

HP Education Services

HP NonStop Operating System Architecture for NS-series (U8609S)



This course provides an in-depth understanding of the H-series operating system architecture. It includes the Itanium2-based processors and modular I/O. Post S-series changes include debugging, run-time architecture, memory, process control, and synchronization. TNS and TNS/E process executions are explained along with the internals that support user services. User services such as Guardian and Open System Services (OSS) file systems and process control are also examined. The five-day course is a combination of lecture and live demonstration using HP servers.

Audience

- System programmers
- Field analysts
- Application designers

Prerequisites

- Concepts and Facilities for NonStop Systems (U4147S) and
- HP NonStop Kernel Principles (U4179S) and
- Working knowledge of C/C++ or pTAL

Course Objective

At the conclusion of this course you should be able to:

- Understand Itanium-based systems
- Know when to use a particular debugger
- Build ordinary DLLs and programs using DLLs
- Describe how virtual addressing is supported by the addressing schemes of both TNS and TNS/E processes
- Understand the fundamental tools and mechanisms used by the NonStop operating system
- Describe memory management process functions
- Understand the Guardian and OSS file systems and their supporting structures
- Know the elements of the NonStop operating system that constitute the message system
- Support HP software products

Benefits to You

- Gain an understanding of the NonStop operating system in Itanium-based processors in order to design programs and subsystems more effectively
- Learn how to support NonStop software products more efficiently

Why education services from HP?

- Focus on job-specific skills
- Hands-on practice
- Experienced and best-in-the-field HP instructors
- Comprehensive student materials
- More than 80 training locations worldwide
- Customized on-site delivery

Course Title: HP NonStop Operating System Architecture for NS-series

HP Product Number: U8609S

Category/Subcategory: NonStop/Systems and Operations Management

Course Length: 5 days

Level: Advanced

Delivery Language: English

To Order: To review course schedules and to register for a course, visit www.hp.com/learn/nonstop and select your country from the drop down menu, or, contact your HP sales representative or HP authorized channel partner.

Detailed Course Outline

Module 1 - Hardware and Software Overview

- NonStop Advanced Architecture (NSAA) hardware
- Modular I/O
- Code generation, address space, code space, and process execution
- Interprocessor and I/O architecture
- Message-based operating system
- Software layers

Module 2 - Debuggers

- NS-series debuggers
- Debugger selection
- eGarth and eInspect
- Visual Inspect (VI)

Module 3 - Process Run-Time Architecture

- TNS/E processes
- Building TNS/E programs and libraries
- TNS processes
- Legacy TNS processes
- Interpreted TNS on Itanium
- TNS accelerated on Itanium
- TNS transitions
- TNS calling native procedures
- TNS application migration and debugging

Module 4 - Addressing

- Itanium processor addressing
- TNS/E process layout
- TNS process layout

Module 5 - Interrupts and Exceptions

- Interruptions overview
- Synchronization and coordination mechanisms
- Interrupt and auxiliary processes

Module 6 - Operating System Tools and Mechanisms

- Data structures
- Time services
- Process contention controls
- Process events
- PROCESS_WAIT_ and PROCESS_AWAKE_
- Classic privileged semaphores

Module 7 - Memory Access and Management

- Hardware
- Itanium2 virtual addressing hardware support
- Physical layer
- Logical segments
- Logical map
- Sharing
- Priv considerations
- Page faults

Module 8 - The Message System

- Interprocess communication within the same node
- ServerNet topology and the message system
- MQCs
- Communication across nodes
- Expand
- ServerNet clusters
- QIO

Module 9 - Guardian Process Control

- Guardian process creation
- Process states
- Monitor process
- Processor load and reload

Module 10 - OSS Process Control

- Process creation
- fork() and exec()
- Process termination

Module 11 - Guardian File System

- Functions of the file system
- Control structures
- Open request processing
- Receive depth
- Nowait depth
- Sync depth
- NSAA considerations

Module 12 - OSS File System

- File systems
- OSS file system and support
- OSS file organization
- OSS pathname mapping
- OSS open

Module 13 - The I/O Subsystem

- Storage: architecture, initiation, transfer, completion
- Configuring storage device
- Comparing storage and comm I/O
- QIO
- Outgoing comm I/O
- Incoming comm I/O
- WAN I/O
- Other devices

Onsite Delivery Equipment Requirements

- One Integrity NonStop NS-series server with NonStop operating system version H06.03 or later
- One PC compatible workstation per attendee and instructor

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ver a.00, November 2008

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