

Data Center SAN Design

Length
3 days

Format
Workshop

Track
Support

Version
3.2

Course Description

DCSD is a 3-day interactive workshop that teaches you how to apply the unique features of the Cisco MDS 9000 platform to Data Center SAN designs.

You will learn about the key features of the MDS 9000 platform, and how to leverage these features to build highly available, extensible, intelligent SANs.

This course focuses on interactive design workshops where you will learn to design multiprotocol SANs and SAN extension solutions.

Who Should Attend

This course provides in-depth technical training for pre-sales engineers, system engineers, and network engineers who need to design SAN fabrics using MDS 9000 switches.

Recommended Prerequisites

This course is designed for students who have already taken the 2-day *Cisco Storage Design Fundamentals (CSDF)* course. You should be familiar with the MDS 9000 platform and its key features before you take this course.

Related Training

- Cisco Storage Design Fundamentals (CSDF)
- Designing Cisco Storage Networking Solutions (DCSNS)

DCSD

Learning Objectives

After you complete this course, you will be able to:

- Identify host and storage connectivity and performance requirements
- Design a SAN topology that optimizes fan-in and fan-out, oversubscription, port usage, and redundancy
- Simplify device management with FCID assignment and DDAS
- Explain the options for interoperating with Brocade and McDATA fabrics
- Discuss how key MDS 9000 technologies enable and simplify SAN consolidation
- Explain how to segregate, load-balance, and prioritize application data flows to improve performance
- Design an MDS 9000 iSCSI configuration for mid-range application hosts
- Describe common SAN security vulnerabilities and mitigation techniques
- Discuss key concepts in disaster recovery and business continuity planning
- Design SAN extension solutions using FCIP, WDM, and TDM networks
- Design SAN extension solutions to meet application reliability and performance requirements

Data Center SAN Design

Module 1: MDS 9000 Platform Overview

Lesson 1: MDS 9000 Platform Components

- The MDS 9000 Platform
- MDS 9000 Supervisor Modules
- Oversubscription
- MDS 9000 Modules
- Port Bandwidth Reservation
- Selecting the Optimum Line Card
- Installation Guidelines
- Configuring Power Supplies

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 Host Port Type
- Calculating Host I/O Requirements

Lesson 4: Designing Storage Connectivity

- Array Architecture Overview
- RAID Overview
- Selecting the Optimum Storage Port Type
- LUN Masking on the Array
- LUN Mapping on the Host
- Single Initiator Zoning
- LUN Zoning
- SAN Device Virtualization
- RSCN Issues

Lesson 5: Building the SAN

- Fabric Design Considerations
- Collapsed Core Architecture
- Core-Edge Fabrics
- PortChannels
- Selecting the Correct Switch Port Type

Lesson 6: Redundant Fabric Design

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

Module 3: Consolidating Storage in the Data Center

Lesson 1: Overview of Storage Consolidation

- The Benefits of Consolidation
- Server Virtualization
- Network Consolidation
- Storage Consolidation
- Storage Virtualization
- FAIS Overview

Lesson 2: Business Continuity

- What is Business Continuity?
- Snapshots and Replication
- SANTap Overview
- Data Migration
- Backup Overview
- NASB Overview

Lesson 3: SAN Extension Solutions

- RTO and RPO
- Recovery Methods
- The RDBMS Recovery process
- Latency and Distance Limitations
- DWDM and CWDM
- Credits and Buffers
- SONET and SDH
- ONS 15454 MSTP
- FCIP Protocol Overview
- Planning for High Availability
- Exercise: Selecting an Appropriate Platform



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Course Outline

Lesson 4: Designing Interoperable SANs

- Interoperability Modes
- MultiVendor SANs
- Platform Migration
- Migrating from Brocade and McDATA Fabrics

Appendix A: SCSI Overview

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

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
- FC Login
- Zoning
- Fabric Services
- Well-Known Addresses
- FSPF Routing
- FC Error Handling

Appendix C: MDS 9000 Hardware Installation Reference

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



Learning
Solutions



Data Center SAN Design

Course Labs

- Case Study 1: Designing a Fibre Channel SAN
- Case Study 2: Designing an Enterprise SAN
- Case Study 3: Designing SAN Extension Solutions



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