HP NonStop S-series servers

Ordering and configuration guide

Contents

Overview

This document describes the major components of the HP NonStop S-series server hardware and software. In addition to component descriptions, there is a hardware compatibility and connectivity table for NonStop S-series servers to help you determine which storage, communications, and printer components to order. The table includes compatible devices supported for migration from other NonStop systems.

Configuration information and rules, specifications, ordering examples, and warranty and support information are also provided.

Components

The basic building blocks for the NonStop S-series servers are listed in this section. A single type of enclosure (cabinet) can house processors or serve as an I/O enclosure.

This document includes information to help you determine which NonStop S-series server components best suit your computing needs (see figure). I/O and communications components for NonStop S-series servers include disk, tape, printer, and communications devices. All of these devices and the Metrocluster for NonStop Server are listed in this section. All orders need to be processed using the latest version of the Quote Management System (QMS) to check for correct configuration and to produce manufacturing build documents. The manufacturing build documents, called *tech docs*, must be produced for manufacturing to implement the correct configuration.
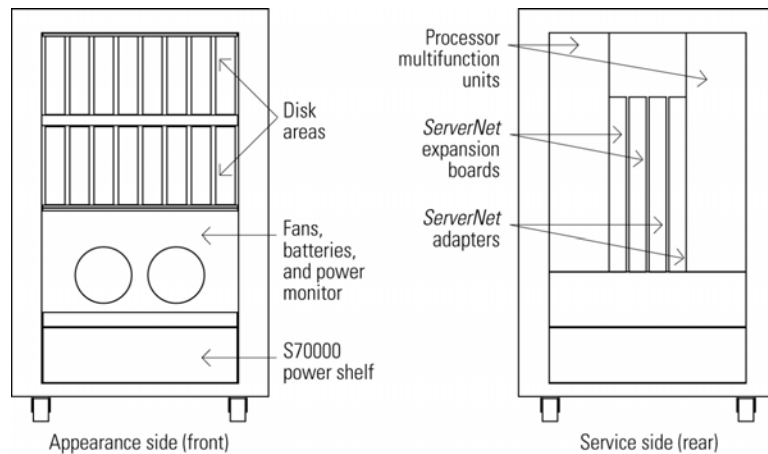
Inside view of components within a NonStop S-series enclosure.

Processors and enclosures

1974-x NonStop S88000 Processor Multifunction Unit

- Contains processor, memory, multifunction I/O, and power conversion boards
- Two MIPS RISC R16000 processors running in lockstep
- 8 MB of L2 cache that runs at 448 MHz, accessed at double-data rate

- Ordering options:
  - 1974-A: Not used
  - 1974-B: Not used
  - 1974-C: PMF CRU with 2 GB of main memory
  - 1974-D: PMF CRU with 4 GB of main memory
  - 1974-E: PMF CRU with 8 GB of main memory
  - 1974-F: PMF CRU with 16 GB of main memory
- Multifunction I/O board with one ServerNet router, three Ultra SCSI ports (two internal and one external), one 10Base-T controller, and one service processor
- Bulk power provided by the NonStop S70000 Power Shelf (product number 7360)
- A NonStop system with greater than two NonStop S88000 Processors (including add-on processors) must have Modular ServerNet Expansion Board (MSEB) units (6750M) installed in slots 51 and 52 of all system enclosures (groups 01–08). These MSEB units must also utilize either fiber or serial copper connections to adjacent system enclosures. Connections to IOMF21980 may use ECL cables and PICs (6750M-E).
- The 16-GB memory size (1974-F) requires the following:
  - At least one 36-GB or larger disk volume present for RECEIVEDUMP.
  - 40 GB of available disk space allocated to file swap space.
  - A large-capacity tape drive attached to enclosure 1 for offline memory dumping. Acceptable tape drives are the Fibre Channel CT9841FC-x series, 5242 and 5242ACL DAT 72, 525x Super DLT, or DLT 7000 Tape Drives when using the largest media sizes (DLTtape III, DLTtape IIIXT, DLTtape IV, 9840, and DAT 72 Tape Cartridges).
- A tape backup alternative is to use virtual tape. See the description of virtual tape in a later section of this document.
- Requires NonStop Kernel Operating System, Release Version Update (RVU) G06.24 or later.

1973-x NonStop S78000 Processor Multifunction Unit

- Contains processor, memory, multifunction I/O, and power conversion boards.
- Two MIPS RISC R14000 processors running in lockstep.
- 8 MB of L2 cache that runs at 262 MHz, accessed at single data rate.
- Ordering options:
  - 1973-A: Not used
  - 1973-B: Not used
  - 1973-C: PMF CRU with 2 GB of main memory
  - 1973-D: PMF CRU with 4 GB of main memory
  - 1973-E: PMF CRU with 8 GB of main memory
  - 1973-F: Not used
- Multifunction I/O board with one ServerNet router, three Ultra SCSI ports (two internal and one external), one 10Base-T controller, and one service processor.
- Bulk power provided by the NonStop S70000 Power Shelf (product number 7360).
- A NonStop system with greater than 2 NonStop S76000 or S86000 (or later) Processors (including add-on processors) must have MSEB units (6750M) installed in slots 51 and 52 of all system enclosures (groups 01–08). These MSEB units must also utilize either fiber-optic or serial copper connections to adjacent system enclosures. Connections to IOMF2 (1980) may use ECL cables and PICs (6750M-E).
- Requires NonStop Kernel Operating System, RVU G06.16 or later, plus appropriate SPRs.

1961 NonStop S7600 Processor Multifunction Unit

- Contains processor, memory, multifunction I/O, and power conversion boards.
- Two MIPS RISC R12000 processors running in lockstep.
- 2 MB of L2 cache.
- Ordering options:
  - 1961-B: PMF CRU with 1 GB of main memory
  - 1961-D: PMF CRU with 4 GB of main memory
- Multifunction I/O board with one ServerNet router, three Ultra SCSI ports (two internal and one external), one 10Base-T controller, and one service processor
- Bulk power provided by the NonStop S70000 Power Shelf (product number 7360)

- Requires NonStop Kernel Operating System, RVU G06.17 or later

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1962 NonStop S7800 Processor Multifunction Unit

- Contains processor, memory, multifunction I/O, and power conversion boards.
- Two MIPS RISC R14000 processors running in lockstep.
- 2 MB of L2 cache.
- Ordering options:
    - 1962-C: PMF CRU with 2 GB of main memory
    - 1962-D: PMF CRU with 4 GB of main memory
- Multifunction I/O board with one ServerNet router, three Ultra SCSI ports (two internal and one external), one 10Base-T controller, and one service processor.
- Bulk power provided by the NonStop S70000 Power Shelf (product number 7360).
- A NonStop system with greater than two NonStop S7800 Processors (including add-on processors) must have MSEB units (6750M) installed in slots 51 and 52 of all system enclosures (groups 01–08). These MSEB units must also utilize either fiber-optic or serial copper connections to adjacent system enclosures. Connections to IOMF2 (1980) may use ECL cables and PICs (6750M-E).
- Requires NonStop Kernel Operating System, RVU G06.16 or later, plus appropriate SPRs.

1971-x NonStop S76000 Processor Multifunction Unit

- Contains processor, memory, multifunction I/O, and power conversion boards.
- Two MIPS RISC R14000 processors running in lockstep.
- 4 MB of L2 cache that runs at 250 MHz.
- Ordering options:
    - 1971-A: Not used
    - 1971-B: PMF CRU with 1 GB of main memory
    - 1971-C: PMF CRU with 2 GB of main memory
    - 1971-D: PMF CRU with 4 GB of main memory
    - 1971-E: PMF CRU with 8 GB of main memory
    - 1971-F: PMF CRU with 16 GB of main memory
- Multifunction I/O board with one ServerNet router, three Ultra SCSI ports (two internal and one external), one 10Base-T controller, and one service processor.
- Bulk power provided by the NonStop S70000 Power Shelf (product number 7360).
- A NonStop system with greater than two NonStop S76000 or S86000 Processors (including add-on processors) must have MSEB units (6750M) installed in slots 51 and 52 of all system enclosures (groups 01–08). These MSEB units must also utilize either fiber or serial copper connections to adjacent system enclosures. Connections to IOMF2 (1980) may use ECL cables and PICs (6750M-E).
- The 16-GB memory size (1971-F) requires the following:
    - At least one 36-GB or larger disk volume present for RECEIVEDUMP.
    - 40 GB of available disk space allocated to file swap space.
    - A large-capacity tape drive attached to enclosure 1 for offline memory dumping. Acceptable tape drives are the Fibre Channel CT9841FC-x series, 5242 and 5242ACL DAT 72, 525x Super DLT, or DLT 7000 Tape Drives when using the largest media sizes (DLTtape III, DLTtape IIIXT, DLTtape IV, 9840, and DAT 72 Tape Cartridges).
    - A tape backup alternative is to use virtual tape. See the description of virtual tape in a later section of this document.
- Requires NonStop Kernel Operating System, RVU G06.16 or later

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1972-x NonStop S86000 Processor Multifunction Unit

- Contains processor, memory, multifunction I/O, and power conversion boards.
- Two MIPS RISC R14000 processors running in lockstep.
- 8 MB of L2 cache that runs at 275 MHz, accessed at double-data rate.
- Ordering options:
    - 1972-A: Not used
    - 1972-B: PMF CRU with 1 GB of main memory
    - 1972-C: PMF CRU with 2 GB of main memory

- 1972-D: PMF CRU with 4 GB of main memory
    - 1972-E: PMF CRU with 8 GB of main memory
    - 1972-F: PMF CRU with 16 GB of main memory
- Multifunction I/O board with one ServerNet router, three Ultra SCSI ports (two internal and one external), one 10Base-T controller, and one service processor.
- Bulk power provided by the NonStop S70000 Power Shelf (product number 7360).
- A NonStop system with greater than 2 NonStop S76000 or S86000 Processors (including add-on processors) must have MSEB units (6750M) installed in slots 51 and 52 of all system enclosures (groups 01–08). These MSEB units must also utilize either fiber-optic or serial copper connections to adjacent system enclosures. Connections to IOMF2 (1980) may use ECL cables and PICs (6750M-E).
- The 16-GB memory size (1972-F) requires the following:
    - At least one 36-GB or larger disk volume present for RECEIVEDUMP
    - 40 GB of available disk space allocated to file swap space
    - A large-capacity tape drive attached to enclosure 1 for offline memory dumping. Acceptable tape drives are the Fibre Channel CT9841FC-x series, 5242 and 5242ACL DAT 72, 525x Super DLT, or DLT 7000 Tape Drives when using the largest media sizes (DLTtape III, DLTtape IIIXT, DLTtape IV, 9840, and DAT 72 Tape Cartridges).
    - A tape backup alternative is to use virtual tape. See the description of virtual tape in a later section of this document.
- Requires NonStop Kernel Operating System, RVU G06.16 or later.

7360 NonStop S70000 Power Shelf

- Provides power for all NonStop S-series Processor Multifunction Units (one per pair of processor units) and the NonStop S-series I/O Multifunction Unit, ServerNet II or IOMF 2 (one per pair of IOMF 2)
- Slides into space beneath chassis in the 19-inch rack frame
- Has two power cords
- Weight: 38 kg (85 lb)

Note: Refer to the "Hardware environment and power specifications" section later in this document for important information about power connector requirements.

1980 NonStop S-series I/O Multifunction Unit, ServerNet II (IOMF 2)

- Multifunction I/O board contains one ServerNet II router, three Ultra SCSI controllers, one 10Base-T controller, and one service processor.
- Power supplied by NonStop S70000 Power Shelf (7360).
- Requires NonStop Kernel Operating System, RVU G06.11 or later.
- ServerNet input port requires a plug-in card (PIC) in port 1. PICs can be any of 6750M-C, 6750M-E, 6750M-S, 6750M-L, or 6750M-N. The PIC selected must match the cable and interface type at the other end of the cable. Use autoconfigure in QMS to automatically determine the right PIC and cable.

1952R Trade-in credit for I/O multifunction unit to IOMF 2/PMF

- This credit may only be used by customers upgrading existing IOMF (1952) to IOMF 2 (1980) or to any PMF CRU. To receive this credit, the customer must return the 1952 to HP.

7190 NonStop S-series Chassis (old appearance)

- Must be used for any NonStop S-series processor or I/O expansion configuration
- Can hold up to 16 internal disk drives attached via SCSI-2 or Ultra SCSI, depending on which multifunction CRU is installed
- Can be mounted in an industry-standard 19-inch rack frame (requires an air baffle, S7x-AB, when rack mounted)
- Can be stacked in a double-high rack configuration
- Uses independent power supplies and battery backup modules
- Designed to accommodate:
  Processor or I/O multifunction units   2
  ServerNet adapter boards   2 or 4

ServerNet expansion boards	2 or 4
Disk drives	16

- Dimensions:

Height	63.8 cm (25 in)
Width	48.3 cm (19 in)
Depth	65.0 cm (26 in)
Maximum weight	101.6 kg (223 lb)
Minimum weight	48.5 kg (107 lb)

7191 NonStop S-series 19-inch Base with casters (old appearance)

- Base fits bottom of NonStop S-series 19-inch rack frame
- Base has two movable casters and two fixed casters
- One base supports a double-high stack
- Dimensions:

Height	8.9 cm (3.5 in)
Width	55.2 cm (22 in)
Depth	81.3 cm (32 in)
Weight	10.9 kg (24 lb)

- Floor space requirements   0.5 sq m (5.0 sq ft)

7192 NonStop S-series 19-inch Rack Frame and Enclosure (old appearance)

- One 7190 NonStop S-series chassis can be mounted within it
- Can be stacked two high, for double-high enclosures
- NonStop S-series rack base with casters should be ordered to allow movement and stability
- Can house any 19-inch rack-mountable device
- Dimensions of single-high rack with base:

Height	86.6 cm (34.1 in)
Width	55.2 cm (22 in)
Depth	81.3 cm (32 in)
Weight	21.3 kg (47 lb)

- Floor space requirements   0.5 sq m (5.0 sq ft)

7193 NonStop S-series Single-High Enclosure with base (old appearance)

- Contains the following products: one 7190, one 7192, and one 7191
- Can be used for any NonStop S-series processor or I/O expansion configuration
- Houses a completely self-contained two-processor system in 5 square feet of floor space
- Enclosures can hold up to 16 internal disk drives attached via SCSI-2
- Uses independent power supplies and battery backup modules
- Designed to accommodate:

Processor or I/O multifunction units	2
ServerNet adapter boards	1 to 4
ServerNet expansion boards	2 or 4
Disk drives	16

- Dimensions—single-high rack with base:

Height	95.5 cm (37.6 in)
Width	55.2 cm (22 in)
Depth	81.3 cm (32 in)
Maximum weight (as NonStop S7000)	133.5 kg (294 lb)
Maximum weight (as NonStop S7x000)	170 kg (375 lb)
Minimum weight	80.8 kg (178 lb)

- Floor space requirements:

Service clearance, front	61 cm (24 in)
Service clearance, rear	76.2 cm (30 in)
Footprint	0.5 sq m (5.0 sq ft)
Footprint with service clearance	1.2 sq m (13.2 sq ft)

7194 NonStop S-series Double-High Enclosure with base (old appearance)

- Contains the following products: two 7190s, two 7192s, and one 7191
- Can be used for any NonStop S-series processor or I/O expansion configuration
- Houses a completely self-contained four-processor system in 5 square feet of floor space
- NonStop S-series rack base with casters included to allow movement and stability
- Uses independent power supplies and battery backup modules
- Designed to accommodate:
Processor or I/O multifunction units	2 or 4
ServerNet adapter boards	1 to 8
ServerNet expansion boards	2 to 8 in pairs
Disk drives	32
- Dimensions—double-high rack with base:
Height	182.1 cm (71.7 in)
Width	55.2 cm (22 in)
Depth	81.3 cm (32 in)
Maximum weight (as S7x000)	330 kg (726 lb)
Minimum weight	150.7 kg (332 lb)
- Floor space requirements:
Service clearance, front	61 cm (24 in)
Service clearance, rear	76.2 cm (30 in)
Footprint	0.5 sq m (5.0 sq ft)
Footprint with service clearance	1.2 sq m (13.2 sq ft)

7195 NonStop S-series Add-on Enclosure (old appearance)

- Contains one 7190 chassis and one 7192 19-inch rack frame
- Allows a single-high enclosure to become a double-high enclosure
- Stacks on top of the single-high enclosure

S7x-BC NonStop S-series Back Cover (old appearance)

- Optional rear door for all NonStop S-series cabinets with original appearance style
- Connects to the back of the cabinet
- Protects cables
- Improves appearance of system as viewed from the service side (back)

7280 NonStop S-series Single-High Enclosure with base and updated appearance package

- New appearance package with side panels for the NonStop S7600, S7800, S76000, S86000, and later Servers
- Includes rear door
- Can be used for any NonStop S-series processor or I/O expansion configuration
- Houses a completely self-contained two-processor system in 5 square feet of floor space
- Enclosures can hold up to 16 internal disk drives attached via SCSI-2
- Uses independent power supplies and battery backup modules
- Designed to accommodate:
Processor or I/O multifunction units	2
ServerNet adapter boards	1 to 4
ServerNet expansion boards	2 or 4
Disk drives	16
- Dimensions—single-high rack with base:
Height	95.5 cm (37.6 in)
Width	55.2 cm (22 in)
Depth	81.3 cm (32 in)
Maximum weight (as NonStop S7000)	133.5 kg (294 lb)
Maximum weight (as NonStop S7x000)	170 kg (375 lb)
Minimum weight	80.8 kg (178 lb)
- Floor space requirements:
Service clearance, front	61 cm (24 in)
Service clearance, rear	76.2 cm (30 in)
Footprint	0.5 sq m (5.0 sq ft)

Footprint with service clearance	1.2 sq m (13.2 sq ft)

7281 NonStop S-series Double-High Enclosure with base and updated appearance package

- New appearance package with side panels for the NonStop S7600, S7800, S76000, S86000, and later Servers
- Includes rear door
- Can be used for any NonStop S-series processor or I/O expansion configuration
- Houses a completely self-contained four-processor system in 5 square feet of floor space
- NonStop S-series rack base with casters included to allow movement and stability
- Uses independent power supplies and battery backup modules
- Designed to accommodate:

Processor or I/O multifunction units	2 or 4
ServerNet adapter boards	1 to 8
ServerNet expansion boards	2 to 8 in pairs
Disk drives	32

- Dimensions—double-high rack with base:

Height	182.1 cm (71.7 in)
Width	55.2 cm (22 in)
Depth	81.3 cm (32 in)
Maximum weight (as S7x000)	330 kg (726 lb)
Minimum weight	150.7 kg (332 lb)

- Floor space requirements:

Service clearance, front	61 cm (24 in)
Service clearance, rear	76.2 cm (30 in)
Footprint	0.5 sq m (5.0 sq ft)
Footprint with service clearance	1.2 sq m (13.2 sq ft)

7282 NonStop S-series Add-on Enclosure and updated appearance package

- New appearance package with side panels for the NonStop S7600, S7800, S76000, S86000, and later Servers
- Contains one 7190 chassis and one 7192 19-inch rack frame
- Allows a single-high enclosure to become a double-high enclosure
- Stacks on top of the single-high enclosure
- Includes rear door

7285 Full appearance upgrade, single enclosure

- Appearance upgrade for 7193 or 7195 to the new appearance package for the NonStop S7600, S7800, S76000, S86000, and later Servers
- Contains the new style front door, rear door, and side panels
- For a double-high enclosure (7194), order two of these

7286 Partial appearance upgrade, single enclosure

- Appearance upgrade for the 7193 or 7195 to the new appearance package for the NonStop S7600, S7800, S76000, S86000, and later Servers
- Contains the new style front door and rear door
- Used for upgrading enclosures in the middle of a row, where no side panels are needed
- For a double-high enclosure (7194), order two of these

S7x-AB NonStop S-series Air Baffle

- Required when chassis is mounted in a standard 19-inch rack or sold as NonStop S7X00SE or S8X000SE Server
- Provides proper airflow for rack-mounted chassis

6750M Modular ServerNet Expansion Board (MSEB)

- ServerNet II based expansion board, with interface options.
- Scale systems by extending the ServerNet fabric across enclosures.
- Each MSEB handles one X or Y ServerNet system area network fabric.
- MSEBs are installed only in system enclosures and always in pairs.
- MSEBs require ServerNet PICs to support the Tetra-8 and Tetra-16 topologies. See PIC descriptions below.
- MSEBs are required in all systems that will be part of a Metrocluster for NonStop Server, in slots 51 and 52 of Group 01. These two MSEBs must have the NNA PIC installed in Port 6. All other MSEBs (NNA is excluded from these) may select the interface that connects with adjacent enclosures (the ends must match for cabling purposes; see below).
- Two system area network topologies are supported:
  - Tetra-8 allows up to 8 processors
  - Tetra-16 allows up to 16 processors
- Refer to the installation guide to change topologies.
- MSEBs and HP Metrocluster for NonStop Servers add more cable selection criteria:
  - Intra-node cables for interconnecting enclosures within a given system (known as the internal ServerNet fabric) can be several varieties; HP does not recommend using ECL cables unless connecting to an IOMF 21980(1952).
  - Inter-node cables for connecting each node/system of a Metrocluster for NonStop Servers (and connected to the NonStop Cluster Switch, known as the external ServerNet fabric) are always fiber-optic cables.
  - Existing ECL cables for SEB-to-SEB internal fabric are not compatible with the connector on the MSEB ECL PIC. The cable must be replaced with one of the 677-*nnn* cables; note: HP strongly recommends using only MSEB units with copper serial or fiber-optic cable.
- Cables for MSEBs (to create the ServerNet fabric) are ordered separately. The serial copper PIC and cables are the preferred option for most applications. Where potentially problematic environmental conditions exist, such as noisy grounds or inadequate signal reference ground, fiber-optic connections will improve noise immunity. Use the QMS configuration checker to determine the correct length and style, and to verify the configuration of the PICs:
  - ECL adapter cable pigtail, for MSEB ECL PIC to existing ECL cable:
    677-JMP   ServerNet cable 0.5 m (1.5 ft; not recommended)

  - ECL cables for MSEB ECL PIC to SEB or IOMF (1952):
    677-003   ServerNet cable 1.0 m (3.0 ft)
    677-005   ServerNet cable 1.6 m (5.2 ft)
    677-007   ServerNet cable 2.0 m (7.0 ft)
    677-008   ServerNet cable 2.5 m (8.2 ft)
    677-010   ServerNet cable 3.0 m (9.8 ft)
    677-013   ServerNet cable 4.0 m (13.1 ft)
    677-016   ServerNet cable 5.0 m (16.4 ft)
    677-019   ServerNet cable 6.0 m (19.7 ft)
    677-023   ServerNet cable 7.0 m (23.0 ft)
    677-026   ServerNet cable 8.0 m (26.2 ft)
    677-029   ServerNet cable 9.0 m (29.5 ft)
    677-033   ServerNet cable 10.0 m (32.8 ft)
    677-082   ServerNet cable 25.0 m (82 ft)

  - Serial copper cables, MSEB to MSEB or IOMF 2 (1980) only:
    678-003   ServerNet cable 1.0 m (3.0 ft)
    678-005   ServerNet cable 1.6 m (5.2 ft)
    678-007   ServerNet cable 2.0 m (7.0 ft)
    678-008   ServerNet cable 2.5 m (8.2 ft)
    678-010   ServerNet cable 3.0 m (9.8 ft)
    678-013   ServerNet cable 4.0 m (13.1 ft)
    678-016   ServerNet cable 5.0 m (16.4 ft)
    678-019   ServerNet cable 6.0 m (19.7 ft)
    678-023   ServerNet cable 7.0 m (23.0 ft)
    678-026   ServerNet cable 8.0 m (26.2 ft)
    678-029   ServerNet cable 9.0 m (29.5 ft)
    678-033   ServerNet cable 10.0 m (32.8 ft)
    678-049   ServerNet cable 15.0 m (49 ft)
    678-066   ServerNet cable 20.0 m (66 ft)
    678-082   ServerNet cable 25.0 m (82 ft)

  - ECL cables, ECL PIC to ECL PIC only:
    679-003   ServerNet cable 1.0 m (3.0 ft)

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679-005          ServerNet cable 1.6 m (5.2 ft)
679-007          ServerNet cable 2.0 m (7.0 ft)
679-008          ServerNet cable 2.5 m (8.2 ft)
679-010          ServerNet cable 3.0 m (9.8 ft)
679-013          ServerNet cable 4.0 m (13.1 ft)
679-016          ServerNet cable 5.0 m (16.4 ft)
679-019          ServerNet cable 6.0 m (19.7 ft)
679-023          ServerNet cable 7.0 m (23.0 ft)
679-026          ServerNet cable 8.0 m (26.2 ft)
679-029          ServerNet cable 9.0 m (29.5 ft)
679-033          ServerNet cable 10.0 m (32.8 ft)
679-082          ServerNet cable 25.0 m (82 ft)
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– Multimode fiber cables, MMF PIC to MMF PIC only
  This fiber cable is 62.5/125 micron, with dual SC connectors:

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676MZ-010        Multimode fiber cable, zip cord, 3 m (9.8 ft)
676MZ-016        Multimode fiber cable, zip cord, 5 m (16.4 ft)
676MZ-033        Multimode fiber cable, zip cord, 10 m (32.8 ft)
676MR-082        Multimode fiber cable, ruggedized, 25 m (82 ft)
676MR-164        Multimode fiber cable, ruggedized, 50 m (164 ft)
676MR-328        Multimode fiber cable, ruggedized, 100 m (328 ft)
676MR-656        Multimode fiber cable, ruggedized, 200 m (656 ft)
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– Single-mode fiber cables, SMF PIC to SMF PIC only
  This fiber cable is 9/125 micron, with dual SC connectors:

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676-033          Single-mode fiber cable, 10 m (32.8 ft)
676-132          Single-mode fiber cable, 40 m (132 ft)
676-265          Single-mode fiber cable, 80 m (265 ft)
676-265P         Single-mode fiber cable, plenum rated, 80 m (265 ft)
676SR-033        Single-mode fiber cable, ruggedized, 10 m (32.8 ft)
676SR-132        Single-mode fiber cable, ruggedized, 40 m (132 ft)
676SR-265        Single-mode fiber cable, ruggedized, 80 m (265 ft)
676SRP-265       Single-mode fiber cable, ruggedized, plenum rated, 80 m (265 ft)
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6750R Trade-in credit for ServerNet Expansion Board

Only available in conjunction with the purchase of an MSEB (6750M)

6750M-C Serial copper PIC, ServerNet internal fabric

- Serial copper PIC for use on MSEB or IOMF 2 (1980)
- Provides reliable gigabit serial connection using full-duplex, twisted-pair cable
- Cable required is 678-*nnn*
- Cable used can be up to 25 meters

6750M-S Multimode fiber PIC (MMF), ServerNet internal fabric

- Multimode fiber PIC for use on MSEB or IOMF 2 (1980)
- Uses short wavelength optical signal, 850 nm over 62.5/125 micron cable type
- Provides reliable gigabit serial connection using full-duplex fiber cable pair
- Cable required is 676MZ-*nnn* or 676MR-*nnn*, with dual SC connectors (MZ is zip cord and MR is ruggedized)
- Customers may supply their own cable; using multimode fiber for internal fabric from system enclosure (MSEB) to system enclosure (MSEB) or from system enclosure (MSEB) to IOMF 2 (1980), the maximum MMF cable length is 200 meters

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6750M-L Single-mode fiber PIC, ServerNet internal fabric

- Single-mode fiber PIC for use on MSEB or IOMF 2 (1980)
- Uses long wavelength optical signal, 1300 nm over 9/125 micron cable type
- Provides reliable gigabit serial connection using full-duplex fiber cable pair
- Cable required is 676-*nnn*, 676SR-*nnn*, or 676SRP-*nnn* with dual SC connectors (SR is ruggedized and SRP is ruggedized air-plenum rated)

- Customers may supply their own cable; maximum cable length depends on the application
  - For internal fabric from system enclosure (MSEB) to system enclosure (MSEB), maximum SMF cable length is 200 meters
  - For internal fabric from system enclosure (MSEB) to IOMF 2 (1980), maximum SMF cable length (without extenders) is 5 km; performance degrades as distance increases (see 3134S for extended distance)

6750M-E ECL PIC, ServerNet internal fabric

- ECL PIC for use on MSEB or IOMF 2 (1980)
- Provides ServerNet technology compatible interface at 50 MB per second
- Provides reliable byte-wide parallel connection
- Compatible with ServerNet interface devices
- Cable required is either 677-*nnn* or 679-*nnn*
- Cable used can be up to 25 meters

Metroclusters

6750M-N NNA PIC, ServerNet external fabric, Network Naming Agent

- Special fiber-optic PIC used to connect a system to a NonStop cluster switch
- Provides plug-and-play capability, without cluster numbering
- Provides reliable gigabit serial connection using single-mode fiber-optic cable
- Always installed in slot 6 of an MSEB (6750M) and in slot 51 or 52 of Group 01, it is automatically assigned by QMS
- Cable required is 676-*nnn* or 676-265P
- Cable used can be up to 80 meters

6780-LmZn HP NonStop ServerNet Cluster Switch 3 for HP Metrocluster for NonStop Servers

The new generation of ServerNet cluster switches introduces several new features and larger configurations. The ServerNet Clusters product is now branded the same as other HP cluster solutions for metropolitan areas. The name for the solution is now "HP Metrocluster for NonStop Servers." In line with supporting metropolitan area networks, the solution can now span up to 15 kilometers between zones (requires NonStop S76000, S86000, or later Processors in all nodes). The previous limit was 5 kilometers.

Each 6780 Switch 3 has two power supplies for hot-pluggable fault tolerance. Each power supply should be connected to separate power sources. Each Switch 3 also has multiple fans for fault tolerance. Each Switch 3 starts with support for two ServerNet nodes, including two 40-meter cables to connect each node (to one fabric).

The 6780-LmZn series of ServerNet cluster switches (where m = 1 through 4 and n = 1 through 3) introduces the layering concept for NonStop clustering. The naming convention maps the switch configuration to its position in the cluster topology. The list below shows all possible cluster switches for a maximum configuration, where up to 128 processors (8 nodes) can be connected through each of the 12 switches. Fully populated, this cluster would support 1,536 processors (96 nodes). The list below is for only one of two required fabrics.

These new switches are modular in nature in that they are designed for rack mounting (see RACK-42). Each switch takes up 3U of space (1U = 1.75 inches).

Zone 1	Zone 2	Zone 3	
6780-L1Z1	6780-L1Z2	6780-L1Z3	Layer 1
6780-L2Z1	6780-L2Z2	6780-L2Z3	Layer 2
6780-L3Z1	6780-L3Z2	6780-L3Z3	Layer 3
6780-L4Z1	6780-L4Z2	6780-L4Z3	Layer 4

RACK-42 HP NonStop 42U, 19-inch rack, for mounting MetroCluster Switch 3 units

This is a standard rack, equivalent to the 10642 rack. Intended for mounting Switch 3 units, it comes with front and rear doors and side panels. HP recommends separate racks for each ServerNet fabric, but it is not required. Any EIA standard 19-inch rack mounted device may be installed in this rack.

6780-ADD2N Add two-node support to a 6780-LmZn

This product adds interconnects for two additional nodes for a ServerNet Cluster Switch 3 (each switch starts with interconnects for two nodes). It includes two 40-meter cables to attach the added nodes to the switch. Order one per fabric. Up to three of these may be added to each Switch 3.

6780-PDU Power distribution unit for rack-mounted Switch 3 units

This device is required whenever there are more than two Switch 3 units in a single rack. When there are more than two switches in a rack, the power lines of the switches must be connected to either a PDU or a 6780-UPS. Plug the two power lines for each switch into separate PDU or power sources. HP recommends line cord A be plugged into a PDU and line cord B be plugged into a UPS (if UPS needed). If no UPS is used, two PDUs are required per rack (if there are more than two switches in the rack).

6780-UPS Uninterruptible power supply for Switch 3

The UPS is now an optional part of a NonStop cluster solution. Many customers include UPS in their computer room, so requiring a UPS in that situation would be redundant. The recommended configuration is to place a UPS on only one of the two power lines feeding each switch. Order 6780-ERM to extend the holdup time. It is 3U high and is rack mounted.

6780-ERM Extended runtime module for UPS

The extended runtime module plugs into the 6780-UPS and adds additional batteries for added holdup time. It is 3U high, and is rack mounted.

6780-SMF Substitute single-mode plug-in cards for zone-to-zone connections

Zone-to-zone connections vary in distance, depending on the customer configuration. If the distance between Switch 3 units from zone to zone is greater than 200 meters, single-mode plug-in cards (PICs), and cables to connect them, are required. Each 6780-SMF contains two PICs, enough for one switch in one zone. (There are two PICs used to connect a zone switch to any other zone). All cables for zone-to-zone connections, single-mode or multimode, must be custom made. See the *ServerNet Cluster 6780 Planning and Installation Guide* for specifications of the cables and their connectors. This document is available in the NonStop Technical Library.

Configuration rules:

1. Software required per node: SA57-SN for all nodes in a cluster.

2. Switches must be ordered in pairs to support both the X and Y ServerNet fabrics; the simplest configuration is 2 X 6780-L1Z1).

3. All zones must have the same number of layers, always starting with layer 1.

4. Three zone configurations are limited to 5 kilometers between switches.

5. Each switch comes populated with connections and cables for two nodes. The default cables are 40 meters long.

6. To support greater than two nodes per switch, order 6780-ADD2N for each additional two nodes. Up to three of these may be added per switch. Each 6780-ADD2N comes with two 40-meter cables. You must order one of these per switch ordered.

7. 6780-LmZn are not compatible with previous cluster switches (because of the layering). If an existing cluster must be expanded beyond the capacity of its older switches, those units must be replaced by all new switches.

8. Interconnect cables for layer to layer are included with each switch. If a single layer configuration exists and needs to be expanded, the necessary cables and interconnect plug-in cards are shipped with the next layer. If a two-layer configuration is ordered from the factory, it will come installed in the rack (if ordered) with all layer connections in place.

9. Because zones can be separated by long distances, zone-to-zone cables must be custom made. See the installation guide for details on ordering these cables.

Installation services

- This information applies to installation during standard business hours (product ID INSTALL0 through INSTALL9); for nonstandard after-hours installation, see product ID INSTALL0-AH through INSTALL9-AH.
- This is an optional installation charge for NonStop S-series product purchases. Installation pricing is based on list price of items ordered.
- Installation service includes the following tasks:
  - Unpack and inventory equipment
  - System placement
  - Peripheral installation (45*xx* pedestal, 519*x* tapes, ServerNet Wide Area Network [SWAN], asynchronous wide area network [AWAN], and so on)
  - ServerNet cabling (fiber optics)
  - Secure enclosures
  - Open System Management (OSM) console and hub installation
  - Power-on and cold-load system
  - System exclusive (sysex) file initialization (internal tool), hardware troubleshooting, and so on
  - OSM remote access to Global Customer Support Center (GCSC)
  - Turn system over to customer

System consoles

S7x-iPaqUP Windows 2000 NonStop System Console Upgrade Package (Discontinued)

- Upgrade package for NSC Software.
- Integrated PC console and NonStop S-series support software.
- Monitor not included; this product sold as upgrade to existing S7*x-nnnn* console.
- Important: This model does not include a serial port to support an existing serial model (SMOD-US or similar model for other regions). Customer must purchase new USB modem (or have existing one); product is SMOD-USB.
- Software included: TSM workstation client, OutsideView, Carbon Copy, Microsoft® Windows® 2000 operating system.

S7x-NSC4 NonStop System Console and flat-panel monitor with Windows XP Professional

- Integrated PC console and NonStop S-series NSC support software, with flat-panel monitor
- Unit can be used vertically or horizontally
- Package includes a 2+ GHz Intel® Pentium® processor, keyboard and mouse, 1 GB of memory, DVD-ROM, 40-GB hard drive, keyboard, mouse, several USB ports, and an empty PCI slot
- A USB modem should be ordered for use with this product; USB to serial adapter cable is shipped with this bundle in case an older modem is already in place
- The factory-installed software on this product is the OSM management suite with some other tools, OutsideView, Carbon Copy, Internet Explorer, and the Adobe Acrobat Reader
- The TSM management tool is also shipped on the installation CD included with this product
- Updates to the NSC software suite (order product ID S7X-SWV1) included with this product must be ordered through Scout for NonStop servers or SDRC; purchasing this product entitles the customer to upgrades to version 1 of that product

S7x-RACKMON 1U Rack flat-panel monitor, keyboard, and pad, NonStop System Console

- Rack-mounted keyboard, touch pad, and flat-panel monitor; height is 1U (one rack unit = 1.75 inches)
- For use with NonStop S-series console PC
- NonStop S-series systems require one console per site (can be shared by multiple NonStop S-series systems); two is the recommended configuration

S7PQV1 NonStop System Console Migration CDs for iPAQ PC (Discontinued)

- Includes two CDs to update the TSM Workstation Software
  - Installs Windows 2000 Professional with appropriate fixes to support TSM
  - Installs NonStop Kernel Operating System, RVU G06.10* based TSM and DSM/SCM
  - Installs OutsideView and Carbon Copy
- Preserves setup parameters for the workstation software

* A later version of TSM and DSM/SCM may need to be overlaid after this installation if the customer has a more recent release installed prior to this upgrade. See the product installation instructions.

S7DPV1 NonStop System Console Migration CDs for Deskpro EN (Discontinued)

- Includes two CDs to update the TSM Workstation Software
  - Installs Windows 2000 Professional with appropriate fixes to support TSM
  - Installs NonStop Kernel Operating System, RVU G06.10* based TSM and DSM/SCM
  - Installs OutsideView and Carbon Copy
- Preserves setup parameters for the workstation software

* A later version of TSM and DSM/SCM may need to be overlaid after this installation if the customer has a more recent release installed prior to this upgrade. See the product installation instructions.

S7X-SWV1 NonStop System Console Software Suite

- Bundle of client-based software components required for managing NonStop systems, including TSM and OSM client components, Internet Explorer 6.0, and several other HP and third-party products.
- It includes a console installation guide; a new requirement beginning with the first release of OSM is a license key for the third-party product OutsideView; the license key is included with this product; older versions of OutsideView are not supported on Windows XP.
- This product may be installed on any PC, but each site must have at least one HP supplied NSC so software defects can be reproduced on a known platform; a new support contract will be put in place for this software.
- The console created by installing this suite is licensed for S7X-SWV1 and will receive free updates to S7X-SWV1 when ordered through Scout for NonStop servers; S7X-PROMO may be applied to this product; it does not include two CDs to update the TSM Workstation Software.

S7X-CREDIT Upgrade credit—NonStop System Console

- This is an upgrade credit that may only be ordered in conjunction with the purchase of an upgrade package; the upgrade packages this applies to are S7X-NSC4NM, S7X-NSCXPUP, and S7X-NSCSWUP; this will be withdrawn when the upgrade packages stop being offered, which is planned to be no sooner than October 31, 2004.

S7X-NSC4NM Upgrade NonStop System Console, including Windows XP Professional

- Upgrade to existing NonStop System Console (NSC). This product is a bundle of a standard HP personal computer and the NSC Software Suite. This model has Windows XP Professional installed. It may only be purchased as an upgrade to an existing HP NonStop System Console. It does not include a monitor. This model includes 1 GB of memory, a 2+ GHz Intel Pentium processor, a 40-GB hard drive, keyboard, mouse, several USB ports, and an empty PCI slot. USB modem should be ordered for use with this product. A USB-to-serial adapter cable is shipped with this bundle.

S7X-NSCXPUP Upgrade NonStop System Console to Windows XP Professional

- Operating system upgrade to existing NonStop System Console (NSC). This product is only available for purchase in North America. It may only be purchased as an upgrade to an existing HP NonStop System Console.
- HP suggests purchasing S7X-NSC4NM for other geographical regions. If that is not feasible, HP suggests ordering a localized version of this Microsoft upgrade package.

S7X-NSCSWUP Upgrade NonStop System Console Software Suite

- Upgrade software suite. It does not include any hardware. The NSC Software Suite included with this package installs TSM as the default systems management tool. OSM will become the default systems management tool as of the availability of RVU G06.22. This product may only be purchased as an upgrade to an existing HP NSC Suite. Customers are expected to perform an operating system upgrade to Windows XP using their own site license. If no site license exists, customers should purchase S7X-NSCXPUP.

SMOD-USB NonStop Console Service Connect USB Modem

Required to dial in/dial out for service

SHUB-12 Ethernet hub (Discontinued)

- 12-port unmanaged Ethernet hub with 10/100-TX autosensing per port and a built-in bridge.
- This hub has been tested and works with SWANs (3880 and 3881). However, managed Ethernet switches such as the 3870-24 are recommended for use with SWANs instead of hubs.
- This is the same product as HP ProCurve 10/100 Hub 12 (J3294A).

3870-X8 Ethernet switch

- 8-port Ethernet unmanaged switch.
- This switch has been tested and works with SWANs (3880 and 3881). However, managed Ethernet switches such as the 3870-24 are recommended for use with SWANs instead of hubs.
- HP Auto-MDIX: automatically adjusts for straight-through or crossover cables on all 10/100 and 100/1000 ports.
- Rack mountable in pairs with additional hardware

This is the same product as HP ProCurve 408 Switch (J4097B).

3870-24 Ethernet switch

- 24-port Ethernet managed switch.
- Managed switch should be used for critical data paths where connectivity of the ports needs to be monitored.
- 9.6-gigabit-per-second switch fabric integrated on chip: high-performance switch design with nonblocking architecture.
- HP Auto-MDIX: automatically adjusts for straight-through or crossover cables on all 10/100 and 100/1000 ports.
- Stacking capability: single IP address management for a virtual stack of up to 16 switches.
- This is the same product as HP ProCurve 2524 Switch (J4813A).

S7x-EPO NonStop S-series Emergency Power-off Cable

- Cable that can be added to the NonStop S-series servers to provide a single emergency power-off (EPO) switch
- Comes in only one length (4 meters, or 13 feet) and can be cut to customer requirement; EPO connector is located on NonStop S-series enclosure
- One cable per enclosure should be ordered

NonStop Modular I/O Subsystem

M8311-01 Modular cabinet, power 4W, 60A, 3PH

- Is EIA standard 19-inch rack with 42U of rack space (similar to HP 10642 rack).

- This is one of five different power configurations available.

- Specific wiring and voltage information will be added to this guide at a later date. Please refer to the *NonStop S-series Planning and Configuration Guide.*

- Specifically intended to house/mount the IOAM Enclosure, uninterruptible power supplies, extended runtime modules, and maintenance switches for modular subsystem components defined by HP. Because this is a standard rack, other standard components may be installed in it.

- This will support installation of Intel Itanium® microprocessor–based NonStop servers when they are available.

- Contains HP specified power distribution unit (PDU) installed in a cabinet extension on the back of the unit. The power cords feeding the PDUs are included.

- Includes front and rear doors.

M8311-02 Modular cabinet, power 3W, 63A, 1PH

- Is EIA standard 19-inch rack with 42U of rack space (similar to HP 10642 rack).

- This is one of five different power configurations available.

- Specific wiring and voltage information will be added to this guide at a later date. Please refer to the Planning and Configuration Guide for HP NonStop S-series servers.

- Specifically intended to house/mount the IOAM Enclosure, uninterruptible power supplies, extended runtime modules, and maintenance switches for modular subsystem components defined by HP. Because this is a standard rack, other standard components may be installed in it.

- This will support installation of Intel Itanium microprocessor–based NonStop servers when they are available.

- Contains HP specified PDU installed in a cabinet extension on the back of the unit. The power cords feeding the PDUs are included.

- Includes front and rear doors.

M8311-03 Modular cabinet, power 4W, 60A, 3PH

- Is EIA standard 19-inch rack with 42U of rack space (similar to HP 10642 rack).

- This is one of five different power configurations available.

- Specific wiring and voltage information will be added to this guide at a later date. Please refer to the *NonStop S-series Planning and Configuration Guide.*

- Specifically intended to house/mount the IOAM Enclosure, uninterruptible power supplies, extended runtime modules, and maintenance switches for modular subsystem components defined by HP. Because this is a standard rack, other standard components may be installed in it.

- This will support installation of Intel Itanium microprocessor–based NonStop servers when they are available.

- Contains HP specified power distribution unit (PDU) installed in a cabinet extension on the back of the unit. The power cords feeding the PDUs are included.

- Includes front and rear doors.

M8311-04 Modular cabinet, power 4W, 60A, 3PH

- Is EIA standard 19-inch rack with 42U of rack space (similar to HP 10642 rack).

- This is one of five different power configurations available.

- Specific wiring and voltage information will be added to this guide at a later date. Please refer to the Planning and Configuration Guide for HP NonStop S-series Servers.

- Specifically intended to house/mount the IOAM Enclosure, uninterruptible power supplies, extended runtime modules, and maintenance switches for modular subsystem components defined by HP. Because this is a standard rack, other standard components may be installed in it.

- This will support installation of Itanium microprocessor–based NonStop servers when they are available

- Contains HP specified PDU installed in a cabinet extension on the back of the unit. The power cords feeding the PDUs are included.

- Includes front and rear doors.

M8311-05 Modular cabinet, power 4W, 60A, 3PH

- Is EIA standard 19-inch rack with 42U of rack space (similar to HP 10642 rack).

- This is one of five different power configurations available.

- Specific wiring and voltage information will be added to this guide at a later date. Please refer to the Planning and Configuration Guide for HP NonStop S-series Servers.

- Specifically intended to house/mount the IOAM Enclosure, uninterruptible power supplies, extended runtime modules, and maintenance switches for modular subsystem components defined by HP. Because this is a standard rack, other standard components may be installed in it.

- This will support installation of Itanium microprocessor–based NonStop servers when they are available.

- Contains HP specified PDU installed in a cabinet extension on the back of the unit. The power cords feeding the PDUs are included.

- Includes front and rear doors.

M8301 Modular cabinet side panels

- Use with any of the five modular cabinets, product IDs M8311-0n

- Matches modular cabinet design

- Used at either end of a row of cabinets or for a single, standalone cabinet

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M8302 Modular cabinet baying kit

- For use with any of the five product IDs M8311-0n

- Used to mechanically attach a pair of modular cabinets

M8330-6 Uninterruptible power supply for NonStop modular subsystems

- This is a 6 KVA UPS that rack mounts, taking 3U of space

- For North America and Japan

- Includes power cable to attach to the rack PDU

M8330-6W Uninterruptible power supply for worldwide use

- This is a 6 KVA UPS that rack mounts, taking 3U of space

- For all locations other than North America and Japan

- Includes power cable to attach to the rack PDU

M8330-ERM UPS Extended Runtime Module

- This is an extra battery option for the above UPS units

- Provides extra holdup time for all devices attached to the UPS

- Must be rack mounted, taking 3U of space

M8200-24 24-port Ethernet switch

- This is a 24-port managed Ethernet switch.

- All modular systems require an Ethernet connection to a maintenance subsystem.

- This managed switch allows the safe integration of the private maintenance LAN with the customer's operations LAN.

- 9.6-gigabit-per-second switch fabric integrated on chip: high-performance switch design with nonblocking architecture.

- HP Auto-MDIX: automatically adjusts for straight-through or crossover cables on all 10/100 and 100/1000 ports.

- Stacking capability: single IP address management for a virtual stack of up to 16 switches.

- This is the same product as HP ProCurve 2524 Switch (J4813A).

- Must be rack mounted, taking 1U of space.

M8360-10 I/O Adapter Module Enclosure (IOAM Enclosure)

- The IOAM Enclosure is the infrastructure for modular I/O. It is supported on NonStop S-series systems as well as Intel Itanium microprocessor–based NonStop processors, when available.

- Must be rack mounted (use product ID M8311-0n; see above).

- Enclosure has slots for 10 ServerNet II or ServerNet III based I/O adapters.

- Each slot has four ports for each of the two ServerNet fabrics (for high-bandwidth capability), but the initial adapters do not use all of those potential connections.

- Supports the Fibre Channel ServerNet Adapter (M8840, FCSA) and the Multi-port Ethernet ServerNet Adapter (M8800, G4SA).

- Has two fault zones, with slots 1–5 in one fault zone, and slots 6–10 in the other fault zone. This obviates the need to have two IOAM enclosures for fault tolerance.

- There is a power supply, maintenance function, cooling, and ServerNet distribution for each of the two modules in one IOAM Enclosure.

- Suggested configuration is to install pairs of the new adapters (FCSA and/or G4SA) in separate fault zones/modules of the IOAM Enclosure.

- Both Tetra-16 and Tetra-8 topologies are allowed to connect to IOAM Enclosures.

- Requires NonStop Kernel Operating System, RVU G06.24 or later.

- Must be rack mounted, taking 11U of space.

M8840 Fibre Channel ServerNet Adapter (FCSA)

The Fibre Channel ServerNet Adapter (FCSA) provides connectivity for the HP StorageWorks XP Disk Array family. The HP StorageWorks XP storage arrays meet the stringent NonStop server requirements for continuous availability, scalability, and mission-critical capabilities.

The high-performance FCSA is one of a new generation of ServerNet I/O adapters that
- Provide dual Fibre Channel interfaces for Fibre Channel storage subsystems and devices.

- Interface with (are installed in) the IOAM Enclosure (part of Modular I/O); the FCSA is not compatible with previous NonStop S-series I/O enclosures. HP recommends using a pair of these controllers in separate modules of the IOAM Enclosure for fault tolerance.

- Are field replaceable units (FRUs)

The FCSA features include
- High-performance, powerful embedded RISC processor
- Very large number of concurrent I/Os
- High-bandwidth I/O performance
- Two X and two Y ServerNet fabric connections (2 redundant, complex, ServerNet III ports)
- Dual ServerNet III to PCI-X bridge ASICs
- 2 x 128 megabytes on-board memory buffer
- Industry-standard Fibre Channel plug-in card
- Single PCI-X 1.0 expansion slot
- 64-bit, 100-megahertz PCI
- 2 x 2 Gb/s Fibre Channel ports
- A common ServerNet I/O baseboard, which is also used for other adapters
- Common storage and networking code

SE93 NonStop Enterprise Storage Connectivity Software

Required for NonStop system connection to HP StorageWorks XP 128 or StorageWorks 1024. Requirements for NonStop server connection to Enterprise Storage:
- NonStop servers:
  — NonStop S-series S86000/S76000, S7800, or S88000/S78000 Servers
- Modular I/O:

  — I/O Adapter Module (IOAM) Enclosure

  — Dual Fibre Channel ServerNet Adapters (FCSA)

  — Modular rack (see M8811-*nn* above)

- Storage Area Network (SAN):

  — HP StorageWorks XP128 or HP StorageWorks XP1024

  — Dual Fibre Channel SAN fabrics (Dual Fibre Channel switches):

    ▪ HP StorageWorks Edge Switch 2/16 or StorageWorks Edge Switch 2/32

- Fiber-optic cables:
  — The FCSA uses only multimode fiber-optic cables with the LC style connector; the maximum cable length is 250 meters
- *Site-wide UPS NonStop software:*
  — Requires NonStop Kernel Operating System, RVU G06.24 or later
  — NonStop Enterprise Storage Connectivity Software (SE93)
  — OSM must be used for NonStop server management

For detailed configuration rules, please reference the *NonStop Fibre Channel ServerNet Adapter Installation and Support Guide.*

M8800 Multi-port Ethernet ServerNet Adapter (G4SA)

- This is a modular form-factor Ethernet adapter with four ports that installs into the IOAM Enclosure

- HP recommends using a pair of these controllers in separate modules of the IOAM Enclosure for fault tolerance

- Supports Dynamic DFT/DHT to adjust automatically to traffic conditions

- Supports Jumbo Frames (9,018 bytes frames)

- Provides an open interface for SWAN and AWAN attachment to ServerNet interconnect

- Supports multiple protocols (TCP/IP, IPX/SPX, Expand/IP, and PAM)

- Supported by all currently available TCP/IP stacks:

  — NonStop TCP/IPv6

  — Conventional TCP/IP

  — Parallel Library TCP/IP

- The 4 ports of the G4SA are configured in the following manner:

  — Port 1—10/100 Mb/s, using UTP cabling conformant to CAT 5, CAT 5e, and CAT 6 standards with RJ-45 connector

  — Port 2—same as Port 1

  — Port 3—10/100/1000-Mb/s, using UTP cabling conformant to CAT 5, CAT 5e, CAT 6 standards with RJ-45 connector. This port has an alternate LC connector for multimode fiber cabling (mutually exclusive) operating at 1000 Mb/s

  — Port 4—same as Port 3

- Ports 3 and 4 have additional features because of the LC fiber-optic connector/port

  — Suited for high-density applications and each port is easily duplexed as per TIA 558-A and ISO 11801 specifications

  — Telcordia, TIA/EIA and IEC complaint

  — These ports can use either copper or fiber and Port 3 does not have to be the same as port 4

  — Requires NonStop Kernel Operating System, RVU G06.24 or later

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M8900xxx Fiber-optic cables, multimode with LC-LC connectors

- This is a group of multimode fiber cables

- These cables have LC-style connectors at both ends

- Can be used for Fibre Channel connections (between the FCSA and a Fibre Channel switch or between the FCSA and an HP StorageWorks XP SAN Device)

- Can be used for ServerNet signals between two zone switches of an HP Metrocluster for NonStop Servers (see 6780-LmZn)

- Various lengths are available:

M8900-02	2 meters
M8900-05	5 meters
M8900-15	15 meters
M8900-40	40 meters
M8900-80	80 meters
M8900250	250 meters

M8910xxx Fiber-optic cables, multimode with SC and LC connectors

- This is a group of multimode fiber cables

- These cables have LC-style connectors at one end and SC style connectors at the other end

- Used for ServerNet signals between an IOAM enclosure and the MSEB of an NonStop S-series system

- The MSEB of the S-series system must have the plug-in card (PIC) with product ID 6750M-S (the SC connector end) installed in the correct position to interface to the IOAM Enclosure

- Various lengths are available:

M8910-10	10 meters
M8910-20	20 meters
M8910-50	50 meters
M8910125	125 meters

ServerNet adapters

See individual product descriptions for detailed information about these products.

3860 ServerNet/ATM—CCSA (ATM Adapter)

- Direct connectivity to Asynchronous Transfer Mode (ATM), 155-Mb/s OC-3
- Open interface to connect ServerNet interconnect to campus ATM backbones and wide area ATM network services
- Support for TCP/IP and native multipath Expand software (NonStop Kernel Operating System, RVU G06.00 or later)
- Support for current and emerging ATM Forum specifications
- Supports ServerNet LAN Systems Access (SLSA); implemented to take advantage of the ServerNet architecture

3861 ServerNet/4E—E4SA (Four-Port Ethernet ServerNet Adapter)

- Direct connectivity to 10Base-T Ethernet
- Open interface for SWAN and asynchronous wide area network (AWAN) attachment to ServerNet interconnect
- Single board provides four ports at 10 Mb/s each
- Support for multiple protocols, including TCP/IP, IPX/SPX, Expand/IP, and Port Access Method (PAM)
- Supports SLSA; implemented to take advantage of the ServerNet architecture

3862 ServerNet/TR—TRSA (Token Ring ServerNet Adapter)

- Direct connectivity to Token Ring communications protocol
- Single board provides one port at 4 or 16 Mb/s
- Support for standard Token Ring IEEE 802.5 protocol
- Supports SLSA; implemented to take advantage of the ServerNet architecture

3863 ServerNet/FE—FESA (One-Port Fast Ethernet ServerNet Adapter)

- Direct connectivity to 10/100Base-T Ethernet
- Open interface for SWAN and AWAN attachment to ServerNet interconnect
- Single board provides one port at 10/100 Mb/s
- Support for multiple protocols, including TCP/IP, IPX/SPX, Expand/IP, and PAM
- Supports SLSA; implemented to take advantage of the ServerNet architecture

3865-C (GESA-C)—One-Port Gigabit Ethernet ServerNet Adapter for UTP Category 5, 5e cabling

- Full-height ServerNet adapter, compliant with the form factor of existing NonStop S-series ISDN Ordering Cable (IOC) Adapters
- Single board provides one port operating at 10/100/1000 Mb/s in full duplex
- Conforms to the following standards:
  - IEEE 802.3   10Base-T CSMA/CD (Ethernet)
  - IEEE 802.3u   100Base-TX CSMA/CD (Ethernet)
  - IEEE 802.3ab   1000Base-T CSMA/CD (Ethernet)

| | IEEE 802.3x | Flow control in full-duplex Ethernet LANs |
| | IEEE 802.3u | Auto-negotiation of speed and duplex of an Ethernet link |

- Connector—standard RJ-45
- Media—supports standard UTP Category 5, 5e cabling

Port type	Connector	Media	Maximum distance
10Base-T	RJ-45	Cat. 3, 4, or 5 UTP	100 m (328 ft)
100Base-TX	RJ-45	Cat. 5 UTP (2 pair)	100 m (328 ft)
1000Base-T	RJ-45	Cat. 5 and Cat. 5e UTP (4 pair)	100 m (328 ft)

- Requires NonStop Kernel Operating System, RVU G06.16 or later
- Open interface for SWAN and AWAN attachment to ServerNet interconnect
- Support for multiple protocols, including TCP/IP, IPX/SPX, Expand/IP, PAM, and HP SNAX Software over Ethernet
- Supports SLSA; implemented to take advantage of the ServerNet architecture
- Media access controller (MAC) is software configurable to allow override of auto-negotiation settings
- Single board provides one port at 10/100/1000 Mb/s
- Concurrent support of up to 16 NonStop S-series processors
- Supports Jumbo Frames up to 9,018 bytes
- Dual ServerNet connection
- IOC enclosure LED controls:
  - Green—valid power
  - Amber—fault condition
- Ethernet connection LED controls

LED	State	Description
Activity	Blinking	Burst of data detected on the port
	On	Data is streaming on the port
	Off	No data is detected on the port
10	On	10-Mb/s Ethernet link is good
	Off	10-Mb/s Ethernet link is not connected or is no good
100	On	100-Mb/s Ethernet link is good
	Off	100-Mb/s Ethernet link is not connected or is no good
1000	On	1000-Mb/s Ethernet link is good
	Off	1000-Mb/s Ethernet link is not connected or is no good

3865-F (GESA-F)—One-Port Gigabit Ethernet ServerNet Adapter for multimode fiber cabling

- Full-height ServerNet adapter, compliant with the form factor of existing NonStop S-series IOC adapters
- Single board provides one port operating at 1,000 Mb/s
- Conforms to the IEEE 802.3z 1000Base-SX standard
- Connector—standard SC duplex
- Cabling—multimode fiber
- Operating distances for 1000BASE-SX

Media	Connector	Maximum distance
850 nm multimode	SC duplex	500 m (1,640 ft)
62.5/125 um multimode	SC duplex	220 m (721 ft)
50/100 um multimode	SC duplex	500 m (1,640 ft)

- Requires NonStop Kernel Operating System, RVU G06.16 or later
- Open interface for SWAN and AWAN attachment to ServerNet interconnect
- Single board provides one port at 1,000 Mb/s

- Support for multiple protocols, including TCP/IP, IPX/SPX, Expand/IP, PAM, and SNAX software over Ethernet
- Support SLSA; implemented to take advantage of the ServerNet architecture
- Concurrent support of up to 16 NonStop S-series processors
- Supports jumbo frames up to 9,018 bytes
- Dual ServerNet connection
- IOC enclosure LED controls
  - Green—valid power
  - Amber—fault condition
- Ethernet connection LED controls

LED	State	Description
Activity	Blinking	Burst of data detected on the port
	On	Data is streaming on the port
	Off	No data is detected on the port
1000	On	1000-Mb/s Ethernet link is good
	Off	1000-Mb/s Ethernet link is not connected or is no good

3890 ES connect IBM ESCON Channel Controller (Discontinued)

- Direct connectivity to IBM ES9000 ESCON channel
- Higher-performance connectivity to IBM
- HP SNAX support with SD44/SD44U
- Uses HP ProLiant Server as controller, NonStop Kernel Operating System, and Microsoft Windows NT® integration

6742 ServerNet/FX 2 (Fiber Extension Adapter)

- High-speed fiber-optic connection between NonStop S-series and NonStop K10000 and K20000 Servers
- Fiber-optic connectivity up to 2 km for NonStop S-series servers
- Can be installed in either a system cabinet or an expansion cabinet
  7618   Fiber-optic cable assembly (100 m)
  7619   Fiber-optic cable connector kit
            (for use with third-party fiber-optic cables)
- Requires NonStop Kernel Operating System, RVU G06.06 or later

6760 ServerNet/DA—SNDA (Device Adapter)

- Provides connectivity of select external NonStop K-series Disk and Tape Subsystems, standard SCSI tape drives, open SCSI port, and Signaling System 7 (SS7) communications to NonStop S-series servers
- Common baseboard with provision to install device-specific PICs
- Four PICs per adapter (equivalent to four controllers)
- PIC types cannot be mixed on the same SNDA
- Requires NonStop Kernel Operating System, RVU G06.01 or later

6761 Fiber-interface plug-in card (FPIC)

- Replaces functionality of NonStop K-series 3129 Disk Controller or 3216 Tape Controller as a migration aid when moving from NonStop K- to S-series servers
- Provides primary connection for NonStop K-series tape drives on NonStop S-series servers for customers requiring long fiber-optic cables
- Requires new fiber-optic cable or cable adapter (as listed in ServerNet/DA Cables—fiber section)
- Requires NonStop Kernel Operating System, RVU G06.01
- PIC types cannot be mixed on the same SNDA

Warning: NonStop S-series Fibre Channel Tape Drives should not be connected directly to the SNDA via the 6761.

6762 SCSI plug-in card (SPIC)

- Provides a SCSI Fast and Wide interface for high-speed tape connectivity and replaces the functionality of the NonStop K-series 3223 Controller (open SCSI)
- For connection to Fibre Channel tape drives (such as the 9840C), see the description below for the Fibre Channel converter in the section titled "Tapes, power pedestals, and cables"
- SPIC and open SCSI cannot be installed on the same SNDA
- SPIC requires NonStop Kernel Operating System, RVU G06.04; open SCSI requires RVU G06.06

6763 Common Communications ServerNet Adapter—CCSA

- Provides for SS7 communications connectivity to NonStop S-series servers
- Common baseboard with provision to install communications-specific PICs
- Four PICs per adapter (equivalent to four controllers)
- PIC types cannot be mixed on the same CCSA
- Requires NonStop Kernel Operating System, RVU G06.01 or later

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SS7TE SS7 56-/64-Kb/s PIC (Discontinued)

- Provides SS7 standard telecommunications protocol for signaling system functionality; the SS7TE1 operates over analog lines at 56-/64-Kb/s speeds
- This PIC can be mixed on the same SNDA board with SS7TE2 PICs

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SS7TE1 SS7 56-/64-Kb/s PIC (Discontinued)

- SS7TE1 is a technology refresh and a replacement for the older SS7TE PIC
- Provides SS7 standard telecommunications protocol for signaling system functionality; the SS7TE operates over analog lines at 56-/64-Kb/s speeds
- This PIC can be mixed on the same SNDA board with SS7TE and SS7TE2 PICs

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SS7TE2 SS7 T1/E1/J1 PIC

- Provides a digital multiplexed channelized SS7 network signaling interface for NonStop S-series platforms over T1/E1/J1. The SS7TE2 extends the present SS7 signaling technology to include the direct termination of industry-standard T1/E1/J1 digital links. The SS7TE2 operates at either 1.544 Mb/s for interfacing to North American T1 and Japanese J1 or DS-1–based SS7 signaling facilities, or at 2.048 Mb/s or DS-30 for European-standard E1-based SS7 signaling facilities on a software-selectable basis.
- This PIC can be mixed on the same SNDA board with SS7TE and SS7TE1 PICs.

ServerNet/DA Cables—Fiber

The ServerNet/DA FPIC has a new fiber-optic cable connector. This means that if you are migrating from NonStop K-series disks attached to 3129 controllers to a NonStop S-series ServerNet/DA Adapter, you will need an adapter for each cable. If the cable that is unplugged from the 3129 controller can still reach the ServerNet/DA Adapter, all that is required is an F12-01 cable. The F12-01 cable is 1 meter long, with an old-style female socket on one end for the old cable from the 3129 controller and a new-style ServerNet/DA Connector on the other end.

F12-01   One-meter-long adapter cable to enable NonStop K-series F9 cables to be used with the ServerNet/DA Adapter. It has a NonStop K-series F9 connector at one end and a NonStop S-series F12 connector at the other end. (If F12-01 is not long enough, an F12-*xx* cable plus an F12-CP coupler will need to be ordered.)

For new installations, the following new cables are available:

F12-10   10-meter fiber-optic cable for connecting the ServerNet/DA Adapter to 519*x*/515*x* tape and NonStop K-series 4560/70/80/90 Disk

F12-25	25-meter fiber-optic cable for connecting the ServerNet/DA Adapter to 519x/515x tape and NonStop K-series 4560/70/80/90 Disk
F12-50	50-meter fiber-optic cable for connecting the ServerNet/DA Adapter to 519x/515x tape and NonStop K-series 4560/70/80/90 Disk
F12-100	100-meter fiber-optic cable for connecting the ServerNet/DA Adapter to 519x/515x tape and NonStop K-series 4560/70/80/90 Disk
F12-250	250-meter fiber-optic cable for connecting the ServerNet/DA Adapter to 519x/515x tape and NonStop K-series 4560/70/80/90 Disk
F12-500	500-meter fiber-optic cable for connecting the ServerNet/DA Adapter to 519x/515x tape and NonStop K-series 4560/70/80/90 Disk
F12-CP	Coupler to connect NonStop K-series F9 Fiber-Optic Cable to a NonStop S-series F12 fiber-optic cable
F12-FOI	Fiber-optic cable interface kit for new 519x and 515x tape drives

The F12-FOI Fiber-Optic Interface provides a 50-pin SCSI connection. It is not recommended for use with 68-pin Ultra Wide SCSI tape devices.

Note: 519x and 515x tape drives (except 5155 unit inside a 9710ACS) used with the ServerNet/DA adapter require that a fiber-optic interface be installed inside the tape drive. This fiber-optic cable interface board was previously included with a NonStop K-series 3216 controller. Order the F12-FOI fiber-optic interface board for tape drives not previously connected to a 3216 controller.

ServerNet/DA Cables—Copper

A selection of 68-pin SCSI cables for use with the ServerNet/DA SCSI PIC is available as follows:

519-001W	68-pin to 68-pin SCSI cable, 1 m (3.3 ft)
519-003W	68-pin to 68-pin SCSI cable, 3 m (9.8 ft)
519-015W	68-pin to 68-pin SCSI cable, 15 m (49.2 ft)
519-020W	68-pin to 68-pin SCSI cable, 20 m (65.6 ft)
519-023W	68-pin to 68-pin SCSI cable, 23 m (75.4 ft)

Communications devices

3880 ServerNet Wide Area Network (SWAN) Concentrator

- Six-port concentrator for synchronous or asynchronous WAN communications
- Compatibility for applications through support of existing application program interfaces (APIs)
- Connects to system through two 10Base-T Ethernet connections
- External design offloads host communications processing

SWAC32	SWAN adapter cable for RS-232, 3.2 m (10.5 ft)
SWAC21	SWAN adapter cable for X.21, 3.2 m (10.5 ft)
SWAC35	SWAN adapter cable for V.35, 3.2 m (10.5 ft)
SWAC49	SWAN adapter cable for RS-449, 3.2 m (10.5 ft)
SWLB80	SWAN loopback test connector
SWRM80	SWAN metric rack-mount kit

3881 ServerNet Wide Area Network 2 (SWAN 2) Concentrator

- 12-port concentrator for synchronous or asynchronous WAN communications
- Compatibility for applications through support of existing APIs
- Connects to system through two 10Base-T or two 100Base-TX Ethernet connections
- External design offloads host communications processing

SWAC32	SWAN adapter cable for RS-232, 3.2 m (10.5 ft)
SWAC21	SWAN adapter cable for X.21, 3.2 m (10.5 ft)
SWAC35	SWAN adapter cable for V.35, 3.2 m (10.5 ft)
SWAC49	SWAN adapter cable for RS-449, 3.2 m (10.5 ft)
SWLB80	SWAN loopback test connector

3886-8 Asynchronous wide area network (AWAN) concentrator

- Connects asynchronous devices to NonStop K- or S-series servers via a single 10Base-T link from product 3861 or 3863
- Fixed eight-port configuration
- Connects to system through Ethernet connection
- Adapters may be required for existing network connections (such as male DB-25 to RJ-45)
- 6530 support requires the 3886-6530 flash card, which is ordered separately
- External design offloads host communications processing
- Ideal migration path from NonStop K- to S-series server for asynchronous terminals and printers

3886-16 Asynchronous wide area network (AWAN) concentrator

- Connects asynchronous devices to NonStop K- or S-series servers via a single 10Base-T link from product 3861 or 3863
- Fixed 16-port configuration
- Connects to system through Ethernet connection
- Adapters may be required for existing network connections (such as male DB-25 to RJ-45)
- 6530 support requires the 3886-6530 flash card, which is ordered separately
- External design offloads host communications processing
- Ideal migration path from NonStop K- to S-series server for asynchronous terminals and printers

3886-32 Asynchronous wide area network (AWAN) concentrator

- Connects asynchronous devices to NonStop K- or S-series servers via a single 10Base-T link from product 3861 or 3863
- Fixed 32-port configuration
- Connects to system through Ethernet connection
- Adapters may be required for existing network connections (such as male DB-25 to RJ-45)
- 6530 support requires the 3886-6530 flash card, which is ordered separately
- External design offloads host communications processing
- Ideal migration path from NonStop K- to S-series server for asynchronous terminals and printers

3886-6530 6530 Code for 3886 AWANs

- PCMCIA form factor FLASH memory card containing code that enables 6530 support on 3886 AWANs.
- This card is also required when using GAP software from GEMINI Communications with 3886 AWANs.

Disk drives

4638 NonStop S-series Very High Speed 36-GB Disk

- Low-cost internal storage
- Dual access and mirroring for fault tolerance and data integrity
- Drive storage capacity: 36 GB (formatted)
- Overall average seek time: 3.75 ms
- Average rotational latency: 2.0 ms
- Rotational speed: 15,000 rpm
- Mirrored pairs must be the same disk type
- Configuration:
    - Minimum of 4 internal system drives required per system
    - Maximum of 16 internal drives per enclosure
    - Disk types can be mixed within an enclosure
- Requires NonStop Kernel Operating System, RVU G06.09 or later

46144 NonStop S-series Very High Speed 72-GB Disk

- High-capacity, low-cost-per-megabyte internal storage
- Dual access and mirroring for fault tolerance and data integrity
- Drive storage capacity: 144 GB (formatted)
- Overall average seek time: 3.75 ms
- Average rotation latency: 2.0 ms
- Rotational speed: 15,000 rpm
- Mirrored pairs must be the same disk type
- Configuration:
  - Minimum of 4 internal system drives required per system
  - Maximum of 16 internal drives per enclosure
  - Disk types can be mixed within an enclosure
- Requires NonStop Kernel Operating System, RVU G06.19 or later

Tapes, power pedestals, and cables

HP StorageWorks DAT 72 Tape Drives for NonStop S-series servers

HP StorageWorks DAT 72 Tape Drives are based on the Digital Data Storage (DDS) format, the most successful tape backup format of all time, with an installed base of more than 9 million drives. DDS technology has led the tape market for many years because of its capacity, reliability, and low cost. DAT 72 Tape Drives for NonStop servers have backward compatibility with two previous DDS generations, providing excellent media investment protection. The low cost of DDS media contributes to the extraordinarily low cost of ownership for DAT tape drives.

Ordering information

Part number	Product name
5242	HP DAT 72, Single-Cartridge Table-Top Tape Drive
5242ACL	HP DAT 72 Tape Drive with 6-media slot ACL
5242-2SE	HP DAT 72 2-Tape Drive Unit, NEBS compliant, 19-inch rack mountable
514M	Media Magazine for ACL-equipped DAT tape drives

Controller hardware options

Any NonStop S-series PMF CRU SCSI port	
1980	IOMF2 SCSI port
6760 and 6762	ServerNet/DA with SCSI PIC

SCSI cables—copper

519-001W	SCSI cable, 1 m (3.3 ft)
519-003W	SCSI cable, 3 m (9.8 ft)
519-015W	SCSI cable, 15 m (49.2 ft)
519-020W	SCSI cable, 20 m (65.6 ft)
519-023W	SCSI cable, 23 m (75.4 ft)

HP Ultrium LTO 460 Tape Storage for NonStop S-series servers

HP Ultrium LTO 460 (Gen 2) Tape Drives are now available for use with NonStop S-series servers. This product delivers the highest performance and capacity of any tape drive offered for use with NonStop S-series servers to date. The Ultrium 460 Tape Drive is the latest generation of the HP Ultrium tape rive family, with a single cartridge capacity potential of 400 gigabytes and a transfer rate of up to 60 megabytes per second (assuming 2:1 data compression). The Ultrium LTO 460 Product was adapted for use with NonStop S-series servers in partnership with HP development partner Tributary Systems, Inc.

System requirements

Software   NonStop Kernel Operating System, RVU G06.21 and later

Ordering information

Part number	Product name
N1521A	HP Ultrium LTO 460; CTL700 or CTL700M Tape Library
N1524A	HP Ultrium LTO 460; 11-slot ACL; NonStop S-series Enclosure
N1525A	HP Ultrium LTO 460; 11-slot ACL; tabletop

Controller hardware options

NonStop S74000 or later PMF CRU SCSI Port	
1980 and 6762	IOMF2 with SCSI PIC
6760 and 6762	ServerNet/DA with SCSI PIC

SCSI cables—copper

519-001W	SCSI cable, 1 m (3.3 ft)
519-003W	SCSI cable, 3 m (9.8 ft)
519-015W	SCSI cable, 15 m (49.2 ft)
519-020W	SCSI cable, 20 m (65.6 ft)
519-023W	SCSI cable, 23 m (75.4 ft)

NonStop S-series Enclosure for N1524A

7186	Enclosure, single high
7187	Enclosure, double high
7188	Enclosure, single high add-on (no castors)

SCSI extenders for long-distance attachment

HP Ultrium LTO 460 Tape Drives for the NonStop Kernel Operating System can be attached at distances beyond copper SCSI limitations through the use of the SCSI extender products CTSFE and CTFSE listed below.

The two types of SCSI extenders are used in series along with a customer-supplied single-mode fiber cable. The connection using SCSI extenders is described as follows:

Host → 519-0x cable → CTSFE → single-mode fiber cable → CTFSE → 519-0x cable → HP Ultrium 460 Tape Drive

CTSFE	SCSI extender, host side
CTFSE	SCSI extender, device side
7290	Half-height NonStop S-series Enclosure (optional)
7291	Half-height NonStop S-series Enclosure Add-on (optional)

StorageTek/TSI 9840C tape drives

9840C tape drives for NonStop servers are based on the 9840 media format. The StorageTek access-centric 9840C tape drive is ideal for applications that demand high data throughput and fast recall. The StorageTek T9840C tape drive stores up to 40 gigabytes native on a single cartridge.

Technical specifications

System requirements

Hardware	NonStop S-series S74000 Server or later PMF SCSI Port
	IOMF2 SCSI port (product number 1980)
	HP ServerNet Device Adapter SCSI Port (product numbers 6760 and 6762)
Software	NonStop Kernel Operating System, RVU G06.24 and later
	or
	RVU G06.16 and later with OSM and OSM prerequisite SPRs as follows:

Ordering information

CT9841FC-1	9840C tape drive for CTL700/CTL700M tape libraries
CT9841FC-4	9840C tape drive for STK 9310 Powderhorn Tape Libraries

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Required Fibre Channel converter

CT9800FC	Fibre Channel converter

Controller hardware options

Any NonStop S-series S74000 Server or later PMF CRU SCSI Port

1980	IOMF2 SCSI port
6760 and 6762	ServerNet/DA with SCSI PIC

9840C tape drives are attached to NonStop servers using a copper SCSI cable, a Fibre Channel converter (CT9800FC), and a 62.5/125um multimode fiber cable as described and listed below. The connection sequence is as follows:

Host SCSI port → copper SCSI cable → CT9800FC → 62.5/125um fiber cable → CT9841FC-x tape drive

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Copper SCSI cables

519-001W	SCSI cable, 1 m (3.3 ft)
519-003W	SCSI cable, 3 m (9.8 ft)
519-015W	SCSI cable, 15 m (49.2 ft)
519-020W	SCSI cable, 20 m (65.6 ft)
519-023W	SCSI cable, 23 m (75.4 ft)

Fiber cables

62.5/125um multimode fiber cables for use with the CT9841FC-x tape drives are available from HP as listed below. Attachment at distances up to 500 meters is supported; however, customers choosing to install these tape drives at distances greater than 125 meters must obtain and install 62.5/125um multimode fiber-optic cable. The length of a customer-supplied 62.5/125um fiber cable may not exceed 500 meters.

M8910-10	10-meter LC-SC, MMF cables
M8910-20	20-meter LC-SC, MMF cables
M8910-50	50-meter LC-SC, MMF cables
M8910125	125-meter LC-SC, MMF cables

The following enclosure products are supported for use with the CT9800FC Fibre Channel converters:

7290	Half-height NonStop S-series Enclosure (optional)
7291	Half-height NonStop S-series Enclosure Add-on (optional)

Dimensions	125 mm x 109 mm x 25.88 mm (4.92 in x 4.29 in x 1.0 in)
Weight	262 grams (9.17 oz)

Media data

Media	Advanced metal particle
Substrate	Polyethylene Naphthalate (PEN)
Coercivity	1625+/− 75 Oersteds (130 +/− 16.0 KA/m)
Number of tracks	288
Tape speed	2 m/s R/W, up to 11 m/s search (80 i/s R/W, up to 440 i/s search)
Capacity	20 GB uncompressed
Archival life	15–30 years

CTL700 and CTL700M tape libraries (tape silos)

The CTL700 and CTL700M tape libraries address the need for high-performance, industrial-strength automated tape storage. The CTL700 and CTL700M are based on the StorageTek L700 tape library. The CTL700 and CTL700M deliver large-capacity tape automation and high-performance tape storage.

System requirements

NonStop Kernel Operating System, RVU G06.06 and later

HP offers two operations management options for the CTL700 and CTL700M:

- SF10V*x*; requires a workstation running The Windows NT operating system
- CTL7UXW (UNIX® workstation with STK ACSLS); requires SF02 for the NonStop host server

See the CT9841FC-*x* system requirements above for important information regarding host connections and software requirements for the CT9841F-*x* tape drives.

Ordering information

Part number	Product name
CTL700	156 Data cartridge capacity CTL700 silo
CTL700M	618 Data cartridge capacity CTL700 silo
CTL700UPG	Field upgrade for CTL700 to increase capacity to 618 cartridges

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Long-distance attachment

Super DLT and LTO tape drives may be attached at distances beyond copper SCSI limitations through the use of the SCSI extender products listed below. The two types of SCSI extender are used in a series along with a customer-supplied single-mode fiber cable. The connection using SCSI extenders is illustrated as follows:

Host → 519-0*x* cable → CTSFE → single-mode fiber cable → CTFSE → 519-0*x* cable → Super DLT/ LTO Tape Drive

Part number	Product name
CTSFE	SCSI extender, host side

CTFSE	SCSI extender, device side
7290	Half-height NonStop S-series Enclosure (optional)
7291	Half-height NonStop S-series Enclosure Add-on (optional)

CTSFE SCSI extender, host side

The CTSFE SCSI extender converts SCSI I/O to the Fibre Channel protocol. This unit is placed on the host side of a long-distance I/O connection to an external SCSI device (for example, a LTO tape drive) in series with a CTFSE. A copper SCSI cable (product number 519-0*xx*W) connects to a SCSI port on the host server (either ServerNet/DA S-PIC, S74K SCSI port, or IOMF 2 SCSI port) and to a SCSI port on the CTSFE. The CTSFE SCSI extender is then connected to a customer-supplied single-mode fiber cable of up to 10 kilometers in length, in series with the CTFSE. The CTSFE may be installed as a table-top, standalone unit, or it may be installed inside a 7290 or 7291 SCSI extender enclosure. All the hardware required for either installation is included with the CTSFE SCSI extender. The copper SCSI cable must be ordered separately.

CTFSE SCSI extender, device side

The CTFSE SCSI extender converts Fibre Channel protocol I/O to SCSI. This unit is placed on the device side of a long-distance I/O connection to a SCSI device, in series with a CTSFE and a single-mode fiber cable. The single-mode fiber cable connects to the Fibre Channel port on the CTFSE. A copper SCSI cable (product number 519-0xxW) connects the SCSI port on the CTFSE SCSI extender to the SCSI port on the SCSI device. CTFSE supports attachment of SCSI devices up to 10 kilometers distance from the host server. The CTFSE may be installed as a table-top, standalone unit, or it may be installed inside a 7290 or 7291 SCSI extender Enclosure. All the hardware required for either installation is included with the CTFSE SCSI extender. The copper SCSI cable must be ordered separately.

7290 SCSI extender enclosure

The 7290 SCSI extender enclosure is a half-height NonStop S-series server–style enclosure designed to house the CTSFE and CTFSE HP TSI SCSI extenders. Each 7290 enclosure will accommodate installation of up to seven CTSFE or CTFSE extenders.

7291 SCSI extender enclosure

The 7291 SCSI extender enclosure add-on is a half-height NonStop S-series server–style enclosure designed to house the CTSFE and CTFSE HP TSI SCSI extenders. Each 7291 enclosure will accommodate installation of up to seven CTSFE or CTFSE extenders. The 7291 is delivered without a base and casters so that it may be stacked on top of another 7291, a 7290 (SCSI extender enclosure with base and casters), or a NonStop S-series enclosure.

Virtual tape

Stated in simple terms, virtual tape storage is tape-emulated storage on disk. HP offers a virtual tape product based on the Tape Laboratories, Inc. product, Virtual TapeServer, which runs in a FreeBSD environment on an HP ProLiant server platform.

Virtual TapeServer

Minimum system requirements

All installations of the Virtual TapeServer Product Set must include attachment to at least one NonStop S-series server.

Object Storage Management (OSM) is the required service management subsystem. Release Version Update (RVU) G06.10 is the minimum HP NonStop Kernel Operating System RVU required.

All Virtual TapeServer server hardware platforms include HVD SCSI interface connections, which are pin-for-pin compatible with NonStop S-series PMF, IOMF, or SNDA SCSI connections. That is, any existing NonStop S-series server–attached tape drive device may be replaced by any Virtual TapeServer product by simply moving the 68-pin copper SCSI cable connected to an existing physical tape drive to an HVD SCSI port on

the Virtual TapeServer product. Tape operations on the NonStop system remain entirely unchanged, as if the NonStop server were still attached to a physical tape device.

OSM prerequisite software product revisions

RVU G06.10   T1089ABK (SP)

                               T9753AFC (I/O drivers; requires system load)

RVUs G06.11 to G06.20   T1089ABK

RVU G06.21 and later   No additional software product revisions (SPRs) required for OSM

Controller hardware options

Part number	Product name
Any NonStop S-series PMF SCSI port	Any NonStop S-series SCSI port
1952	IOMF SCSI port
1980	IOMF2 SCSI port
6760 and 6762	ServerNet/DA with SCSI PIC

ProLiant servers

VT5900-A ProLiant 4U Server

The VT5900-A is based on the ProLiant DL585 Server and includes the following features:

3   1U 4 x HVD/LVD Conversion Rack Kit

12   6-ft MD68—VHDCI Cable

1   ProLiant DL585 Base Configuration includes:

- (2) AMD Opteron Model 850 Processors at 2.4 GHz standard
- 1-MB Integrated Level 2 cache
- 2 GB of PC2100 DDR SDRAM running at 266 MHz (Standard)
- Dual-Port NC7782 embedded Gigabit Ethernet NIC
- Smart Array 5i Plus Controller (Dual Channel, Ultra3)
- Battery-Backed Write Cache Enabler (integrated on system board)
- Integrated Lights-Out (iLO) Standard management
- Two 800-W Hot-Plug Redundant Power Supplies
- 24x IDE Universal Media Bay CD-ROM Drive

2   36.4-GB 15,000-RPM, U320 Universal Hard Drive, 1 in

6   64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter

2   HP StorageWorks FCA2214DC Dual Channel Fibre Channel HBA

A quantity of one VT-INS-12 product is required each instance of the VT5900-A Server ordered.

VT5900-C ProLiant 2U Server

The VT5900-C is based on the ProLiant DL380 G4 Server and includes the following features:

1   ProLiant DL380R04 Server

1   X3.2/00-1M 380 G4 ALL

2   36.4-GB Pluggable Ultra 320 SCSI 10,000-RPM Universal Hard Drive

1	Hot-Plug AC Redundant Power Supply Module (NEMA and IEC cords)
1	ProLiant DL380 G3 Redundant Fan Option Kit (3 fans)
1	StorageWorks fca2214 Dual FC Controller
2	Dual Channel Ultra3 SCSI
1	BBWC for SA6I ALL
1	Optical Drive Slimline CD-RW/DVD-ROM Combo Option Kit
1	1U 4 x HVD/LVD Conversion Rack Kit
4	6-ft MD68—VHDCI Cable

A quantity of one VT-INS-12 product is required for each instance of the VT5900-C Server ordered.

VT5900-B/VT5900-B00 Virtual TapeServer Appliance

The VT5900-B and VT5900-B00 must always be ordered together. One cannot exist on an order or in an installation without the other. Together, the VT5900-B and VT5900-B00 make up the Virtual TapeServer "Virtual TapeServer Appliance" product. The Virtual TapeServer Appliance is a fully self-contained, non-configurable, non-scalable Virtual TapeServer hardware/software bundle. The following features exist in the VT5900-B/VT5900-B00 Virtual TapeServer Appliance. A quantity of one VT-INS-10 product is required for each instance of the VT5900-B/VT5900-B00 Server ordered.

VT5900-B ProLiant Rack Model 2U Server

ProLiant DL380 G4 Server

RAID storage: 1.5 Terabytes Internal disk storage

Host connections: 2 SCSI

Internal tape: 1; DAT 72

External tape ports: 2 SCSI

1	1U 4 x HVD/LVD Conversion Rack Kit
4	6-ft MD68—VHDCI Cable
1	ProLiant DL380R04 X3.2 1 MB/800, 1 GB
1	Smart Array 6i 128-MB Battery Backed Write Cache Enabler Option Kit
1	Slimline CD-RW/DVD-ROM Combo Option Kit
1	Redundant Fan Option Kit
1	Hot-Plug AC Redundant Power Supply Module (NEMA and IEC cords)
2	Ultra 3 SCSI Controller
5	300-GB 10,000-RPM, U320 Universal Hard Drive, 1 in
1	HP StorageWorks DAT 72 Tape Drive, Internal Hot-Plug (Carbon)

VT5900-B00 Virtual TapeServer Software

Virtual TapeServer Appliance Site License

Two Virtual Tape Drives Licenses

Two Data Compression Licenses

File Replication utility

No additional software or hardware options are available for this appliance product. This product's configuration may not be altered in any way.

A quantity of one VT-INS-10 product is required for each instance of the VT5900-B/VT5900-B00 Server ordered.

Virtual TapeServer storage components

VT5904 "6-Pack" of internal disks for use in the VT5900-C

The VT5904 includes 6 146-GB internal disk drives.

VT5904-A Single internal 146-GB Disk Drive for use with VT5900-A and VT5900-C servers

VT5905 2 Terabyte RAID array; external storage component based on StorageWorks MSA 1000 RAID array

A quantity of one VT-INS-8 product is required for each instance of the VT5905 Server ordered.

One of the following cables must be included for each unit of VT5905 ordered.

Part number	Cable length
M8900-2	2 m
M8900-05	5 m
M8900-15	15 m
M8900-40	40 m
M8900-80	80 m
M8900250	250 m

VT5906 2 Terabyte RAID array add-on to the VT5905, also based on the StorageWorks MSA 100 RAID array

A quantity of one VT-INS-8 product is required for each instance of the VT5906 Server ordered.

Up to two VT5906 RAID arrays may be stacked on a single VT5905 for a maximum capacity of 6 terabytes. The VT5906 may only be added to an existing VT5905 and may not exist as the only storage component in a Virtual TapeServer configuration.

One of the following cables must be included for each unit of VT5906 ordered.

Part number	Cable length
M8900-2	2 m
M8900-05	5 m
M8900-15	15 m
M8900-40	40 m
M8900-80	80 m
M8900250	250 m

Virtual TapeServer required and optional software licenses

Note: None of the optional products listed below can be used with the VT5900-B/VT5900-B00 Virtual TapeServer Appliance.

VT5903 Virtual TapeServer Middleware Site License

One VT5903 is required at each installation of Virtual TapeServer product, except the VT5900-B/VT5900-B00 appliance product.

A quantity of one VT-INS-00 product is required for each instance of the VT5903 Server ordered.

VT5907 Instant Disaster Recovery Option—4 virtual tape drives

The VT5907 Instant Disaster Recovery software provides automatic data replication from one Virtual TapeServer installation to another. The Virtual TapeServer product can be configured to write data automatically to a remote virtual tape drive, located on a remote Virtual TapeServer. Licenses must be purchased for each initiating Virtual TapeServer (i.e., if two sites are initiating disaster recovery backups to each other, enough licenses must be bought to match the number of virtual tape drives at each site). The number of VT5907 Instant/Disaster Recovery licenses must match the number of VT5910 or VT5910-A licenses at the initiating site. The VT5907 licenses this capability on up to four virtual tape drives. VT5907 software is optional.

A quantity of one VT-INS-SOW product is required for each instance of the VT5907 Server ordered.

VT5907-A Instant Disaster Recovery Option—1 virtual tape drive

The VT5907 Instant Disaster Recovery software provides automatic data replication between two Virtual TapeServer installations (see description of VT5907 above). The VT5907-A licenses this capability on one virtual tape drive. VT5907-A software is optional.

A quantity of one VT-INS-SOW product is required for each instance of the VT5907-A Server ordered.

VT5908 Virtual Tape Drive Daisy Chain Option—4 virtual tape drives

The VT5908 Virtual Tape Daisy Chain software provides the ability to "daisy chain" an additional virtual tape drive on a single host SCSI connection. The VT5908 licenses this capability on up to four virtual tape drives. VT5908 software is optional.

A quantity of one VT-INS-04 product is required for each instance of the VT5908 Server ordered.

VT5908-A Virtual Tape Drive Daisy Chain Option—1 virtual tape drive

The VT5908-A Virtual Tape Daisy Chain software provides the ability to "daisy chain" an additional virtual tape drive on a single host SCSI connection. The VT5908-A licenses this capability on one virtual tape drive. VT5908-A software is optional.

A quantity of one VT-INS-01 product is required for each instance of the VT5908-A Server ordered.

VT5910 Virtual Tape Drive—4 virtual tape drives

The VT5910 virtual tape drive software is the software license to connect a NonStop S-series (or other supported server) server to the Virtual TapeServer SCSI port(s) and virtual tape drives. Each VT5910 includes a license for four virtual tape drives. VT5910 or VT59010-A is required on all Virtual TapeServer installations, except the VT5900-B/VT5900-B00.

A quantity of one VT-INS-04 product is required for each instance of the VT5910 Server ordered.

VT5910-A Virtual Tape Drive—1 virtual tape drive

The VT5910-A virtual tape drive software is the software license to connect a NonStop S-series (or other supported server) server to a Virtual TapeServer SCSI port and a virtual tape drive. Each VT5910-A includes a license for a single virtual tape drive. VT5910 or VT59010-A is required on all Virtual TapeServer installations.

A quantity of one VT-INS-01 product is required for each instance of the VT5910-A Server ordered.

VT5911 Virtual TapeServer Powderhorn Software

The VT5911 Powderhorn Software is an optional software module for Virtual TapeServer installations that interact directly with StorageTek ACSLS and StorageNet 6000 Storage Domain manager (SN6000) modules, which are used to manage the tape library functions of StorageTek 93xx, L4xxx, and L5xxx series tape libraries/silos. This optional software module is required when a Virtual TapeServer user wishes to attach the above STK tape library managers to Virtual TapeServer. Support for STK libraries not mentioned above is a feature provided in the base Virtual TapeServer product VT5903. A unit of VT5911 is required for every instance of StorageTek Tape library (identified above) attached to a single Virtual TapeServer VT5903 site license. VT5911 software is optional.

A quantity of one VT-INS-16 product is required for each instance of the VT5911 Server ordered.

VT5912 Virtual TapeServer Data Compression Software

The VT5912 Virtual Tape Data Compression Software enables the Virtual TapeServer to store data on virtual tape volumes in a compressed form, potentially doubling or more, available storage capacity. Data compression is accomplished with no overhead to Virtual TapeServer and in some cases may actually increase throughput performance. If data compression is selected for a Virtual TapeServer installation, one VT5912 is required for each virtual tape drive that exists in the configuration. VT5912 software is optional.

VT5913 Virtual TapeServer Redundant Virtual Tape Drive

The VT5913 Redundant Virtual Tape Drive Software is available for installations where fully redundant virtual tape drive connections between the virtual tape device and the host NonStop server are required. These virtual tape drives are idle-spare virtual tape drive connections utilized only in the event of a failure in the primary virtual drive connection. VT5913 redundant virtual tape drives may be ordered independent of the number of virtual drive licenses installed. There is no quantity relationship requirement; any number may be purchased where a VT5903 site license exists. VT5913 is optional software.

Warranty and support

Virtual TapeServer products are delivered with a next-business day, on-site warranty. Hardware products are covered by the warranty for 3 years and software for 90 days. For an additional fee, the warranty may be upgraded to provide 24 hour x 7 days a week, 4-hour response time support coverage.

Installation services

VT-INS-00 through VT-INS-16 and VT-INS-SOW (Statement Of Work) installation services products are required in order to physically install Virtual TapeServer and integrate the product into a particular computing environment. The particular installation product required for each of the main products is listed, along with the product's description.

Virtual TapeServer product summary

Each Virtual TapeServer configuration is made up of at least one component from each of the following three component categories. Once the required components are configured, optional software components may be added.

Exception: The VT5900-B/VT5900-B00 Virtual TapeServer Appliance product is fully self-contained and requires no additional hardware or software components. For the VT5900-B/VT5900-B00 product, only the installation service, VT-INS-10, is required in addition to the base product.

ProLiant server hardware component:

- VT5900-A 4U server

- VT5900-C 2U server
- VT5900-B/VT5900-B00 Virtual TapeServer Appliance

Storage component:

- VT5904 Internal RAID Array of 6 146-gigabyte disk drives
- VT5904-A Single internal 146-gigabyte disk drive
- VT5905 2 Terabyte RAID Array
- VT5906 2 Terabyte RAID Array Add-on to VT5905
- Other external storage component (HP StorageWorks XP SAN, for example)

Virtual TapeServer software

- Middleware software license:
  - VT5903 Virtual TapeServer Middleware License

- Virtual Tape Drive software license:
  - VT5910 Virtual Tape Drive Software License—4 virtual tape drives
  - VT5910-A Virtual Tape Drive Software License—1 virtual tape drive

Virtual TapeServer installation products

- VT-INS-00 through VT-INS-16
- VT-INS-SOW (Statement Of Work)

Optional software components

In addition to the required components above, optional software components described above may be included.

SCSI cables—copper

Part number	Product name
519-001W	SCSI cable, 1 m (3.3 ft)
519-003W	SCSI cable, 3 m (9.8 ft)
519-015W	SCSI cable, 15 m (49.2 ft)
519-020W	SCSI cable, 20 m (65.6 ft)
519-023W	SCSI cable, 23 m (75.4 ft)

SCSI extenders for long-distance attachment

Virtual tape products for NonStop servers can be attached at distances of up to 10 kilometers from the host NonStop S-series server through the use of the SCSI extender products listed below. The two types of SCSI extenders are used in series along with a customer-supplied single-mode fiber cable. The connection using SCSI extenders is described as follows:

Host → 519-0x cable → CTSFE → single-mode fiber cable → CTFSE → 519-0x cable → Virtual TapeServer

Part number	Product name
CTSFE	SCSI extender, host side
CTFSE	SCSI extender, device side
7290	Half-Height NonStop S-series Enclosure (optional)
7291	Half-Height NonStop S-series Enclosure Add-on (optional)

Technical specifications

RAID disk technology	SCSI/FC
Hot-swap disk drives	Yes
Hot spare in RAID array	Yes
Number of virtual tape cartridges	Unlimited
Support for "back-end" attachment of NonStop tape drives	All
Support for back-end attachment of open systems tape drives	Any
Simultaneous connection to open systems	Yes
Support provided by	HP

Printers

5531 Line printers

- 1,000-line-per-minute (lpm), very heavy duty line-matrix printer
- Monthly printing volume of up to 205,000 pages
- Wide range of fonts, including OCR A and B plus bar codes (POSTNET)
- Quiet cabinet (50 dBA) model suitable for installation in office environments
- Standard interface includes RS-232C serial and Centronix parallel interfaces
- Interface options include Ethernet and Dataproducts Long-Line Parallel Interface

5532 Line printers

- 1,500-lpm, heavy-duty line-matrix printer
- Monthly printing volume of up to 320,000 pages
- Wide range of fonts, including OCR A and B plus bar codes (POSTNET)
- Quiet cabinet (52 dBA) model suitable for installation in office environments
- Standard interface includes RS-232C serial and Centronix parallel interfaces
- Interface options include Ethernet and Dataproducts Long-Line Parallel Interface

5525B Line printers

- 500-lpm, heavy-duty line-matrix printer
- Monthly printing volume of up to 130,000 pages
- Wide range of fonts, including OCR A and B plus bar codes (POSTNET)
- 5525B is pedestal mounted
- Standard interface includes RS-232C serial and Centronix parallel interfaces
- Interface options include Ethernet and Dataproducts Long-Line Parallel Interface

55R280/55R801 Ethernet TCP/LAN interface

The 55R280 replaces product number 55R180. This option allows the Dataproducts Long-Line Parallel Interface in the 552x, 553x Printer to be upgraded with an Ethernet interface. This interface supports TCP/IP and Novell IPX/SPX protocols. This product is the field-installable version of product number 55R801 and includes all the required material and written instructions to complete the installation. Installation of this product includes updating the firmware in the printer using a Microsoft Windows based PC, which is not supplied as part of this product.

This 55R801 replaces product number 55R701. This option allows the Dataproducts Long-Line Parallel Interface in the 552x, 553x printer to be upgraded with an Ethernet interface. This interface supports TCP/IP and Novell IPX/SPX protocols. This product is factory installed when ordered in conjunction with the printer (5525B, 5531, or 5532). The field-installable version of this interface is product number 55R280.

Software products

This section provides summary descriptions of the software products that can be ordered on NonStop S-series servers.

Note: Some products will not be available in early software releases. Customers should contact their sales representatives for product availability.

Standard NonStop S-series Package (SN73)

The NonStop Kernel Operating System is required for all NonStop S-series servers. License per system via this standard package. NonStop Kernel Operating System components are included as follows:

NonStop TMF Software	Enscribe	TFORM	TGAL
EDIT	TACL	FastSort	TSM
HP TAL/pTAL	Binder/nld	Crossref	HP Inspect/Visual Inspect Software
FUP	DSM/SCM	Spooler	SCF
Backup	Restore	PS Text Edit (TEDIT)	SLSA
HP Enform Software	SYSGEN	Data Definition Language (DDL)	

To provide customers with the basic functionality commonly used in most system environments, the standard NonStop Kernel Operating System for NonStop S-series servers also includes these products that are separately licensed on other NonStop platforms:

- TCP/IP communications protocol (formerly SD20)
- Open System Services (OSS) Runtime Environment (formerly SA16)
- Nonsecure HP iTP WebServer Solution (SJ99V6)

Other operating system environments

OSS customers may elect to have OSS preinstalled for new NonStop S-series systems. To do so, the following no-charge product must be ordered. This requires two additional disk drives beyond the minimum system order. Note that Safeguard (9750) must also be ordered if the customer is going to have OSS preinstalled.

OSS manufacturing installation and configuration (MC01)

Database software

- NonStop SQL/MP and NonStop SQL/MX Database (MP tables only)—per CPU license (SR90 CPUs 1–4, SR91 CPUs 5–16). If NonStop SQL/MX Software is used, OSS is required.
- NonStop SQL/MP Runtime—per CPU license (SR94 CPUs 1–4, SR95 CPUs 5–16)
- NonStop SQL/MP Parallel Query Option—per CPU license (SR98 CPUs 1–4, SR99 CPUs 5–16)
- NonStop SQL/MX (MX tables) (SR92 CPUs 1-4, SR93 CPUs 5-16)
- Add MX tables support for NonStop SQL/MP (SR90-MXT

Remote database access

- NonStop ODBC Server, Release 2 (SJ08V1)
- NonStop ISG Navigator Developer Edition Bundle (includes SM71V1, SM72V1, SM73V1, SM74V1, and SM75V1)—Discontinued
    - Customers should contact Attunity for these products (contact Jim Beliveau at +1 (781) 221 1450, ext. 332, or by e-mail at jim.beliveau@attunity.com).

Database tools

- Enform Optimizer (SE03)
- Enform Plus (SE17)
- Data Build (SE06)
- Reload Analyzer (SE07)
- DataLoader/MP Software (SE41; order SE41V1 for native mode DataLoader or SE40 for DataLoader/MP Software)
- NonStop SQL Data Compression (SA93)
- NonStop dba/m (SM80V1)
- NonStop Storage Management Foundation (NonStop SMF) Software (SA26)

Business continuity software

- NonStop RDF/IMP Remote Database Facility Software (SA43v1)
- NonStop RDF/IMPX Remote Database Facility Software (SA44v1)
- NonStop RDF/ZLT Zero Lost Transaction (SA88v1) Controlled Availability, add-on to SA44v1, requires RDF professional Services and appropriate training
- NonStop AutoTMF Software (SA45v1)
- NonStop AutoSYNC Software (SA46v1)

Transaction services software

- Generalized Device Support—(9170)
- NonStop TS/MP Software—per CPU license (SR50 CPUs 1–4, SR51 CPUs 5–16)
- NonStop Tuxedo Software—per CPU license Release 8.0 (SR71v1 CPUs 1–4, SR72v1 CPUs 5–16)
- NonStop DTE Software, Release 6.7.1v33 (SJ54 CPUs 1–4, SJ55v3 CPUs 5–16, SJ56v3 additional dev. license)
- Pathway/XM Software—per CPU license (SR57v2 CPUs 1–4, SR58v2 CPUs 5–16)
- Pathway with NonStop TS/MP Software—per CPU license (SR53 CPUs 1–4, SR54 CPUs 5–16)
- Pathway/iTS with NonStop TS/MP Software—per CPU license (SR76v1 CPUs 1–4, SR77v1 CPUs 5–16)
- NonStop Remote Server Call (NonStop RSC/MP)—Host (SM58v1)
- NonStop RSC/MP—Client
  - HP Tru64 UNIX Client (SM56V1)
  - Linux Client (SM57V1)
  - Lite Client (SM59V1)
  - HP Integrity Client (SM60V1)
  - NCR Client (SM61V1)
  - SCO UnixWare Client (SM62V1)
  - HP-UX Client (SM63V1)
  - IBM AIX Client (SM64V1)
  - Solaris Client (SM65V1)
  - OS/2 32-bit Client (SM66V1)
  - 32-bit Windows Client (SM67V1)
  - Microsoft Server TSE Client (SM55V1)
- HP iTP Active Transaction Pages (iTP ATP) Software (SJ72V*x*; consult CPSA for the current version)
- NonStop CORBA 2.6.1 (SE65V3 CPUs 1-4, SE66v3 CPUs 5-16)
- NonStop Server for Java™ Message Service (3SE53V2 CPUs 1–4, SE54V3 CPUs 5–16)
- iTP WebServer Solution (SJ99V*x*; consult CPSA for the current version—SJ99V6 Sept. 2002)
- iTP Secure WebServer Solution
  - Secure Exportable 40-bit version (SJ91V*x*; consult CPSA for the current version)
  - Strong International 128-bit secure version (SJ95V*x*; consult CPSA for the current version)
  - Strong Domestic (U.S.) 28-bit secure version (SJ98V*x*; consult CPSA for the current version)
- NonStop Servlets for JavaServer Pages (JSP) Software (SJ88V*x* CPUs 1–4, SJ89V*x* CPUs 5–16; consult CPSA for the current versions)
- NonStop SOAP Client Software (SX24v1)
- NonStop SOAP for Pathway Software (SX21V*x*; consult CPSA for the current version)
- NonStop SOAP for Java Software (SX23V*x*; consult CPSA for more information)
- NonStop XSLT Software (SX22V*x*; consult CPSA for the current version)

- NonStop XML Parser (SX20Vx; consult CPSA for the current version)
- NonStop Fast XML Parser Software (SX25Vx; consult CPSA for the current version)
- Server Object Gateway is Discontinued. Contact TICSoftware at www.ticsoftware.com.

Web services software

- NonStop Server Toolkit for BEA WebLogic Server 8.1, which allows BEA WebLogic Server 8.1 SP2 to run on NonStop servers (SE12V2; available free)
- NonStop Server Toolkit for BEA WebLogic Platform 8.1 SP2, which allows BEA WebLogic 8.1 SP2 and BEA WebLogic Integration SP2 to run on NonStop servers (SE12V3; available free)

Messaging software

- OSI/FTAM package (SD50)
- OSI/FTAM standalone (SD51)
- OSI/MHS switching services (SD80; Controlled Availability)
- OSI/MHS GPI for SD80 (SD81; Controlled Availability)
- OSI/MHS restricted switching services (SD82)
- OSI/MHS GPI for SD82 (SD83)
- PS Mail 6530 (9131)
- PS Mail 3270 (9132)
- PS Mail TTY (9130)
- ActionView.400 (PC client) (SD43; Controlled Availability)
- ActionView.400 Config. Management (CMF) (SD52)
- ActionView.400 System Performance Monitor (SPM) (SD53)
- ActionView.400 CAF/ALERT (SD54)
- Transfer (SA60) Discontinued

Application development software

HP languages for NonStop servers

- COBOL74 runtime library (9261)
- COBOL85 compiler (SB80)
- COBOL85 runtime library (SB81)
- Native COBOL compiler (SB70)
- Native COBOL runtime (SB71)
- FORTRAN (9252)
- FORTRAN runtime library (9262)
- TNS (CISC) C compiler—NonStop S-series server (for HP Guardian and OSS Environments) (SB79)
- Native-Mode C (Guardian Environment) (SB73)
- Native-Mode C++ (SB74)
- OSS Native C compiler—NonStop S-series server (SB76)
- OSS Native C++ compiler—NonStop S-series server (SB75; includes SB76)
- TNS (CISC) C++ (SB77)
- Open System Services Development Version (SA02)
- NonStop Server for Java Version 4.2 (SJ96V4A)
- NonStop Server for Java Version 4 (SJ96V4)
- JToolkit for NonStop Servers (SJ76V2; required to use SJ96V4)

Tools

- Enable (SA55)
- Pathmaker (9154)
- HP Enterprise Toolkit (SB93V2 to SB93V2C, depending on the number of users)
  - Native C/C++ for Enterprise Toolkit (cross-compiler) (SB92V1 to SB92V1C, depending on the number of users)

- – Native mode COBOL for Enterprise Toolkit (cross-compiler) (SB95V1 to SB95V1C, depending on the number of users)
  - – pTAL for Enterprise Toolkit (cross-compiler) (SB94V1 to SB94V1C, depending on the number of users)
- Promo credit for SB93Vx to buy SB40v2x (SB93P1 to SB93P1C)
- Upgrade credit SB93v1 to SB93v2 (SB93v1U to SB93v1CU)
- Tandem-DDE Gateway (SJ06)
- Tandem Extensions for CodeWright V3 (SB42V, SB42V3A to E, depending on the number of users) Discontinued
- Visual Inspect Client V2 for Windows 32 PCs (SB40V2, SB40V2A to E, depending on the number of users)
- NonStop Technical Library—NTL (SH41C) CD version
- NonStop Technical Library —NTL (SH41D) DVD version
- NonStop Technical Library —NTL 1, 10, 25 users one year CD subscription (SH43C-1/10/25)
- NonStop Technical Library—NTL 1, 10, 25 users one year DVD subscription (SH43D-1/10/25)
- NonStop Technical Library—NTL D-Series DVD initial version—Controlled Availability (SH47)
- NonStop Technical Library—NTL D-Series 1, 10 , 25 users DVD license—Controlled Availability (SH48-1/10/25)
- NonStop Silo Media Manager (SF10V2)
- NonStop 18N Multibyte Character Support (SA08)

Communications software

- 6100 ADCCP (9077)
- 6100 ATP (SD89)
- 6100 BSC Multipoint Supervisor (9508)
- 6100 BSC Multipoint Tributary (9509)
- 6100 BSC Point-to-Point (9076)
- 6100 Burroughs Multipoint Supervisor (9079)
- 6100 Generalized Full-Duplex Protocol (9505)
- 6100 TINET (9078)
- AM3270 Access Method (9061)
- CSS Async (9074)
- CSS Point-to-Point S.W.I.F.T. (9526)
- EM3270 Access Method (9059)
- Envoy ACP/XF (9088)
- Exchange (9054)
- Expand (SA57)
- Expand over ServerNet (SA57-SN)
- Expand over ServerNet for all nodes in a cluster if any zone to zone connects exceeds 5 km (SA57-SN2)
- IXF File Transfer Method (9407)
- TR3271 Access Method (9062)
- PC6530 (9943)—Discontinued
- PCFormat (9108)
- X6530 Terminal Emulator (SD33)

Networking software

- NonStop CORBA 2.3 (SE65V1, SE66V1)
- NonStop DCE Core Services (SM01, SM02) Controlled Availability
- NonStop DCE Cell Directory Services (SM03)
- NonStop DCE Security Server (SM04)
- NonStop DOM/MP STK (SE60V2) Discontinued
- NonStop DOM/MP Runtime (SE61V2) Discontinued
- NonStop IPX/SPX (SD90)
- SMB File Server (MLSRV) (SD93) Discontinued

- Tandem NetBIOS for IPX (SD92)
- Tandem NetBIOS for TCP (SD21)

SNA

- SNAX/APC (9096)
- SNAX/APN (SD42)
- SNAX/APN Bundle (SD41) includes SNAX/XF (9064), SNAX/APC (9096), and SNAX/APN (SD42)
- SNAX/HLS (9089)
- SNAX/XF (9064)
- SNAX/APN End Node (SD37)
- SNAX End Node Bundle (SD38)
- SNAX/CPI-C (SD39v1)

OSI

- Tandem OSI/AS Application Support (9570)
- Tandem OSI/TS (9083)
- X25AM X.25 Access Method (9060)

TCP/IP

- TN6530S (SUN/3) (SD28 System License, SD28C License client)
- TN3270 Server (SD08)
- TN3270 Enhanced Server (SD07V1)
- *SS7 (telco only):*
  - SS7 Firmware Kit (SG10 or SG11)

Operations management software

Production management

- Automatic Process Balancer (SA33V1)
- Spooler Plus (SD79)
- LAN print spooler for NetWare (SD91)
- NetBatch (9190)
- NetBatch-Plus (9189)
- SMB LAN print spooler (SD35)
- TCP/IP LAN print spooler (SD70)
- X.25 WAN print spooler (SD71)
- XNS LAN print spooler (SD72)
- HP Availability Stats and Performance (ASAP) Software (SE30V2)
- Availability Stats and Performance Extension (ASAPX) Software (SE31V2)
- Open Enterprise Management Adapter for Unicenter TNG (SE32V1)
- ViewPoint (9640)
- Web ViewPoint (SJ70V5)
- Web ViewPoint plug-in for Pathway (SJ69V1) requires SJ70V5
- Pocket ViewPoint (SJ71V1)
- Operations Management Bundle (SA29V2) includes ASAP (SE30v2), Web ViewPoint (SJ70v5), and Pocket ViewPoint (SJ71v1)

Performance and capacity planning

- Guardian Performance Analyzer (GPA) (6942)
- Measure (9086)
- SNMP Manager Services (SJ81)
- Tandem Capacity Model—Host (9173)
- Tandem Capacity Model—PC (9174)

- Viewsys (SE11)
- Performance Management Bundle—Host (SA30)
- Performance Management Bundle—Workstation (SA31V4)
- Tandem Performance Data Collector (SJ42)
- Open Database (SJ47V4)
- Data Browser (SJ48V4)
- Insight (SJ49V4)
- Disk Prospector (SJ50V2)
- Pathway View (SJ38V1)
- System Performance Analyzer (SPA) Software (SJ37V1)
- FTPC32 (SJ53V1 or SJ53V1C, SJ53V1D, SJ53V1D for 25, 50, 100 License Packs)
- OpenView NonStop Server Management (OV01v1)
- Open View NonStop Server Performance Management (OV02v1)
- OpenView NonStop Server Management Bundle (OV03v1) includes OV0V1, OVO2V1

Configuration management

- Distributed Systems Management/Software Configuration Manager (DSM/SCM) Software (SJ44); included in NonStop S-series package (SN73)

Security

- Safeguard (9750) (highly recommended if the customer is going to use OSS)

Problem management

- EMS Analyzer (SE04)
- EMS Faststart (9263)
- NonStop NET/MASTER (SA18)
- Programmatic Network Administrator (PNA) (SE01/SE02)
- SeeView (6965)

Software licensing and support

All NonStop S-series processors require the NonStop Kernel Operating System, Release Version G02 or later. More recently introduced processors may require later versions of the operating system. Check the individual product for release requirements.

- Customers will normally license the NonStop Kernel Operating System with one standard NonStop S-series package per system (product SN73).
- Each NonStop server platform—S76, S78, S760, S780, S7600, S7800, S76000, S78000, S86000, and S88000—has a software price tier reflecting performance and competitive price positioning. Servers must be licensed at the software price tier designated for the platform. See chart below for tier definitions.
- Customers license software for the NonStop S76, S78, S760, or S780 System Type (type S5) regardless of processor type. This price tier is only for two-processor systems. Customers may upgrade from a midrange NonStop S7400 Processor to a high-end NonStop S76000 (that is, a NonStop S760 System) Processor within system type S5 without re-licensing the software. Customers that upgrade beyond two CPUs (from a NonStop S76, S78, S760, or S780 Server) must relicense all software to the upgraded system type, either S6 or S7.

Software licenses (NonStop S7800, S78000 and S88000 servers)

Server type	S78/S780	S7800	S78000/S88000

System type (software price tier)	S5	S6	S7
S7800 Processor	OK	OK	
S78000 Processor	OK		OK
S88000 Processor			OK
Maximum number of processors	2	16	16

Software licenses (NonStop S7600, S76000, S86000 servers)

Server type System type (software price tier)	S76/S760 S5	S7600 S6	S76000/S86000 S7
S7600 Processor	OK	OK	
S76000 Processor	OK		OK
S86000 Processor			OK
Maximum number of processors	2	16	16

- Server software is licensed via a one-time license charge (OLC) or monthly license charge (MLC). It is permissible to have some software products on the same server licensed via OLC and others via MLC. Because of price level or product usage, some software products may only be offered with an OLC license. Server software licensed via OLC or MLC may be delivered in conjunction with a software release or may be available independent of a software release via CD.
- License provides the right to use the software product on the delivered release on the designated system and processors.
  - OLC provides the right to use the product as long as it is installed on the designated system and processors (that is, with no expiration).
  - MLC provides the right to use the product on the designated system and processors as long as MLCs are paid.
  - Certain software products are offered on a per-seat, per-client or workstation, or per-processor basis. Usage limitations are specified in the individual product number descriptions. License provides a right to use the software at a maximum of the specified usage level. Refer to the "Software products" section for information about usage-based products.
- Workstation software may be offered via a one-time charge (OTC) license. OTC-licensed software is governed by a limited-use license. OTC products may be delivered via the server with a software release or via alternate media such as CD or diskette.

License exclusions

The OLC or MLC license does not include

- The right to use new releases, updates, or interim product modifications (IPMs)
- Updates to manuals
- Telephone or electronic support, except as provided under warranty provisions

These features are available most cost-effectively via standard software support offerings or as individually orderable items. Customers are encouraged to elect software support coverage for all servers to ensure timely and economical support availability.

OLC versus MLC licensing

The OLC provides the right to use the delivered release of the software product as long as it is installed on the designated system and processors. Upgrade of a system or its processors requires relicensing the product on the new processor platform at its designated software tier. Refunds or credits for all or part of OLC license payments are not standard, so customers should consider future requirements when choosing a license option.

HP offers MLC as an alternative license payment method to OLC, which permits the right to use the software as long as MLC payments are made.

OLC

Customers should choose OLC when they

- Intend to use the system or product longer than the equivalent MLC payment period
- Want to capitalize the software asset

MLC

Customers should choose MLC when they

- Plan a system upgrade or product changes in the near term
- Anticipate a change in their product usage levels, such as required number of seats, clients, or processor expansion, in the near term
- Prefer ongoing monthly fees rather than capital outlay

HP sometimes introduces replacement software products when significant functional enhancements are made in a new version. HP may introduce limited-time promotional programs for both OLC and MLC customers as incentives for migration to new products or platforms.

OLC and MLC provide license only. Customers are encouraged to elect software support coverage in addition to the license. Payment is made under a monthly support charge (MSC). Contact your HP sales representative or support representative for additional information.

Platform support services

The following standard services are available from HP Services.

Operations review

An operations review looks at all levels of a NonStop server customer's operation. Each of the processes and procedures are examined, and recommendations are made that will lead to higher levels of availability and efficiency.

Performance review and analysis

This service examines the customer's system utilization and balancing and makes a set of recommended changes to improve overall performance. An in-depth analysis of the NonStop subsystems is included that also helps to improve performance.

Availability review

This is a comprehensive analysis of a customer's NonStop solution and includes an in-depth analysis of the six domains of a customer's computing environment.

IPM partnership service

This review service analyzes the customer's current software revision levels and recommends IPMs that will help the customer maintain their systems on the latest software releases.

NonStop system security audit

Our security analysts provide customers with a series of recommendations on improvements to the overall security of a NonStop system, and aid customers in understanding potential security risks.

Environmental and site audit service

This service provides an in-depth assessment of the physical environment of the customer's NonStop system. An emphasis is placed on air conditioning and power, and recommendations are provided for risk reduction.

System performance audit

Customers receive an assessment of their system's overall performance in order to identify potential problems before they affect availability and performance. Customers will receive a report that details how they can improve their application performance.

NonStop RDF Software implementation service

Working as a team, the NonStop RDF consultant and the customer's staff determine the recovery time and recovery point objectives. The consultant makes recommendations for hardware, software, and communications requirements, and operational procedures to ensure that resumption of business processes is accomplished with minimal downtime. The consultant also provides both hands-on experience and formal classroom training for the customer's staff.

NonStop S-series hardware compatibility and connectivity

		Part number	Compatible	Connection
ServerNet adapters				
ServerNet/FX 2		6742	Yes	ServerNet
ServerNet/DA	(SNDA)	6760	Yes	ServerNet
ServerNet/SS7	(CCSA)	6763	Yes	ServerNet
ServerNet/ATM	(CCSA)	3860	Yes	ServerNet
ServerNet/E4	(E4SA)	3861	Yes	ServerNet
ServerNet/TR	(TRSA)	3862	Yes	ServerNet
ServerNet/FE	(FESA)	3863	Yes	ServerNet
GESA-C		3865-C	Yes	ServerNet
GESA-F		3865-F	Yes	ServerNet

ESCON Connect	3890	Yes	ServerNet
G4SA	M8800	Yes	ServerNet
FCSA	M8840	Yes	ServerNet

Disk products

NonStop S-series 8-GB Disk	4609	Yes	Internal SCSI
NonStop S-series 18-GB Disk	4619	Yes	Internal SCSI
NonStop S-series 36-GB Disk	4637	Yes	Internal SCSI
NonStop S-series 72-GB Disk	4672	Yes	Internal SCSI
Pedestal, modular storage system*	7159	Yes	
Disk drive, single 2 GB for 455mod8*	4561S	Yes	ServerNet/DA
Disk drive, single 2 GB without 455mod8*	4561A	Yes	ServerNet/DA
Disk drive, single 4 GB for 455mod8*	4571S	Yes	ServerNet/DA
Disk drive, single 8 GB for 455mod8*	4581S	Yes	ServerNet/DA
Disk drive, single 18 GB for 455mod8*	4591S	Yes	ServerNet/DA
Disk module, 8 slot*	455mod8	Yes	ServerNet/DA

* Controlled Availability (limited supply).

Tape products

3490-E tape cartridge	5194	Yes	SCSI or ServerNet/DA
DLT 7000	515x	Yes	SCSI or ServerNet/DA
Additional magazine to be used in ACL	519M	Yes	SCSI or ServerNet/DA
Single 5194 CRU installed in modular storage system	5196	Yes	SCSI or ServerNet/DA
5194 with ACL installed in modular storage system	5196ACL	Yes	SCSI or ServerNet/DA
Single-drive CRU only (36 track)	5194	Yes	SCSI or ServerNet/DA
Single-drive CRU with ACL only (36 track)	5194ACL	Yes	SCSI or ServerNet/DA
Field upgrade ACL kit	5193	Yes	SCSI or ServerNet/DA
Additional magazine to be used in ACL	519M	Yes	SCSI or ServerNet/DA
Pedestal, modular storage system	7159	Yes	
Tape subsystem, DAT, DDS-3	5142	Yes	SCSI
Tape subsystem, DAT DDS-3, ACL	5142ACL	Yes	SCSI
156 data cartridge capacity CTL700 silo	CTL700	Yes	
618 data cartridge capacity CTL700 silo	CTL700M	Yes	

Communications products

ServerNet Wide Area Network (SWAN) concentrator	3880	Yes	3861 or 3863
SWAN 2 concentrator	3881	Yes	3861 or 3863
Asynchronous wide area network (AWAN)	3886-8	Yes	3861 or 3863
AWAN	3886-16	Yes	3861 or 3863
AWAN	3886-32	Yes	3861 or 3863

Printers

Line matrix, 1,500 lpm	5532	Yes	LAN/WAN
Line matrix, 1,000 lpm	5531	Yes	LAN/WAN

| Line matrix, 1,500 lpm | 5532 | Yes | LAN/WAN |
| Line matrix, 500 lpm | 5525B | Yes | LAN/WAN |

Hardware environment and power specifications

NonStop S76, S78, S760, S780, S7600, S7800, S76000, S78000, and S88000 Server Enclosure specifications

Environment

Temperature

Operating	5° to 38° C (41° to 100° F)
Shipping	–40° to 66° C (–40° to 151° F)
Storage	–29° to 55° C (–20° to 131° F)

Relative humidity

Operating	10% to 85% (noncondensing)
Nonoperating	10% to 95% (noncondensing)

Power dissipation

Processor enclosure	1,600 W (full); 5,460.8 BTU/hr

Altitude

Operating	0 to 3,048 m (0 to 10,000 ft)
Nonoperating	0 to 12,192 m (0 to 40,000 ft)

Noise	60 dBA (maximum sound pressure)

Power

100–120-volt model

Nominal rating	100–120 V AC, single phase, 50–60 Hz
Operating range	85–132 V AC, continuous, 48–62 Hz, maximum
Line current	16-A RMS, maximum
Power cord/plug	2.5-meter cord, 20-A plug (NEMA L5-20P) 20-A wall receptacle (NEMA L5-20R)

200–240-volt model

Nominal rating	200–240 V AC, single phase, 50–60 Hz
Operating range	177–264 V AC, continuous, 48–62 Hz, maximum
Line current	8-A RMS, maximum
Power cord/plug	2-meter IEC-320 standard detachable cord Included, based on ship-to location: NEMA L5-20P (W. Japan); CEE (7) VII type VIIG (continental Europe); AS 3112 type SAA/3 (Australia and New Zealand); BS 1363/A type BS/89/13A (United Kingdom and Ireland); IEC 309 type 248 (Switzerland and Denmark); CEI 23-16 type I/3/16 (Italy); SI 32/1971 type IL/3 (Israel); CEE (7) VII type VIIG (4) (Brazil and Argentina); SA BS/164/1980 type SABS/16 (South Africa)

NonStop S-series I/O Enclosure specifications (contains product 1980)

Environment

Temperature

Operating	5° to 38° C (41° to 100° F)
Shipping	–40° to 66° C (–40° to 151° F)
Storage	–29° to 55° C (–20° to 131° F)

Relative humidity

Operating	10% to 85% (noncondensing)
Nonoperating	10% to 95% (noncondensing)

Power dissipation

I/O enclosure	850 W (full); 2,900 Btu/hr

Altitude

Operating	0 to 3,048 m (0 to 10,000 ft)
Nonoperating	0 to 12,192 m (0 to 40,000 ft)

Noise	60 dBA (maximum sound pressure)

Power

100–120-volt model

Nominal rating	100–120 V AC, single phase, 50–60 Hz
Operating range	85–132 V AC, continuous, 48–62 Hz, maximum
Line current	9-A RMS, maximum
Power cord/plug	3-meter cord, 20-A plug (NEMA L5-20P) 20-A wall receptacle (NEMA L5-20R)

200–240-volt model

Nominal rating	200–240 V AC, single phase, 50–60 Hz
Operating range	177–264 V AC, continuous, 48–62 Hz, maximum
Line current	4.5-A RMS, maximum
Power cord/plug	2.5-meter IEC-320 standard detachable cord Choice of CEE 7/7 Schuko (Germany, France, and other countries); BS 1363 (United Kingdom, Hong Kong, and some Middle Eastern countries); AS 3112-1981 AP SAA (Australia and New Zealand); Afsnit 107, #4 (Denmark); CE123-16 (Italy); SEV 1011.1959 (Switzerland); NEMA L6-20P (United States, Canada, and Japan, for use on 200–240 V models only)

Configuration rules and information

The following configuration rules apply to the NonStop S-series servers:

- A single type of physical enclosure is used to create any system enclosure.
- An I/O enclosure (with a 1980) can be changed to a NonStop S78000 or S88000 System Enclosure.
- All NonStop S-series enclosures require a power shelf (7360).
- The default power cord for North America is twist-lock, 20-amp cord.
- Alternative power cords are supplied by manufacturing based on the region of the shipping address. If an alternative power plug is desired, please make a note for this configuration in the comments section of the order.
- Enclosures can be stacked double high.
- Enclosures are placed directly next to each other.
- A NonStop S76 or S78 Server node can contain only two-processor multifunction units (2 x 1961-*x*) or (2 x 1962-*x*)
- A NonStop S780 Server node can contain only two-processor multifunction units; that is, 2 x 1973-*x*.
- A NonStop S760 Server node can contain only two-processor multifunction units; that is, 2 x 1971-*x*.
- A NonStop S7600, S7800, S76000, S86000, or S88000 Server node can contain 2 to 16 processor multifunction units.

- A NonStop system with greater than two NonStop S7800, S76000, S86000 or later Processors (including add-on processors) must have MSEB units (6750M) installed in slots 51 and 52 of all system enclosures (groups 01–08). These MSEB units must also utilize either fiber or serial copper connections to adjacent system enclosures. Connections to IOMF (1952) may use ECL cables and PICs (6750M-E), but HP recommends upgrading IOMF units to IOMF 2 units (1980) and using fiber or serial copper connections.
- NonStop S-series servers cannot have an odd number of processors.
- NonStop S7400 Processors have 512 megabytes of memory, which is included in the 1960-A product number. No other memory options are available.
- NonStop S7600 Processors can have 1 or 4 gigabytes of main memory. Processors within the same system can have different amounts of memory.
- NonStop S7800 Processors can have 2 or 4 gigabytes of main memory. Processors within the same system can have different amounts of memory.
- NonStop S74000 Processors can have 512 megabytes or 2 or 4 gigabytes of memory configured with the processor. Processors can have different amounts of memory.
- NonStop S76000 or S86000 Processors can have 1, 2, 4, 8 or 16 gigabytes of memory configured with the processor. Processors can have different amounts of memory.
- NonStop S78000 Processors can have 2, 4, or 8 gigabytes of memory configured with the processor. Processors within the same system can have different amounts of memory.
- NonStop S88000 Processors can have 2, 4, 8, or 16 gigabytes of memory configured with the processor. Processors within the same system can have different amounts of memory.
- NonStop S7000 Processors may not be combined with any other NonStop S-series processor type. This is due to microcode differences between the R4400, R10000, and later microprocessors.
- NonStop S70000 or S72000 Processors can be combined with NonStop S74000 Processors within the same node or the same cabinet (requires NonStop Kernel Operating System RVU G06.08 or later).
- NonStop S7600 or S7800 processors can be combined with NonStop S7400 processors within the same node (requires NonStop Kernel Operating System RVU G06.17 or later).
- NonStop S7600 and S7800 Processors can be combined within the same cabinet (requires NonStop Kernel Operating System RVU G06.17 or later).
- NonStop S72000 or S74000 can be combined with NonStop S76000 or S86000 Processors within the same node (requires NonStop Kernel Operating System RVU G06.16 or later). The NonStop S70000 Processor may not be combined with NonStop S76000 or S86000 Processors in the same node.
- NonStop S72000, S74000, S76000, or S86000 can be combined with NonStop S78000 Processors within the same node (requires NonStop Kernel Operating System RVU G06.16 or later). The NonStop S70000 processor may not be combined with NonStop S76000, S86000, or later Processors in the same node.
- NonStop S72000, S74000, S76000, S78000, or S86000 can be combined with NonStop S88000 Processors within the same node (requires NonStop Kernel Operating System RVU G06.24 or later). The NonStop S70000 Processor may not be combined with NonStop S76000, S86000, or later Processors in the same node.

- A minimum of five disks per system is required: one for $SYSTEM, one for the $SYSTEM mirror, one for the NonStop TMF audit log, one for the NonStop TMF audit log mirror, and one for the DSM/SCM database. HP recommends all volumes can be configured with a mirrored pair.
- Disks may be configured for high availability using Enclosure Interleaving or Flexible Disk Configuration.
- Servers can support multiple I/O enclosures per system enclosure. The NonStop S7400, S7600, or S7800 Server can support two I/O enclosures per system cabinet. The NonStop S74000, S76000, or S78000, or S88000 Servers can support up to five I/O enclosures on Groups 1 through 4, and up to four I/O enclosures on Groups 5 through 8.
- Software licenses and support are not included with server packages and must be ordered separately.
- Users must purchase one tape boot device.
- Users must purchase one system console per site. Two system consoles are recommended for fault tolerance. The rule of thumb is that one system console (or pair of system consoles) can support up to 10 servers.
- Modular ServerNet Expansion Boards (MSEBs) must be installed in all system enclosures (for nodes larger than two processors). Two expansion boards are required for fault-tolerant X and Y ServerNet fabric connections.
- MSEBs cannot be installed in I/O expansion cabinets.
- Two standard topologies, based on tetrahedral topology, allow for complete online expansion: Tetra-8 and Tetra-16. These configurations are explained in detail in the *NonStop S-series Planning and Configuration Guide* and are briefly outlined in the "Standard configurations" section. If a node is ever expected to grow beyond 8 processors, Tetra-16 is highly recommended as the initial topology. This guide may be accessed at http://www.h71033.www7.hp.com/object/SPLGUDLK.html h71033.www7.hp.com/object/SPLGUDLK.html.
- Major system reconfiguration is allowed; however, it may involve taking down some or all system resources.
- Two-processor servers (includes all NonStop S-series servers) can have ServerNet adapters installed in slots 51 and 52. ServerNet II based processors (NonStop S74000 or later) make these slots fully fault tolerant (dual ported).

Contact your HP account representative for detailed information on product availability. Configuration information for ServerNet adapters, tape devices, and printers can be found in documents dealing with these specific products.

The following table describes standard system configurations for NonStop S-series servers. These are all fully expandable online and based on tetrahedral topology. However, when you switch from Tetra-8 to Tetra-16 topologies, some system resources must be taken down. Tetra-8 configurations are meant for customers that do not expect greater than eight processors and are seeking a lower cost of entry (two- to eight-processor) system.

Standard configurations

	S76/S760/ S78/S780 (Tetra-8 only)	S7600/ S7800 Tetra-8	S78000/ S88000 Tetra-8	S7600/ S7800 Tetra-16	S78000/ S88000 Tetra-16

Maximum number of processors per node	2	8	8	16	16
Maximum number of system enclosures	1	4	4	8	8
Maximum number of I/O enclosures	2	8	8	16	36
ServerNet expansion boards required per system enclosure	0	2	2	2 or 4*	2 or 4*
Maximum number of internal disk drives**	48	192	192	384	704
Maximum number of ServerNet adapters	10	40	40	72	152

* The number of MSEBs configured in a system enclosure is dependent on the group number and whether the enclosure supports any I/O enclosures. System enclosures in Groups 01 through 04 must have four MSEBs if any I/O expansion cabinets are to be attached to that specific cabinet. Groups 05 through 08 support only two MSEBs. All groups can support ServerNet adapters in slots 53 and/or 54 if no MSEBs are installed.

** There are at least two disk drive sizes for sale at any given time. As of September 2004, the 4619 and 4672 are the available internal disk drives. These contain 18 gigabytes and 72 gigabytes, respectively. The maximum formatted storage capacity for internal drives is the number in each row multiplied by the size of the disk.

NonStop S-series enclosure characteristics

Each enclosure (cabinet) can be configured according to the following options.

NonStop S-series system enclosure

Processor multifunction units	2 (required)
NonStop S74 or S7400: memory per processor	512 MB
NonStop S740 or S74000: memory per processor	512 MB, 2 GB, or 4 GB
NonStop S76 or S7600: memory per processor	1 GB or 4 GB
NonStop S760 or S76000/S86000: memory per processor	1 GB, 2 GB, 4 GB, 8 GB, or 16 GB
NonStop S78 or S7800: memory per processor	2 or 4 GB
NonStop S780 or S78000: memory per processor	2 GB, 4 GB, or 8 GB
NonStop S88000: memory per processor	2 GB, 4 GB, 8 GB, or 16 GB
ServerNet expansion boards	0, 2, or 4
ServerNet adapters	0 to 4
Internal disk drives	0 to 16
Internal formatted disk storage (maximum)	Varies by disk used (see chart above)

NonStop S-series I/O enclosure

I/O multifunction units (1980)	2 (required)
ServerNet expansion boards	0 (not allowed)
ServerNet adapters	0 to 4
Internal disk drives	0 to 16
Internal formatted disk storage (maximum)	Varies by disk used (see chart above)

Ordering examples

Example 1: NonStop S7800 Server Tetra-8 configuration

The customer requirements are as follows:

- Four-processor (4 gigabytes per processor) development server with 10 system developers connected via an Ethernet network (non-fault-tolerant connections required)
- Rack-mounted in NonStop S-series server 19-inch rack
- System console with full fault-tolerant connections via a private LAN
- Unmirrored disk with 144 gigabytes of application capacity
- Shipped to the United States with 110-volt requirement

Hardware product list (Tetra-8 configuration)

Qty	Part number	Product name
4	1962-D	NonStop S7800 Processor Multifunction Unit with 4 gigabytes of memory
1	7281	NonStop S-series Double-High Enclosure (cabinet) with base
4	6750M	MSEB
4	6750M-C	Serial copper PICs
2	678-008	Serial copper ServerNet Cable, 2.5 m (8.2 ft)
2	S7X-NSC4	System console, 15.2-m (50-ft) cable
3	3870-X8Unmanaged	Ethernet Switch—8 ports
1	SMOD-USB	NonStop server connect USB modem
13	4619	NonStop S-series High-Speed 18-GB Disk Drives ($SYSTEM, $SYSTEM mirrored, NonStop TMF audit log, NonStop TMF audit log mirror, DSM database, plus 144 GB of application room)
1	3861	ServerNet/E4, 4-Port Ethernet controller (connected to SWAN via SHUB)
1	3880	SWAN concentrator
1	SWAC32	RS-232 cable

Plus software as required

Example 2: NonStop S88000 Server

The customer requirements are as follows:

- Four-processor (4 gigabytes per processor) development server with 20 system developers connected via an Ethernet network (non-fault-tolerant connections required)
- Rack-mounted double-high in NonStop S-series server 19-inch rack
- System console connected via a private LAN in a non-fault-tolerant configuration
- Shipped to the United States with 110-volt requirement

Hardware product list (Tetra-8 configuration)

Qty	Part number	Product name
4	1974-C	NonStop S88000 Processor Multifunction Unit with 2 GB of memory
1	7281	NonStop S-series Double-High Enclosure (cabinet) with base
4	6750M	MSEB
4	6750M-C	Serial copper PICs
2	678-008	Serial copper ServerNet cable, 2.5 m (8.2 ft)
1	S7X-NSC4	System console, 15.2-m (50-ft) cable
1	3870-X8	Unmanaged Ethernet Switch—8 ports
1	SMOD-USB	NonStop server connect USB modem
17	4619	NonStop S-series 18-GB Disk Drives ($SYSTEM, $SYSTEM mirror, NonStop TMF audit log, NonStop TMF audit log mirror, DSM database, plus application storage room)
4	3861	ServerNet/E4, 4-port Ethernet controller
1	3880	SWAN concentrator

| 1 | SWAC32 | RS-232 cable |

Plus software as required

Hardware product list (Tetra-16 configuration)

Qty	Part number	Product name
4	1974-D	NonStop S88000 Processor Multifunction Unit with 4 GB of memory
1	7281	NonStop S-series Double-High Enclosure (cabinet) with base
1	7280	NonStop S-series Single-High Enclosure (cabinet) with base*
2	1980	NonStop S-series I/O Multifunction Units*
4	6750M	MSEB*
4	6750M-C	Serial copper PIC, ServerNet II
2	678-008	ServerNet cable (serial copper), 2.5 m (8.2 ft)
1	S7X-NSC4	System console, 15.2-m (50-ft) cable
1	3870-X8	Unmanaged Ethernet Switch— 8 ports
1	SMOD-USB	NonStop server connect USB modem
17	4619	NonStop S-series High-Speed 18-GB Disk Drives ($SYSTEM, $SYSTEM mirror, NonStop TMF audit log, NonStop TMF audit log mirror, DSM database, plus application storage room)
4	3861	ServerNet/E4, 4-port Ethernet controller
2	3881	SWAN concentrator
20	SWAC32	RS-232 cable

Plus software as required

- Additional hardware is required for the Tetra-16 configuration, which allows customers to upgrade online to a 16-processor system.

Sample configuration for connecting HP StorageWorks XP 128/1024 (Enterprise Storage) to an existing NonStop S-series system

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HP NonStop S-series systems can be attached to the HP StorageWorks XP 128 or HP StorageWorks XP 1024. There are hardware and software requirements to accomplish this. The following list is a minimum sample set of products (specifically for a European installation) that can be ordered to connect these high-performance storage subsystems to NonStop servers. The XP subsystems must be purchased through the HP NSS organization. Other configurations can be implemented that may offer more fault tolerance than this basic configuration. A great deal of reference material for this storage solution on NonStop systems is available at the following internal HP Web site:
http://nedmigration.cac.cpqcorp.net/domains/enterprise%20storage.htm.

Qty	Part number	Product name
1	SE93	NonStop Enterprise Storage Connectivity Software
1	M8360-10	10-slot IOAM Enclosure
1	M8311-05	Modular cabinet (200 to 250 VAC Single Phase, 63A RMS, 3 wires, Harmonized)
1	M8301	Modular cabinet side panels
2	M8200-24	Maintenance switches
2	M8840	FCSA controllers
2	6750M-S	Fiber Pics for MSEBs
2	M8910-20	Fiber-optic cables (ServerNet) from MSEB to MSIO
4	M8900-15	Fiber-optic cables (Fibre Channel) from FCSA to XP

Several Ethernet cables will need to be added for connecting the maintenance switches with the 2 ports of the IOAM enclosure and the console processor.

Sample configuration for creating HP Metrocluster for NonStop Servers Solution (previously called a ServerNet Cluster) from two existing NonStop S-series servers

- Each system requires an MSEB (6750M) in slots 51 and 52 (X and Y bus) of Group 01 to be able to attach to the NonStop Cluster Switch. These two MSEBs in each system must have an NNA PIC (6750M-N) installed in ServerNet Port 6.
- Each MSEB (Group 01) must have an appropriate PIC installed in Ports 1–4 to connect to the existing SEB or MSEB units in the other system enclosures. The PIC must match the technology of the other unit. It may be an ECL PIC (6750M-E), a serial copper PIC (6750M-C), a multimode fiber PIC (6750M-S), or a single-mode fiber PIC (6750M-L) installed for each existing connection to another system enclosure (within the same system). Because Group 01 can have up to four connections (Groups 02 through 05), the maximum number of ECL PICs per MSEB is four. HP recommends updating PICs to either serial copper or fiber for the cluster solution.
- Each system requires that the existing SEB (not recommended) or MSEB (recommended) connections (cables) from Group 01 to the other groups (02 through 05) be changed to a new cable (see above for cable order numbers) that matches the technology installed (ECL cable for ECL, and so on).
- The SEBs that are replaced by MSEBs can be returned for a credit (6750R).
- The NNA PICs (6750M-N) are connected to the NonStop Cluster Switches (6780-*xxxx*) via twin (full-duplex) single-mode fiber-optic cables with dual SC connectors at one end and dual LC connectors at the other end. The 6780-*xxxx* products include a pair of default length (40 meter) cables for this purpose.
- Every node of a NonStop ServerNet Cluster requires a software license for HP Expand Software over ServerNet Technology (SA57-SN).
- One pair of NonStop Cluster Switches (6780-*xxxx*) is required to implement the switch/hub function of NonStop ServerNet Cluster.
- For this example, assume system \A has 8 processors and system \B has 16 processors. Assume this customer has MSEB with fiber connections between in all enclosures. Also assume the customer has already licensed the standard Expand Software (SA57) and is located in North America.

Products to order for system \A (modify existing configuration in QMS)

Quantity	Part number	Product name
2	6750M-N	NNA PIC, for ServerNet Cluster
6	6750M-E	ECL Pic for ServerNet
6	677-010	Replace existing cable to ECL PIC connector
1	SA57-SN	Expand Software for transport over ServerNet technology

Products to order for system \B (modify existing configuration in QMS)

Quantity	Part number	Product name
2	6750M-N	NNA PIC, for ServerNet Cluster
8	6750M-E	ECL Pic for ServerNet
8	677-010	Replace existing cable to ECL PIC connector
1	SA57-SN	Expand Software for transport over ServerNet technology

The two NonStop cluster switches must be added to *one* of the above orders or ordered as a separate add-on.

Quantity	Part number	Product name
2	6780-L1Z1	NonStop Cluster Switch 3

Warranties

NonStop S-series servers are shipped with a one-year, next-business-day, on-site support hardware warranty. In the event of a hardware problem, HP will dispatch a customer engineer (CE) to the customer site.

The software support warranty is provided for defects only, for 90 days from date of purchase. A warranty is not intended to replace a comprehensive support offering.

Upgrades to the base warranty for both hardware and software are available for an additional charge. A discount, reflecting the value of the hardware and software warranty, is built into the upgrade pricing during the warranty period.

Support offerings

For more information about current support offerings for NonStop servers, refer to http://www.hp.com/hps/servers/sr_nonstop.html or www.hp.com/hps/servers/sr_nonstop.html.

For more information, go to www.hp.com/go/nonstop.
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