At a glance	
Course Name	SAN Essential : San fundamental + Clustering HP San Storage
Course number	UC434S
Length	5 days – 40 hours
Delivery method	Instructor Led Training
Price	

Course overview

This 5-day course provides a comprehensive and accelerated understanding of SAN technologies and concepts. Students will gain the experience needed to tackle the challenges of working in enterprise class SAN environments.

Prerequisites

Participants will be expected to have the following experience:

- Basic technical understanding of networking and storage, concepts and terminology.
- Experience managing Windows or UNIX systems.

Course outline

Introduction

- What is a SAN? / Why a SAN?
- Definition of a SAN
- HP SAN goals
- Fast backup and restore
- Business continuance
- High availability
- Server and Storage consolidation
- Efficiency improvements
- Centralized management
- DAS, NAS and SAN
- Direct Attached Storage (DAS)
- Network Attached Storage (NAS)
- Storage area Network (SAN)
- SAN considerations
- Comparing SAN and NAS
- DAS versus NAS versus SAN
- Comparison by purpose
- SAN components
- Host, target and interconnect device characteristics
- Power-on sequence

Fibre Channel - Basics

- Why not SCSI?
- SAS vs. parallel SCSI
- World Wide Name (WWN)
- Fibre Channel WWN
- Nodes, Ports and Links
- SAN Topologies
- Point-to-point topology
- Arbitrated loop topology
- Arbitrated loop hubs
- Private and public loop
- Switched fabric topology
- Topology comparison
- Fibre Channel port types
- Fibre Channel architecture - Functional levels
- FC-0 - Physical level
- Transceivers
- Fibre Channel cabling
- Multi and single-mode fiber
- Single-mode step-index fiber
- Attenuation
- Dispersion
- Cable bends and damage
- FC-1 Coding layer and encoding process
- FC-2 - Signaling Protocol level
- Fibre Channel terminology
- Frame structure and header
- Cisco EISL header
- SCSI (FCP) write operation
- Class of service
- FC-3 Common Services
- FC-4 ULP mappings

Fibre channel switches

- Principal switch
- Upstream and Downstream links
- Frame routing - FSPF
- Flow- and Exchange-based routing
- ISL bandwidth aggregation
- B-series Trunk
- C-series portchannel
- FSPF and host-based load balancing
- Virtual fabrics
- B-series virtual fabrics
- C-series virtual SANs (VSANs)
- Switches and Directors
- Switch management

SAN hosts

- Hosts and Fibre Channel
- Virtualization for hosts
- HP Integrity Virtual Machines

- NPIV - N_Port Virtualization
- Server virtualization with NPIV
- Brocade Access Gateway
- F_Port Trunking
- Cisco N_Port Virtualixation
- Boot from SAN
- Host preparation and install
- HBA installation
- Windows connectivity – Device Manager
- Windows Disk Manager
- Local HBA management
- Verifying HBA installation hp-ux
- HBA interrogation
- Agile addressing hp-ux 11i v3
- Multiple paths to storage
- Multi-path concepts
- Automatic path failover
- Load balancing
- Microsoft Multi-Path I/O (MPIO)
- Microsoft storage stack
- MPIO driver modules
- DSM utilities

Disk targets

- Disk Drives
- Standard disk driver interfaces
- Parallel ATA/IDE and SCSI
- SATA (Serial ATA)
- SAS (Serial Attached SCSI)
- SAS device limitations
- SCSI-3 command set and encapsulation
- RAID - Redundant Array of Inexpensive Disks
- Disk enclosures
- Disk drive connections
- LUN masking
- Storage Virtualization
- Fabric Based virtualization
- Thin and Fat provisioning
- HP StorageWorks arrays
- Storage Management Utility – MSA 2300, P2000
- Command View EVA
- Command View XP AE

SAN design

- SAN architecture choices and considerations
- Planning process
- Defining the infrastructure requirements
- Approaches to simplified design
- HP Standard SAN topologies
- Design using HP SAN topologies
- Cascaded Fabric
- Ring, meshed and core-edge Fabrics
- Initial cost of deployment

- Data locality
- Topology data access usage
- SAN infrastructure performance factors
- Level 1: Single connectivity fabric
- Level 2: Single resilient fabric
- Level 3: Single resilient fabric with multiple device paths
- Level 4: Multiple fabrics and device paths
- HP StorageWorks SAN Design Reference Guide
- B-Series, C-Series and M-Series port topology maximums
- Review - Solution design and complexities

iSCSI

- IP storage
- iSCSI Stack
- iSCSI encapsulation
- iSCSI Packet
- iSCSI Host Driver
- iSCSI initiators
- iSCSI Name Support
- iSCSI Name Structure
- iSCSI name examples
- iSNS
- State Change Notification
- iSCSI target discovery
- iSCSI operations
- iSCSI authentication
- iSCSI CHAP
- IP Security
- HP StorageWorks iSCSI SAN
- HP StorageWorks iSCSI SAN Recommended architecture
- Centralized Management Console (CMC
- CMC Navigation

SAN management

- Storage management tasks
- Why storage management?
- Storage Resource Management
- HP Information Lifecycle Management (ILM)
- Information Lifecycle Management
- SAN management concepts
- HP SAN Management strategy
- SAN performance management
- Storage capacity management
- SMI-S
- Storage Essentials
- Enterprise Edition plug-ins
- Description of Base Components
- System Manager
- Capacity Manager
- Performance Manager
- Application Viewer
- Policy Manager
- Event Manager

- Database Viewer
- Exchange Viewer
- File System Viewer
- Backup Manager
- HP StorageWorks Fabric Manager
- HP Data Center Fabric Manager (DCFM)
- Cisco Fabric Manager

Security

- Security in a SAN
- Attacks and Exposures
- Mitigation of risk
- Authorization
- Audits
- Encryption
- Role Based security
- RADIUS
- Planning SAN Security prevention
- Response to attacks
- Security in practice
- FCIP encryption and Data encryption at rest

Data Protection

- Challenges in Data Protection
- Recovery Operations
- Protection and Recovery methods
- Data Protection Technologies
- Direct backup - tape
- Centralized server backup
- Automated centralized backup
- Centralized SAN backup
- Tape Libraries
- Zoning for backup
- Backup performance considerations
- Virtual Tape Libraries
- Disk to Tape
- Data replication
- Split-mirror backup concept
- Snapshot backup concept
- De-duplication
- How Accelerated De-duplication Works
- How Hash Based Chunking Works
- How Hash Based Chunking Performs restores
- Disk to Dsik and virtual library portfolio with duplication
- Remote replication
- HP StorageWorks Continuous Access EVA (CA EVA)
- Synchronous and Asynchronous replication
- Comparing replication modes
- HP OpenView Storage Mirroring
- OVSM mirroring - full and file difference

SAN Performance

- SAN performance objectives
- Performance factors
- Performance terms
- Drive speed
- Response time
- Bus utilization
- Device utilization
- Improving performance
- Reducing service time
- SAN performance Considerations
- Latencies
- ISL oversubscription
- Bandwidth consumption and congestion
- Hop latency
- Data Priority – Quality of Service
- Device attachment points
- Distance considerations
- Maintaining performance in an extended SAN beyond 5 or 10km
- Distributed fabrics
- Long distance link modes
- Performance Guidelines within the SAN
- Determining the required bandwidth
- Drive selection and performance
- RAID and RAID selection
- RAID levels
- RAID selection and planning
- RAID level efficiency
- Disk Performance
- Planning a disk system
- Data caching technologies
- Write-back caching
- Write-back cache benefits
- Protecting write-back cache
- Cache coherency in dual controller configurations
- Effects of cache
- Read-ahead caching
- Application effects on performance
- Environment profiling
- Large sequential read environment
- Server Application
- Databases, mail and messaging
- SQL Server 2000
- Oracle 8 Server
- Exchange Server
- Improving performance
- Comparing VRAID1 and VRAID5
- Safe IOPs Calculator
- EVAPerf
- Windows Performance Monitor counters
- Physical disk counters
- EVAPerf counters
- EVA storage cell counters
- End to End monitoring

- Top talker

At a glance	
Course Name	Implementing MSA Storage Solutions
Course number	U4226S
Length	2 days – 16 hours
Delivery method	Instructor Led Training
Price	

Course overview

This 2-day course introduces the Modular Smart Array (MSA) solutions 2312fc, 2324 and P2000 .

This course focuses on implementing and managing an MSA SAN solution. The student gains an understanding of the features, benefits, and components of each of the systems and learns the main considerations for installing, configuring, and troubleshooting the systems. The student also learns to use the various tools and utilities available for configuring and managing the array systems.

Prerequisites

You should have successfully completed the following courses before attending this course:

- HP Storage Technologies WBT
- HP StorageWorks Full-Line Technical Training WBT
- HP Storage Software and Solutions Full-Line Technical WBT
- Working knowledge of Window 2000, Windows Server 2003, or Linux operating systems

Detailed Course Outline

Benefits of a SAN

- Overview of SANs
- Features and benefits
- Industry trends
- SAN topologies
- Supported switches
- Zoning
- iSCSI

Product Overview

- Product positioning
- Key features and benefits
- Management tools
- Hardware components
- Supported hardware and software

MSA Hardware Components

- Controllers and components
- Drive enclosures and drives
- Sample configurations
- Available interconnect options

MSA2324fc/P2000 Management Utilities

- Available tools and utilities
- SMU
- CLI

Caching and ULP

- Multipathing

Local replicationx

- Snapshot
- Volume Copy

Enhanced Data Services

- Remote Replication
- Disaster Recovery

MSA Service and Support

- Basic troubleshooting techniques
- Replacement procedures
- Known service issues

At a glance	
Course Name	EVA-Managing HP storage works EVA
Course number	UC420S
Length	4days – 32 hours
Delivery method	Instructor Led Training
Price	

Course overview

This4-day course combines theory and practical labs to teach users how to manage the HP StorageWorks Enterprise Virtual Array. The hardware, concepts and terminology are covered

	in-depth followed by configuration tasks which include Command View EVA, Local Replication using Business Copy EVA with Snapshots, Snapclones and Mirrorclones, Replication Solutions Manager for Business Copy, Multi-path management with HP MPIO DSM on Windows, native multi-pathing on HP-UX 11iv3, command line/scripting with SSSU, Upgrading controller and disk drive firmware.

Prerequisites

- SAN and Storage Technologies training/experience
- Operating System Administration training/experience
- SAN Fundamentals (U5527aae).
- HP Accelerated SAN Essentials (U4235S).

Course outline

Course Overview

- EVA hardware and software components and their functions, including the storage management server
- How the EVA storage system implements virtualization technology, including its use of eXtensible Controller Software (XCS)
- How to configure and manage the EVA solution
- Best practices and troubleshooting sources

Solution Overview

- This module is an overview of EVA hardware and software. Many components are covered in more detail in later modules which have a detailed overview of each array

EVA Hardware

- This module discusses EVA hardware configurations and compares the features and capabilities of the different hardware generations. The module refers to controllers and disk shelves, but those components are discussed in more detail in later modules

EVA4400 Controller and Management Module

- HSV300 controllers
- The EVA4400 Management Module

Controllers for Gen 4 Arrays

- This module covers the fourth generation controllers:
  - HSV400 controllers used with the EVA6400
  - HSV450 controllers used with the EVA8400

Generation 2 Arrays

- This module covers the second generations arrays:

- HSV2x0 controllers, used with the EVA4000/6000/8000 and EVA4100/6100/8100 series arrays
- M5x14x disk enclosures

Host System Configuration

- Operating system support
- Installing and configuring hosts
- Host properties
- Presenting Storage (LUN mask/map)
- Verifying LUN presentation

Drive Enclosure for Gen 3 and Gen 4 Arrays

- Drive enclosures used with EVA4400/6400/8400 arrays

Basic Concepts and Terminology

- This module describes concepts and terminology essential to understanding how the Enterprise Virtual Array (EVA) virtualization software operates. It defines the terms you need to know and then explores the concepts behind the terms

Command View EVA Introduction

- This module is an introduction to HP StorageWorks Command View EVA software, and describes the following:
  - General topics such as features, history, delivery, and software interoperability
  - Server-based management of the EVA
  - Array-based management of the EVA
  - Command View EVA user interface

  This module focuses on Command View EVA 9.x, the current version

Storage System Configuration

- This module applies to Command View EVA 9.x and is compatible with several versions of Controller Software code

Host System Configuration

- This module describes HP StorageWorks Command View EVA host system preparation and configuration

HP StorageWorks Multipath Solutions

- This module covers the installation and configuration of MPIO DSM for Windows hosts and other multipathing solutions

Advanced Concepts and Terminology

- This module describes concepts and terminology essential to understanding how the Enterprise Virtual Array (EVA) irtualization software operates. It defines the terms you need to know and then explores the concepts behind the terms

Storage System Scripting Utility

- This chapter defines many of the commands and switches available in the utility, including:
  - ADD
  - CAPTURE
  - DELETE
  - EXIT
  - FILE
  - HELP
  - LOCATE
  - LS
  - RESTART
  - SELECT
  - SET
  - SHUTDOWN

Local Replication- Business Copy

- This module describes concepts and terminology essential to understanding how the Enterprise Virtual Array (EVA) virtualization software performs and manages local replication, Business Copy. It defines the terms you need to know and then explores the concepts behind the terms

Replication Solution Manager

- This module provides an introduction to local replication capabilities of the HP Replication Solution Manager

Continuous Access EVA Solution Overview

- The course material in this module will give you a high level overview of the EVA Continuous Access (CA) solution

Command View Scenarios

- In this module you will be presented with screen shots from Command View. Each slide will present a different scenario/issue. Examine the Command View screen shots to help address each scenario/issue

Troubleshooting - Event Management

- In this module we will address numerous events, log files, and concepts which will be elpful in EVA troubleshooting

Performance Monitor

- This module describes the use of EVAPerf and other tools to measure the performance of products in the EVA family

Upgrading EVA Software

- This module will address upgrading EVA software. Although many pieces of software are involved in the EVA environment, the focus of this module will be the upgrade process of the XCS firmware on the EVA controllers. Upgrading the disk drive firmware will also be

discussed

Configuration Best Practices

- This module summarizes the configuration best practices for the EVA4x00/6x00/8x00 (current family) solutions.
  This module addresses the configuration from the perspective of:
  - High availability
  - Performance
  - Minimum total cost of ownership (referred to as cost best practices)

At a glance	
Course Name	Installing and Configuration of HP Storage works VLS
Course number	HG827S
Length	1 days – 8 hours
Delivery method	Instructor Led Training
Price	

Course overview

This 1-day course will help students understand where virtual library systems fit in a modern data protection strategy. The course introduces the HP StorageWorks 6000, 9000 and 12000 Gateway Series Virtual Library System (VLS). In addition, students will learn how to configure, operate and monitor the VLS; how to configure a target Tape Unit and run Echo Copy operations and how to perform VLS disaster recovery.

Prerequisites

Before taking this course, students should have knowledge of the following:

- The fundamentals and troubleshooting curriculum for backup environments
- Tape backup technologies and Standalone Tape Drives, tape libraries, and backup software
- Command View TL
- SAN environments and basic connectivity foundations

Course outline

Introduction

- Course and class introductions

VLS Overview

- What is a virtual tape?
- The HP VLS devices
- VLS usage model
- VLS Benefits
- Virtual tape compared with write-to-disk
- HP Storage Works disk-based backup
- VLS6200
- VLS6000 and VLS9000 model numbers and descriptions
- VLS9000 capacity and performance
- VLS12000 capacity and performance
- Emulated libraries, autoloaders, and tape drives
- Compatibility
- Copy to physical tape - Automigration

VLS Basic Operations

- VLS Software Overview
- VLS Network Settings
- VLS GUI, CLI and Serial Access
- VLS power on/off and reboot operations
- Multi-Node Setup on VLS9000 and VLS Gateway
- VLS6000 Storage Pool Operations
- VLS9000 Storage Pool Operations
- VLS12000 Storage Pool Operations
- VLS License Installation
- VLS Software and Firmware Upgrade
- VLS Gathering Support Information

Device Configuration

- VLS Virtual Library, Drive and Cartridge Configuration
- VLS Cartridge Management
- VLS LUN Mapping (1.x and 2.x firmware)

- VLS LUN Mapping (3.x firmware or higher)
- VLS Status and Notifications
- VLS Reporting
- VLS General Preferences

Deduplication

- Accelerated deduplication overview
- Accelerated deduplication sizing and licensing
- Accelerated deduplication configuration and reporting

Replication

- VLS Replication Overview: Features, topologies, licensing, configuration overview
- VLS Replication: Network Configuration
- Remote VLS Configuration
- Local VLS Configuration
- Tape Initialization for Deduplicated Replication
- Job Reporting
- Cartridge Summary Screen

Automigration

- VLS Automigration Overview
- HP VLS Automigration Pool/Policy Configuration
- HP VLS Automigration Destination Library Management

At a glance	
Course Name	HP Software Data protector
Course number	U1610S
Length	4 days – 32 hours
Delivery method	Instructor Led Training
Price	

Detailed Course Outline

Data Protector Software Overview and Architecture

• HP Data Protector 6.0 Highlights
• Backup Models
• Backup and Replication Methods
• Split-Mirror and Snapshot Backup Concept
(ZDB/IR)
• HP Software Integration
• The Cell Concept
• Data Protector Architecture
• Cell Manager

- Capacity Planning Spreadsheet
- Disk, Media and Integration Agents
- AES Encryption- Backup/Restore

Data Protector Installation

- Installation Sequence, Planning and Methods
- Automating Windows Installation
- Supported Upgrades
- Installation Requirements (UX and Windows)
- Data Protector Graphical User Interface
- Importing Clients

Data Protector Basics

- Concept: General Backup
- Concept: The Scheduler
- Concept: Backup Types
- Configure a New Backup
- Choose a Device
- Schedule Options
- Running a Report

Backup Device Preparation

- Library Terminology
- Tape Drives for HP Libraries
- Drive and Library Performance
- Web-based Remote Library Management
- Drive and slot numbering
- Configuring the Fibre Channel Interface
- RSM
- Data Protector Device Tools
- Tape Drive Performance

Logical Devices

- The Data Protector Logical Device
- Configuration Flexibility
- Device Features
- Multipath or Multiple Devices
- Device Concurrency
- Configuration Methods

Media Pool Concepts

- Creating Media Pools
- Media Pool properties
- Media Allocation Policies
- Free Pool Concept and Implementation
- Location Tracking and Priority
- Formatting Tape Media
- Importing Media
- Media Allocation and Usage

Backup

- Performing Backups

- Backup Specification Types and contents
- Backup Features
- Static and Dynamic Device Allocation
- Load Balancing — Object Allocation
- Backup Mirroring
- Creating Backup Specifications (template and wizards)
- The Backup Process Flow

Enhanced Incremental Backup

- Incremental Backup Overview
- DP General Incremental Limitations
- Enhanced Incremental Backup
- Performance Impact
- Limitations

Object Consolidation

- Restore of Incremental Backups
- Object Consolidation
- Synthetic Full Backup
- Automatic Media-Set-Selection (AMSS)
- Virtual Full Backup
- Object Consolidation Architecture

Media Management and Replication

- Media Duplication
- Automated Media Operation -- Media Copy
- Object Copy
- Freeing Media
- Disk Staging
- Session Information Flow
- Copy Specification
- Interactive Object Copy
- Limitations and Performance Restore
- Performing Restores
- Restore Sequence and Objects
- Restore from a Session
- Parallel or Single Restore
- Point in Time Restore
- Restore by Query, Query Timeframe and Options

Internal Database (IDB)

- Internal Database (IDB)
- IDB Information Storage
- IDB Tablespaces
- Directory Structure
- Transaction Logs
- Managing Database Growth
- Monitor the Internal Database
- Database Cleanup
- Backup the Internal Database
- Creating a New IDB
- Manual Restore of the IDB
- Recovery from Corruption

- IDB Maintenance Commands

Monitoring and Reporting

- Reporting Possibilities
- Report Categories
- Reporting GUI
- Web Reporting Interface
- Reporting Command
- Report Groups and Group Schedule
- Service Level Management

Event Notifications

- Monitoring, Reporting and Notifications
- Data Protector Event Logging
- Report or Event Notification

Access Control and Security

- User Groups
- The Admin Group
- The Operator Group
- The User Group
- Custom Groups
- Group Permissions
- Adding Users and Groups
- Client Security
- Network Access
- Firewall Support

Disaster Recovery

- Disaster Recovery Terminology
- Data Protector 4-Phase Approach to DR
- Supported Recovery Options
- HP One Button Disaster Recovery
- Recovery Procedure
- Requirements / Limitations

Troubleshooting

- Log Files
- Execution Tracing
- Debug Log Collector
- Network Connectivity
- Services
- User Interface Startup Problems
- Backup Devices
- Backup and Restore
- Health Check Config file
- Debugging UNIX Pre- and Post- exec Scripts

Licensing

- Data Protector Licenses
- HP AutoPass
- Synchronization of Passwords
- License Migration from Previous Versions

• License Reporting Tool
©

At a glance	
Course Name	HP Blade System Administration C-Class Course
Course number	
Length	4 days – 32 hours
Delivery method	Instructor Led Training
Price	

Course overview

This 4-day course provides instruction on HP BladeSystem administration and management. Discussion of the portfolio overview will ensure understanding of components and solutions. Students will configure HP Insight Control tools featuring HP Systems Insight Manager and HP Rapid Deployment tools. Labs engage students in configuring management and monitoring components for: HP Onboard Administrator,HP Integrated Lights-Out 2,HP BladeSystem instrumentation, Performance Monitoring and Blade Server deployment. Virtual Connect discussion includes examples of configuration with simple network setups.

Prerequisites

HP recommends that students have attained the following credentials or levels of experience before taking this course:

- HP BladeSystem Hardware: Installation and Configuration (c-Class) (similar experience is recommended

Course outline

Module 1: HP BladeSystem c-Class Portfolio Introduction

- HP BladeSystem c-Class – Infrastructure in a Box
- HP Consolidated Client Infrastructure
- HP Blade Workstation Solution
- HP BladeSystem c-Class
- Operating system support
- Virtualization support
- Multiple boot and storage options
- Onboard Administrator modules
- Insight Display
- HP Insight Control
- HP Insight Control and HP Systems Insight Manager
- HP Insight Control server deployment

Module 2: HP BladeSystem c-Class Enclosures

- HP BladeSystem c-Class enclosure comparison
- c7000 Enclosure
- 6 of 6 RoHS compliance (Restriction of Hazardous Substances)
- Onboard administrator with KVM
- Blade form factors
- Management
- c3000 Enclosure
- Redundant Onboard Administrator modules
- Power Configurations
- HP Dynamic Power Saver
- ProLiant Power Regulator
- Dynamic Power Capping
- Enclosure Dynamic Power Capping
- Enclosure management configuration
- Certificate Administration
- Users/Authentication
- SSH Administration
- HP SIM Integration
- Two Factor Authentication

Lab:

- Access the HP Virtual Lab
- Configure Microsoft FTP server
- Perform Onboard Administrator GUI script execution
- Connect to the Onboard Administrator using Telnet
- Use the Onboard Administrator command line interface (CLI) to retrieve and alter Onboard Administrator configurations

Module 3: HP Lights Out Management

- Integrated Remote Console
- Blades and Security
- Configuring iLO
- Power Management
- Administration

Lab:

- Access the HP Integrated Lights-Out 2 (iLO 2) component of your HP BladeSystem server blade
- Review version of the iLO 2 firmware
- Activate iLO 2 Advanced for BladeSystem licensing
- Set the BladeServer boot order from the Onboard Administrator
- Reboot and replay the boot sequence to identify issues for troubleshooting

Module 4: HP BladeSystem Instrumentation and SMH

- HP Systems Management Homepage
- Installation Requirements
- Settings
- Webapps
- Agents and Operating Systems
- Providers

Lab:

- Use the HP Smart Update Manager (SUM) to add HP Insight Management WBEM Providers to the System Management Homepage (SMH)
- Identify firmware and Blade Server configuration using SMH
- Evaluate status of Blade Server sensors using SMH
- Send a Test Indication to the system log

Module 5: Connectivity Options

- Fabric convergence and c-Class architecture
- BladeSystem c-Class interconnect module architecture
- Interconnect modules
- Ethernet modules
- Figure Channel, Infiniband and SAS modules
- HP ProCurve Ethernet Blade Switches
- Mezzanine slots and cards

Lab:

- Exercises to review server blade port mapping within HP BladeSystem c7000 enclosure
- Use HP Systems Insight Manager and Onboard Administrator to identify port mapping for deployed blades

Module 6: Virtual Connect

- Overview of Virtual Connect Technology
- How Virtual Connect Works
- Overview of Virtual Connect Flex-10 Technology

- How Virtual Connect Flex-10 Works

Lab:

- Use the HP Virtual Connect wizards to complete the initial set up
- Verify data center connections
- Configure and demonstrate Fast MAC Cache Failover

Module 7: ProLiant Server Blade Management

- Thermal Logic management
- Enclosure management using Onboard Administrator
- HP Systems Insight Manager Onboard Administrator integration
- HP BladeSystem Integrated Manager

Lab: HP Insight Control – Completing pre-installation requirements

Lab: HP Insight Control – Installation on Windows Server 2003

Lab:Configuring HP Systems Insight Manager

- Access HP Systems Insight Manager (HP SIM)
- Navigate the HP SIM homepage
- Configure the HP SIM system links
- Run the First Time Wizard
- Run an automatic discovery
- Perform a manual discovery
- Perform hardware status polling
- View HP SIM events
- Run data collection
- View information on the device page and the System Management home page
- Configure Repair Agents

Lab: HP Systems Insight Manager Tasks, Collections and Events

- Create personal folders and collections
- View events
- Configure HP SIM Remote tool that will run on selected target systems
- Create and modify tools

Lab: Using HP BladeSystem Integrated Manager

- Exploring HP BladeSystem Integrated Manager
- Reviewing Rack and Enclosure configurations

Lab: Configuring and Implementing Power Management

- License HP integrated Lights-Out 2 (iLO 2) and turn on power management
- Configure and implement HP Insight Power Manager (IPM)
- Gather power information, customize power settings, and generate power-related reports
- Implement group power capping and reporting

Module 8: HP BladeSystem Performance Monitoring

- Introduction to Performance Management Pack (PMP)
- Features
- Analysis tools
- The Insight Control performance management process
- Server status
- Monitoring
- Reports

Lab: HP BladeSystem Performance Monitoring

- Configure HP ProLiant Essentials Performance Management Pack (PMP)
- License servers
- Monitor licensed servers with Insight Control performance management
- Perform an offline analysis
- Perform an online analysis
- Run a Insight Control performance management report

Module 9: HP ProLiant Server Blade Deployment

- HP Insight Control software portfolio
- Product technology overview
- Dynamic Power Capping
- Software Requirements
- HP Insight Control for Linux
- Booting from SAN

Lab: Configuring Insight Control server deployment

- Configure the Preboot Execution Environment (PXE) images
- Configure PXE to process new computers immediately
- Synchronize the console name with the Microsoft Windows name
- Customize the Altiris client installation file
- Enable Microsoft Sysprep
- Explore the Microsoft Internet Information Services (IIS) and FTP components within RDP

Lab: Installing and Configuring Windows Server 2008

- Install an operating system to an HP Blade Server using a scripted install deployment job

Appendix A - Server Blades

- List the features and benefits of BladeSystem c-Class server blades
- Describe the server blades that constitute the BladeSystem c-Class portfolio

Appendix B - Storage Overview

- Describe the different storage options available for HP BladeSystem c-Class
- Direct-attached storage (DAS)
- Network-attached storage (NAS)
- Storage Area Network (SAN)

- Describe storage software options for BladeSystem c-Class

Appendix C - Infiniband

- Describe InfiniBand technology as it applies to the BladeSystem c-Class
- Explain how to install an HP 4X DDR IB Mezzanine HCA
- Troubleshoot the HP 4X DDR InfiniBand Switch Module

Appendix D - Support and Troubleshooting

- BladeSystem c-Class support services
- Identify the diagnostic tools available for the BladeSystem c-Class
- Maintain the BladeSystem c-Class firmware
- Troubleshoot the components of a BladeSystem

At a glance	
Course Name	Deploying an updating Insight Control Environment
Course number	
Length	3 days – 24 hours
Delivery method	Instructor Led Training
Price	

Course overview

This 3-day course provides students with the skills needed to effectively deploy and update ProLiant servers using HP Insight Control software deployment v6. This course is applicable to ProLiant customers that have previously used the Rapid Deployment Pack (RDP) product.

Prerequisites

HP recommends that students have attained the following credentials or levels of experience before taking this course:

- HP Insight Foundation

Course outline

Module 0: Course Overview

Module 1: Touring the HP Insight Rapid Deployment Software 6

- Describe the benefits of the HP Insight Control server deployment 6
- Identify the new features
- Name the components of the HP Insight Control server deployment 6
- Describe the licensing and update options
- Explain how the HP Insight Control server deployment 6 and HP SIM provide a complete deployment and change management solution

- Explain how the HP Insight Control server deployment 6 supports the HP BladeSystem solutions
- Explain the relationship between the HP Insight Control server deployment 6 and Insight Control Management tools
- Name the other HP server deployment tools and compare them with the HP Insight Control server deployment 6

Module 2: PXE Technology

- Describe PXE technology and its key benefits
- Explain how to configure HP servers for PXE deployment
- Install an automation environment
- Name the alternatives to PXE and how to use them

Module 3: Installing and Configuring RDP 6

- Describe the hardware and software requirements for installing the HP Insight Control server deployment 6
- Explain the process of installing the HP Insight Control server deployment 6 and upgrading from previous version
- Describe the configuration steps necessary to deploy an operating system to a server

Lab:

- Configure Insight Control server deployment

Module 4: Using the RDP Deployment Server Console

- Describe the features available from the RDP WE 6 Deployment Server Console
- Name the tools available from the Deployment Server Console Tools menu
- List the remote operations available from the Deployment Server Console Operations menu

Module 5: Scripted Installation and Imaging Jobs

- Define jobs and tasks and explain how they are used
- Describe how RDP 6 uses scripting in server deployment
- Describe how RDP 6 uses imaging in server deployment
- Compare scripting and imaging deployment methods
- Explain how to install Linux on a target server using a scripted installation

Lab:

- Scripted installation of Windows 2008 Enterprise server
- Image deployment of Windows 2008 Enterprise server
- Scripted installation of Windows 2003 Enterprise server
- Image deployment of Windows 2003 Enterprise server
- Scripted installation of VMware ESX 4 Update 1
- Scripted installation of RedHat 5.3 x64

Module 6: HP Insight Control software deployment agents

- Identify the HP Insight Control software deployment 6 Deployment Agents for Windows and Linux. (DAgent,AClient,ADLagent)

- Explain how to install the agents
- Describe the tasks the agents perform

Module 7: Using the Deployment Web Console

- Describe the Deployment Web Console basics
- Explain how to Install the RDP 6 Deployment Web Console
- Describe how the Deployment Web Console is used with RDP WE 6
- Scripted deployment of VMware and Red Hat systems (Labs 8, 9 & 10)

Lab:

- Deploying Linux RPM with the Deployment web console

Module 8: Software Support

- List the available documentation and online resources for HP Insight Control software deployment 6
- List the HP support and services available for HP Insight Control software deployment 6
- Identify some of the known issues with version 6 and describe how to remedy them
- Identify the PXE error codes and describe the reason for error

Lab:

- Configuring ProLiant NIC Teaming
- Creating Virtual Computers
- Using conditional jobs and filters
- Making bootable disks for non-PXE deployment
- Preinstallation configuration for installation
- Installing Insight Control server deployment

At a glance	
Course Name	ITIL V3 Foundation (For Data Center)
Course number	
Length	2days -16 hours
Delivery method	Instructor Led Training
Price	

Course overview

This 2-day course introduces the fundamentals of IT Service Management (ITSM) from a data center perspective. Based on ITIL® Version 3, this course shows how key concepts, processes, functions and roles of the ITIL service lifecycle relate to managing a data center. The course uses the exciting HP Race to Results Data Center Simulation, an interactive learning experience, to illustrate aspects of ITIL and how those enhance the quality and efficiency of data center operations. The course also emphasizes the extent to which the delivery of IT Services depends on how data center facilities and other components are planned, implemented, operated, and managed. The course prepares attendees for the ITIL V3 Foundation Certificate examination.

Prerequisites

- Experience and knowledge of IT computing environments are useful but not essential

Course outline

Module 1: Service Management as a Practice

- CIO challenges today
- What is an IT Service?
- Formal Definition of a Service
- ITIL Definition of Service Management
- Characteristics of a process
- Automating Processes
- Functions and Roles
- The ITIL V3 Service Lifecycle

Module 2: Service Operation

- Service Operation - Purpose/Goal/Objectives
- Event Management
- Incident Management
- Request Fulfillment
- Self Help
- Problem Management
- Access Management
- Service Desk
- Technical Management

- IT Operations Management
- Application Management

Module 3: Continual Service Improvement

- CSI - Objectives
- Continual Service Improvement Model
- Plan, Do, Check, Act Model (Deming Cycle)
- What is Service Measurement?
- Baselines
- CSFs and KPIs
- Types of metrics
- RACI Model
- Role - Service Owner
- Enterprise Governance

Module 4: Service Transition

- Service Transition - Goals/Objectives/Scope
- Knowledge Management
- Service Knowledge Management System
- Change Management
- 7 Rs of Change Management
- Service Asset and Configuration Management (SACM)
- SACM - Configuration Item (CI)
- SACM - Logical Configuration Model
- SACM - Configuration Management System
- SACM - Definitive Media Library (DML)
- DML and CMDB relationship
- Release and Deployment Management

Module 5: Service Design

- Service Design - Goals and Objectives
- Scope of Service Design - The Four Ps
- Service Design Package (SDP)
- 5 major aspects of Service Design
- Service Catalog Management
- Service Level Management
- SLM - Multi-level SLAs
- Availability Management
- Information Security Management
- Supplier Management
- Suppliers and Contracts
- Supplier Management Supplier and Contract Database (SCD)
- Capacity Management
- IT Service Continuity Management (ITSCM)

Module 6: Service Strategy

- Service Strategy - Goals and Objectives
- Utility and Warranty
- Assets, Resources and Capabilities
- Value Creation

- Service Portfolio
- Service Provider
- Risk Analysis and Management
- Demand Management - Objectives and Business Value
- Financial Management - Objectives

Module 7: ITIL Qualification Scheme

At a glance	
Course Name	VMware Infrastructure: Install and Configure

Course number	HH627S
Length	4 days – 32 hours
Delivery method	Instructor Led Training
Price	

Course overview

This 4 - day hands-on training course explores installation, configuration, and management of VMware® vSphere™, which consists of VMware ESX™/ESXi and VMware vCenter™ Server. The course is based on ESX/ESXi 4 and vCenter Server 4. Upon completion of this course, you can take the examination to qualify as a VMware Certified Professional. Students who complete this course may enroll in any of several more-advanced vSphere courses.

Prerequisites

- System administration experience on Microsoft Windows or Linux operating systems

Course outline

Module 1: Course Introduction Module 2: Introduction to VMware Virtualization

- Introduce virtualization, the cloud, and vSphere components

Module 3: Configuring ESX/ESXi

- Introduce the architecture of ESX and ESXi
- Manually configure ESX/ESXi

Module 4: VMware vCenter Server

- Install and configure vCenter Server components
- Manage vCenter Server inventory objects

Module 5: vNetwork Standard Switch

- Create, configure, and manage vNetwork standard switches, network connections, and port groups

Module 6: Storage

- Configure ESX/ESXi with iSCSI, NFS, and Fibre Channel storage
- Create and manage vSphere datastores

Module 7: Virtual Machines

- Deploy virtual machines using the Create New Virtual Machine wizard, templates, cloning, and VMware vCenter Converter
- Modify and manage virtual machines
- Perform Storage vMotion migrations

Module 8: Access Control

- Control user access through roles and permissions

Module 9: Resource Monitoring

- Control virtual machine access to CPU, memory, and I/O resources
- Monitor resource usage using vCenter Server performance graphs and alarms

Module 10: Data Protection

- Back up and recover virtual machines using VMware Data Recovery

Module 11: Scalability

- Manage multiple vCenter Server inventories using VMware vCenter Linked Mode
- Manage ESX/ESXi configuration compliance using Host Profiles
- Create, configure, and manage vNetwork distributed switches, network connections, and port groups
- Perform VMware vMotion™ migrations
- Configure and manage a VMware Distributed Resource Scheduler cluster
- Configure and manage VMware Distributed Power Management

Module 12: Patch Management

- Manage patching and patch compliance using vCenter Update Manager

Module 13: High Availability and Fault Tolerance

- Configure and manage a VMware High Availability cluster
- Configure fault-tolerant virtual machines using VMware Fault Tolerance

Module 14: Installing VMware ESX and ESXi

- Introduce ESX and ESXi Installable installation

At a glance	
Course Name	Enterprise Linux
Course number	H7091S
Length	5 days – 40 hours
Delivery method	Instructor Led Training

Price	

Course overview

This 5-day course provides those with basic UNIX or Linux user experience, the knowledge & skills necessary to install, configure and manage their Red Hat and SUSE Linux systems. Topics include installation, system admin, configuring X Windows, configuring the kernel, Logical Volume Manager (LVM) and RAID, security and basic troubleshooting. Coupled with the next course, Linux system administration II is our recommended curriculum to assist those system admins wishing to prepare for one of the Linux certifications. Linux Professional Institute (LPI) Level 1, Red Hat (RHCE, RHCT) or SAIR.

Prerequisites

- Fundamentals of the UNIX System or
- Linux fundamentals

Course outline

- Linux introduction & installation
  - Multi-OS booting
  - Partitioning and file systems
  - Pre-Installation considerations
  - Hardware compatibility
  - Boot Loader
- PC Hardware & Linux
  - Detecting New Hardware Manually
  - Configuring New Hardware with Kudzu
  - Configuring New Hardware with hwinfo
  - PC System Hardware
  - SCSI Devices
  - Serial Ports
  - USB Devices
  - USB Configuration
  - Linux Devices Files
  - Configuring New Hardware
  - Kernel Modules
  - Handling Module Dependencies
  - Configuring the Kernel
  - Kernel Hardware Information
- Post-install system configuration
  - Configuration utilities and files
  - Network services
  - Managing software and packages
  - Configuration printers
- Boot process and SysV init
  - Booting Linux and LILO options
  - Kernel boot parameters
  - Managing daemons
  - Controlling startup services
  - Shutdown and reboot
- User/group administration and NFS
  - User Administration
  - Group Administration
  - Password ageing and default user files
  - PAM
  - File sharing with NFS

- File system administration
  - Partition tables and file system creation
  - SWAP
  - Disk quotas and file access control lists
- LVM & RAID
- Task automation and process accounting
  - Automating tasks
  - Using cron, at and batch commands
  - Managing processes
  - Limiting system resources
- Client networking
  - Linux network interfaces
  - Configuring routing tables
  - Enabling IPv6, VLANS, DNS and DHCP
  - Network diagnostics
- The X Window system
  - Xfree86
  - Configuring X
  - Display manager and XDMCP
  - X security and servers
- Security concepts
  - Tightening default security
  - Security advisories
  - TCP wrappers
  - A more secure approach with iptables
- Linux kernel compilation
  - Why compile?
  - Getting kernel source
  - Configuring the kernel
  - Compiling the kernel
  - Installing the kernel
  - Tips & Tricks
- Xen Virtualization
  - What is Virtualization?
  - Virtualization Technologies
  - What is Xen?
  - Xen Architecture
  - Xen Deployment
  - Xen Server Farms
  - Xen Server Farm Storage
  - Xen Networking
  - Xen Virtual Server Migration
  - xm Command & Xen Tools
- Troubleshooting
  - Basic troubleshooting
  - Gathering information
  - Useful debugging aids
  - Common problems
  - Network settings
  - The rescue environment

At a glance	
Course Name	Oracle Administration I
Course number	
Length	4days – 32 hours

Delivery method	Instructor Led Training
Price	

At a glance	
Course Name	Oracle Administration II
Course number	
Length	4 days – 32 hours
Delivery method	Instructor Led Training

Price	