Szkolenie: HPE

# HPE SAN Essentials II: Advanced B-series Networking

Hewlett Packard Enterprise

## Cel szkolenia:

This course is designed for advanced B-Series SAN administrators and is a follow-up to the SAN Essentials I: Administration Fundamentals class. It does not cover basics since those are discussed in the Fundamentals training. This course introduces new topics such as advanced Fibre Channel (FC) features, additional B-Series management options, SAN extension technologies, advanced SAN security, and hardware installation. All practical parts are based on B-Series devices. This course helps students gain the experience needed to tackle the challenges of working in medium-sized and enterprise-class B-Series SAN environments.

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

- Explain advanced FC terminology
- Describe the role of the principal switch
- Talk about FCP routing
- Explain ISLs and trunking
- Explain advanced FC concepts ,SAN services, and associated well-known addresses
- Describe FC stack, Classes of Service, and frame structure
- Discuss additional zoning types (Peer, TDPZ, TI, QoS) as well as ingress rate limiting
- List and talk about SAN extension options, B-Series Extended Fabrics, and Buffer-to-Buffer Credits
- Describe FCIP technology including tunnels, circuits FCIP QoS, performance and security
- Discuss FC-FC routing including definitions and elements.
- Talk about Virtual Fabrics including IDs, types of logical switches and links between them
- Present SAN security in both theory and practice (policy distribution, SCC, DCC, FCS policies as well as IP Filter and AUTH policies)
- Talk about performance monitoring on HPE StoreFabric B-series products (Fabric Vision, with focus on Flow Vision and MAPS)
- Talk about additional SAN management options and switch firmware
- Present basic troubleshooting and diagnostics methods by using SAN Network Advisor, Web Tools, and CLI.
- Perform Firmware upgrade

Audience / Job Roles



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Intermediate to advanced technical professionals seeking a learning path that includes more advanced knowledge of SAN technologies and experience in HPE B-series SAN environments.

## Plan szkolenia:

- FCP Routing and Trunking
  - Fabric Terminology
  - Principal switch
  - Upstream and downstream links
  - Fabric Initialization Process
  - Basics of FSPF and frame routing within a fabric
  - FCping
  - Inter-Chassis Link
  - Trunking
- Advanced Fibre Channel Theory and Services
  - FC stack and layers
  - Class of service
  - Frame structure and frame head
  - Advanced Fibre Channel terminology
  - Flow control
  - Link and fabric services
  - Well known addresses
  - Fabric and N_Port login sequence
  - Registered State Change Notification
  - Peer Zoning
  - Target Driven Zoning
  - QoS zoning
  - Virtual Channels implementation
  - QoS naming convention
  - QoS over routers
  - QoS configuration
  - TI Zoning theory
  - TI Zoning implementation
  - TI Zone Failover
  - TI and FSPF
  - TI Zoning configuration
  - Ingress Rate Limiting



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- Long Distance Connectivity
  - Why extend the SAN?
  - Long distance cabling
  - HPE Supported SAN extension technologies
  - Cables and SFPs
  - C/DWDM
  - Fabric OS Extended Fabrics theory and configuration
  - Working with Buffer-to-Buffer Credits
- Fibre Channel over IP (FCIP)
  - FCIP and its role in SAN extension
  - FCIP Tunnels
  - FCIP Circuits
  - FCIP Trunking
  - FCIP performance and security
  - Selective Acknowledgement
  - Compression
  - Adaptive Rate Limiting (ARL)
  - FCIP QoS
  - FastWrite and Open Systems Tape Pipelining
  - FCIP network best practices, advantages and disadvantages.
  - Basic configuration and analysis overview
  - FC-FC Routing & Virtual Fabrics Introduction
  - SAN scaling and Fabric services limits
  - LSAN Zoning
  - EX_Ports
  - Domains
  - Trunking
  - Integration of Fibre Channel routing and FCIP
  - Supported platforms
  - Virtual fabrics overview and terminology
  - Logical Switch types
  - FIDs and Domain IDs
  - ISL Sharing
  - ISL Types
  - Basic configuration
  - VF Supported platforms



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- SAN Security
  - Security policies list
  - Policy Database Distribution
  - Switch Connection Control (SCC) policy
  - Setting Device Connection Control (DCC) policy
  - Fabric Configuration Server (FCS)
  - FCS Switch Operations
  - Authentication policy for fabric elements (FCAP and DH-CHAP)
  - IP Filter policies and rules
  - How to configure them
  - Encryption and compression
- Performance
  - B-Series Fabric Vision Introduction
  - Fabric Vision Elements
  - Dashboards
  - Flow Vision Overview
  - What is Flow?
  - Flow Vision Elements – Flow Monitor
  - Flow Monitor Example
  - Flow Vision Elements – Flow Learning
  - Flow Learning Example
  - Flow Vision Elements – Flow Generator
  - SIM port attributes and configuration
  - Flow Generator Example
  - Flow Generator + Monitor
  - Flow Generator + Monitor Example
  - Flow Vision Elements – Flow Mirroring
  - Flow Mirror Example
  - Flow Vision - IO Insight and VM Insight
  - Monitoring and Alerting Policy Suite (MAPS)
  - MAPS monitoring categories
  - MAPS Groups, and Conditions
  - MAPS Rules, and Policies
  - MAPS Dashboard
  - Port monitoring using MAPS
  - Monitoring Flow Vision Flow Monitor data with MAPS



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- Fabric performance impact monitoring using MAPS
- Other Features: Fabric Performance Impact (FPI) Monitoring
- Other Features: Configuration and Operational Monitoring

- Policy Automation Services Suite (COMPASS)
  - Other Featureas: ClearLink Diagnostics, Forward Error
- Correction (FEC), Credit Loss/Buffer Credit Recovery
  - Fabric Vision licensing
  - SAN Network Advisor and Fabric Vision technology
- Management and Troubleshooting
  - HPE SAN Network Advisor - its features and editions
  - Configuration backup
  - CP details for B-Series switches and Directors
  - Firmware management and upgrade process
  - General approach
  - Information to collect
  - Supportshow and supportsave
  - Common issues
  - Tools and features to use
  - Diagnostic Tools and D_Port use
  - Checking FRUs status via SAN Network Advisor, Web Tools, and CLI

## Wymagania:

- HPE SAN Essentials I: Administration Fundamentals (HM9Q1S)
- A good technical understanding of networking and storage concepts
- Basic experience in managing Windows systems

## Poziom trudności

## Certyfikaty:

The participants will obtain certificates signed by HPE (course completion).

## Prowadzący:



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Authorized HPE Trainer.



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