

What is a ServerNet Cluster?

Revised: 21, May 2004

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The HP NonStop™ ServerNet Cluster product is an interconnection technology for NonStop S-series servers. This technology enables multiple servers to be connected in a group, or ServerNet cluster. A server or "node" in the cluster can communicate with any other server in the cluster using the ServerNet protocol.

ServerNet clusters extend the ServerNet X and Y fabrics outside the system boundary and allow the ServerNet protocol to be used for intersystem messaging. A ServerNet cluster consists of individual servers, each containing internal ServerNet X and Y fabrics, connected through fiber-optic cables and cluster switches to other servers. The fiber-optic cables and cluster switches constitute external ServerNet X and Y fabrics.

ServerNet clusters allow multiple multiprocessor systems to work together and appear to client applications as one large processing entity. Only NonStop S-series servers can belong to a ServerNet cluster. (NonStop K-series servers do not use the ServerNet protocol.) S-series servers using either the Tetra 8 or Tetra 16 topologies can participate in a cluster.

There are two main types of ServerNet clusters--clusters that use the star topologies (star, split-star, and tri-star), and clusters that use the layered topology.

Star Topologies

The star topologies are built with the HP NonStop Cluster Switch (model 6770), formerly called the Compaq NonStop Himalaya Cluster Switch. The star topology supports up to 8 nodes, the split-star topology supports up to 16 nodes, and the tri-star supports up to 24 nodes. For details about the different star topologies, see the ServerNet Cluster Manual.

Layered Topology

The layered topology is built with the HP NonStop ServerNet Switch (model 6780). The layered topology supports up to 64 nodes and is generally available with the G06.22 RVU. For details about the layered topology, see the **ServerNet Cluster 6780 Planning and Installation Guide**.

What's New and What's Changed for the ServerNet Cluster Web Site

May 21, 2004

New! A new cause code that can appear in the SCF STATUS SUBNET display has been added to Known Problems With Manuals for the ServerNet Cluster Manual and the ServerNet Cluster 6780 Operations Guide.

January 29, 2004

New! More information about domestic and international AC power receptacles for the NonStop Cluster Switch (model 6770) has been added to Known Problems With Manuals for the Himalaya Cluster Switch Hardware Installation and Support Guide.

December 5, 2003

- **New!** With the G06.22 RVU, the HP NonStop Open Service Management (OSM) package is generally available. This means that the HP NonStop ServerNet Switch (model 6780) and the layered topology for ServerNet clusters are also generally available. The long-distance option for ServerNet clusters is available as a controlled-availability product. For more information, see the *ServerNet Cluster 6780 Planning and Installation Guide* and the *ServerNet Cluster 6780 Operations Guide*.
- **New!** Information about AC power receptacles for the NonStop Cluster Switch (model 6770) has been added to the Known Problems for the *Himalaya Cluster Switch Hardware Installation and Support Guide*
- **New!** Questions about OSM, the 6780 switch, and the layered topology have been added to the FAQ.
- **New!** Procedures for OSM, the 6780 switch, and the layered topology have been added to the How Do I? section.
- **New!** Information has been added about an updated version of the ZPMCONF macro, called ZSCCONF.
- **Changed** What Is a ServerNet Cluster has been updated to introduce the 6780 switch and the layered topology.
- **Changed** Product names have changed throughout the ServerNet Cluster web site to reflect the new HP names.

August 19, 2003

New! The G06.21 RVU supports the HP NonStop ServerNet Switch (model 6780) and the layered topology for ServerNet clusters. For more information, see the *ServerNet Cluster 6780 Planning and Installation Guide* and the *ServerNet Cluster 6780 Operations Guide*.

December 16, 2002

New! Known Documentation Problems has been replaced by two separate topics: Known Problems With Manuals and Known Problems With Online Help. Each of these topics is organized by the version of manual or online help system. You can check only the problems that pertain to the version of the documentation you are using.

May 28, 2002

- **Changed** Known problems with Documentation. Added the following correction:
 - In Section 4, "Upgrading a ServerNet Cluster," the "Steps for Merging Two Star Topologies to Create a Split-Star Topology" include sub-steps for aborting all Expand-over-ServerNet lines and stopping the ServerNet cluster subsystem (\$ZZSCL) before running the guided procedure for adding a cluster switch (Add Switch). However, the guided procedure will not run if the \$ZZSCL subsystem is stopped. An error message (Error 1002: Cluster Software Not Ready) is returned.
- FAQ addition: What are the requirements for using 5-kilometer cable for the switch-to-switch links in the split-star and tri-star topologies?

February 6, 2002

- **Changed** Known problems with Documentation. Added the following correction:
 - The version number of the online help file included in the TSM 2001D client software is incorrect. The help file (FABRICTS.CHM) included with the TSM 2001D client software shows the help version as Version 2.0. The correct online help version for TSM 2001D should be Version 3.0 or later.

November 29, 2001

- **New!** Starting with G06.14, ServerNet Cluster has increased support from 16 to 24 servers. These servers can be connected in a group, or ServerNet cluster.
- **Changed** Known problems with Documentation. Added the following corrections:
 - In the "Upgrading a Split-Star Topology to a Tri-Star Topology" topic, Step 1 directs the user to merge two split-star topologies, which is not supported. Step 1 should direct the user to merge a split-star topology with a star topology.

- The height of the cluster switch enclosure is listed as 37.6 in. (95.5 cm) in the Switch Enclosure Dimensions table in Section 2, "Planning for Installation." The correct height of the switch enclosure is 20.5 in. (52 cm).

October 1, 2001

- **Changed** Known problems with Documentation. Added the following corrections:
 - The online help file (SWITCH.CHM) that is included with the TSM 2001C client software is the wrong file. TSM 2001C contains Version 1.0 of the online help for Replace Switch, which is dated August 2, 2000. The correct online help version for TSM 2001C is Version 3.0, dated March 28, 2001.
 - A caution on page 1-2 of the Himalaya S-Series System Expansion and Reduction Guide incorrectly states that if a system you want to resize is a member of a ServerNet cluster and you want to perform this expansion online, you must first remove the system from the cluster.
 - F1 help is not available for SCL (ServerNet cluster) and SMN (external ServerNet SAN) subsystem events displayed in the TSM EMS Event Viewer Application. TSM client software versions 10.0 through Compaq TSM 2001C are affected. These client software versions support releases G06.09 through G06.13.

July 17, 2001

- **Changed** Known problems with Documentation. Added the following corrections:
 - In the procedure to merge two ServerNet clusters that use a star topology (one cluster switch per fabric), additional steps are needed to ensure successful merging. The procedure that needs modification appears in Section 4 of the G06.12 versions (429153-001 and 520371-001) of the *ServerNet Cluster Manual*.

June 22, 2001

- Starting with G06.12, ServerNet Cluster has increased support from 8 to 16 servers. These servers can be connected in a group, or ServerNet cluster.
- **Changed** Known problems with Documentation. Added the following corrections:
 - Added information about the Missing Remote ServerNet Switch alarm or time limits for connecting the four-lane links.
 - The Loopback Plugs topic lists an incorrect part number (U11674) for the ECL loopback plug.

What is a ServerNet Cluster?

The HP NonStop™ ServerNet Cluster product is an interconnection technology for NonStop S-series servers. This technology enables multiple servers to be connected in a group, or ServerNet cluster. A server or "node" in the cluster can communicate with any other server in the cluster using the ServerNet protocol.

ServerNet clusters extend the ServerNet X and Y fabrics outside the system boundary and allow the ServerNet protocol to be used for intersystem messaging. A ServerNet cluster consists of individual servers, each containing internal ServerNet X and Y fabrics, connected through fiber-optic cables and cluster switches to other servers. The fiber-optic cables and cluster switches constitute external ServerNet X and Y fabrics.

ServerNet clusters allow multiple multiprocessor systems to work together and appear to client applications as one large processing entity. Only NonStop S-series servers can belong to a ServerNet cluster. (NonStop K-series servers do not use the ServerNet protocol.) S-series servers using either the Tetra 8 or Tetra 16 topologies can participate in a cluster.

There are two main types of ServerNet clusters--clusters that use the star topologies (star, split-star, and tri-star), and clusters that use the layered topology.

Star Topologies

The star topologies are built with the HP NonStop Cluster Switch (model 6770), formerly called the Compaq NonStop Himalaya Cluster Switch. The star topology supports up to 8 nodes, the split-star topology supports up to 16 nodes, and the tri-star supports up to 24 nodes. For details about the different star topologies, see the ServerNet Cluster Manual.

Layered Topology

The layered topology is built with the HP NonStop ServerNet Switch (model 6780). The layered topology supports up to 64 nodes and is generally available with the G06.22 RVU. For details about the layered topology, see the ServerNet Cluster 6780 Planning and Installation Guide.

Frequently Asked Questions: HP NonStop™ ServerNet Cluster

Below is a list of frequently asked questions (FAQ) for the **NonStop™** ServerNet Cluster product. The questions are grouped into topics, and the topics are listed in alphabetical order. The table provides links to each question. If you can't find the answer to your question or you want to propose a question for the FAQ, please click the Contact Us link in the main menu to find out how to let us know.

List of Topics and Questions

Topics	Question
Cables	What kind of cables are required for connections between a node and a cluster switch?
	What kind of cables are required for connections between cluster switches?
	What lengths of fiber-optic ServerNet cables are available?
	Can fiber-optic cables for other NonStop™ S-series communications products be used in a ServerNet cluster?
	How are ServerNet cables attached to a NonStop™ Cluster Switch (model 6770)?
	How are ServerNet cables attached to a NonStop™ ServerNet Switch (model 6780)?
	What are the requirements for using 5-kilometer cables between switches?
Cluster Size	How many nodes are supported in a ServerNet cluster?
	Will larger clusters be supported in future releases?
	Is it possible to have a one-node cluster?
	Can multiple clusters be connected to enable communication between the clusters?
Coexistence	Can a ServerNet cluster be combined with other types of Expand networks?
	Will ServerNet clusters coexist with Windows NT clusters?
	Will I have to make changes to my applications in order to use a ServerNet cluster?
Definitions	What is a ServerNet cluster?
	What is a node?
	What is a NonStop Cluster Switch (model 6770)?
	What is a NonStop ServerNet Switch (model 6780)?
	What is a ServerNet II Switch?
	What is an AC transfer switch?
	What is an MSEB?

	What is an external ServerNet fabric?
	What are guided procedures?
Dial-Outs	How do dial-outs work in a ServerNet cluster?
Documentation	Which manuals document the Nonstop™ ServerNet Cluster product?
Expand	What does the Expand-over-ServerNet line-handler process do?
	What is the Expand/ServerNet profile?
	If two systems are linked by more than one type of Expand line (for example, Expand-over-ServerNet and Expand-over-FOX), which line will be used?
Installation	Do I have to install new hardware to construct a ServerNet cluster?
	How do I replace an SEB with an MSEB?
	Do I have to install new software to connect a ServerNet cluster?
	Can I obtain clustering software by installing IPMs?
	Are ServerNet clusters customer-installable?
	How do I construct a ServerNet cluster?
	What is the maximum allowable distance between nodes in a ServerNet cluster?
Measure	Is Measure supported for ServerNet clusters?
Message System	Are message system statistics provided?
	How are the message system paths monitored?
MSGMON	What does MSGMON do?
Naming and Numbering	Do ServerNet clusters have logical names?
	Do ServerNet clusters have cluster numbers?
	What is a ServerNet node number?
	How is a ServerNet node number different from an Expand node number?
NNA	What is an NNA?
	How does the NNA modify ServerNet packets for delivery over the external ServerNet fabrics?
OSM and TSM	Which service management software do I need to manage a ServerNet Cluster with one of the star topologies?
	Which service management software do I need to manage a ServerNet Cluster with the layered topology?
Plug-in Cards (PICs)	What is a PIC?
	Are PICs replaceable in MSEBs?

	Are PICs replaceable in the NonStop™ Cluster Switch (model 6770)?
	Are PICS replaceable in the NonStop™ ServerNet Switch (model 6780)?
Power Products	What is the function of a UPS?
	What is the function of an AC transfer switch?
	What is the function of a power distribution unit (PDU)?
SANMAN	What does SANMAN do?
	How often does SANMAN poll each ServerNet II switch?
SCF	What SCF commands are supported for the ServerNet cluster subsystem (SNETMON)?
	What SCF commands are supported for the external ServerNet SAN manager subsystem (SANMAN)?
	What SCF commands are supported for MSGMON?
ServerNet	What's the difference between ServerNet I and ServerNet II?
Servers	Can a ServerNet cluster include different types of Nonstop™ S-series servers?
	Can a ServerNet cluster include Nonstop™ K-series servers?
	Can a server be a member of two different ServerNet clusters at the same time?
ServerNet Switches	Can any ServerNet Switch product be used in a NonStop™ Cluster Switch (model 6770)?
	How are the cluster switches packaged?
	Can I stack Nonstop™ Cluster Switches (model 6770) on top of each other?
	How does a ServerNet II Switch become configured as an X-fabric or Y-fabric switch?
	How do I replace a Nonstop™ Cluster Switch (model 6770)?
	How do I replace a Nonstop™ ServerNet Switch (model 6780)?
SNETMON	What does SNETMON do?
Topologies	Can an external fabric contain multiple Nonstop™ Cluster Switches?

Cables

What kind of cables are required for connections between a node and a cluster switch? Connections between the MSEBs in group 01 of each node and the cluster switches are made using single-mode fiber-optic cables. Connections between cluster switches using the star topologies also use single-mode fiber-optic cables. Connections between cluster switches using the layered topology use either multimode or single-mode fiber-optic cables.

What kind of cables are required for connections between cluster switches? Connections between cluster switches using the star topologies use only single-mode fiber-optic cables. Connections between cluster switches using the layered topology use either multimode or single-mode fiber-optic cables.

What lengths of fiber-optic cables are available for ServerNet clusters? ServerNet cables are 10 meters, 40 meters, and 80 meters long. A plenum-rated cable is available in the 80-meter length.

For connections between the cluster switches, single-mode fiber-optic cables up to five kilometers in length are supported. However, HP does not supply cables longer than 80 meters

Can fiber-optic cables for other Nonstop™ S-series communications products be used in a ServerNet cluster? Other Nonstop™ S-series communications products sometimes use the same type of connectors used for ServerNet clusters. You must use the appropriate multimode or single-mode fiber-optic cable with the correct connectors.

How are cables connected to a NonStop™ Cluster Switch (Model 6770)? Single-mode fiber-optic ServerNet cables are connected to the plug-in cards of the ServerNet II Switch component of the 6770 switch. To extend the ServerNet II Switch for servicing, you loosen the thumb screws securing the ServerNet II Switch to the enclosure or rack frame. Then you use the handles to extend the CRU on its rails until the latches click.

Click to see the ServerNet II Switch CRU extended for cable servicing.



How are cables connected to a NonStop™ ServerNet Switch (Model 6780)? Single-mode fiber-optic ServerNet cables are connected to the plug-in cards of the 6780 Switch.

What are the requirements for using 5-kilometer cables for connections between cluster switches? To use 5-kilometer cables, all of the following requirements must be met:

- All nodes in the cluster must run G06.16 or a later version of the operating system.
- All nodes in the cluster must be S76000 or S86000.
- All processors in all nodes must have the NSR-X or NSR-Y processor type.

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Cluster Size

How many nodes are supported in a ServerNet cluster? Up to 24 nodes are supported for the tri-star topology. Up to 64 nodes are supported for the layered topology.

Will larger clusters be supported in future releases? Possibly. The ServerNet cluster architecture can theoretically support 1,024 nodes. However, ServerNet clustering relies on Expand, which currently supports no more than 255 nodes.

Is it possible to have a one-node cluster? Yes. It is possible to configure a single system so that the software necessary for external ServerNet communication (SNETMON/MSGMON and SANMAN) is running and ready to communicate with other nodes. However, if no other nodes are connected to the cluster switches, no communication will occur. In this case, communication with remote nodes will occur as soon as the nodes are configured and connected.

Can multiple clusters be connected to enable communication between the clusters? Yes, a node in one cluster can be connected to a node in another cluster using any of the HP LAN or WAN solutions (Ethernet, Token Ring, ATM, and so on).

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Coexistence

Can a ServerNet cluster be combined with other types of Expand networks? Yes. Nodes in a ServerNet cluster coexist as systems belonging to an Expand network and therefore are compatible with other Expand nodes. A node in a ServerNet cluster can simultaneously function as a node in a FOX ring, an ATM network, an Ethernet LAN, or other type of Expand transport.

Support Note S00068 and the Expand Configuration and Management Manual show examples of integrated Expand networks, including ServerNet clusters coexisting with FOX rings and ServerNet clusters linked by ATM or IP lines. This support note also offers considerations for configuring Expand networks that include ServerNet clusters.

Will ServerNet clusters coexist with Windows NT clusters? Coexistence with Windows NT clusters is not supported.

Will I have to make changes to my applications in order to use a ServerNet cluster? No.

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Definitions

What is a ServerNet cluster? A ServerNet cluster is a network of NonStop™ S-series servers connected using the ServerNet protocol, and sharing a common transport for interprocessor communication across and within a cluster. ServerNet clusters offer fast end-to-end communication without intermediate protocol stacks, achieving comparable speeds for internal and external ServerNet fabric communication.

What is a node? A node is a uniquely identified computer system connected to one

or more other computer systems in a network. Nodes in a ServerNet cluster are called "ServerNet nodes." Because ServerNet clusters use Expand, a ServerNet node is also an Expand node.

What is a Nonstop™ Cluster Switch (Model 6770)? A Nonstop™ Cluster Switch is an assembly consisting of a ServerNet II Switch, an uninterruptible power supply (UPS), and an AC transfer switch. 6770 switches support the star topologies.

Click below to view NonStop™
Cluster Switch photo



What is a Nonstop™ ServerNet Switch (Model 6780)? A 6780 switch consists of a logic board, 13 plug-in cards, two fans, and two power supplies. An uninterruptible power supply (UPS) is not part of a 6780 switch; however, a separate UPS is recommended for certain configurations of the layered topology.

What is a ServerNet II Switch? The ServerNet II Switch is the subcomponent of a 6770 switch that provides a physical junction point for the fiber-optic cables that link the nodes in a ServerNet cluster. The ServerNet II Switch routes messages across the external ServerNet fabrics. Only the ServerNet II Switch is supported for use in a 6770 switch.

What is an AC transfer switch? An AC transfer switch is a subcomponent of a 6770 switch that provides fault-tolerant access to dual AC power sources. The ServerNet II Switch and UPS each have only a single power input. To provide fault-tolerant power for these components, an AC transfer switch with two power cords is connected to them. The AC transfer switch is connected to primary and secondary current sources. The AC transfer switch draws power from its primary current source as long as it is available. If the primary source fails, then the load is switched to the secondary current source.

What is an MSEB? An MSEB is a modular ServerNet expansion board (MSEB). MSEBs provide connections for the ServerNet cables that link a system enclosure to another system enclosure or to a cluster. The MSEBs in group 01 of a Nonstop™ S-series server allow the connection of ServerNet cables from the server to the cluster switches. These MSEBs route packets out of each server and onto the external ServerNet fabrics. All packets destined for other nodes travel through port 6 of the MSEBs in slots 51 and 52 of group 01.

Click below to view MSEB photo



What is an external ServerNet fabric? It is one of two fabrics (X or Y) that link the nodes in a ServerNet cluster. A fabric is a complex set of interconnections through which there can be multiple paths from point to point. In a ServerNet

cluster, the external fabrics consist of the fiber-optic cables and cluster switches that provide the infrastructure for routing ServerNet packets between ServerNet nodes. Each Nonstop™ S-series server also has internal ServerNet fabrics that route ServerNet packets either to a ServerNet device within the server or out across the external fabrics to another node.

What are guided procedures? Guided procedures are software tools that assist in the configuration or replacement of system components. Guided procedures automate some of the steps in complex tasks, such as:

- Adding a cluster switch to expand the topology
- Adding a ServerNet node to a cluster
- Troubleshooting a ServerNet fabric
- Replacing an SEB with an MSEB
- Replacing a defective MSEB with another MSEB

- Replacing a cluster switch or cluster switch component

With the introduction of the HP NonStop Open Service Management (OSM) package, some guided procedures have been replaced with interactive actions. If you use OSM to manage a cluster, see [How OSM Replaces TSM and the Guided Procedures](#).

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Dial-Outs

How do dial-outs work in a ServerNet cluster?

Dial-outs for clustered servers generally work the same as dial-outs for nonclustered servers. However, for some types of switch failures, multiple dial-outs can occur from all the nodes connected to a 6770 switch. For ServerNet clusters using the layered topology, a failure causes only one dial-out from any 6780 switch in the cluster.

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Documentation

Which manuals document the NonStop™ ServerNet Cluster product?

- The **ServerNet Cluster Manual and the NonStop™ Himalaya Cluster Switch Hardware Installation and Support Guide** document ServerNet clusters using the star topologies and the 6770 switch.
- The **ServerNet Cluster 6780 Planning and Installation Guide and the ServerNet Cluster 6780 Operations Guide** document ServerNet clusters using the layered topology and the 6780 switch.

In addition, online help is available for the guided procedures that support configuration and replacement operations in a ServerNet cluster.

The **Expand Configuration and Management Manual** documents Expand considerations for ServerNet clusters.

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Expand

What does the Expand-over-ServerNet line-handler process do?

The Expand-over-ServerNet line-handler process is a process pair that handles incoming and outgoing Expand messages using the ServerNet protocol. Like the Expand-over-FOX line-handler process, Expand-over-ServerNet manages security-related messages. Other messages usually bypass the line-handler process and are handled directly by the message system. A single Expand line is associated with an Expand-over-ServerNet line-handler process.

What is the Expand/ServerNet profile? The Expand/ServerNet profile is a software component that must be present on a NonStop™ S-series server in order for the server to join a ServerNet cluster. This profile is not a standard part of the site update tape (SUT) but is included on the SUT when you order the ServerNet Cluster product.

If two systems are linked by more than one type of Expand line (for example, Expand-over-ServerNet and Expand-over-FOX), which line will be used? The path with the lowest configured TIMEFACTOR is the one chosen. System operators can configure the path with whatever value they want. Expand-over-ServerNet is currently the fastest supported line.

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Installation

Do I have to install new hardware to construct a ServerNet cluster?

Yes. At least two cluster switches must be installed for each cluster. One cluster switch serves the external ServerNet X fabric. The other cluster switch serves the external ServerNet Y fabric. Additional cluster switches are needed for large topologies.

In addition, MSEBs must be installed in slots 51 and 52 of the group 01 enclosure of each system to join a cluster. The MSEBs must contain an NNA FPGA in port 6. Also, single-mode fiber-optic ServerNet cables must be connected between the group 01 enclosure and the cluster switches.

How do I replace an SEB with an MSEB? You can replace an SEB with an MSEB (or an MSEB with another MSEB) online using the guided procedure for replacing an SEB or MSEB.

Do I have to install new software to connect a ServerNet cluster? Yes. For ServerNet clusters using the star topologies, you must upgrade to G06.09 or a later RVU. G06.12 is required for the split-star topology, and G06.14 is required for the tri-star topology.

The layered topology (built with 6780 switches) requires G06.19 plus SPRs or the G06.21 and later RVUs.

The RVU includes most of the software components required for clustering—SNETMON/MSGMON, SANMAN, SP firmware, and TSM or OSM. In addition, you must also have an Expand license and purchase the Expand/ServerNet profile that is required for ServerNet communications using Expand.

Can I obtain clustering software by installing SPRs? Yes, but only for servers running certain RVUs. Add SPRs to G06.09 through G06.11 to obtain support for a split-star topology (for clusters up to 16 nodes). Add SPRs to G06.13 to obtain support for a tri-star topology (for clusters up to 24 nodes). For information about these SPRs, refer to the ServerNet Cluster Manual.

Add SPRs to G06.19 and G06.20 to obtain support for the layered topology built with 6780 switches (for clusters up to 64 nodes). For information about these SPRs, refer to the ServerNet Cluster Planning and Installation Guide.

Are ServerNet clusters customer-installable? Yes. With special training, customers can perform all tasks for installing a ServerNet cluster.

How do I construct a ServerNet cluster? Assuming the correct software is installed on each system that will join the ServerNet cluster, you construct the cluster by installing cluster switches for the external ServerNet X and Y fabrics and then connecting the group 01 enclosure of each system to the cluster switches using fiber-optic cables. Systems are added to the cluster one at a time. You must use the guided procedure to add a ServerNet node to the cluster.

What is the maximum possible distance between nodes in a ServerNet cluster?

Star topology: 160 meters (528 feet).

Tri-star or split-star topology: 5160 meters (17,028 feet).

Layered topology: 5160 meters (17,028 feet) when using single-mode fiber cables between zones.

Regardless of the topology, a node can be positioned no more than 80 meters (264 feet) from a cluster switch. This is cable distance, which may be reduced by bends in the cable. Because a star topology uses only one cluster switch per fabric, the maximum distance between two nodes connected to a cluster switch is 160 meters (528 feet).

For topologies that support multiple cluster switches per fabric, the distance possible depends on the type of fiber-optic cables used between switches and the type of nodes in the ServerNet cluster. For these topologies, the greatest possible distance between the cluster switches is 5 kilometers if the correct software and processors are used in all nodes of the cluster.

As of G06.22, a long-distance option is available for the layered topology as a restricted SPR. The long-distance option supports distances up to 15km between cluster switches. For details, see the G06.22 or later ServerNet Cluster 6780 Planning and Installation Guide.

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Measure

Is Measure supported for ServerNet clusters? Yes. Counters have been added to the CPU, PROCESS, and SERVERNET entities to support ServerNet clusters.

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Message System

Are message system statistics provided? Yes. Statistics are gathered continuously by each processor. Each processor keeps a set of counters for each node in the cluster, including the local node. Statistical information is reported using an EMS event: ZSCL-EVT-STATISTICS. On an hourly basis, SNETMON causes the generation of this event. Operators can use the TSM Service Application to generate the event on demand or reset the counters. The event and its token information can be viewed using the TSM EMS Event Viewer Application.

How are the message system paths monitored? SNETMON maintains a matrix of information about the status of processor-to-processor connections between nodes. This information is made available to clients, such as the TSM package, for use in incident analysis. You can view this information using the SCF STATUS SUBNET command. For a local node, SNETMON stores the state of each internal path within that node. For remote nodes, SNETMON maintains information about the condition of the external ServerNet message system paths from the local node to all remote nodes and from all remote nodes to the local nodes.

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MSGMON

What does MSGMON do?

MSGMON is a new monitor process that resides in each processor of a server and executes various functions required by the message system. MSGMON is a helper for the ServerNet cluster subsystem monitor process (SNETMON). MSGMON handles communications between SNETMON and individual processors. MSGMON also logs events from and generates events on behalf of the IPC subsystem. MSGMON was created to relieve the system monitor subsystem. MSGMON is a persistent process. Once it is started, it terminates only in the event of an internal failure or a termination message from the persistence monitor, \$ZPM. Unlike SNETMON and SANMAN, MSGMON is a single process—not a process pair.

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Naming and Numbering

Do ServerNet clusters have logical names? No. The ServerNet cluster itself has no logical name. There is no software function for naming a ServerNet cluster. However, each node in a ServerNet cluster has a system name.

Do ServerNet clusters have cluster numbers? No. There is no number associated with a ServerNet cluster as a whole. However, each node in a ServerNet cluster has a ServerNet node number.

What is a ServerNet node number? A ServerNet node number is a number used to identify a node within a ServerNet cluster. The node number is unique for each member, or node, in a ServerNet cluster. You do not configure the ServerNet node number. This number is assigned automatically, based on the port to which you connect the node on the cluster switch and the position of the switch in the topology.

How is a ServerNet node number different from an Expand node number? The Expand node number, also known as the "system number," is a number in the range 0 through 254 that identifies a node in an Expand network. You configure this number when you install a new NonStop™ S-series server and set the system number. Note that a ServerNet node has both an Expand node number and a ServerNet node number.

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NNA

What is an NNA? NNA stands for "node-numbering agent." An NNA is a field-programmable gate array (FPGA) contained within some—but not

all—single-mode fiber PICs. The NNA FPGA is installed only in the single-mode fiber PIC of port 6 of the MSEB installed in slots 51 and 52 of group 01. The NNA modifies the ServerNet ID for each ServerNet packet entering or exiting the external ServerNet fabrics.

How does the NNA modify ServerNet packets for delivery over the external ServerNet fabrics? All ServerNet packets destined for other nodes in a cluster must pass through port 6 of the MSEB in slot 51 or 52 of the group 01 enclosure. As each packet passes through the PIC in port 6, the NNA FPGA modifies the source ServerNet ID (SID), replacing the default ServerNet node routing ID with a node routing ID that can be used on the external ServerNet fabrics. The modified ServerNet packet traverses the external fabric (X or Y) unchanged until it arrives at its destination node. At the destination node, the NNA FPGA modifies the destination ServerNet ID (DID), replacing the ServerNet node-routing ID with the default node routing ID.

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OSM and TSM

Which service management software do I need to manage a ServerNet cluster with one of the star topologies? The TSM software is required. For the specific SPRs, see the **ServerNet Cluster Manual**.

Which service management software do I need to manage a ServerNet cluster using the layered topology? The OSM software in the G06.22 or later RVU is required. For the specific client-based and server-based SPRs for OSM, see the **OSM Migration Guide**.

You cannot use TSM to manage a cluster using the layered topology.

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Plug-in Cards (PICs)

What is a PIC? A PIC, or plug-in card, is a subcomponent of an MSEB, ServerNet II Switch, or 6780 switch. PICs provide a choice of connection media for attaching cables.

- PICs installed in ports 0 through 7 of each ServerNet II Switch are single-mode fiber PICs. They are used for connections to the ServerNet nodes.
- PICs installed in port 6 of the MSEBs in group 01 (slots 51 and 52) of each node are single-mode fiber PICs that contain the node-numbering agent (NNA) field programmable gate array (FPGA).
- PICs installed in slots 2 and 3 of each 6780 Switch can contain either single-mode fiber transceivers or multimode fiber transceivers. They are used for connections between zones in the layered topology.
- PICs installed in slots 6 through 9 of each 6780 Switch are used for connections to the ServerNet nodes in the layered topology.
- PICs installed in slots 11 through 13 of each 6780 Switch are used for connections between layers in the layered topology.



Are PICs replaceable in MSEBs? Yes. PICs installed in an MSEB are Class-3 CRUs. However, they can be replaced only by personnel who have Compaq-provided training.

Are PICs replaceable in the Nonstop™ Cluster Switch (Model 6770)? No. PICs installed in the ServerNet II Switch component of the 6770 switch cannot be replaced at the installation site. If any component of the switch requires servicing, the entire switch must be replaced.

Are PICs replaceable in the Nonstop™ ServerNet Switch (Model 6780)? Yes. PICs installed in a 6780 switch can be replaced at the installation site. However, if a transceiver in a PIC requires servicing, the entire PIC must be replaced.

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Power Products

What is the function of a UPS? Within a Nonstop™ Cluster Switch (model 6770), the UPS (uninterruptible power supply) powers the ServerNet II Switch temporarily when both primary and secondary AC power rails fail. A battery inside the UPS typically provides about two hours of backup power.

A UPS is optional for a Nonstop™ ServerNet Switch (model 6780). A UPS, if used, provides power to 6780 switches temporarily when both the primary and secondary AC power fail.

What is the function of an AC transfer switch? Within a Nonstop™ Cluster Switch (Model 6770), the AC transfer switch allows the ServerNet II Switch and UPS to receive current from either of two AC power rails. Power is drawn from the primary rail as long as it is available. If the primary rail fails, then the load is connected to the secondary rail.

What is the function of a power distribution unit (PDU)? When used with Nonstop™ ServerNet Switches (Model 6780), the PDU allows multiple 6780 Switches to receive current from either of two AC power sources. Power is drawn from the primary power source as long as it is available. If the primary rail fails, then the load is connected to the secondary power source.

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SANMAN

What does SANMAN do? SANMAN is the NonStop™ Kernel external system area network manager (SANMAN). SANMAN manages the external ServerNet fabrics and is responsible for initializing, monitoring, configuring, and controlling the cluster switches. SANMAN also configures the node-numbering agent (NNA) FPGA. SANMAN is a fault-tolerant

process pair with the process name \$ZZSMN. There is a SANMAN process pair on every node in a functioning ServerNet cluster.

How often does SANMAN poll each cluster switch? 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, later product versions of SANMAN poll the switch more often until the link is repaired.

SANMAN Version	No Error	Link Error
T0502 (G06.09)	180 seconds	180 seconds
T0502AAA (G06.09)	180 seconds	180 seconds
T0502AAE (G06.12)	60 seconds	60 seconds
T0502AAG (G06.14)	180 seconds	60 seconds
T0502AAH (G06.16)	180 seconds	60 seconds

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SCF

What SCF commands are supported for the ServerNet cluster subsystem (SNETMON)? The following SCF commands are supported for the ServerNet cluster subsystem:

- ALTER
- INFO
- PRIMARY
- START
- STATUS
- STOP
- TRACE
- VERSION

What SCF commands are supported for the external ServerNet SAN manager subsystem (SANMAN)? The following SCF commands are supported for the external ServerNet SAN manager subsystem:

- ALTER
- DUMP
- INFO
- LOAD
- PRIMARY
- RESET
- STATUS
- TRACE
- VERSION

What SCF commands are supported for MSGMON? No SCF commands are supported for MSGMON.

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What's the difference between ServerNet I and ServerNet II? ServerNet I is the first-generation ServerNet protocol. It features 50 MB/s speed, six-port routers, parallel encoding, and a 64-byte maximum packet size. ServerNet II is the second-generation ServerNet protocol. It features 125 (or 50) MB/s speed, 12-port routers, serial encoding, and a 512-byte maximum packet size.

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Servers

Can a ServerNet cluster include different types of NonStop™ S-series servers? Yes. All NonStop™ S-series models can participate in the same cluster. However, some models of NonStop™ S-series servers can support greater distances between nodes.

Can a ServerNet cluster include NonStop™ K-series servers? No. NonStop™ K-series servers do not use the ServerNet protocol. Only NonStop™ S-series servers can join a ServerNet cluster. Note that a NonStop™ S-series server can simultaneously be a member of a ServerNet cluster and a FOX ring. (FOX rings can contain multiple NonStop™ S-series and NonStop™ K-series nodes.) In this arrangement, all of the servers can communicate with each other using Expand.

Can a server be a member of two different ServerNet clusters at the same time? No. While a NonStop™ S-series server can be a node in a FOX ring and a ServerNet cluster at the same time, a server cannot simultaneously be a member of two different ServerNet clusters.

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ServerNet Switches

Can any ServerNet Switch product be used in a NonStop™ Cluster Switch (Model 6770)? No. Only the 12-port ServerNet II Switch can be used in a 6770 switch. Neither the ServerNet Switch used for Windows NT clusters, nor the NonStop™ ServerNet Switch (Model 6780) are supported for the star topologies. There are circuit board and firmware differences between the cluster switch models used in these clustering applications.

How are the cluster switches packaged? Nonstop™ Cluster Switches (model 6770) can be packaged in a cluster switch enclosure or in a 19-inch rack. The cluster switch enclosure resembles—but is half the height of—an S-series system enclosure.

Click below to view NonStop™
Cluster Switch Enclosure



Can I stack Nonstop™ Cluster Switches (Model 6770) on top of each other? Although there is no technical limitation, stacking Nonstop™ Cluster Switches on top of each other is not recommended. To reduce the likelihood of cabling errors, HP recommends that the X-fabric and Y-fabric Nonstop™ Cluster Switches be installed with some distance between them. Do not install Nonstop™ Cluster Switches next to

or on top of each other. When packaged in switch enclosures, Nonstop™ Cluster Switches can be installed on the floor or on top of a single system enclosure. (They must not be installed on top of two stacked system enclosures).

How does a ServerNet II Switch become configured as an X-fabric or Y-fabric switch? Newly ordered ServerNet II Switches are not configured for either fabric. When SANMAN detects a ServerNet II Switch that is not configured for the X or Y fabric, it automatically configures it for the X fabric or Y fabric, depending on the fabric to which it is connected. For example, a ServerNet II Switch that is connected to an MSEB in slot 51 will be configured for the X fabric. After a ServerNet II Switch has been configured, its fabric setting can no longer be changed automatically by SANMAN. However, an operator using TSM client software can perform an action to reconfigure the fabric setting to X, Y, or NONE. The NONE fabric setting may be used for a ServerNet II Switch to be returned to the spares pool.

How do I replace a Nonstop™ Cluster Switch (Model 6770)? You or your service provider must use the guided procedure to replace one of the components of the cluster switch: ServerNet II Switch or AC transfer switch or UPS. It is recommended, but not required, that the ServerNet II Switch or AC transfer switch be replaced by a service provider. The UPS must be replaced by a service provider only. The guided procedure can be performed while the cluster is online, provided that the fabric of the peer ServerNet II Switch is operating normally.

How do I replace a Nonstop™ ServerNet Switch (Model 6780)? It is recommended, but not required, that the components be replaced by a service provider. You or your service provider must use the guided procedure to replace these components of the 6780 switch: logic board, the plug-in cards that connect to the nodes, or the entire 6780 switch. The guided procedure can be performed while the cluster is online, provided that the fabric of the other 6780 switch is operating normally. To replace a fan, power supply, or the plug-in cards that connect to other 6780 switches, follow the written procedures in the ServerNet Cluster 6780 Operations Guide.

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SNETMON

What does SNETMON do? SNETMON is the Subsystem Programmatic Interface (SPI) server for ServerNet cluster subsystem management commands. SNETMON:

- Monitors and responds to events relevant to ServerNet cluster operations.
- Discovers systems in a cluster.
- Brings up the message system connections
- Re-integrates processors and nodes in a cluster after an interruption in communications

SNETMON is a fault-tolerant process pair with the process name \$ZZSCL. There is an SNETMON process pair on every node in a functioning ServerNet cluster.

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Topologies

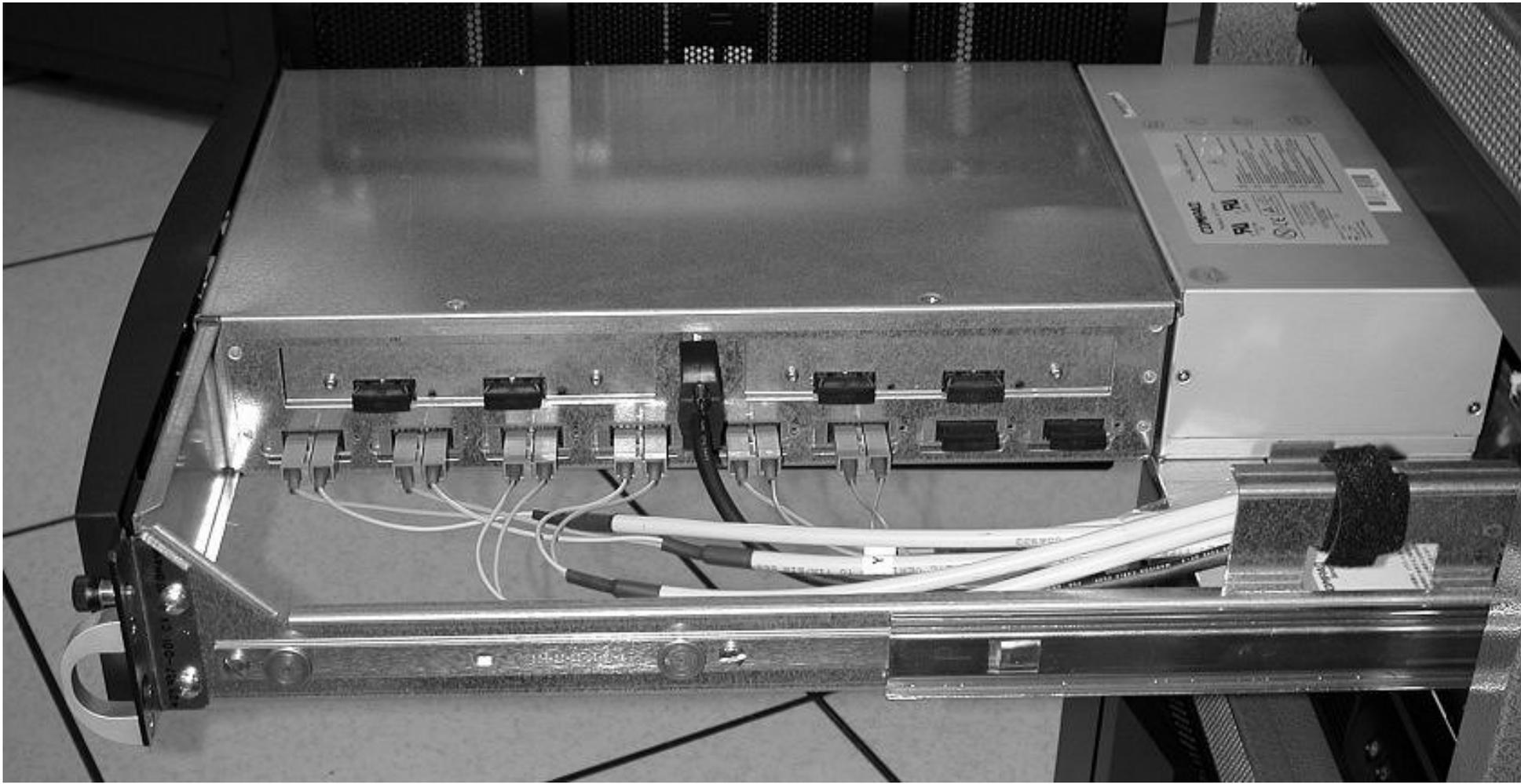
Can an external fabric contain multiple cluster switches? Yes. The cluster switches are linked by fiber-optic cables.

- The star topology does not support multiple cluster switches on the same fabric.

- The split-star topology, supported for G06.12 (or equivalent SPRs) or later RVUs, allows up to two cluster switches per fabric.
- The tri-star topology, supported for G06.14 (or equivalent SPRs) or later RVUs, allows up to three cluster switches per fabric.
- The layered topology, supported for G06.21 (or equivalent SPRs) or later RVUs, allows up to 12 cluster switches per fabric.
- For all topologies, each cluster switch supports up to 8 ServerNet nodes.

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ServerNet II Switch CRU extended for servicing

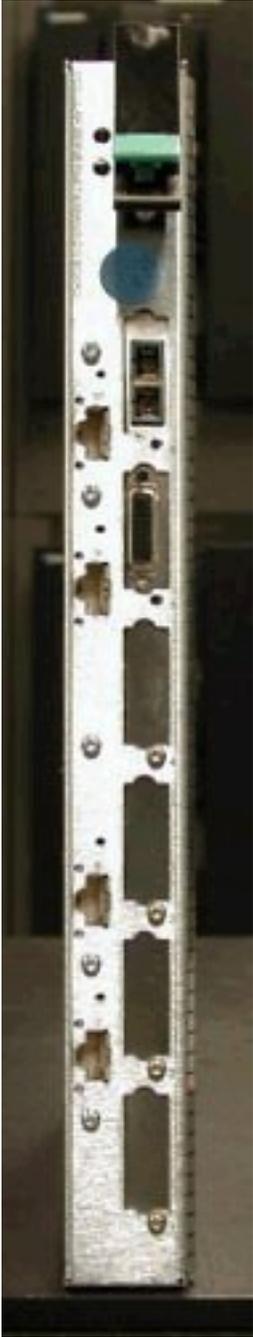


NonStop™ Cluster Switch

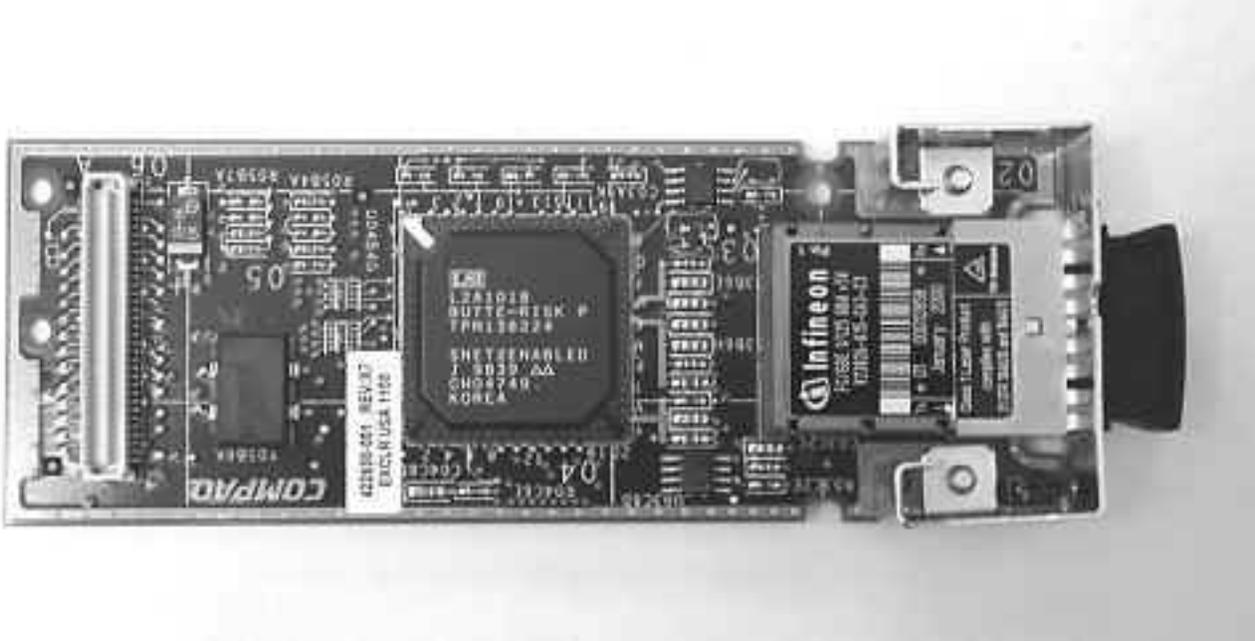
ServerNet II Switch
AC Transfer Switch
Uninterruptible Power Supply (UPS)



Modular ServerNet Expansion Board (MSEB)



ServerNet Single-Mode Fiber Plug-In Card (PIC)



NonStop™ Cluster Switch Enclosure



How do I ...

How do I ...	Solution
<p>Add a node to a ServerNet cluster?</p>	<p>You add a node to a ServerNet cluster by using a guided procedure. You must perform the procedure on a workstation that has a LAN connection to the node you want to add. The guided procedure that you use depends on whether you are using TSM or OSM. (OSM is required for clusters that use the layered topology.)</p> <ul style="list-style-type: none"> ● If you are using TSM, from the TSM workstation, choose Start> Programs> Compaq TSM> Guided Configuration Tools> Configure ServerNet Node. ● If you are using OSM, in the tree pane, right-click the local node and select Actions, and then select the Add Node to ServerNet Cluster action.
<p>Replace an SEB with an MSEB?</p>	<p>You replace an SEB with an MSEB by using the guided procedure for SEB/MSEB Replacement. You must perform the procedure on a workstation that has a LAN connection to the system containing the SEB. The procedure can be performed while the system is online, but you can replace only one SEB at a time. The guided procedure that you use depends on whether you are using TSM or OSM. (OSM is required for clusters that use the layered topology.)</p> <ul style="list-style-type: none"> ● If you are using TSM, from the TSM workstation, choose Start> Programs> TSM Client> Guided Replacement Tools> Replace SEB or MSEB. ● If you are using OSM, in the tree pane, right-click the SEB you are replacing, select Actions, and then select the Replace action.
<p>Replace a defective MSEB with another MSEB?</p>	<p>You can replace a defective MSEB with another MSEB using the guided procedure for SEB/MSEB Replacement. See How do I replace a SEB with an MSEB?</p>
<p>Replace a ServerNet II Switch?</p>	<p>You replace a ServerNet II Switch, a component of a NonStop™ Cluster Switch, by using a guided replacement procedure. Online help for the guided procedure provides detailed instructions on how to physically replace a ServerNet II Switch. It is recommended but not required that the ServerNet II Switch be replaced by a service provider. You can perform the procedure on a workstation that has a LAN connection to any node connected to the ServerNet II Switch. The guided procedure that you use depends on whether you are using TSM or OSM. (OSM is required for clusters that use the layered topology.)</p> <ul style="list-style-type: none"> ● If you are using TSM, from the TSM workstation, choose Start> Programs> Compaq TSM> Guided Replacement Tools> Replace Switch Component. ● If you are using OSM, in the tree pane, right-click the ServerNet II Switch you are replacing, select Actions, and then select the Replace action.

<p>Replace an AC Transfer Switch?</p>	<p>You replace an AC transfer switch, a component of a Nonstop™ Cluster switch, by using a guided procedure. Online help for the guided procedure provides detailed instructions on how to physically replace an AC transfer switch. It is recommended but not required that the AC transfer switch be replaced by a service provider. You can perform the procedure on a workstation that has a LAN connection to any node connected to the Nonstop™ Cluster Switch.</p> <ul style="list-style-type: none"> ● If you are using TSM, from the TSM workstation, choose Start> Programs> Compaq TSM> Guided Replacement Tools> Replace Switch Component. ● If you are using OSM, in the tree pane, right-click the AC Transfer Switch you are replacing, select Actions, and then select the Replace action.
<p>Remove a node from a ServerNet cluster?</p>	<p>You remove a node from a ServerNet cluster first by stopping the Expand-over-ServerNet lines configured from the node to all other nodes in the cluster and from all other nodes to the node being removed.</p> <p>On the node being removed, you must then use an SCF command to bring ServerNet cluster services to a STOPPED logical state. This causes the node being removed to inform other nodes that it is leaving the cluster.</p> <ul style="list-style-type: none"> ● If your cluster uses one of the star topologies, see the ServerNet Cluster Manual for more information. ● If your cluster uses the layered topology, see the ServerNet Cluster 6780 Planning and Installation Guide for more information.
<p>Replace an MSEB PIC?</p>	<p>To replace a PIC in an MSEB, you must remove the MSEB from its enclosure. To do this while the system is online, you must use the guided procedure for SEB/MSEB Replacement. See How do I replace a SEB with an MSEB?</p> <p>Instructions for removing and installing a PIC can be found in the Procedures section of the CSSI home page on this web.</p>
<p>Replace a PIC in a ServerNet II Switch?</p>	<p>You cannot replace a PIC installed in a ServerNet II Switch. If a PIC installed in a ServerNet II Switch is faulty and no other functional PICs are available, you must replace the ServerNet II Switch.</p>

<p>Replace a UPS?</p>	<p>The uninterruptible power supply (UPS), a component of a Nonstop™ Cluster Switch, is a field-replaceable unit that can be replaced only by specially-trained service providers.</p> <p>Your service provider must use the NonStop S-Series Service Providers Supplement in conjunction with a guided replacement procedure. Detailed instructions on how to physically replace a UPS are available to service providers in the supplement. Your service provider can perform the procedure on a workstation that has a LAN connection to any node connected to the Nonstop™ Cluster Switch. The guided procedure that your service provider uses depends on whether TSM or OSM is used for service management.</p> <ul style="list-style-type: none"> ● From the TSM workstation, your service provider chooses Start> Programs> Compaq TSM> Guided Replacement Tools> Replace Switch Component. ● From OSM, in the tree pane, your service provider right-clicks the UPS, selects Actions, and then selects the Replace action.
<p>Move a node from one ServerNet cluster to another?</p>	<p>Complete the procedure for removing a node from a cluster. Then use the guided procedure to add a ServerNet node to the new cluster.</p>
<p>Move ServerNet cables from one port to another on the cluster switches?</p>	<p>If unused ports are available on the X-fabric and Y-fabric cluster switches, you can move a node's connection to the switches by shutting down your applications and then removing the node from the ServerNet cluster. Removing a node in this case requires aborting Expand-over-ServerNet line-handler processes, bringing ServerNet cluster services to a STOPPED logical state, and disconnecting the cables from the cluster switches. Then you can re-connect the cables to the unused ports (you must use the same port number for the X and Y fabrics). Then you can add the removed node back into the cluster by using SCF commands or the guided configuration procedure:</p> <ul style="list-style-type: none"> ● From a TSM workstation, click Start> Programs> Compaq TSM> Guided Configuration Tools> Configure ServerNet Node. ● From a system console running OSM, in the tree pane, right-click the local node and select Actions, and then select the Add Node to ServerNet Cluster action. <p>If your cluster is built with the layered topology, see the ServerNet Cluster 6780 Planning and Installation Guide for more information.</p>

<p>Add a NonStop Cluster Switch (model 6770) to each fabric of a ServerNet cluster to upgrade to the split-star or tri-star topology?</p>	<p>Use the Add Switch guided configuration procedure (Start> Programs> Compaq TSM> Guided Configuration Tools> Add Switch). The steps for using the procedure depend on the topology you want to upgrade to. In general, you start with two or three functioning ServerNet clusters. You run the procedure on each fabric of each cluster before connecting four-lane or two lane-links between the cluster switches. For detailed steps, refer to the online help or the ServerNet Cluster Manual.</p>
<p>Replace a NonStop ServerNet Switch (model 6780)?</p>	<p>You replace a 6780 switch by using an OSM guided procedure. OSM is used for clusters built with 6780 switches in a layered topology. Online help for the guided procedure provides detailed instructions on how to physically replace the 6780 switch. It is recommended but not required that the switch be replaced by a service provider.</p> <p>You can launch the procedure on a workstation that has a LAN connection to any node connected to the 6780 switch. From a system console running OSM, in the tree pane, right-click the switch module, select Actions, and then select the Replace action.</p>
<p>Replace components in a 6780 switch?</p>	<p>You replace the 6780 switch logic board or node PICs by using the OSM Replace a Switch component guided procedure. Online help for the guided procedure provides detailed instructions on how to physically replace the 6780 switch logic board or a 6780 node PIC. It is recommended but not required that these components be replaced by a service provider.</p> <p>You can launch the procedure on a workstation that has a LAN connection to any node connected to the 6780 switch. From a system console running OSM, in the tree pane, right-click either the logic board or node PIC you want to replace, select Actions, and then select the Replace action.</p> <p>Other PICS and components in a 6780 switch are replaced manually. See the ServerNet Cluster 6780 Planning and Installation Guide for the specific manual procedure.</p>
<p>Migrate a cluster from one of the star topologies to the layered topology?</p>	<p>To migrate a cluster to the layered topology, you must have on hand all the necessary hardware and software described in the ServerNet Cluster 6780 Planning and Installation Guide.</p> <p>See the instructions in the ServerNet Cluster 6780 Planning and Installation Guide to migrate to the layered topology.</p>
<p>Add zones or layers to a cluster with the layered topology?</p>	<p>Adding zones or layers to a layered topology is done with manual procedures. See the instructions in the ServerNet Cluster 6780 Planning and Installation Guide to add zone or layers to a cluster with the layered topology.</p>

Known Problems With Manuals

Click the Links in the Part Numbers column of the table below to display known documentation problems for specific manuals. Detailed problem descriptions and workarounds are provided.

Updated May 21, 2004

Manual Title	Part Numbers With Known Problems	Released With
Himalaya S-Series Service Provider Supplement	429953-001	G06.12
Himalaya S-Series System Expansion and Reduction Guide	426721-001	G06.09
	427555-001	G06.10
	429228-001	G06.11
ServerNet Cluster Manual	425019-001	G06.09
	427410-001	G06.10 G06.11
	429153-001	G06.12
	520371-001	G06.12
	520440-001	G06.13
	520575-001	G06.14 G06.15
	520575-002	G06.16
ServerNet Cluster 6780 Operations Guide	525606-002	G06.22
Himalaya Cluster Switch Hardware Installation and Support Guide	All	G06.09 through G06.14

Himalaya S-Series Service Provider Supplement (PN429953-001)

- ▶ Problem: Procedures on pages 13-3, 13-4, and 13-5 include the SCF INFO SWITCH \$ZZSMN command to check the status of the Compaq NonStop Himalaya Cluster Switch and ensure that the cluster switch is ready for the next operation.

Correction: The correct command to use is the SCF STATUS SWITCH \$ZZSMN command.

Himalaya S-Series System Expansion and Reduction Guide (PN426721-001, PN427555-001, and PN429228-001)

- ▶ **Problem:** A caution on page 1-2 of the guide incorrectly states that if a system you want to resize is a member of a ServerNet cluster and you want to perform this expansion online, you must first remove the system from the cluster.

Correction: There is no restriction for expanding or reducing a system online when a system is a member of a ServerNet cluster. Online expansion and reduction is fully supported for ServerNet nodes.

ServerNet Cluster Manual (PN 425019-001)

- ▶ **Problem:** Page 2-7 of the ServerNet Cluster Manual states that single-mode fiber-optic cables provided by Compaq are not plenum-rated.

Correction: An 80-meter plenum-rated cable is now available. You can order the cable using:

- order number 676-265P
- cable part number 427246-001

For tips on routing and labeling fiber-optic cables, refer to the Compaq NonStop Himalaya Cluster Switch Hardware Installation and Support Guide (PN 426921-001).

- ▶ **Problem:** Table D-1 on page D-2 categorizes the uninterruptible power supply (UPS) as a Class 3 customer-replaceable unit (CRU).

Correction: The UPS is a field-replaceable unit (FRU). As a FRU it can be replaced in the field only by qualified personnel trained by Compaq and cannot be replaced by customers. Service providers should refer to the instructions in the Himalaya S-Series Service Provider Supplement.

- ▶ **Problem:** Page 5-3 of the ServerNet Cluster Manual does not contain a procedure for moving ServerNet cables to different ports on the ServerNet II Switches. A reference to this procedure points to another manual, which also does not contain the procedure.

Correction: A procedure for moving ServerNet cables to different

ports on the ServerNet II Switches is included in Section 5 of the G06.10 revision of the ServerNet Cluster Manual (427410-001). For more information see [How Do I ...](#) topic.

- ▶ Problem: The height of the cluster switch enclosure is listed as 37.6 in. (95.5 cm) in the Switch Enclosure Dimensions table in Section 2, "Planning for Installation." The correct height of the switch enclosure is 20.5 in. (52 cm).

Correction: The correct height of the cluster switch enclosure appears in the G06.16 version of the ServerNet Cluster Manual (520575-002).

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[ServerNet Cluster Manual \(PN 429153-001\)](#)

- ▶ Problem: In the procedure to merge two ServerNet clusters that use a star topology (one cluster switch per fabric), additional steps are needed to ensure successful merging. The procedure that needs modification appears in Section 4 of the G06.12 versions (429153-001 and 520371-001) of the ServerNet Cluster Manual.

Before two ServerNet clusters can be merged, one of the clusters must be configured to use ServerNet node numbers 9 through 16. These are the high node numbers. Reconfiguration is achieved by downloading the T0569AAB configuration file to both the X-fabric and Y-fabric cluster switches and specifying position 2 for the configuration.

During the upgrade, some nodes might retain their old node numbers (1 through 8). This can happen if the nodes do not detect a loss of link alive during the upgrade. (SANMAN and the service processor (SP) must be notified that the link to a cluster switch is in the down state before changing the ServerNet node number in the NNA. If the SP interrupt burst suppression is activated on the NNA port when SANMAN needs to see a link down event, the nodes cannot detect the loss of link alive.)

Recovery: If you encounter this problem, use the following SCF script to abort and restart SANMAN on all affected nodes in the X2/Y2 logical cluster:

```
ABORT PROCESS $ZZKRN.#ZZSMN
DELAY 5
START PROCESS $ZZKRN.#ZZSMN
```

Aborting and restarting SANMAN causes the nodes to correctly pick up the high node numbers (9 through 16) and configure the X and Y NNAs with these new numbers.

Workaround: To avoid this problem, use the G06.13 version of the ServerNet Cluster Manual (520440-001). The procedure has been corrected in the G06.13 manual.

If you do not have access to the G06.13 manual, perform the "Steps for Merging Two ServerNet Clusters" in Section 4 of the ServerNet Cluster Manual. However, before running the guided procedure for adding a cluster switch on the cluster that will use the high (9 through 16) ServerNet node numbers (step 5 of the documented procedure), perform the following steps on all nodes of the cluster to be configured as the X2/Y2 cluster. These steps ensure an orderly shutdown of ServerNet communications on the cluster. The shutdown is recommended because the ServerNet node numbers will change from the 1-8 range to the 9-16 range when the cluster is configured as the X2/Y2 cluster.

1. On all nodes of the X2/Y2 cluster, stop any applications that depend on ServerNet cluster connectivity.
2. On all nodes of the X2/Y2 cluster, abort all Expand-over-ServerNet lines.
3. On all nodes of the X2/Y2 cluster, use the SCF STOP SUBSYS \$ZZSCL command to ensure an orderly shutdown of ServerNet communications.

From any node on the X2/Y2 cluster, run the guided procedure for adding a cluster switch, as documented in the G06.12 ServerNet Cluster Manual. After running the guided procedure, perform the following steps on all nodes of the X2/Y2 cluster:

1. On all nodes of the X2/Y2 cluster, use the SCF START SUBSYS \$ZZSCL command to bring up direct ServerNet connectivity between the nodes.
2. On all nodes of the X2/Y2 cluster, start the Expand-over-ServerNet lines to all other nodes.
3. If desired, start any applications that utilize ServerNet connectivity to nodes within the X2/Y2 cluster.

- ▶ Problem: The manual contains no information about the Missing Remote ServerNet Switch alarm or time limits for connecting the four-lane links.

The TSM incident analysis (IA) software generates an alarm if one external fabric has two cluster switches while the other external fabric has only one cluster switch. After a second cluster switch is added to an external fabric, the IA checks the peer fabric to determine if it has two cluster switches. If, after 4 minutes, only one external fabric has two cluster switches, the IA generates a Missing Remote ServerNet Switch alarm. If, after 4 more minutes, the peer fabric still does not have two cluster switches, the IA dials out the Missing Remote ServerNet Switch alarm.

If a second cluster switch is added to the peer fabric after the alarm is generated but before the alarm is dialed out, the alarm is deleted and is not dialed out.

Workaround: When adding cluster switches to create a split-star topology, connect the four-lane links for both external fabrics within 4 minutes to avoid generating the Missing Remote ServerNet Switch alarm. If the four-lane links cannot be connected within 4 minutes, connect them within 8 minutes to avoid dialing out the Missing Remote ServerNet Switch alarm.

- ▶ Problem: The version of the ServerNet Cluster Manual (429153-001) included on the G06.12 TIM CD contains a page-numbering problem in which the section numbers increment sequentially rather than restarting at 1. Consequently, the table of contents and index do not indicate the correct page numbers. In addition, the appendices appear as Appendix K through Q instead of Appendix A through G.

Workaround: Do not use the ServerNet Cluster Manual (429153-001) included on the G06.12 TIM CD. A corrected version of the manual (520371-001) is available from the G06.12 TIM online collection. Except for the page numbers and appendix letters, the corrected version of the manual is identical to the version of the manual on the G06.12 TIM CD.

To access online collections via an Internet connection:

1. Launch TIM.
2. Choose "Add/Remove" from the Collections menu item.
3. Select "Access Web" in the Remote Collections box.
4. Add the collections you wish to use to your list of current collections.
5. Expand the collections to see the documents.

You should use TIM Viewer Version 2.1 or higher to view this collection. Details about the TIM viewer, Version 2.1 can be found in Support Note S99010.

To access the TIM server, set your Default WWW Master Collection under Edit-->Preferences to:

`http://tex.zcac.compaq.com/cgi-bin/timcfg.exe`

or

`http://tex.tandem.com/cgi-bin/timcfg.exe`

- ▶ Problem: The height of the cluster switch enclosure is listed as 37.6 in. (95.5 cm) in the Switch Enclosure Dimensions table in Section 2, "Planning for Installation." The correct height of the switch enclosure is 20.5 in. (52 cm).

Correction: The correct height of the cluster switch enclosure appears in the G06.16 version of the ServerNet Cluster Manual (520575-002).

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[ServerNet Cluster Manual \(520371-001\)](#)

- ▶ Problem: In the procedure to merge two ServerNet clusters that use a star topology (one cluster switch per fabric), additional steps are needed to ensure successful merging. The procedure that needs modification appears in Section 4 of the G06.12 versions (429153-001 and 520371-001) of the ServerNet Cluster Manual.

Before two ServerNet clusters can be merged, one of the clusters must be configured to use ServerNet node numbers 9 through 16. These are the high node numbers. Reconfiguration is achieved by downloading the T0569AAB configuration file to both the X-fabric and Y-fabric cluster switches and specifying position 2 for the configuration.

During the upgrade, some nodes might retain their old node numbers (1 through 8). This can happen if the nodes do not detect a loss of link alive during the upgrade. (SANMAN and the service processor (SP) must be notified that the link to a cluster switch is in the down state before changing the ServerNet node number in the NNA. If the SP interrupt burst suppression is activated on the NNA port when SANMAN needs to see a link down event, the nodes cannot detect the loss of link alive.)

Recovery: If you encounter this problem, use the following SCF script to abort and restart SANMAN on all affected nodes in the X2/Y2 logical cluster:

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

DELAY 5

START PROCESS \$ZZKRN.#ZZSMN

Aborting and restarting SANMAN causes the nodes to correctly pick up the high node numbers (9 through 16) and configure the X and Y NNAs with these new numbers.

Workaround: To avoid this problem, use the G06.13 version of the ServerNet Cluster Manual (520440-001). The procedure has been corrected in the G06.13 manual.

If you do not have access to the G06.13 manual, perform the "Steps for Merging Two ServerNet Clusters" in Section 4 of the ServerNet Cluster Manual. However, before running the guided procedure for adding a cluster switch on the cluster that will use the high (9 through 16) ServerNet node numbers (step 5 of the documented procedure), perform the following steps on all nodes of the cluster to be configured as the X2/Y2 cluster. These steps ensure an orderly shutdown of ServerNet communications on the cluster. The shutdown is recommended because the ServerNet node numbers will change from the 1-8 range to the 9-16 range when the cluster is configured as the X2/Y2 cluster.

1. On all nodes of the X2/Y2 cluster, stop any applications that depend on ServerNet cluster connectivity.
2. On all nodes of the X2/Y2 cluster, abort all Expand-over-ServerNet lines.
3. On all nodes of the X2/Y2 cluster, use the SCF STOP SUBSYS \$ZZSCL command to ensure an orderly shutdown of ServerNet communications.

From any node on the X2/Y2 cluster, run the guided procedure for adding a cluster switch, as documented in the G06.12 ServerNet Cluster Manual. After running the guided procedure, perform the following steps on all nodes of the X2/Y2 cluster:

1. On all nodes of the X2/Y2 cluster, use the SCF START SUBSYS \$ZZSCL command to bring up direct ServerNet connectivity between the nodes.
2. On all nodes of the X2/Y2 cluster, start the Expand-over-ServerNet lines to all other nodes.
3. If desired, start any applications that utilize ServerNet connectivity to nodes within the X2/Y2 cluster.

- ▶ **Problem:** The manual contains no information about the Missing Remote ServerNet Switch alarm or time limits for connecting the four-lane links.

The TSM incident analysis (IA) software generates an alarm if one external fabric has two cluster switches while the other external fabric has only one cluster switch. After a second cluster switch is added to an external fabric, the IA checks the peer fabric to determine if it has two cluster switches. If, after 4 minutes, only one external fabric has two cluster switches, the IA generates a Missing Remote ServerNet Switch alarm. If, after 4 more minutes, the peer fabric still does not have two cluster switches, the IA dials out the Missing Remote ServerNet Switch alarm.

If a second cluster switch is added to the peer fabric after the alarm is generated but before the alarm is dialed out, the alarm is deleted and is not dialed out.

Workaround: When adding cluster switches to create a split-star topology, connect the four-lane links for both external fabrics within 4 minutes to avoid generating the Missing Remote ServerNet Switch alarm. If the four-lane links cannot be connected within 4 minutes, connect them within 8 minutes to avoid dialing out the Missing Remote ServerNet Switch alarm.

- ▶ **Problem:** The height of the cluster switch enclosure is listed as 37.6 in. (95.5 cm) in the Switch Enclosure Dimensions table in Section 2, "Planning for Installation." The correct height of the switch enclosure is 20.5 in. (52 cm).

Correction: The correct height of the cluster switch enclosure appears in the G06.16 version of the ServerNet Cluster Manual (520575-002).

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[ServerNet Cluster Manual \(427410-001 and 520440-001\)](#)

- ▶ **Problem:** The height of the cluster switch enclosure is listed as 37.6 in. (95.5 cm) in the Switch Enclosure Dimensions table in Section 2, "Planning for Installation." The correct height of the switch enclosure is 20.5 in. (52 cm).

Correction: The correct height of the cluster switch enclosure appears in the G06.16 version of the ServerNet Cluster Manual (520575-002).

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ServerNet Cluster Manual (520575-001)

- ▶ **Problem:** In Section 4, "Upgrading a ServerNet Cluster," the "Steps for Merging Two Star Topologies to Create a Split-Star Topology" include sub-steps for aborting all Expand-over-ServerNet lines and stopping the ServerNet cluster subsystem (\$ZZSCL) before running the guided procedure for adding a cluster switch (Add Switch). However, the guided procedure will not run if the \$ZZSCL subsystem is stopped. An error message (Error 1002: Cluster Software Not Ready) is returned.

Workaround: Do not stop the ServerNet cluster subsystem (\$ZZSCL) before running the guided procedure for adding a cluster switch (Add Switch).

- ▶ **Problem:** The height of the cluster switch enclosure is listed as 37.6 in. (95.5 cm) in the Switch Enclosure Dimensions table in Section 2, "Planning for Installation." The correct height of the switch enclosure is 20.5 in. (52 cm).

Correction: The correct height of the cluster switch enclosure appears in the G06.16 version of the ServerNet Cluster Manual (520575-002).

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ServerNet Cluster Manual (520575-002)

- ▶ **Problem:** Page 8-13 does not include a cause code that appears when \$ZZSCL abends because of a duplicate node number. Cause codes appear in the Cause column of the SCF STATUS SUBNET display.

Correction: The list of cause codes on page 8-14 should include DPSN (Duplicate System Number)

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ServerNet Cluster 6780 Operations Guide (525606-002)

- ▶ **Problem:** Page 4-17 does not include a cause code that appears when \$ZZSCL abends because of a duplicate node number. Cause codes appear in the Cause column of the SCF STATUS SUBNET display.

Correction: The list of cause codes on page 4-17 should include DPSN (Duplicate System Number)

Himalaya Cluster Switch Hardware Installation and Support Guide

- ▶ **Problem:** The manual does not say what type of AC power receptacle is required for the primary and secondary power sources for the cluster switch.

Corrections:

- The AC power cord for North America and Japan (T24242) uses a NEMA 5-15P plug, so the power sources must have NEMA 5-15R receptacles.
- The international power cord (T29490) uses a CEE 7 plug, so the power sources must have CEE 7 receptacles.

Known Problems With Online Help

Click the Links in the Versions column of the table below to display known documentation problems for specific online help systems. Detailed problem descriptions and workarounds are provided.

Updated December 16, 2002

Help System Title	Versions With Known Problems	Released With
All guided procedures	All	All TSM releases
Add Switch	1.0	TSM 2001B
	2.0	TSM 2001C
	3.0	TSM 2001D TSM 2002A
Configure ServerNet Node	1.0	TSM 10.0
Replace Switch	1.0	TSM 2001C
Troubleshoot ServerNet Fabric	1.0	TSM 2001B
	2.0	TSM 2001C TSM 2001D TSM 2002A
TSM EMS Event Viewer Application	All from 10.0 though 2002A	TSM 10.0 through TSM 2002A

Online Help: All Guided Procedures

- Problem: Cannot use the print function for online help when it is started from the guided procedure interface.

Workaround: Open the online help file independently of the guided procedures interface and then use the print function. Online help files are stored on the TSM workstation in the C:\ZUPPORT\GUIDED PROCEDURES\HELP directory:

- CLUSTER.CHM (supports the Configure ServerNet Node procedure)
- PDK.CHM (supports the guided procedures interface)
- SEB.CHM (supports the Replace SEB or MSEB procedure)
- TSM.CHM (supports the connect-to-system task used by all guided procedures)

- SWITCH.CHM (supports the Replace Switch Component procedure)

Double-click any of the .CHM files to open the HTML Help application independent of the guided procedures interface. To print one or more topics, click the Print button.

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Add Switch Guided Procedure (Versions 1.0 & 2.0)

- ▶ Problem: The online help contains no information about the Missing Remote ServerNet Switch alarm or time limits for connecting the four-lane links.

The TSM incident analysis (IA) software generates an alarm if one external fabric has two cluster switches while the other external fabric has only one cluster switch. After a second cluster switch is added to an external fabric, the IA checks the peer fabric to determine if it has two cluster switches. If, after 4 minutes, only one external fabric has two cluster switches, the IA generates a Missing Remote ServerNet Switch alarm. If, after 4 more minutes, the peer fabric still does not have two cluster switches, the IA dials out the Missing Remote ServerNet Switch alarm.

If a second cluster switch is added to the peer fabric after the alarm is generated but before the alarm is dialed out, the alarm is deleted and is not dialed out.

Workaround: When adding cluster switches to create a split-star topology, connect the four-lane links for both external fabrics within 4 minutes to avoid generating the Missing Remote ServerNet Switch alarm. If the four-lane links cannot be connected within 4 minutes, connect them within 8 minutes to avoid dialing out the Missing Remote ServerNet Switch alarm.

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Add Switch Guided Procedure (Version 3.0)

- ▶ Problem: In the "Upgrading a Split-Star Topology to a Tri-Star Topology" topic, Step 1 directs the user to merge two split-star topologies, which is not supported. Step 1 should direct the user to merge a split-star topology with a star topology.

Workaround: Download Version 3.1 of the Help file (SWITCHADDITION.CHM) from the CSSI Intranet. To install the

updated Help file on a TSM workstation, copy the file to the C:\ZSUPPORT\GUIDED PROCEDURE\HELP directory. You can overwrite the current SWITCHADDITION.CHM Help file.

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Configure ServerNet Node Guided Procedure (Version 1.0)

- ▶ **Problem:** Clicking the Help button on the CNP0001: Internal Error dialog box shows "Page not found" instead of the online help topic for the error dialog box.

Workaround: After you have dismissed the error dialog box, do the following:

1. From the Help menu, click Procedure Help. Or open the online help system by clicking Help in any other dialog box for the guided procedure.
2. Click the Index tab to view the index.
3. Type CNP0001: Internal Error.
4. Click Display.

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Replace Switch Guided Procedure (Version 1.0)

- ▶ **Problem:** The online help file (SWITCH.CHM) that is included with the TSM 2001C client software is the wrong file. TSM2001C contains Version 1.0 of the online help for Replace Switch, which is dated August 2, 2000. The correct online help version for TSM 2001C is Version 3.0 or later.

Workaround: Authorized Service Providers can download Version 3.0 or later from the CSSI intranet.

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Troubleshoot ServerNet Fabric Guided Procedure (Version 1.0)

- ▶ **Problem:** The Loopback Plugs topic lists an incorrect part number (U11674) for the ECL loopback plug.

Correction: The correct part number for ordering the ECL loopback plug is 138894.

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Troubleshoot ServerNet Fabric Guided Procedure (Version 2.0)

- ▶ Problem: The Loopback Plugs topic lists an incorrect part number (U11674) for the ECL loopback plug.

Correction: The correct part number for ordering the ECL loopback plug is 138894.

- ▶ Problem: The version number of the online help file included in the TSM 2001D client software is incorrect. The help file (FABRICTS.CHM) included with the TSM 2001D client software shows the help version as Version 2.0. The correct online help version for TSM 2001D should be Version 3.0 or later.

Workaround: No workaround is necessary unless a help file containing the correct version is needed. There are no known problems with the online help content for the file included with TSM 2001D. If a help file with the corrected version is needed, Service Providers can download Version 3.0 (dated January 8, 2002) or later from the CSSI intranet web site. The downloadable file shows the correct version number and copyright date.

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TSM EMS Event Viewer Application (TSM Releases 10.0 through 2002A)

- ▶ Problem: F1 help is not available for SCL (ServerNet cluster) and SMN (external ServerNet SAN) subsystem events displayed in the TSM EMS Event Viewer Application. TSM client software versions 10.0 through Compaq TSM 2002A are affected. These client software versions support releases G06.09 through G06.15.

Correction: F1 help is available for SCL and SMN subsystem events in TSM EMS Event Viewer Application with TSM client software versions 2002B and later.

Workaround: Consult the Operator Messages Manual for cause, effect, and recovery information for SCL and SMN subsystem events.

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ZPMCONF and ZSCCONF

ZSCCONF

As of the G06.21 RVU, an updated version of the ZPMCONF macro is available . The new version, called ZSCCONF, does not need to be downloaded. It is installed in the \$SYSTEM.ZSUPPORT subvolume.

For details on running ZSCCONF, see the *ServerNet Cluster 6780 Planning and Installation Guide*.

ZPMCONF

ZPMCONF is an example macro that automates the process of adding MSGMON, SANMAN, and SNETMON to the system configuration database.

ZPMCONF does the following:

- Detects the number of processors currently loaded and prompts you to confirm this number (if your system has fewer than four processors).
- Aborts and deletes the MSGMON, SANMAN, and SNETMON processes, if they are already present.
- Returns error messages if the processes could not be successfully deleted.
- Adds the processes using a processor list that is appropriate for the system size.
- Starts MSGMON, SANMAN, and SNETMON and attempts to start the ServerNet cluster subsystem.

The manual steps for adding these processes are documented in the *ServerNet Cluster Manual* (Appendix E), located in G06.09 and later collections.

ZPMCONF TAACL Macro

```
?tacl macro
== This is a sample TAACL macro that configures the $ZPM entries for
== Msgmon, Sanman, and Snetmon. HP recommends different
== configurations depending upon whether the system has 2 processors,
== 4 processors, or more than 4 processors. This macro starts by
== determining the number of processors currently loaded. If it is
== 5 or more, the macro configures the $ZPM entries as such. If it is
== less than 5 processors, it prompts the user for the number of
== processors to configure for.
#frame
#push listProcessors numProcessors parseTest ptrChar scf^output
#push #inlineprefix
#set #inlineprefix +
== This routines parses the user responses
[#def parseResponse routine
|BODY|
#result [#argument number /minimum 2, maximum 16/
token /token yes/
token /token no/
token /token quit/
otherwise]
]
```

```

== This is the main processing routine. It gets executed once at the
== bottom of the TACL macro.
[#def mainBody routine
|BODY|
#output Determining the total of number of processors...
#output
#set listProcessors [#processorstatus]
#set ptrChar [#charfindrv listProcessors [#charcount listProcessors] "-1"]
#set numProcessors -1 == Initialize to -1 because we always overshoot by 1
[#loop
|WHILE| [ptrChar]
|DO|
#set ptrChar [#charfindrv listProcessors [#compute [ptrChar]-1] " "]
#set numProcessors [#compute numProcessors + 1]
]
[#if numProcessors <= 4
|THEN|
#output In order to properly configure this system for Servernet
#output Clusters we need to know how many processors it has.
#output
#output Based on the number of processors currently running, it appears
#output that this system has a total of [numProcessors] processors.
[#loop
|DO|
#set parseTest [parseResponse &
[#input Is this the correct number of processors? (YES/NO/QUIT)]]
[#if parseTest = 4 |THEN| #return]
|UNTIL| parseTest = 2 or parseTest = 3]
== Does the user want to specify the number of processors?
[#if parseTest = 3
|THEN|
[#loop
|DO|
#set numProcessors &
[#input Please enter the total number of processors or QUIT->]
#set parseTest [parseResponse [numProcessors]]
[#if parseTest = 4 |THEN| #return]
|UNTIL| parseTest = 1
]
]
]
#output
#output Deleting the existing $ZPM entries...
#output
== Collect the $ZZKRN information in a variable called scf^output.
== The next time we are in SCF, we will parse that variable for
== configuration information.
scf /name, outv scf^output/ ; info process $zzkrn.*
scf /name, inline, out [#myterm]/

```

```

+ allow all errors
[#if [#charfindv scf^output 1 "SNETMON"]
|THEN|
  + abort process $zzkvrn.#zzscl
  #delay 200
  + delete process $zzkvrn.#zzscl]
[#if [#charfindv scf^output 1 "SANMAN"]
|THEN|
  + abort process $zzkvrn.#zzsmn
  #delay 200
  + delete process $zzkvrn.#zzsmn]
[#if [#charfindv scf^output 1 "MSGMON"]
|THEN|
  + abort process $zzkvrn.#msgmon
  #delay 200
  + delete process $zzkvrn.#msgmon]
+ exit
#output
#output Verifying that the entries were successfully deleted...
#output
== Repeat the above process to verify that we really did delete all
== of the entries.
scf /name, outv scf^output/ ; info process $zzkvrn.*
[#if [#charfindv scf^output 1 "MSGMON"]
|THEN|
  #output ERROR! The Msgmon entry was not successfully deleted.
  #output Please delete the entry manually and then rerun this macro.
  #output
  #return
]
[#if [#charfindv scf^output 1 "SANMAN"]
|THEN|
  #output ERROR! The Sanman entry was not successfully deleted.
  #output Please delete the entry manually and then rerun this macro.
  #output
  #return
]
[#if [#charfindv scf^output 1 "SNETMON"]
|THEN|
  #output ERROR! The Snetmon entry was not successfully deleted.
  #output Please delete the entry manually and then rerun this macro.
  #output
  #return
]
#output
#output Adding the new $ZPM entries...
#output
[#case [numProcessors]

```

```

| 2 3 |           #set listProcessors (0,1)
| 4 5 |           #set listProcessors (2,1,3)
| OTHERWISE | #set listProcessors (2,5,6,3,7,4)
]
scf /name, inline, out [#myterm]/
+ allow all errors
+ add process $zzkcrn.#msgmon, autorestart 10, cpu all, &
  hometerm $zhome, outfile $zhome, name $zim, &
  priority 199, program $system.system.msgmon, saveabend on, &
  startmode system, stopmode sysmsg
+ add process $zzkcrn.#zzsmn, autorestart 10, priority 199, &
  program $system.system.sanman, cpu firstof [listProcessors], &
  hometerm $zhome, outfile $zhome, name $zzsmn, saveabend on, &
  startmode system, stopmode sysmsg, startupmsg "cpu-list <cpu-list>"
+ add process $zzkcrn.#zzscl, autorestart 10, priority 199, &
  program $system.system.snetmon, cpu firstof [listProcessors], &
  hometerm $zhome, outfile $zhome, name $zzscl, saveabend on, &
  startmode system, stopmode sysmsg, startupmsg "cpu-list <cpu-list>"
+ start process $zzkcrn.#msgmon
+ start process $zzkcrn.#zzsmn
+ start process $zzkcrn.#zzscl
+ alter subsys $zzscl, startstate started
+ abort process $zzkcrn.#zzscl
+ start process $zzkcrn.#zzscl
#delay 500
+ info subsys $zzscl
+ status subsys $zzscl
+ exit
]

```

```

== This is the line of code that actually executes the mainBody routine
mainBody
#unframe

```

Notes:

- ZPMCONF requires G06.09 or later RVUs of the operating system, or equivalent SPRs.
- ZPMCONF is intended as an example and may not be appropriate for all systems.
- You must log on using the super ID (255, 255) in order to run ZPMCONF successfully.
- Do not run the macro on a system that is currently a member of a ServerNet cluster. MSGMON, SANMAN, and SNETMON will be aborted, and the connection to the cluster will be lost temporarily.

If you are having technical problems with the TACL macro ZPMCONF, please [contact us](#).

Contact Us

What do you think? Your views on what we do and how we could make things better are important. Please send us your comments or suggestions. We appreciate your input and look forward to hearing from you.

- Click on this link to e-mail your comments regarding any of the [HP NonStop publications](#) . A detailed response to your message will be sent as soon as possible. In your e-mail message, be sure to include:
 - your name
 - company name
 - address
 - phone number

If your comments are specific to a particular manual, also include the part number and the title of the manual.

- If you have a question regarding ServerNet Cluster, please check our [Frequently Asked Questions](#) (FAQ) page - you'll find lots of answers and information there. To propose a question for inclusion in the FAQ, you can [e-mail](#) us.

Help

Welcome to the ServerNet Cluster web site! We want to help you get the most out of our site.

1. **Which browser should I be using to get the most from your site ?**

The web site is optimized for version 4 and above of Internet Explorer.

2. **How do I know if I am viewing the most up-to-date material?**

The most up-to-date material is available on the Compaq extranet and the Compaq intranet (Compaq employees only). Click the refresh or reload button on your browser every time you visit the online versions of the web site.