

NETAPP-CMESERIES Configuring and Monitoring NetApp E-Series and EF-Series Storage Systems (NETAPP-CMESERIES)

Modality: Multi-Location Classroom

Duration: 4 Days

About this course:

In this course, you learn how to configure a new E-Series or EF-Series storage system and establish connectivity with a SAN. You use the SANtricity® storage management software and CLI to manage the E-Series and EF-Series controllers. You also use SANtricity storage management software features to restore data. Additionally, you learn how to support and monitor E-Series and EF-Series storage systems by performing various troubleshooting tasks, such as evaluating support data and using the built-in tools to identify storage system errors.

The average salary for a NetApp storage administrator is **\$122,000** per year.

Course Objectives:

- Identify E-Series and EF-Series product hardware
- Cable and connect E-Series or EF-Series systems to a fabric
- Install the SANtricity client on a storage management station
- Configure an E-Series or EF-Series storage system
- Create usable storage space on an E-Series or EF-Series storage system
- Evaluate customers' needs and suggest storage configurations that meet those needs
- Use SANtricity features to restore lost data
- Check E-Series or EF-Series storage system status
- Upgrade and maintain SANtricity and E-Series or EF-Series code levels
- Use the AutoSupport feature
- View and use support data that provides information about E-Series or EF-Series storage systems
- Diagnose management connection issues
- Resolve storage system host-side issues
- Resolve drive failures
- Use SANtricity tools to service E-Series or EF-Series storage systems

Audience:

- This course is designed for Professional Services workers who are NetApp employees, NetApp partners, or NetApp customers.

Prerequisite:

- Basic Windows or Linux administrative experience

Course Outline:

Module 1: E-Series and EF-Series Product Lines

- Describe the features of the E-Series and EF-Series storage product lines
- Identify and describe the components of the controllers and disk shelves
- Interpret the LED indicators

Module 2: Hardware Installation and Cabling

- List the basic steps for installing storage system hardware
- Explain the purpose of shelf IDs
- Describe proper disk-side and host-side cabling techniques
- Explain procedures for cabling controller and disk shelves
- Zone a SAN for redundant access to storage system controllers

Module 3: Storage Management Software

- Install NetApp SANtricity Storage Manager on a Windows or Linux management and data host
- Identify the components of the SANtricity operating system
- Use the SANtricity Storage Manager interface to access and control E-Series or EF-Series storage systems

Module 4: Logical Configuration

- Create logical configurations from physical disks
- Modify logical configuration settings
- Map a volume to an individual host or host group
- Use storage-based partitions to control LUN assignment and volume visibility

Module 5: Monitoring and Troubleshooting the Storage System

- Troubleshoot storage system issues
- Check the system status
- Use logs and storage system tools to identify system issues
- Resolve storage system issues

Module 6: Cache

- Set caching options on the storage system
- Choose caching options to maximize performance and efficiency
- Manage the cache battery
- Configure solid-state drive (SSD) read cache

Module 7: Disaster Recovery with Storage Management Software Features

- Differentiate among the SANtricity Snapshot, Volume Copy, and Remote Volume Mirroring

features

- List the benefits of the Snapshot feature
- List the benefits of the Volume Copy feature
- Describe the functionality of remote mirroring modes
- Use SANtricity features in backup and disaster recovery scenarios

Module 8: Upgrading Storage System Firmware

- Identify the internal code that operates and controls the storage system
- Upgrade code and maintain proper levels of code on the storage system

Module 9: Management Connections

- Diagnose communication issues that involve the management connection
- Define SYMBol and explain SYMBol commands
- Explain operation error conditions for managing storage systems

Module 10: Host-Side and Controller Operation Troubleshooting

- Describe how controllers process data I/O
- Explain normal controller startup
- Distinguish between foreign and native controllers
- Describe controller states

Module 11: Host-Side Multipath Failover

- Describe multipath failover drivers
- Set the appropriate multipath failover driver for your I/O host
- Determine the status of a multipath failover driver
- Troubleshoot issues with multipath failover

Module 12: Drive-Side Operation

- Describe the drive-side I/O communication path
- Describe disk states and hot-spare functionality
- Analyze the drive-channel communication architecture
- Explain operational and error conditions that occur for drive-side cabling
- Describe predictive failure analysis (PFA)

Labs

- Identify hardware components
- Identify controller ports
- Identify E-Series and EF-Series LED indicators
- Install E-Series and EF-Series shelves
- Identify cabling best practices
- Diagram proper zones
- Describe the behavior of seven-segment LEDs

- Install SANtricity software
- Create the storage management domain and explore the enterprise management window
- Explore the script editor and SMCLI
- Explore the array management window
- Configure controller IP addresses for the out-of-band management
- Create a RAID 5 volume group
- Create a volume in a volume group
- Assign a Hot Spare disk
- Create a disk pool
- Create a volume in a disk pool
- Create a thin-provisioned volume in a disk pool
- Change a volume
- Change a disk pool
- Delete a volume
- Define a host
- Create a host group and partitions
- Investigate the AutoSupport feature
- Configure Alerts
- Save support data
- Save and view an event log file
- Use the recovery guru
- Use the onboard backup of the configuration database for disaster recovery
- Examine the storage system configuration and profile
- Use the CLI to evaluate the storage system
- Prepare a volume on a Windows server to receive data
- Prepare a volume on a Linux to receive data
- Test I/O performance based on cache settings
- Test I/O performance based on cache block size
- Recommend volume settings
- Work with SnapShot images for data backup and recovery
- Create and access a volume copy
- Activate asynchronous remote mirroring and create a mirrored pair
- Access mirrored data on a remote storage system
- Use the SnapShot feature with mirror volumes
- Save storage system recovery information
- Update controller firmware and NVSRAM for a storage system
- Update disk shelf ESM Firmware
- Use storage management software to review management connection details
- Use the storage system profile to review management connection details
- Create in-band and out-of-band connections
- Restart the monitoring agent
- Check the network response
- Save, remove, and recover connection files
- Delete and restore the access volume
- Connect to the controller shell
- Set a controller in service mode
- Take a controller offline
- Reset a controller

- View cache attributes
- View battery attributes
- Examine storage and host multipath configurations
- Debug a single-fault multipath scenario
- Debug a double-fault multipath scenario
- Locate disk properties from the management interface
- Locate disk and drive channel properties in the storage system profile
- Recover from a single-disk failure (online volumes)
- Recover from a multiple-disk failure
- Check the cable connections report
- Investigate support data