

# HP Education Services Course Description

Introduction to HP NonStop S-Series Server Support (U4158S)



This 15-day class teaches skills necessary to perform operational procedures on HP NonStop S-series servers and associated equipment.

## Audience

- HP service providers
- HP account or support engineers
- Customer service personnel responsible for NonStop S-series Servers

## Prerequisites

- Electronics background with general computer knowledge

## Course Objective

- Describe the NonStop server architecture and the changes that have resulted from the introduction of the ServerNet system area network (SAN) technology
- Use the OSM application to operate, manage, and maintain the NonStop S-Series server
- Install, configure, and troubleshoot a NonStop S-series server
- Install, configure, and troubleshoot the NonStop S-series server storage subsystem
- Install, configure, and troubleshoot the NonStop S-series server communications subsystems
- Perform online expansion and/or reduction of a NonStop S-series server
- Recognize proper system operations
- Perform system monitoring
- Isolate and repair malfunctions to the CRU/FRU

## Benefits to You

- Understand the NonStop server architecture and the changes that have resulted from the introduction of the ServerNet system area network (SAN) technology
- Using the OSM system to operate, manage, and maintain a NonStop S-series server; and installing, configuring, and troubleshooting a NonStop S-series server
- Installing, configuring, and troubleshooting the NonStop S-series storage subsystem
- Installing, configuring, troubleshooting the NonStop S-series server communications subsystem and performing online expansion and reduction of a system and recognizing proper system operations

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**Course Title:** Introduction to HP NonStop S-Series Server Support

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**HP Product Number:** U4158S

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**Category/Subcategory:** NonStop/Server System Support

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**Course Length:** 15 days

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**Level:** Advanced

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**Delivery Language:** English

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**To Order:** You can order this course online at <http://www.hp.com/learn>. At the site, select a country, then choose "registration" or "Book a course" and fill out the online registration form.

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**Next Steps:** NonStop S-Series TCP/IP System Management (U4176S)  
NonStop S-Series Communications Products (U4166S)  
NonStop S-Series SWAN Troubleshooting and Maintenance Workshop (U4175S)

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## Detailed Course Outline

### Module 1 course introduction

#### Module 2 HP NonStop S-series servers

- Lesson 1a: Introduction to NonStop S-series Servers  
NonStop Server design goals  
Availability  
Data integrity
- Lesson 1b: Performance and scalability  
Compatibility and flexibility  
NonStop Server Software Environment
- Lesson 2: NonStop Server Software Environment  
Major functions of the NonStop Kernel file and message systems  
The role of process pairs in ensuring fault tolerance

#### Module 3 HP NonStop Systems Architecture

- Lesson 1: NonStop Server architecture  
The NonStop S-series and K-series server product lines  
Hardware and software fault tolerance
- Lesson 2: NonStop S-series Servers  
The ServerNet system area network (SAN) and the role it plays in meeting the demand for performance and scalability in NonStop S-series servers  
How HP provides hardware fault tolerance in its NonStop S-series servers

#### Module 4 NonStop Technical Library (NTL)

- Lab exercise:  
Accessing NTL

#### Module 5 NonStop S-series Server Architecture

- Lesson 1a: Introduction to NonStop S-series Servers  
Fundamentals of the ServerNet system area network (SAN)  
Comparing and contrasting NonStop K-series and NonStop S-series server architectures
- Lesson 1b: NonStop S-series server enclosures and components  
ServerNet communications (comm) subsystems  
Functions of the communications subsystems  
Purpose of the ServerNet LAN systems Access (SLSA) subsystem
- Lesson 1c: Purpose of the asynchronous wide area network (AWAN) subsystem  
Purpose of the wide area network (WAN) subsystem  
Supported communications products
- Lesson 1d: Non-supported communications products  
Introduction to the HP OSM application  
Serviceability and testability features of the NonStop S-series server  
New end-to-end service model
- Lab Exercise
- Lesson 2a: Data Transfer Through the ServerNet SAN  
Options for transferring data through the ServerNet SAN and its impact on I/O for NonStop Kernel systems
- Lesson 2b: Data transfer for interprocessor communications  
Standard model for I/O  
I/O models used for NonStop S-series server  
Layered model for I/O
- Lesson 3: ServerNet Hardware Overview  
Review of the fundamental elements of the ServerNet SAN  
Structure of a ServerNet packet  
Identifying the purpose of various fields within the ServerNet packet

## **Module 6 TACL**

- Lesson 1: Introduction to TACL
- Lesson 2: File Terminology
- Lab Exercise: Using TACL

## **Module 7 PS text edit (TEDIT)**

- Purpose of the TEDIT program  
Creating a document using TEDIT

## **Module 8 file utility program (FUP)**

- FUP overview  
Nonstop Kernel files  
File names, filesets, and fileset lists  
Starting FUP interactively or non-interactively  
FUP commands  
Security levels for a file  
Common file system errors
- Lab Exercise: FUP and TEDIT Obey Files

## **Module 9 HP NonStop S-series Hardware Components and Power System Description**

- Lesson 1: Processor and I/O Enclosure Subsystem Overview  
Processor enclosures  
I/O enclosures  
The NonStop S-series naming convention
- Lesson 2a: Power Subsystem Description  
Power subsystem of the NonStop Sx000, and Sxx000 server  
Power subsystem of the I/O enclosures  
Power system architecture  
Components of the power system
- Lesson 2b: Explanation of the power sequences  
Power monitor and control unit (PMCU)  
Power scrubbing background  
What power scrubbing does  
Description of some OSM event messages

## **Module 10 LAN Topologies, Media and Protocols**

- Lesson 1a: Introduction to LAN Topologies, Media, and Protocols  
Definition of a LAN  
Common LAN topologies and variations  
Common Ethernet media types  
The Open Systems Interconnect (OSI) model and its relationship to LANs
- Lesson 1b: The access methods CSMA/CD and token passing  
Common protocols  
Describing in writing how to extend an Ethernet network  
Describing in writing the basic differences between a repeater, bridge, and router
- Lesson 2a – Networking Concepts Overview for the NonStop S-series Server  
Components of client/server computing  
Data communication protocols utilized by the TSM software  
Purpose of the Ethernet LAN as used by the NonStop S-series servers
- Lesson 2b: TCP/IP communications environment  
IP addressing, including classes, subnet addressing, and masks  
Point-to-Point Protocol (PPP)  
Challenge Handshake Authentication Protocol (CHAP)
- Lesson 2c: Simple Network Management Protocol (SNMP), including its main components and use by OSM  
File transfer protocol (FTP)  
Remote Procedure Call (RPC) and its use with OSM

## **Module 11 Service Processor (SP) Functions and Features**

- The service processor (SP) environment  
SP components at a block-diagram level  
SP configuration tables and their structure  
SP services and their functions  
Connectivity between the SP and the system PC console

## **Module 12 System Management Applications**

- Lesson 1 – OSM Overview
- Lesson 2 - OSM configuration

## **Module 13 Introduction to Subsystem Control Facility (SCF)**

- SCF overview:
  - Subsystem managers
  - Online configuration changes
  - Security
- Brief explanation of:
  - SCF commands
  - SCF subsystems
  - object types
- Identifying peripheral devices attached to your system
- Identifying the paths to those devices
- Determining what state the devices and paths are in

## **Module 14 – Storage Subsystem**

- Lesson 1: Disk Storage Subsystem
  - Introduction to the disk storage subsystem
  - System configuration and control by means of SCF
  - Plug and play
  - Online disk upgrade
  - Enclosure interleaving for storage devices
- Lesson 2: Tape Storage Subsystem
  - Introduction to the disk storage subsystem
  - System configuration and control by means of SCF
  - Plug and play
  - Online disk upgrade
  - Enclosure interleaving for storage devices
- Lesson 3a: Introduction to ServerNet/DA Adapter
  - ServerNet/DA
  - Supported products
  - Installing the ServerNet/DA
  - Legal configurations
- Lesson 3b: Configuring disk and tape devices
  - Performing SAC installation and/or removal and replacement
  - Nomadic disk

## **Module 15 Disk and Tape Utilities**

- Lesson 1: Introduction to Disk and Tape Utilities:
  - Disk and Tape Utilities
  - The BACKUP utility
  - The RESTORE utility
  - The BACKCOPY utility
  - The labeled tape environment
  - Processing modes
  - MEDIACOM commands
- Lab Exercise: Tape Utilities
- Lesson 2: DSAP/DCOM
  - Disk space utilization
  - The Disk Space Analysis Program (DSAP)
  - Methods of compressing disk space
  - Using DSAP to determine file ownership and age
  - Using DCOM to reallocate

## **Module 16 Peruse / SPOOLCOM**

- Spooler subsystem
  - Using Peruse to perform basic functions
  - Determining the status of the job
  - Re-assigning the job output location
  - Deleting the job
  - Identifying the spooler components
  - Various states the spooler can be in
- Use SPOOLCOM to:
  - Check the status of the spooler components
  - Properly drain and restart the spooler and devices
- Lab Exercise: Using Peruse/Spoolcom

## **Module 17 System Monitoring**

- Web Viewpoint
  - The Web ViewPoint product
  - Features and benefits
  - Main components of Web ViewPoint
  - Starting Web ViewPoint
  - Using Web ViewPoint
  - Customizing object trees
- Lab Exercise: Using Web ViewPoint

## **Module 18 Processor Recovery Operations**

- Lesson 1: Memory Dumps  
Identify processor problems  
Determining when a processor memory dump should be performed  
Performing a processor memory dump  
Additional information to include when sending a dump to the GCSC
- Lesson 2: Tandem Failure Data System (TFDS)  
Benefits of TFDS  
Components of TFDS  
Configuring TFDS

## **Module 19 Server Configuration and Management**

- Various types of configuration files  
Creating a base configuration  
Creating a user configuration  
Online configuration changes  
NonStop Kernel configuration services  
SCF0000, STARTCOM, and STARTSCF files
- Lab Exercise: Using SCF to Manage and Configure a NonStop S-series server

## **Module 20 Software Management**

- Lesson 1a: Software Management Using DSM/SCM and SYSGENR  
How an OSIMAGE is created using SYSGENR  
How SYSGENR is run  
Files that result from a SYSGEN operation  
Features and capabilities of DSM/SCM
- Lesson 1b: Typical DSM/SCM process flow  
Five actions performed by the DSM/SCM application for software management  
Contents of the CONTEXT file  
Changes to the ALLPROCESSORS paragraph
- Lesson 2: Electronic Delivery And Installation of SPRs  
Access IPM Scout  
Search for an IPM  
Access IPM details  
Download an IPM
- Lesson 2b: Upload an IPM  
Use SWARCSET  
How to request a software update tape (SUT)  
How to request an Independent Product Software Product Relationship Query (SPRQ)

- Lab Exercise: Using the DSM/SCM Planner Interface

## **Module 21 NonStop S-series Server Maintenance and Expansion**

- Lesson 1a: Online CRU Replacement  
Physical and functional characteristics of PMF and IOMF CRUs  
How the loss of a PMF or IOMF CRU in an enclosure affects the adapters in associated enclosures
- Lesson 1b: Replacing a PMF or IOMF CRU online  
Steps necessary to resume operations  
Using the Guided Replacement Tools for online removal and replacement of PMFs, IOMFs, NonStop Sxx000 power supplies, and ServerNet Device Adapter (SNDAs)
- Lab exercise:  
Removing and Replacing a PMF CRU  
Removing and Replacing an IOMF CRU
- Lesson 2a: Online Expansion and Reduction  
Understanding the prerequisites and planning requirements  
Building blocks
- Lesson 2b: Preparing your target system  
Preparing a block  
Adding a block to your target system  
Verifying the resized system
- Lab Exercise: Expanding a 4-Processor System to a 16-Processor System (Including I/O Enclosures)

## **Module 22 NonStop S-series Communications Subsystems**

- Lesson 1: Expand Networks  
Basic Expand architecture  
Expand components  
New features and functions that let Expand work with the ServerNet Cluster more efficiently
- Lesson 2a: ServerNet Lan System Access (SLSA) configuration and management  
Matching components with product name and number  
Functions of the SLSA components  
SCF/SLSA object hierarchy

- Lesson 2b: Recommended names of the SLSA adapter components  
SLSA and QIO subsystem relationship  
Steps to install the adapters  
Features of the Fast Ethernet ServerNet adapter (FESA)
- Lesson 2c: The 6763 Common Communications ServerNet adapter (CCSA) components  
Functions of CCSA components  
The SCF/CCSA object hierarchy  
Recommended names of the CCSA components
- Lesson 3a: ServerNet Wide Area Network (SWAN) Concentrator configuration and Management  
SWAN 2 (3881) concentrator hardware components  
Processes required for proper SWAN and SWAN 2 operation
- Lesson 3b: IOPs available for use with the SWAN and SWAN 2 concentrators  
Startup files used to configure processes for proper SWAN operation  
Using Wan Wizard Pro to configure a SWAN or SWAN 2 concentrator
- Lab Exercise: Installing and Configuring a SWAN Concentrator
- Two ServerNet expansion boards (6750) (may be replaced by MSEBs (6750M)). MSEBs are required if ServerNet clustering is being taught
- Two 3861 ServerNet Ethernet adapters with cables
- One 3880 SWAN or 3881 SWAN 2 concentrator with cables and 2 two multiport Ethernet hubs
- Three multiport Ethernet hubs, including cables
- One 5525B printer or equivalent
- One tape drive (525x, CT9840, 519x, etc.) and appropriate tape cartridges and cables
- Optional equipment:
- Two 6760 ServerNet/DA adapters with cables and a minimum of one F-SAC for each SNDA
- One 455MOD8 disk module with at least two drives
- One 6760 ServerNet/DA adapter with cables and a minimum of one S-SAC
- Two 6740 ServerNet/FX or 6742 ServerNet/FX2 adapters with cables
- One 3863 Fast Ethernet ServerNet adapter
- A minimum of two systems as listed above is required for the class
- ServerNet cables of appropriate length are required to connect the servers to form one server during the class
- Additional optional equipment:
- Two ServerNet Cluster Switches (SC-xx) as appropriate for the location with NNA PICs, and appropriate PICs and cables as required for the system
- Two modular ServerNet expansion boards (6750M) with appropriate PICs for the selected cable types (ECL, SMF, MMF, SCu) and appropriate cables

#### **Onsite-Delivery Equipment Requirements**

- Each group of two students requires a minimum of:
- One 2-processor model NonStop Sxx000 server with G06.21 or later version of the NonStop Kernel operating system (4-processor system recommended)
- One I/O expansion enclosure with cables for each processor enclosure
- One PC workstation per student
- One S7X-iPAQ PC TSM console

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