COURSE DESCRIPTION

The *Veritas InfoScale Storage 7.4.2 for UNIX/Linux: Administration* course is designed for IT professionals tasked with installing, configuring, and maintaining Veritas InfoScale Storage environments, including Volume Manager (VxVM), File System (VxFS), Cluster File System (CFS), and InfoScale support for Cloud environments.

This course covers how to use InfoScale Storage to manage disks, disk groups, and volumes using a variety of InfoScale Storage user interfaces, including the Veritas InfoScale Operations Manager (VIOM) Web console. It also discussed the basics of online file system administration and recovery from disk failures. In addition, the course covers data replication using Veritas File Replicator and Veritas Volume Replicator. The course also describes how to configure Veritas Cluster Volume Manager and Veritas Cluster File System.

Delivery Method(s)
This course is available in the following delivery method(s):
- Instructor-led training (ILT)
- Virtual instructor-led training (VILT)
- Learning Lab

Duration
- Instructor-led training (ILT): 5 days, including 6 months of lab access
- Virtual instructor-led training (VILT): 5 days, including 6 months of lab access
- Learning Lab – Self-paced lesson guide plus 6 months of lab access

Course Objectives
After the completion of this course, you will be able to:
- Install and configure the InfoScale Storage environment.
- Create, configure, and manage disks, disk groups, and volumes.
- Administer file systems and manage components in the VxVM architecture.
- Manage multiple paths to disk devices.
- Identify types of disk failures and how to resolve them.
- Describe concepts and components specific to Veritas Volume Replicator and Veritas File Replicator.
- Configure a CFS cluster according to a specified sample design.
- Configure shared disk groups, shared volumes, and shared file systems.
- Share local disks among systems in a cluster (FSS type storage support).
- Describe InfoScale support for Cloud Environments.
- Describe SmartIO support for FSS type storage in Cloud deployments.

Who Should Attend
This course is designed for UNIX/Linux system administrators, system engineers, technical support personnel, network/SAN administrators, and systems integration/development staff, who will install, configure, manage and integrate InfoScale Storage.

Prerequisites
Knowledge of and hands-on experience with UNIX/Linux systems administration is required.

Hands-On
This course includes practical lab exercises that enable you to test your new skills and begin to transfer those skills into your working environment.

COURSE OUTLINE

Storage Foundation Basics

Installing and Licensing InfoScale
- Introducing the Veritas InfoScale product suite
- Tools for installing InfoScale products
- InfoScale Cloud offerings
- Installing Veritas InfoScale Storage
- Installing Veritas InfoScale Availability
- Upgrading Veritas InfoScale Enterprise

Labs: Introduction
- Exercise A: Viewing the virtual machine configuration
- Exercise B: Displaying networking information

Labs: Installation of InfoScale Storage
- Exercise A: Verifying that the system meets installation requirements
- Exercise B: Installing InfoScale Storage and configuring Storage Foundation
- Exercise C: Performing post-installation and version checks

Virtual Objects
- Operating system storage devices and virtual data storage
- Volume Manager (VxVM) storage objects
- VxVM volume layouts and RAID levels

Labs
- Exercise A: Text-based VxVM menu interface
- Exercise B: Accessing CLI commands
- Exercise C: Adding managed hosts (sys1 and sys2) to the VIOM Management Server (mgt)

Creating a Volume and File System
- Volume layouts
- Creating volumes with various layouts
- Allocating storage for volumes
- Preparing disks and disk groups for volume creation
- Creating a volume and adding a file system
- Displaying disk and disk group information
- Displaying volume configuration information
- Removing volumes, disks, and disk groups

Labs
- Exercise A: Creating disk groups, volumes and file systems: CLI
- Exercise B: Removing volumes and disks: CLI
- Exercise C: Destroying disk data using disk shredding: CLI
- Exercise D: (Optional) Creating disk groups, volumes, and file systems: VIOM
- Exercise E: (Optional) Removing volumes, disks, and disk groups: VIOM

Working with Volumes with Different Layouts
- Volume layouts
- Creating volumes with various layouts
- Allocating storage for volumes

Labs
- Exercise A: Text-based VxVM menu interface
- Exercise B: Accessing CLI commands
- Exercise C: Adding managed hosts (sys1 and sys2) to the VIOM Management Server (mgt)

Making Configuration Changes
- Administering mirrored volumes
- Resizing a volume and a file system
- Moving data between systems
- Renaming VxVM objects

Labs
- Exercise A: Administering mirrored volumes
- Exercise B: Resizing a volume and file system
- Exercise C: Renaming a disk group
- Exercise D: Moving data between systems
- Exercise E: (Optional) Resizing a file system only

Managing Devices

SmartIO
- InfoScale Storage 7.4.2 SmartIO
- Support for caching on Solid State Drives (SSDs)
- Using the SmartAssist Tool

Labs
- Exercise A: Configuring VxVM caching
- Exercise B: Configuring VxFS read caching
- Exercise C: Configuring VxFS writeback caching
- Exercise D: (Optional) Destroying cache area

Dynamic Multi-Pathing
- Managing components in the VxVM architecture
- Discovering disk devices
- Managing multiple paths to disk devices

Labs
- Exercise A: Administering the Device Discovery Layer
- Exercise B: Displaying DMP information
- Exercise C: Displaying DMP statistics
- Exercise D: Enabling and disabling DMP paths
- Exercise E: Managing array policies

Veritas Dynamic Multi-Pathing for VMware
- DMP in a VMware ESX/ESXi environment
- Managing DMP for VMware
- Administering the SmartPool
- Performance monitoring and tuning using the DMP console

Resolving Hardware Problems
- How does VxVM interpret failures in hardware?
- Recovering disabled disk groups
- Resolving disk failures

Labs
- Exercise A: Recovering a temporarily disabled disk group
- Exercise B: Preparing for disk failure labs
- Exercise C: Recovering from temporary disk failure
- Exercise D: Recovering from permanent disk failure
- Exercise E: (Optional) Recovering from temporary disk failure—Layered volume
- Exercise F: (Optional) Recovering from permanent disk failure—Layered volume
- Exercise G: (Optional) Replacing physical drives—without hot relocation
- Exercise H: (Optional) Replacing physical drives—with hot relocation
- Exercise I: (Optional) Recovering from temporary disk failure with vxattachd daemon
- Exercise J: (Optional) Exploring spare disk behavior
- Exercise K: (Optional) Using the Support Web Site

Cluster File System

Installing InfoScale Storage for using Cluster File System
- SFCFS overview
- SFCFS architecture
- SFCFS communication
- VCS management of SFCFS infrastructure

Labs
- Exercise A: Performing a pre-installation check using the installer utility
- Exercise B: Installing Veritas InfoScale Storage and configuring Cluster File System
- Exercise C: Configuring the Cluster File System component in an environment with pre-installed InfoScale Storage
- Exercise D: (Optional) Performing post-installation and version checks
- Exercise E: Verifying cluster communications
- Exercise F: Adding managed hosts to the VIOM management server

Cluster Volume Manager
- VxVM and CVM overview
- CVM concepts
- CVM configuration
- CVM response to storage disconnectivity

Labs
- Exercise A: Creating shared disk groups and volumes using CLI
- Exercise B: Creating a shared disk group and volume using VIOM
- Exercise C: Converting a disk group from shared to private and vice versa
- Exercise D: Investigating the impact of the disk group activation modes
- Exercise E: (Optional) Observing the impact of rebooting the master node in a storage cluster

Cluster File System
- Cluster File System concepts
- Data flow in CFS
- Administering CFS Flexible Storage Sharing

Labs
- Exercise A: Creating a shared file system – CLI
- Exercise B: Changing the primary node role – CLI
- Exercise C: Placing the shared file system under the storage cluster control – CLI
- Exercise D: Deleting shared file systems and disk groups

Flexible Storage Sharing
- Understanding Flexible Storage Sharing
- FSS storage objects
- FSS case study
- Flexible Storage Sharing implementation
- FSS configuration

Labs
- Exercise A: Administering flexible storage sharing (FSS)
- Exercise B: Testing flexible storage sharing

Replication

Disaster Recovery and Replication Overview
- Disaster recovery concepts
- Defining replication
- Replication options and technologies
- Veritas technologies for disaster recovery

Veritas File Replicator
- Veritas Volume Replicator overview
- Comparing volume replication with volume management
- Volume Replicator components
- Volume Replicator data flow

Labs
- Exercise A: Setting up and performing replication for a VxFS file system
- Exercise B: Restoring the source file system using the replication target

Veritas Volume Replicator Components
- Veritas Volume Replicator overview
- Comparing volume replication with volume management
- Volume Replicator components

- Volume Replicator data flow

Veritas Volume Replicator Operations
- Replication setup
- Assessing the status of the replication environment
- Migration, takeover, and fast failback

Labs
- Exercise A: Preparing storage for replication
- Exercise B: Establishing replication
- Exercise C: Observing data replication
- Exercise D: Migrating the primary role

InfoScale support for Cloud environments
- Overview of InfoScale solutions in cloud Environments
- Preparing for InfoScale installations in cloud environments
- Configurations for cloud environments
- Troubleshooting issues in cloud environments

Labs
- Exercise A: Verify S3 server details (sys3)
- Exercise B: Create InfoScale storage support for S3 connector
- Exercise C: (Optional) Create FSS and SmartIO type storage and backup data to S3 server

Challenge Lab (Linux)
- Exercise A: Create a 4-Node storage cluster (CVM type)
- Exercise B: Create a local mount point (VxFS type) and backup data to S3 server (sys3)
- Exercise C: Create a FSS storage type cluster mount point and backup data to S3 server (sys3)

Appendix A: Working with Erasure coding
- Erasure Coded Overview
- Erasure Coded Architecture
- Erasure Coded volume enhancements in 7.4
- Erasure Coded performance comparison