NetApp

Learning Services Academy

ONTAP SAN Fundamentals

Delivery: Web-based training (WBT) Duration: 60 minutes

Course Description

Learn how NetApp® ONTAP® software supports modern SAN environments. Explore the architecture and functionality of supported SAN protocols including iSCSI, FC, FCoE, and NVMe. Discover storage provisioning methods and learn about multipathing protocols and policies.

Role

Systems administrator and technical support engineer

Prerequisites

- *Introduction to ONTAP*
- *ONTAP Cluster Fundamentals*
- *Introduction to SAN*
- A basic knowledge of storage area networking

Objectives

This course focuses on enabling you to do the following:

- Recognize how ONTAP software provides block access to a host
- Discover how SAN protocols transfer data between a host and a storage system
- Identify storage provisioning methods for ONTAP SAN
- Explore multipathing between the host and a cluster

Course Content

This course includes the following modules and lessons:

Modules	Lessons
Module 1: ONTAP SAN introduction	• ONTAP data management software • NetApp storage portfolio for ONTAP: FAS, AFF, and ASA systems • SAN protocols supported by ONTAP: FC, iSCSI, FCoE, NVMe-oF • Why ONTAP software for SAN?
Module 2: iSCSI	• iSCSI concepts and terminology • iSCSI protocol encapsulation • iSCSI commands • iSCSI SAN architecture • iSCSI SAN configurations • Ethernet network recommendations • iSCSI SAN naming convention • iSCSI sessions
Module 3: FC and NVMe/FC	• FC SAN nodes and ports • NVMe/FC SAN nodes and ports • Storage VM with FlexVol volumes • FC and NVMe/FC frames • FC SAN architecture • FC and NVMe/FC SAN configurations • FC and NVMe/FC network recommendations • FC and NVMe/FC SAN address conventions: physical addressing • FC and NVMe/FC SAN naming conventions: ONTAP physical port identification • FC and NVMe/FC SAN naming conventions: logical addressing • FC and NVMe/FC SAN naming conventions: ONTAP physical port identification
Module 4: FCoE	• FCoE-enabling technologies • FCoE frame structure • FCoE architecture • FC and FCoE zoning

Modules	Lessons
Module 5: NVMe/TCP	• TCP/IP introduction • TCP/IP model: layers • NVMe/TCP introduction • NVMe/TCP characteristics • NVMe/TCP protocol data unit structure • NVMe/TCP protocol data unit segmentation • NVMe/TCP SAN
Module 6: Storage provisioning	• What is a LUN? • Thick provisioning • Thin provisioning • LUN access steps • Deciding which configuration to use • Initiator group • Mapping a LUN • What is an NVMe namespace? • Namespace access steps • Subsystem • Mapping a subsystem
Module 7: Multipathing	• Multipath I/O driver • Multipath I/O improves protection • Multipath I/O path selection policy • Asymmetric logical unit access • Active optimized example: direct path • Active nonoptimized example: indirect path • Symmetric pathing example: All SAN Array • ANA protocol

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