

Module 1: MDS 9000 Platform Overview

Lesson 1: MDS 9000 Platform Components

- The MDS 9000 Platform
- The MDS 9000 Modules
- Crossbar and Supervisor Module Architecture
- MDS Switching Module Architectures
- MDS Switching Module Oversubscription
- Exercise: Selecting the Optimum Line Card Installation Guidelines
- Configuring Power Supplies
- Supervisor and Line Card Modules Installation

Lesson 2: Intelligent Fabric Services

- SMB and Enterprise SAN Requirements and Consolidation Methods
- The MDS 9000 Virtual SAN
- MDS Intelligent Services Modules
- I/O Acceleration
- FC-Redirect

Lesson 3: Initial Setup, Fabric Manager, CLI

- Performing the Initial Setup
- Cisco Fabric Manager Server
- Cisco Fabric Manager
- The Command Line Interface

Module 2: Designing SAN Fabrics

Lesson 1: SAN Design Overview

- The SAN Design Methodology
- Small and Midrange Deployments
- Enterprise Data Center Deployments

Lesson 2: Application Architecture

- Application Architecture Tiers
- Presentation Tier Design
- Application Tier Design
- Storage Tier Design
- High-Performance Computing

Lesson 3: Designing Host Connectivity

- Applications and Latency
- Measuring IOPS
- Host I/O Throughput
- Selecting the Optimum Port Type
- Exercise: Calculating Host I/O Requirements

Lesson 4: Designing Storage Connectivity

- Array Architecture Overview
- RAID Overview
- Selecting the Optimum Port Type

Lesson 5: Building the SAN

- Collapsed Core Architecture
- Core-Edge Fabrics
- Oversubscription Considerations
- PortChannels
- Traffic Engineering and QoS

Lesson 6: Redundant Fabric Design

- Redundancy and High Availability
- Redundant Fabrics
- Load Balancing Methods
- Calculating Throughput
- Restricted Bandwidth
- Virtual Fabrics
- IVR Overview

Lesson 7: Simplifying Device Management

- FCID Assignment
- Distributed Device Alias Services
- CFS Infrastructure



Designing Cisco Storage Networking Solutions

Course Outline

Module 3: Consolidating Storage in the Data Center

Lesson 1: Consolidating Storage in the Data Center

- The Benefits of Consolidation
- SAN Fabric Consolidation with VSANs
- Fibre Channel Over Ethernet
- Server Consolidation and Virtualization
- Storage Consolidation
- Storage Virtualization
- FAIS Overview
- Array Based Replication
- Snapshots and Replication
- SANTap and Backup Overview

Lesson 2: Migration and Interoperability

- Multi-Vendor SANs
- Migrating from Third Party Fabrics
- Data Migration
- Simplifying SAN Migration

Lesson 3: iSCSI Host Usage

- Addressing Midrange Application Requirements
- iSCSI Overview
- iSCSI Performance
- When to Deploy iSCSI
- iSCSI Deployment Options
- MDS 9000 iSCSI Options
- MDS 9000 iSCSI High-Availability

Module 4: Securing the SAN

Lesson 1: Securing the SAN Fabric

- Discussion: How Secure is a SAN?
- Loss of Privacy
- AAA Services
- Implementing RBAC
- SAN Vulnerabilities—Data Theft and Integrity
- Zoning Best Practices
- LUN-Level Security
- Denial of Service
- Impersonation

Module 5: Designing SAN Extension Solutions

Lesson 1: Analyzing Business Objectives

- RTO and RPO
- Recovery Methods
- The RDBMS Recovery process
- Snapshots and Replication
- SANTap Overview
- Backup Overview
- Latency and Distance Limitations

Lesson 2: Connecting SANs with Optical Networks

- Dark Fiber
- DWDM
- CWDM
- SONET and SDH
- ONS 15454 MSTP

Lesson 3: Connecting SANs with IP Networks

- FCIP Protocol Overview
- FCIP Topologies
- Comparing SAN Extension Solutions
- Exercise: Selecting an Appropriate Platform

Lesson 4: Tuning FCIP Performance

- Overview of FCIP Tuning Parameters
- Configuring TCP Timeout, Retransmit, and Selective Acknowledgement
- Configuring the MTU
- FCIP Flow Control
- Packet Shaping
- FCIP Compression
- FCIP Write Acceleration
- FCIP Tape Acceleration
- IP QoS Overview
- Using the SAN Extension Tuner
- Buffer Credit Overview
- Exercise: Calculating Buffer Credits



Learning Solutions



Designing Cisco Storage Networking Solutions

Course Outline

Appendix A: SCSI Overview

- SCSI Protocol
- SCSI Addressing
- SCSI Architecture Model
- SCSI Commands
- Building an I/O Request
- Error Handling

Appendix C: Installing Switch Hardware

- Installation Guidelines
- Cabinet and Rack Options
- Configuring Power Supplies
- Installing Fan Modules
- Supervisor and Line Card Modules
- Installation

Appendix B: Fibre Channel Overview

- Fibre Channel Topologies
- Fibre Channel Ports
- Cisco MDS Ports
- FC Layers
- FC Frame Structure
- FC Data Constructs
- FC Flow Control
- Allocating Buffer Credits
- FC Addressing
- Fibre Channel Login
- Zoning Overview

Course Labs

- Lab 1: Initial Switch Configuration
- Lab 2: Configuring Device Aliases and Zoning
- Case Study 1: Designing a Fibre Channel SAN
- Case Study 2: Designing an Enterprise SAN
- Lab 3: Configuring High-Availability SAN Extension
- Lab 4: Configuring IVR for SAN Extension
- Case Study 3: Designing SAN Extension Solutions
- Case Study Solutions



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