sensitive command](#).

NonStop Kernel operating system. The operating system for NonStop S-series servers.

NonStop Kernel user ID. A user ID within a NonStop S-series server. The Guardian environment normally uses the structured view of this user ID, which consists of either the *group-number*, *user-number* pair of values or the *group-name*.*user-name* pair of values. For example, the structured view of the super ID is (255, 255). The Open System Services (OSS) environment normally uses the scalar view of this user ID, also known as the UID, which is the value (*group-number* * 256) + *user-number*. For example, the scalar view of the super ID is (255 * 256) + 255 = 65535.

NonStop S-series servers. The set of servers having product numbers beginning with the letter S. These servers implement the ServerNet architecture and run the NonStop Kernel operating system.

NonStop ServerNet Cluster. The product name for the collection of hardware and software components that constitute a ServerNet cluster.

notification. A message that is generated by a resource managed by the OSM software when something occurs that might affect that resource's performance. There are two types of notifications: OSM notifications and service processor (SP) event messages.

NRT. See [network routing table \(NRT\)](#).

object. (1) One or more of the devices, lines, processes, and files in a subsystem; any entity subject to independent reference or control by one or more subsystems. (2) In the Subsystem Control Facility (SCF), each object has an object type and an object name.

object type. The category of Subsystem Control Facility (SCF) objects to which a specific SCF object belongs. For example, a specific disk has the object type DISK, and a specific terminal might have the object type SU. Each subsystem has a set of object types for the objects it manages.

offline. (1) Used to describe tasks that are performed outside of the control of an application or computer system. (2) Used to describe tasks that require system resources to be shut down. Contrast with [online](#).

online. Used to describe tasks that can be performed while the NonStop Kernel operating system and system utilities are operational. Contrast with [offline](#).

operator message. A message, intended for an operator, that describes a significant event on a NonStop S-series system. An operator message is the displayed-text form of an Event Management Service (EMS) event message. See also [event message](#).

OSM Event Viewer. A component of the OSM software. The OSM Event Viewer lets you set up criteria to view Event Management Service (EMS) log files in several ways, enabling you to rapidly assess service problems.

OSM Low-Level Link. A connection between the software running on a system console and the master service processors (MSPs) on a NonStop S-series server. When the NonStop Kernel operating system is not running, communication must take place over the OSM Low-Level Link. You can also communicate with a NonStop S-series server over an OSM Low-Level Link when the operating system is running. See also [OSM Service Connection](#).

OSM Service Connection. A component of the OSM software package. The OSM Service Connection enables you to communicate with a NonStop S-series server when the NonStop Kernel operating system is running. When the operating system is not running, communication must take place using the [OSM Low-Level Link](#).

packet. A block of information that contains fields for addressing, sequencing of information, possible priority indicators, and a portion of a message or an entire message. See also [ServerNet packet](#).

path. The route between a processor and a subsystem. If a subsystem is configured for fault tolerance, it has a primary path (from the primary processor) and a backup path (from the backup processor).

peer fabric. The fabric on which an operation is not taking place. The X and Y fabrics are peers. If an action is being performed on one fabric, the other fabric is the peer fabric.

persistence. For the Subsystem Control Facility (SCF), the capability of a [generic process](#) to restart automatically if it was stopped abnormally. You configure this capability by specifying a nonzero AUTORESTART value in an ADD command.

persistence count. The number of times the [\\$ZPM](#) persistence manager process will restart a generic process that has been terminated abnormally. A generic process with an AUTORESTART value of 10 (the maximum) is said to have a persistence count of 10. See also [persistence](#).

persistence manager process. The \$ZPM process that is started and managed by the \$ZCNF configuration utility process and that starts generic processes in G-series RVUs and manages their persistence.

persistent process. A process that must always be either waiting, ready, or executing. These processes are usually controlled by a monitor process that checks on the status of persistent processes and restarts them if necessary.

physical interface (PIF). The hardware components that connect a system node to a network.

PIC. See [plug-in card \(PIC\)](#).

PIF. See [physical interface \(PIF\)](#).

ping. A utility used to verify connections to one or more remote hosts. The ping utility uses the Internet control message protocol (ICMP) echo request and echo reply packets to determine whether a particular IP system on a network is functional. The ping utility is useful for diagnosing IP network or router failures.

planned outage. Time during which a system is not capable of doing useful work because of a planned interruption. A planned outage can be time when the system or user application is shut down to allow for servicing, upgrades, backup, or general maintenance.

plug-in card (PIC). A replaceable component that provides a unique function when installed in a CRU or FRU. For example, plug-in cards for the modular SEBs (MSEBs) provide a choice of connection media for attaching ServerNet cables.

PMF CRU. See [processor multifunction \(PMF\) CRU](#).

port. (1) A data channel that connects to other devices or computers. (2) A connector to which a cable can be attached. The system transmits and receives data or requests through ports on ServerNet adapters and processor multifunction (PMF) customer-replaceable units (CRUs). A port is also called a connector. (3) The entrance or physical access point (such as a connector) to a computer, multiplexer, device, or network where signals are supplied, extracted, or observed.

position ID. A character that indicates the position a cluster switch occupies in one of the star topologies. The position ID is a component of the two-character cluster switch name. The cluster switch name includes an external fabric ID (X or Y) as the first character and a position ID as the second character. For example, the cluster switch name X3 indicates that the cluster switch serves the external ServerNet X fabric and occupies position 3 in the topology. Position ID is not used in the layered topology.

primary path. A path enabled as the preferred path. When a primary path is disabled, an alternate path becomes the primary path. Contrast with [alternate path](#).

primary processor. The processor that is designated as owning the [ServerNet addressable controller \(SAC\)](#) connected to separate processors running the NonStop Kernel operating system. The primary processor is the processor that has direct control over the SAC. Contrast with [backup processor](#).

process. A program that has been submitted to the operating system for execution, or a program that is currently running in the computer.

process ID. A number that uniquely identifies a process. It consists of the processor (CPU) number and the process identification number (PIN).

process identification number (PIN). A number that uniquely identifies a process running in a processor. The same number can exist in other processors in the same system. See also [process ID](#).

processor. (1) A functional unit of a computer that reads program instructions, moves data between processor memory and the input/output controllers, and performs arithmetic operations. Processors are sometimes referred to as central processing units (CPUs), but a NonStop S-series system has multiple cooperating processors rather than a single CPU. (2) One or more computer chips, typically mounted on a logic board, that are designed to perform data processing or to manage a particular aspect of computer operations. See also [central processing unit \(CPU\)](#).

processor enclosure. A NonStop S-series system enclosure containing one group, which includes processors, ServerNet adapters, disk drives, components related to the ServerNet fabrics, and components related to electrical power and cooling for the enclosure.

processor multifunction (PMF) CRU. (1) A NonStop S-series customer-replaceable unit (CRU) that contains a power supply, service processor (SP), ServerNet router 1, Ethernet controller, three ServerNet addressable controllers (SACs), and a processor and memory system in a single unit. The PMF CRU consists of three subassemblies: the processor and memory board (PMB), the multifunction I/O board (MFIOB), and the power supply subassembly. (2) A collective term for both PMF CRUs and PMF 2 CRUs when a distinction between the two types of CRUs is not required.

product module (PM). The part of the Subsystem Control Facility (SCF) subsystem that is responsible for subsystem-specific command processing.

public LAN. A local area network (LAN) connected to the Ethernet ports on an Ethernet 4 ServerNet adapter (E4SA). Unlike a dedicated LAN, a public LAN supports the connection of many types of servers and workstations. System consoles can be connected to a public LAN, but such system consoles cannot use all the OSM applications.

radio frequency interference (RFI). Forms of conducted or radiated interference that might appear in a facility as either normal or common-mode signals. The frequency of the interference can range from the kilohertz to gigahertz range. However, the most troublesome interference signals are usually found in the kilohertz to low megahertz range. At present, the terms radio frequency interference and [electromagnetic interference \(EMI\)](#) are usually used interchangeably.

remote interprocessor communication (RIPC). The exchange of messages between processors in different systems or nodes.

remote notification. A form of remote support. Remote notification, or dial-out, allows the OSM package to notify a service provider, such as the Global Customer Support Center (GCSC), of pending hardware and software problems. See also [remote interprocessor communication \(RIPC\)](#).

remote processor. A processor in a node other than the node running the ServerNet cluster monitor (SNETMON) process reporting status about the processor.

remote node. Any system that is not the local system. Contrast with [local system](#).

RIPC. See [remote interprocessor communication \(RIPC\)](#).

router. See [ServerNet router](#).

router 1. See [ServerNet router 1](#).

router 2. See [ServerNet router 2](#).

SAC. See [ServerNet addressable controller \(SAC\)](#).

SANMAN. See [external system area network manager process \(SANMAN\)](#).

SCF. See [Subsystem Control Facility \(SCF\)](#).

SCL. The mnemonic name for the ServerNet cluster subsystem. See [ServerNet cluster subsystem](#).

SCP. See [Subsystem Control Point \(SCP\)](#).

SEB. See [ServerNet expansion board \(SEB\)](#).

SEB port. A connector used for ServerNet links. The ServerNet expansion board (SEB) features six ECL-based ServerNet ports. See also [MSEB port](#).

sensitive command. A Subsystem Control Facility (SCF) command that can be issued only by a user with super-group access, by the owner of the subsystem, or by a member of the group of the owner of the subsystem. The owner of a subsystem is the user who started that subsystem (or any user whose application ID is the same as the server ID—the result of a PROGID option that requires super-group access). Contrast with [nonsensitive command](#).

server. (1) An implementation of a system used as a stand-alone system or as a node in an Expand network. (2) A combination of hardware and software designed to provide services in response to requests received from clients across a network. For example, the NonStop S-series servers provide transaction processing, database access, and other services. (3) A process or program that provides services to a client or a requester. Servers are designed to receive request messages from clients or requesters; perform the desired operations, such as database inquiries or updates, security verifications, numerical calculations, or data routing to other computer

systems; and return reply messages to the clients or requesters. A server process is a running instance of a server program.

ServerNet. A communications protocol developed by HP that is used in NonStop S-series servers. See also [ServerNet I](#) and [ServerNet II](#).

ServerNet I. The first-generation ServerNet network. ServerNet I architecture is used in current NonStop S-series servers and other products, and it features 50 megabytes/second speed, 6-port ServerNet routers, 8b/9b encoding, and a 64-byte maximum packet size. See also [ServerNet II](#).

ServerNet II. The second-generation ServerNet network. ServerNet II architecture is backward-compatible with ServerNet I architecture, and it features 125 (or 50) megabytes/second speed, 12-port ServerNet routers, 8b/9b and 8b/10b (serializer ready) encoding, and a 512-byte maximum packet size. See also [ServerNet I](#).

ServerNet adapter. A customer-replaceable unit (CRU) that connects peripheral devices to the rest of the system through a ServerNet bus interface (SBI). A ServerNet adapter is similar in function to an I/O controller logic board (LB) and backplane interconnect card (BIC) in NonStop K-series servers.

ServerNet address. A virtual memory address that, when translated to a physical address, indicates where the memory access needed by a ServerNet transaction begins. In some cases, the translation can point to some entity other than memory, such as a register. The ServerNet address is included in all ServerNet read request and write request packets.

ServerNet addressable controller (SAC). An I/O controller that is uniquely addressable by a ServerNet ID in the ServerNet fabrics. A SAC is typically implemented on some portion of a processor multifunction (PMF) customer-replaceable unit (CRU), an I/O multifunction (IOMF) CRU, or a ServerNet adapter.

ServerNet cable. A cable that provides ServerNet links between system enclosures.

ServerNet cluster. A network of servers connected together using the ServerNet protocol, and sharing a common transport protocol for interprocessor communication across and within a cluster. A ServerNet cluster offers fast end-to-end communication without intermediate protocol stacks, achieving comparable speeds for internal and external ServerNet communication. See also [cluster](#).

ServerNet Cluster. The abbreviated product name for the collection of hardware and software components that constitute a ServerNet cluster.

ServerNet cluster monitor process (SNETMON). A process pair named \$ZZSCL that manages the state of the ServerNet cluster subsystem. Each node (system) in a ServerNet cluster must have one SNETMON process pair running. See also [ServerNet cluster subsystem](#).

ServerNet cluster services. The functions necessary to allow a [node](#) to join, participate in, or leave a [ServerNet Cluster](#). These functions include:

- Monitoring and control of the physical connections to the cluster
- Discovery of other nodes in the cluster
- Establishment of direct connections with the discovered nodes
- An interface with Expand to provide a high-speed bypass for internode message transport
- Monitoring and reporting of the status of connections within the cluster
- Maintenance and reporting of cluster statistics
- Automatic recovery of failed connections
- Shutdown sequencing to allow orderly withdrawal of an individual node from the cluster

ServerNet cluster subsystem. The subsystem managed by the ServerNet cluster monitor process (SNETMON). The subsystem name is SCL. The subsystem number is 218. The subsystem acronym is ZSCL. See also [subsystem](#) and [ServerNet cluster monitor process \(SNETMON\)](#).

ServerNet device. Interface logic that is associated with a specific hardware unit, such as a processor or I/O adapter, and that provides the interface to the ServerNet communications network. The responsibilities of the ServerNet device are to transform message data into ServerNet packets, to transmit those packets, to receive ServerNet packets, and to unpack the data on behalf of the associated hardware unit.

ServerNet expansion board (SEB). (1) A connector board that plugs in to the backplane to allow one or more ServerNet cables to exit the rear of the enclosure. The SEBs and ServerNet cables allow processors in one group to communicate with processors in another group. Each SEB provides either the ServerNet X fabric or the ServerNet Y fabric for a group. (2) A collective term for both SEBs and modular SEBs (MSEBs) when a distinction between the two types of SEBs is not required.

ServerNet ID. A unique identifier for an addressable unit on a ServerNet communications network. A unit can have multiple ServerNet node IDs. This ID is used for routing: each packet has a source ServerNet node ID and a destination ServerNet node ID. A pair of processors operating in duplex mode share one ServerNet node ID.

ServerNet/FX adapter. A ServerNet adapter that logically extends the ServerNet X and Y fabrics to other clusters in a Fiber Optic Extension (FOX) ring by using fiber-optic lines. Two ServerNet/FX adapters are used, one for the X ring and one for the Y ring.

ServerNet link. Two unidirectional point-to-point communication paths, one in each direction, connecting a router to a ServerNet node or another router. Each ServerNet link contains a transmit channel and a receive channel.

ServerNet node. A system (node) in a ServerNet cluster. See also [node](#) and [ServerNet cluster](#).

ServerNet node number. A number that identifies a member system in a ServerNet cluster. The ServerNet node number is a simplified expression of the six-bit node-routing ID that determines the node to which a ServerNet packet is routed. The ServerNet node number is assigned based on the port to which the node is connected on the ServerNet II Switch. The ServerNet node number, which can be viewed using SCF or the OSM Service Connection, is unique for each node in a ServerNet cluster.

ServerNet node routing ID. A bit field used to route ServerNet packets across the external ServerNet X and Y fabrics. The ServerNet node routing ID occupies the upper six bits of the 20-bit ServerNet ID, and it is unique for each member, or node, in a ServerNet cluster. This term is the fully qualified form of node routing ID.

SERVERNET object type. In the Kernel subsystem, the object type for either the \$ZSNET ServerNet subsystem manager process or the ServerNet X fabric or Y fabric.

ServerNet packet. A unit of information consisting of a header, an address field, a 0-to-64-byte data field, and a 32-bit cyclic redundancy check (CRC) checksum. ServerNet packets negotiate the network using a technique called wormhole routing.

ServerNet port. A connector used for ServerNet links. Six ServerNet ports are located on a ServerNet expansion board (SEB). Ten ServerNet ports are located on a modular ServerNet expansion board (MSEB).

ServerNet router. An application-specific integrated circuit (ASIC) responsible for routing ServerNet packets along ServerNet links in the ServerNet fabrics, using routing information that is present within the packets. A ServerNet router acts as a fully duplex crossbar switch, able to switch any of its input ports to any of its output ports. A ServerNet router in a NonStop S-series server has either six router ports (see [ServerNet router 1](#)) or twelve router ports (see [ServerNet router 2](#)).

ServerNet router 1. A model of ServerNet router that, in a NonStop S-series server, has a total of six input and six output ServerNet ports. A ServerNet router 1 is never an end device. See also [ServerNet router 2](#).

ServerNet router 2. A model of ServerNet router that, in a NonStop S-series server, has a total of twelve input and twelve output ServerNet ports. A ServerNet router 2 is never an end device. See also [ServerNet router 1](#).

ServerNet subdevice. An I/O device that sends and receives its information through a controlling device that acts as the ServerNet device for routing purposes.

ServerNet subdevice ID. The low-order bits (for example, the two least significant bits) of a ServerNet ID, used by a ServerNet device to distribute incoming and outgoing information between itself and its associated subdevices.

ServerNet switch. A point-to-point networking device that connects ServerNet nodes to a single fabric (X or Y) of the ServerNet communications network. The ServerNet switch routes ServerNet packets between these nodes.

service processor (SP). A physical component of the [processor multifunction \(PMF\) CRU](#) or [I/O multifunction \(IOMF\) CRU](#) that controls environmental and maintenance functions (including system load functions) in the enclosure. SPs operate in pairs to provide fault tolerance. The two SPs in group 01 are designated the master service processors (MSPs). Other pairs of SPs within a system are called expansion service processors (ESPs).

service provider. (1) A person trained and qualified to service field-replaceable units (FRUs). (2) An organization, such as the Global Customer Support Center (GCSC), that helps you resolve problems with your NonStop S-series server. The OSM package allows you to use the help of a service provider by configuring the OSM package to support remote notification and remote access.

service side. The side of a system enclosure that contains, behind an optional door, processor multifunction (PMF) customer-replaceable units (CRUs) or I/O multifunction (IOMF) CRUs, ServerNet expansion boards (SEBs), modular SEBs (MSEBs), and ServerNet adapters; it is opposite the appearance side. Cables are accessed from the service side. System enclosures are typically arranged so that the service side is the least visible side. See also [appearance side](#).

SID. See [software product revision \(SPR\)](#).

single-mode fiber-optic (SMF) cable. A fiber-optic cable that allows only one mode to propagate. SMF cable has a small-diameter core for optimized long-distance transmission. See also [multimode fiber-optic \(MMF\) cable](#).

single-wide plug-in card (PIC). A small-form-factor [plug-in card \(PIC\)](#) that occupies one PIC slot within a customer-replaceable unit (CRU). See also [double-wide plug-in card \(PIC\)](#).

SIT. See [system image tape \(SIT\)](#).

site update tape (SUT). One or more tapes that contain each target system's site-specific subvolume and various products. Each product contains a softdoc and a complete set of files. A SUT is delivered with every new system and can be ordered whenever a new RVU of the system software is available. A full SUT contains the current RVU of the operating system and all product software that has been ordered with it. A partial SUT contains a subset of products for the current software RVU.

slot. A physical, labeled space for a [customer-replaceable unit \(CRU\)](#) or [field-replaceable unit \(FRU\)](#) that is part of a module. A module contains one or more slots.

slot location. A 3-number identifier for a particular slot on a system that consists of the group number, module number, and slot number; for example, 02,01,08 (group 02, module 01, slot 08).

SMN. The mnemonic name for the external system area network manager process (SANMAN). See [system area network manager process \(SANMAN\)](#).

SNETMON. See [ServerNet cluster monitor process \(SNETMON\)](#).

soft reset. An action performed on a cluster switch that restarts the firmware on the switch but does not interfere with ServerNet passthrough data traffic.

software product revision (SPR). A method of releasing incremental software updates on NonStop S-series systems. An SPR can include one or more corrections to code, or it can contain code that adds new function to a software product.

source ServerNet ID (SID). A field in the ServerNet packet header indicating the source of the packet.

SP. See [service processor \(SP\)](#).

split-star topology. A network topology that uses up to two cluster switches for each external fabric. External routing is implemented between the two starred halves of a ServerNet cluster. (A starred half consists of up to eight nodes attached to one set of cluster switches.) The starred segments are joined by four-lane links. Introduced with the G06.12 RVU of the ServerNet cluster product, the split-star topology supports up to 16 nodes. A split-star topology requires HP NonStop Cluster Switches (model 6770). See also [star topology](#) and [tri-star topology](#).

SPR. See [software product revision \(SPR\)](#).

star group. One set of X and Y cluster switches and the ServerNet nodes (up to eight) that are connected to them. A star group can be thought of as a segment of a split-star or tri-star topology. A split-star topology can contain up to two star groups. A tri-star topology can contain up to three star groups.

star topologies. The network topologies for ServerNet clusters using the HP NonStop Cluster Switch (model 6770). The three star topologies are the [star topology](#), the [split-star topology](#), and the [tri-star topology](#). See also [layered topology](#).

star topology. A network topology in which all nodes are connected to a central hub (cluster switch). Each node has its own connection to the network, so a break in the connection does not affect other nodes in the network. In a ServerNet cluster, a star topology requires one cluster switch for each external fabric and can support up to eight nodes. A star topology requires HP NonStop Cluster Switches (model 6770). See also [split-star topology](#) and [tri-star topology](#).

state. In the Subsystem Control Facility (SCF), one of the generally defined possible conditions of an object with respect to the management of that object. Examples of states are DEFINED, STARTED, and STOPPED.

STFs. See [super time factors \(STFs\)](#).

store and forward routing. A form of message routing whereby a router must receive an entire packet or message before it can start to forward the packet or message to the next router. Contrast with [wormhole routing](#).

switch group. See [cluster switch group](#).

switch layer. See [cluster switch layer](#).

switch layer number. See [cluster switch layer](#).

switch logic board. See [cluster switch logic board](#).

switch rack. See [cluster switch rack](#).

switch zone. See [cluster switch zone](#).

subnet. See [subnetwork](#).

subnetwork. A physical network within an Internet protocol (IP) network. Each IP network can be divided into a number of subnetworks. Within a given network, each subnetwork is treated as a separate network. Outside the network, the subnetworks appear as part of a single network. The terms subnetwork and subnet are used interchangeably.

subsystem. (1) A secondary or subordinate system, usually capable of operating independently of or asynchronously with a controlling system. (2) A program or set of processes that manages a cohesive set of Subsystem Control Facility (SCF) objects. Each subsystem has a manager through which applications can request services by issuing commands defined by that subsystem. See also [subsystem manager](#).

Subsystem Control Facility (SCF). An interactive interface for configuring, controlling, and collecting information from a subsystem and its objects. SCF enables you to configure and reconfigure devices, processes, and some system variables while your NonStop S-series server is online.

Subsystem Control Point (SCP). The message router for Subsystem Control Facility (SCF). There can be several instances of this process. Using the Subsystem Programmatic Interface (SPI), applications send each command for a subsystem to an instance of the SCP process, which in turn sends the command to the manager process of the target subsystem. SCP also processes a few commands itself. It provides security features, version compatibility, support for tracing, and support for applications implemented as process pairs.

subsystem manager. A process that performs configuration and management functions for a subsystem.

subvolume. A group of related files stored on a disk. All the files have the same volume and subvolume name, but each file has a unique file identifier.

summary report. A brief informational listing of status or configuration information provided by the Subsystem Control Facility (SCF) STATUS or INFO command. Contrast with [detailed report](#).

super group. The group of user IDs that have 255 as the group number. This group has special privileges. Many utilities have commands or functions that can be executed only by a member of the super group.

super-group user. A user who can read, write, execute, and purge most files on the system. Super-group users have user IDs that have 255 as the group number.

super ID. A privileged user who can read, write, execute, and purge all files on the system. In the Guardian environment, the super ID has the user ID 255,255.

super time factors (STFs). An enhancement to Expand that allows the extension of automatically calculated time factors to line speeds greater than 224 Kbps. These new time factors are logarithmic-based and allow a much broader range of line performance to be specified.

SUT. See [site update tape \(SUT\)](#).

SWAN concentrator. See [service processor \(SP\)](#).

SYS_{nn} subvolume. A subvolume on the \$SYSTEM volume where the new version of the NonStop Kernel operating system image is located. Also located on the SYS_{nn} subvolume is system-dependent and release-dependent software. *nn* is an octal number in the range %00 through %77.

system. A node. All the processors, controllers, firmware, peripheral devices, software, and related components that are directly connected together to form an entity that is managed by one NonStop Kernel operating system image and operated as one computer.

system area network manager process (SANMAN). See [external system area network manager process \(SANMAN\)](#).

system console. An HP-approved personal computer used to run maintenance and diagnostic software for HP NonStop S-series servers. New system consoles are preconfigured with the required HP and third-party software. When upgrading to the latest RVU, software upgrades can be installed from the HP NonStop System Console Installer CD. System consoles communicate with NonStop S-series servers over a dedicated local area network (LAN) or a nondedicated (public) LAN. System consoles configured as the primary and backup dial-out points are referred to as the primary and backup system consoles, respectively.

system enclosure. An enclosure for system components. Processor enclosures and I/O enclosures are both system enclosures.

system expansion. The process of making a target system larger by adding enclosures to it. The enclosures being added can be either new enclosures or enclosures from a donor system. Contrast with [system reduction](#).

system image tape (SIT). A tape that can be used to perform a system load on a system if the system subvolume has become corrupted on both \$SYSTEM disks. The tape contains a minimum set of software necessary to bring up and run the system. Use the SIT only for disaster recovery. It is not needed for normal system load. Contact the Global Customer Support Center (GCSC) before loading the system from a SIT. Many additional steps are required to restore your system to working order.

system load. (1) To start the system; to load the NonStop Kernel operating system image into the memory of a processor. (2) The process of loading the operating system. A system load changes a system from an inactive to an active (or operational) state by loading software that establishes communication between the operating system and configured system peripherals.

system number. See [Expand node number](#).

system reduction. The process of making a donor system smaller by removing enclosures from it. The enclosures removed from a donor system might be added to a target system. Contrast with [system expansion](#).

system resizing. See [system expansion](#) or [system reduction](#).

system serial number. A unique identifier, typically five or six alphanumeric characters, assigned to a NonStop S-series server when it is built.

TACL. The user interface to the NonStop Kernel operating system. The TACL product is both a command interpreter and a command language. Users can write TACL programs that perform complex tasks simply or provide a consistent user interface across independently programmed applications.

TB. See [terabyte \(TB\)](#).

TCP/IP. See [Transmission Control Protocol over Internet Protocol \(TCP/IP\)](#).

terabyte (TB). A unit of measurement equal to 1,099,511,627,776 bytes (1024 gigabytes). See also [gigabyte \(GB\)](#), [kilobyte \(KB\)](#), and [megabyte \(MB\)](#).

Tetra 8 topology. A tetrahedral topology of NonStop S-series servers that allows a maximum of four processor enclosures (eight processors) and eight I/O enclosures. See also [tetrahedral topology](#). Contrast with [Tetra 16 topology](#).

Tetra 16 topology. A tetrahedral topology of NonStop S-series servers that allows a maximum of eight processor enclosures (16 processors). The maximum number of I/O enclosures allowed by the Tetra 16 topology varies depending on the software release and the server model. See also [tetrahedral topology](#). Contrast with [Tetra 8 topology](#).

tetrahedral topology. A topology of NonStop S-series servers in which the ServerNet connections between the processor enclosures form a tetrahedron. See also [topology](#).

TF. See [time factor \(TF\)](#).

time factor (TF). A number assigned to a line, path, or route to indicate efficiency in transporting data. The lower the time factor, the more efficient the line, path, or route. See also [super time factors \(STFs\)](#).

topology. The physical layout of components that define a local area network (LAN), wide area network (WAN), or ServerNet communications network. See also [layered topology](#), [star topology](#), [split-star topology](#), and [tri-star topology](#).

topology branch. A processor enclosure and the I/O enclosures attached to it.

Transmission Control Protocol over Internet Protocol (TCP/IP). A set of layered communications protocols for connecting workstations and larger systems.

tri-star topology. A network topology that uses up to three cluster switches for each external fabric. External routing is implemented between the three star groups of a ServerNet cluster. (A star group consists of the eight nodes attached to one set of cluster switches.) The star groups are joined by two-lane links. Introduced with the G06.14 RVU, the tri-star topology supports up to 24 nodes. A tri-star topology requires HP NonStop Cluster Switches (model 6770). See also [star topology](#) and [split-star topology](#).

UCME. See [uncorrectable memory error \(UCME\)](#).

unattended site. A computer environment where no operator resides on site and the only access is from a central monitoring station.

uncorrectable memory error (UCME). An error caused by incorrect data at a particular memory location. The cause of the error is such that the error is not automatically corrected by the system, and memory replacement is required. Contrast with [correctable memory error \(CME\)](#).

uninterruptible power supply (UPS). A source of power, external to a device, capable of supplying continuous power to the device in the event of a power failure.

unplanned outage. Time during which a system is not capable of doing useful work because of an unplanned interruption. Unplanned interruptions can include failures caused by faulty hardware, operator error, or disaster.

UPS. See [uninterruptible power supply \(UPS\)](#).

volume. A logical disk drive, which can be one or two physical disk drives. In NonStop S-series systems, volumes have names that begin with a dollar sign (\$), such as \$DATA. See also [mirrored disk or volume](#).

WAN. See [wide area network \(WAN\)](#).

wide area network (WAN). A network that operates over a larger geographical area than a local area network (LAN)—typically, an area with a radius greater than one kilometer. The elements of a WAN might be separated by distances great enough to require telephone communications. Contrast with [local area network \(LAN\)](#).

wild-card character. A character that stands for any possible character or characters in a search string or in a name applying to multiple objects. In Subsystem Control Facility (SCF) object-name templates, two wild-card characters can appear: ? (question mark) for a single character and * (asterisk) for zero or more consecutive characters.

wormhole routing. A technique for reducing network latency in a router. Packet bytes are immediately switched to the appropriate output port as soon as they arrive, rather than accumulated in a buffer until an entire packet has been received. Contrast with [store and forward routing](#).

X fabric. The X side of the internal or external ServerNet fabrics. See also [fabric](#), [external ServerNet X or Y fabric](#), and [internal ServerNet X or Y fabric](#).

Y fabric. The Y side of the internal or external ServerNet fabrics. See also [fabric](#), [external ServerNet X or Y fabric](#), and [internal ServerNet X or Y fabric](#).

zone. See [cluster switch zone](#).

\$ZPM. The process name for the [persistence manager process](#) that starts generic processes in G-series RVUs and manages their persistence.

ZSCL. See [ServerNet cluster subsystem](#).

ZSMN. The subsystem identifier for the external system area network manager process (SANMAN). See also [external system area network manager process \(SANMAN\)](#).

\$ZZFOX. The name of the Fiber Optic Extension (FOX) monitor process in the ServerNet/FX adapter subsystem.

\$ZZKRN. Kernel subsystem manager process. The generic process that starts and manages other generic processes, some system attributes, and the ServerNet X and Y fabrics in G-series RVUs. \$ZZKRN is started and managed by the \$ZPM persistence manager process.

\$ZZSCL. The process name for the ServerNet cluster monitor process.

\$ZZSMN. The process name for the external system area network manager process (SANMAN). See also [external system area network manager process \(SANMAN\)](#).

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