
HPE SAN Essentials II: Advanced B-series networking

Duration: 2 Days Course Code: HM9Q2S

Overview:

This HPE SAN course is designed for new or entry-level B-Series SAN administrators. It provides a comprehensive understanding of everyday administration within an HPE SAN solution, covering a broad range of technologies and concepts such as FC, iSCSI, and FCoE. It discusses basics and building blocks of FC and IP-SAN, with examples based on B-Series products, as well as the role of SAN-enabled hosts and disk targets. B-Series SAN features and management options are also presented. Other topics include data protection, basic SAN security, and performance aspects of SAN components.

Please note that advanced technologies are only introduced in this course, while they are fully covered in the SAN Essentials II: Advanced B-series Networking course. This training helps students gain the experience needed to tackle the challenges of working in medium-sized and enterprise-class B-Series SAN environments. This course covers general SAN technologies and StoreFabric B-series specific topics.

NOTE: HPE SAN Essentials I: Administration Fundamentals Self-Paced Training has two components: **Web-based training available online** **Hands-on practice available through HPE Virtual Labs**

With this eLearning course, you have options normally unavailable with an instructor-led course. You have a year of access to the web-based portion of the training so that you may repeat sections for reinforcement. Take this training at your own pace and on your own schedule. You have 3 sequential days of access to the HPE Virtual Labs to run the labs associated with this course.

Target Audience:

New or entry-level technical professionals seeking a learning path that includes both conceptual knowledge of SAN technologies and experience in HPE B-series SAN environments

Objectives:

- At the conclusion of this course, you should be able to:
- Describe SAN and SAN benefits
- List SAN components
- Present the overall HPE SAN portfolio
- Identify the differences between DAS, NAS, and SAN
- Compare different data access methods
- Talk about FC topologies
- Discuss WWN identifiers and FC addressing
- Talk about basic switch features and configuration parameters
- Perform initial switch installation, configuration and verification
- Describe the role of a host in a SAN network and host-related technologies including NPIV and load balancing
- Present the role of storage in a SAN network and storage-related technologies including disks and interfaces types, encryption, deduplication and VVOLs overview.
- Explain basic FC concepts and SAN services, such as zoning and name server
- Talk about basic B-Series SAN management options and technologies
- Describe iSCSI protocol and Nimble storage array as an iSCSI-based product example
- Talk about FCoE technologies including building blocks and how it compares to FCIP and iSCSI
- Present the theory of SAN security and basic B-Series based implementation as well as authentication options
- Talk about data protection (backup, replication) including theory, topologies, technologies and related HPE products: StoreOnce, tape, CloudBank Storage and RMC
- Cover SAN and storage planning performance aspects and monitoring options
- Design and document SAN

Prerequisites:

- Basic technical understanding of concepts and terminology related to networking and storage
 - Basic experience in managing Windows systems
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Content:

Introduction

- SAN definition, benefits and goals
- High-speed backup and high availability
- Server and storage consolidation
- DAS, NAS, and SAN concepts and comparisons
- SAN considerations
- Tier storage
- SAN components
- Host, target and interconnect device characteristics
- SAN portfolio overview
- Power-on sequence

Fibre Channel (FC) Basics

- Addressing
- FC terminology, WWNs, port types, and topologies

Switch Installation and Configuration

- In the box
- Steps overview
- Environmental issues
- Configuration parameters
- Initial CLI and serial connection
- Default passwords
- IP settings
- CLI settings
- Time settings
- Licensing management
- Login banner
- Switch, chassis, fabric and port names
- Syslog
- Checkin switch and ports status
- Configuration file backup
- Rebooting

SAN Hosts

- Host role within SAN
- Converged network adapters
- NPIV overview, benefits, scalability and management
- HPE Virtual Connect overview
- Host installation checklist and bus connections
- Boot from SAN
- Finding WWNs
- Multi-path SAN and load balancing
- Multi-path I/O (MPIO) components within OS

Disk Targets

- SATA interface
- SAS interface
- SSD technologies
- Disk enclosures
- Connecting disks to controllers
- Storage presentation
- Storage virtualization

SAN Extension

- Basics and overview
- Cables and SFPs
- Fabric virtualization overview

FCoE/CEE

- FCoE and CEE standards
- FCoE I/O consolidation and terminology
- FCoE stack and encapsulation
- Lossless Ethernet
- Priority-based flow control (PFC)
- Enhanced transmission selection (ETS)
- Congestion notification (CN)
- Data center bridging capabilities exchange (DCBX)
- FCIP, iSCSI and FCoE basic comparison

SAN Security

- Basic storage security model and access points
- Planning security in a SAN environment
- Core components for securing SAN data management
- Data and management security models
- RBAC
- Roles management
- Password rules and local/remote authentication

Data Protection

- Reasons for data protection
- Data protection challenges
- Data classification
- Protection and recovery methods
- RPO and RTO
- Backup types and their differences
- Backup topologies
- Tape libraries overview
- StoreOnce overview and introduction
- Deduplication
- CloudBank storage
- Local and remote replication
- RMC

Performance

- Factors affecting SAN performance
- SAN performance planning and considerations
- Latencies and congestion
- Performance guidelines within the SAN
- Recommendations for switch ISL connectivity
- Determining the required bandwidth
- Storage performance (drive and RAID selection)
- Performance monitoring

SAN Design

Basic Switch Configuration

Working with QConverge for QLogic HBA.

3PAR Volume Provisioning and Presentation

Working with MPIO

Configuring Zoning (Web Tools and CLI)

Working with Nimble iSCSI Array (Provisioning and NCM)

Working with B-Series Switches User Accounts and Password Rules

3PAR Snapshot Management

- Storage deduplication
- Provisioning types
- Data encryption
- VVOLs
- Portfolio overview

Fibre Channel Basic Services

- SNS/name server
- SNS in web tools
- SNS related commands
- Zoning overview
- Zoning building blocks
- Basic zoning configuration via CLI and GUI
- Fabric segmentation
- Zoning best practices

SAN Management

- SAN management choices and considerations
- Technologies driving SAN management
- HPE SAN management today
- B-series management options overview
- Web tools
- SNMP
- SAN Network Advisor
- REST API
- OneView

iSCSI

- IP storage overview
- iSCSI stack, packet construction and name convention
- iSCSI initiator options
- iSCSI discovery methods and security
- HPE Nimble array as an iSCSI product example

- Architecture choices and design considerations
- HPE standard SAN topologies and topology design rules
- Advantages, disadvantages and scalability of different topologies
- Data locality
- Topology data access usage
- SAN infrastructure performance factors
- Levels of high availability in SAN architecture
- SAN planning and documentation utilities

Detailed lab outline

B-Series Switch Exploration and Basic Operations (Web Tools and CLI)

Further Information:

For More information, or to book your course, please call us on 0800/84.009

info@globalknowledge.be

www.globalknowledge.com/en-be/