

HP-UX System and Network Administration for Experienced UNIX System Administrators

Course Summary

Length: Classroom: 5 days Virtual: 6 hrs/day - 5 days

Prerequisite: System Administration experience on a version of SVR4 UNIX (ie. Solaris, AIX, or Linux).

Recommendation Statement:

For System Administrators that are new to HP-UX 11i, but have prior knowledge and system administration experience of a version of SVR4 UNIX (ie. Solaris, AIX, or Linux).

Course Description:

This course covers HP-UX 11i system administration. Because the course moves through each topic at a fast pace, it is essential that students have existing system administration experience on some version of UNIX, as this course does not cover the basic UNIX commands. It is assumed that the student is already knowledgeable in the topics covered in the HP-UX fundamentals course.

The operating system will be HP-UX 11i v3 and the course is taught on both HP 9000 and Itanium.

Topics covered include:

- Understand the boot process on an HP-UX 11i system (PA-RISC and Integrity systems)
- Manage user accounts
- Understand HP system architecture, hardware paths and interpret device information
- Understand the HP-UX file hierarchy
- Configure disk devices and device files
- Understand HP-UX file systems and file system management
- Configure and manage logical volumes using HP's LVM
- Configure and Manage JFS file systems
- Configure and manage the network interface and network services
- Configuring the kernel
- Installing HP-UX patches
- Install the HP-UX operating environment
- Understand the benefits of HP's Ignite-UX

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Detailed Course Outline

Introduction to HP-UX 11i

- Introduction to the HP-UX 11i Operating Environments (Enterprise OE, Mission critical OE, TOE)
- Understand the HP-UX server platforms (HP-UX 9000/PA-RISC and Integrity platforms)
- Understand the HP-UX release levels
- Overview of SAM: Understanding SAM's capabilities and limitations?

Connecting Peripherals

- The HP 9000 family of systems
- HP Architecture and Hardware Addressing
- Basic components of the system architecture
- Understand how hardware paths are derived
- HP I/O architecture terminology
- Viewing and interpreting HP-UX hardware paths and device information with ioscan
- Adding and replacing interface cards
- Adding and removing peripheral devices

Accessing the System Console

Creating, Managing, and Customizing User Accounts

- HP-UX user account overview
- Managing user accounts from the command line and from SAM
- Securing user accounts in HP-UX
- Customizing ASCII logins vs. CDE logins

HP-UX File Hierarchy

- Understanding the difference between static and dynamic files and directories
- Understanding the difference between OS and application directories
- Understanding the purpose of the top-level directories on an HP-UX system
- Understanding the purpose of the subdirectories under /usr, /opt, and /var
- Searching for files and executables using the find, whereis, which, and file commands
- System directories
 - /usr
 - /var
 - /var/adm
 - /opt

Configuring Device Files

- Understanding the HP-UX device file naming convention for disks, CDROMs, and tape drives
- Understanding the HP-UX device file naming convention for terminals and modems
- Viewing device file information (ll, ioscan, lssf, lsdev)
- The layout of /dev
- Device file naming convention
- Disk device file names
- Tape device file names
- Terminal and modem device file names

- Creating device files using SAM, mksf, mknod and insf
- Removing device files with rmsf

Configuring Disk Devices - LVM

- Understanding HP's supported disk partitioning solutions
- LVM concepts and commands
- LVM extents
- LVM device files
- Creating an LVM physical volume
- Creating an LVM volume group
- Creating an LVM logical volume
- Important LVM configuration files

LVM- Advanced tasks

- Extending logical volumes
- Reducing logical volumes
- Deleting logical volumes
- LVM backup and recovery

LVM - Mirroring

- Mirroring logical volumes
- Extend and reduce mirrors
- Synchronizing mirrors
- Splitting and merging mirrors

File System Concepts

- Compare and contrast HP's HFS and JFS file systems
- Understanding the purpose of HFS and JFS superblocks, inodes, and directories (quick review)
- Understanding the purpose of JFS blocks, extents, and allocation units
- Understanding the purpose of the JFS intent log HP-UX file system layout
- Comparison of HFS, BaseJFS. And OnlineJFS
- File system recommendations

File System Creation

(this section should be review for most students so we will quickly review this section)

- Overview of file system creation
- Creating a new file system
- The newfs command
- Mounting / unmounting the new file system
- Automatically mounting file systems
- Mounting/unmounting CD-ROM file systems (CDFS)

File System Repair

(this section should be a review for most students so we will quickly review this section)

- How HFS/JFS handle file system updates
- Preventing file system corruption
- Flushing the buffer cache
- Check and repair HFS and JFS file systems
- Checking lost+found

File System Management

- Monitoring disk usage
- Routine Management and log file maintenance
- Extending a volume group
- Extending a logical volume
- Extending a file system
- Summary of LVM commands

File System Backups

- HP-UX backup utilities
- Backing up and restoring data using `fbackup` and `frecover`
- Supplementing `fbackup` with `make_recovery`
- Creating a recovery tape
- Updating the recovery tape

Managing Swap Space

- HP-UX paging concepts
- Physical, available, and lockable memory
- Describe device swap, file system swap, and pseudoswap
- Understanding the HP-UX swap reservation policy and the role of pseudoswap
- View swap information : device swap, file system swap, and pseudoswap
- Configure device swap and file system swap from the command line
- Guidelines for selecting device swap and file system swap areas

System Boot and Shutdown - PA-RISC Systems

- Understanding the major stages in the HP-UX boot process on the PA-RISC platform
- Describe how the PDC, ISL, and HP-UX utilities load the kernel in memory
- Interacting with the PDC/BootROM
- Interacting with the ISL
- Selecting the primary and alternate boot devices
- Changing states with shutdown and reboot
- Autoboot vs. manual boot
- Initiating the boot sequence
- Boot from a system recovery tape or Core CD-ROM
- Boot from an Ignite-UX network install server
- `/sbin/rc#.d` directories
- Start / Kill scripts
- `/sbin/init.d`
- `/etc/rc.config.d` files
- Console messages when changing run levels
- Creating custom startup and shutdown scripts
- Understand system crashes and dumps

System Boot and Shutdown - Integrity Systems

- Differences between the PA-RISC and Integrity platforms
- Understanding the major stages in the HP-UX boot process on the Integrity platform
- Understand the structure of the boot disk
- Understand the Integrity's disk partitioning scheme

- The EFI boot manager and shell
- Manage the EFI boot menu
- Interact with the OS loader

Configuring Network Connectivity

- Setting an IP address and subnet mask
- Setting a default route
- Setting a system hostname
- Resolving hostnames to IP addresses
- Configuring /etc/hosts
- Configuring a DNS client
- Configuring an NIS client
- Choosing a lookup service
- Configuring the name service switch (nsswitch.conf)
- Configuring network services and the netconf file
- Testing connectivity

Installing software with SD-UX

- Understanding the features and benefits of HP's Software Distributor (SD-UX) technology
- Understanding the purpose of SD-UX bundles, products, and filesets
- Understanding the purpose of SD-UX depots
- SD-UX IPD
- Managing depots
- Starting and stopping the swagentd daemon
- Installing software using swinstall
- Updating software using swinstall
- Listing software using swlist
- Removing software using swremove

Configuring the Kernel

- Understanding when it might be necessary to reconfigure the HP-UX kernel
- Overview of HP-UX configurable parameters
- Adding and removing HP-UX kernel drivers
- Adding and removing HP-UX kernel subsystems
- Modifying static and dynamic kernel parameters
- Moving a newly-built kernel into place in /stand
- Booting from an alternate kernel (when primary kernel fails)
- Static kernel modules
- Define, display and modify dynamic tunable kernel parameters
- Define and modify states of dynamically loadable kernel modules
- Using Command line and GUI tools to configure the kernel
- Create a live kernel dump

Installing patches with SD-UX

- Why install patches?
- Patch naming conventions
- Retrieving patches from the web
- Downloading and installing patches from the ITRC patch database
- Creating a patch depot using the create_depot_hp-ux_11 command

- Installing patches from the SupportPlus CDROM
- Installing patches from patch tapes
- Installing patches from SD-UX patch depot servers
- Listing installed patches
- Removing patches

Installing HP-UX with Ignite-UX

- Compare methods used to install and upgrade the OS
- Install sources
- Which environment to install?
- Planning the install
- Initiating the install from CD-ROM (or an already configured Ignite-UX server)
- Understanding the features and benefits of HP's Ignite-UX technology
- Understand differences between "Pull", "Push", and "local media" installs
- Initiating an Ignite-UX "pull" install

Managing Printers

- LP spooler concepts
- Understanding the purpose of the LP spooler configuration files and directories
- Configuring a local printers via SAM
- Configuring a remote printer via SAM
- Configuring a network printer via hppi
- Troubleshooting LP spooler problems
- Configuring an LP spooler class
- Listing, moving, re-prioritizing, and canceling print requests