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Learning Style: Virtual Classroom

Provider: NetApp

Difficulty: Intermediate

Course Duration: 3 Days

ONTAP Performance Analysis (PERFCDOT)



About the Course:

This course enables you to collect and analyze system performance data from NetApp® storage systems that run NetApp ONTAP® 9 software. You learn how to interpret data and how to identify and implement changes that improve system efficiency. You also learn how to use system commands and features to monitor and enhance storage system performance. You learn from hands-on exercises, case studies, and technical discussions.

A NetApp Storage Administrator can earn up to **\$127,000/-** on average, per annum.

Course Objectives:

Once the course is complete, all those enrolled in this course will be able to;

- Describe how to use NetApp tools for performance measurement
- Describe the layers within the ONTAP architecture
- Diagram the flow of read and write requests through the network and data layers of ONTAP software
- Discuss how storage quality of service (QoS) operates in an ONTAP cluster
- Explain how to monitor and manage workload performance
- Use the performance analysis tools to identify NAS and SAN performance obstacles

Audience:

This course is intended to be undertaken by those professionals who are responsible for managing the storage systems in NetApp and wish to further develop their skills and increase their knowledge of Clustered Data ONTAP System Performance.

Prerequisites:

Prior to opting for this course, the candidate should have;

- ONTAP Cluster Fundamentals
- ONTAP Cluster Administration
- Hands-on experience with ONTAP software (6 months to 12 months)

Course Outline:

Module 1: How a NetApp Storage System Works

- NetApp FAS system architecture
- ONTAP architecture layers
- Data access
- NVRAM

Module 2: Performance Analysis Tools

- Performance terminology
- Performance guidelines and methodologies
- Analysis tools and commands
- Output commands
- Tools for performance measurement
- AutoSupport tools
- Perfstat
- OnCommand Insight

Module 3: OnCommand Performance Manager

- Features
- Dashboard
- Performance troubleshooting
- Events
- User defined thresholds

Module 4: CPU and Memory Performance

- CPU performance bottlenecks
- Resolving bottlenecks
- Memory performance bottlenecks
- Resolving bottlenecks

Module 5: WAFL Performance

- WAFL functions
- Inodes
- WAFL readahead
- Resolving WAFL issues
- Best practices

Module 6: Disk I/O Performance

- Disk subsystem hardware and software
- Subsystem bottlenecks
- Analyzing bottlenecks with Statit
- Resolving bottlenecks
- RAID-DP technology

Module 7: Flash Cache and Flash Pool Performance

- Virtual Storage tier
- Flash pool
- Flash cache
- Automatic workload analyzer
- Cache performance issues

Module 8: Cluster Interconnect Performance

- Cluster interconnect uses
- Switchless and switched configurations
- Cluster interconnect bottlenecks
- Bottleneck resolutions

Module 9: Storage QoS

- Managing system performance with QoS
- QoS policies
- Reactive storage QoS
- Proactive storage QoS
- Monitoring commands

Module 10: NAS Performance

- NAS functions
- Bottlenecks
- NAS protocol traffic
- Monitoring NFS usage commands
- Monitoring SMB usage commands
- Bottleneck resolutions

Module 11: SAN Performance

- SAN overview
- Protocols
- FCoE
- iSCSI
- SAN LIFs
- SAN performance issues
- SAN multipathing
- SAN load balancing
- I/O misalignment
- Queue depth

Module 12: Using What You Learned

- Performance overview
- Performance tools
- Windows monitoring and analysis
- Linux monitoring and analysis
- VMware monitoring and analysis

- Slow application performance
- Using performance manager
- Best practices

Labs:

- Identifying cluster components
- Analyzing performance statistics
- OnCommand performance manager thresholds, events and alerts
- Identifying and resolving storage controller performance issues
- WAFL performance monitoring and analysis
- Identifying and resolving disk I/O bottlenecks
- Exploring cache performance
- Cluster interconnect performance
- Workload management with storage QoS
- NAS performance
- SAN protocol performance

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