ZEROWAIT NetApp Training Course Outline

Module 1
Data Storage and NetApp Concepts

- Identify the key features and functions of NetApp® storage systems
- Describe the advantages that a NetApp storage system provides
- Distinguish between network-attached storage (NAS) and storage area network (SAN) topologies
- Describe NetApp unified storage architecture
- Describe how data is written to and read from a WAFL® (Write Anywhere File Layout) file system on a volume
- Explain the WAFL file system concepts, including consistency points (CPs), RAID management, and storage levels
- Describe how RAID is used to protect disk data
- Explain how the WAFL file system processes write and read requests
- Describe the function of Snapshot® copies
- Explain the benefits of Snapshot copies
- Access the NetApp Support site to obtain software and hardware documentation

Module 2
ONTAP Basic Administration

- Connect remotely to a FAS system by using the console and a remote host
- Identify the configuration of network settings and components in the Data ONTAP® operating system
- Explain and configure name resolution services
- Configure routing tables in the Data ONTAP operating system
- Define and create interface groups
- Access OnCommand® System Manager to administer a storage system
- Restrict administrative access
- Restrict console and OnCommand® System Manager access
- Configure a client machine as an administration host to manage a storage system
- Execute commands by using the console, a remote host, and OnCommand® System Manager
- Use commands to analyze a FAS system
- Configure and manage the NetApp AutoSupport™ support tool for a FAS system

Module 3
Disks, Aggregates and Volumes

- Describe Data ONTAP® RAID technology
- Identify a disk in a disk shelf based on its ID
- Execute commands to determine a disk ID
- Identify a hot-spare disk in a FAS system
- Describe the effects of using multiple disk types
- Create a 32-bit and a 64-bit aggregate
- Execute aggregate commands in the Data ONTAP operating system
- List storage efficiency techniques available within the Data ONTAP® operating system
- State factors that impact space consumption in the Data ONTAP operating system
- Describe how and when a volume consumes space from its containing aggregate
- Explain the concepts related to volume in the Data ONTAP® operating system
- Define and create a flexible volume
- Execute vol commands
- Define and create qtrees

Module 4
NFS and CIFS

- Explain NFS implementation in the Data ONTAP® operating system
- License NFS on a storage system
- Explain the purpose and format of /etc/exports
- List and define the export specification options
- Describe the use of the exportfs command
- Mount an export on a UNIX® host
- Describe the CIFS environment
- Configure the storage system to participate in the CIFS environment
- Share a resource on the storage system
- Map a drive from a client to the shared resource on the storage system

Module 5
Multiprotocol Data Access

- Explain the differences ways of implementing file security and permissions in WAFL, UNIX and NTFS file systems.
- Describe WAFLs UNIX, NTFS and MIXED security styles.
- Describe how ONTAP maps user names between UNIX or Windows and the storage system.
- Describe how NTFS Access Control Lists are implemented in ONTAP.

Module 7
SAN – FCP and iSCSI

- Explain the purpose of a SAN
- Identify supported SAN configurations
- Distinguish between Fibre Channel (FC), Fibre Channel over Ethernet (FCoE), and iSCSI protocols
- Define a LUN and explain LUN attributes
- Use the lun setup command and NetApp® System Manager to create iSCSI-attached LUNs
- Access and manage a LUN from a Windows® or Linux host
- Define SnapDrive® data management software and its features

Module 9
High Availability

- Describe high-availability (HA) solutions
- Discuss how high availability increases the reliability of storage
- Define HA controller configuration
- Describe the three modes of HA operation with an HA pair
- Analyze how high availability affects client protocols during failover and giveback operations

Module 6
Quotas

- Understand the difference between User, Group and Tree quotas
- Examine the format and contents of the /etc/quotas file
- Apply quotas to users, groups and qtrees
- Report on system usage via quotas

Module 8
Data Protection

- Identify and execute Snapshot commands
- Schedule Snapshot copies
- Create and delete Snapshot copies
- Configure and modify Snapshot options
- Explain the importance of the .snapshot directory
- Describe how Snapshot technology allocates disk space for volumes and aggregates
- Configure and manage the Snapshot copy reserve
- Snapshot File Recovery and SnapRestore
- SnapMirror, SyncMirror and SnapVault
- List the methods available to back up and recover data
- Use ndmp to process full and incremental data transfers
- Discuss dump and restore
- Describe, enable, and configure Network Data Management Protocol (NDMP) on a storage system