Veritas InfoScale Storage 8.0 for UNIX/Linux: Administration

Course Number: VIS8-STOR

Duration: 5 days

Course Description

The Veritas InfoScale Storage 8.0 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 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 and support for cloud environments.

Skills Gained

After completing 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 Can Benefit

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.

Course Details

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
- Exercise A: Viewing the Virtual Machine Configuration
- Exercise B: Displaying Networking Information
- Exercise C: Verifying that the System Meets Installation Requirements
- Exercise D: Installing InfoScale Storage and Configuring Storage Foundation
- Exercise E: 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
- Veritas InfoScale Operations Manager (VIOM): Overview

- Exercise A: Using Text-based VxVM Menu Interface
- Exercise B: Accessing CLI Commands
- Exercise C: Adding Managed Hosts to the VIOM Management Server
- Exercise D: Working with the VIOM GUI Dashboard and Inventory Information
- Exercise E: Exploring the VIOM GUI Licensing Option
- Exercise F: Working with the VIOM GUI Settings Option

Creating a Volume and File System

- 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
- 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
- Exercise A: Creating Volumes with Different Layouts (CLI)
- Exercise B: Creating Erasure Coded Volume for Object Store (CLI)
- Exercise C: (Optional) Creating Volumes with User Defaults (CLI)

Making Configuration Changes

- Administering Mirrored Volumes
- Resizing a Volume and a File System
- Moving Data Between Systems
- Renaming VxVM Objects
- 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 Only the File System

Administering File Systems

- Veritas File System: Benefits
- Using Veritas File System Commands
- Veritas File System: Logging
- Controlling File System Fragmentation
- Using Thin Provisioning Disk Arrays
- Exercise A: Preparing to Defragment the Veritas File System
- Exercise B: Defragmenting a Veritas File System
- Exercise C: Working with SmartMove
- Exercise D: Observing Thin Reclamation

Managing Devices

SmartIO

- InfoScale Storage 8.0: SmartIO
- Support for Caching on Solid State Drives
- Using the SmartAssist Tool
- Exercise A: Configuring VxVM Caching
- Exercise B: Configuring VxFS Read Caching
- Exercise C: Configuring VxFS WriteBack Caching
- Exercise D: (Optional) Destroying the Cache Area

Dynamic Multi-Pathing

- Managing Components in the VxVM Architecture
- Discovering Disk Devices
- Managing Multiple Paths to Disk Devices
- 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

Resolving Hardware Problems

- VxVM and Hardware Failures
- Recovering Disabled Disk Groups
- Resolving Disk Failures
- Exercise A: Recovering a Temporarily Disabled Disk Group
- Exercise B: Inducing a Disk Failure in the Lab Environment
- 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

Storage Foundation Cluster File System Architecture

- Storage Foundation Cluster File System: Overview
- SFCFS Architecture
- SFCFS Communication
- VCS Management of SFCFS Infrastructure
- 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 Cluster File System in a Pre-Installed InfoScale Storage Environment
- 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

- Volume Manager and Cluster Volume Manager: Overview
- Cluster Volume Manager: Concepts
- Cluster Volume Manager: Configuration
- CVM Response to Storage Disconnectivity

- Exercise A: Creating Shared Disk Groups and Volumes (CLI)
- Exercise B: Creating a Shared Disk Group and Volume (VIOM)
- Exercise C: Converting a Disk Group from Shared to Private and Vice-versa
- Exercise D: Investigating the Impact of 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
- Group Lock Manager
- Administering CFS
- Exercise A: Creating a Shared File System (CLI)
- Exercise B: Changing the Primary Node Role (CLI)
- Exercise C: Placing the Shared File System Under Storage Cluster Control (CLI)
- Exercise D: Deleting the Shared File System and Disk Groups

Flexible Storage Sharing

- Understanding Flexible Storage Sharing
- Flexible Storage Sharing: Storage Objects
- Flexible Storage Sharing Case Study
- Flexible Storage Sharing: Implementation
- Flexible Storage Sharing: Configuration
- Exercise A: Administering Flexible Storage Sharing
- 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

- Understanding Veritas File Replicator

- Setting up Replication for a Veritas File System
- Error Recovery with Veritas File Replicator
- 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

- Configuring the Replication Setup
- Assessing the Status of the Replication Environment
- Performing Migration, Takeover, and Fast Failback Operations
- 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

- InfoScale Solutions for Cloud Environments
- Preparing for InfoScale Installations in Cloud Environments
- Configuration for Cloud Environments
- Support for Kubernetes on Linux
- Troubleshooting Issues in Cloud Environment
- Exercise A: Configuring REST API Server
- Exercise B: Verifying S3 Server Details
- Exercise C: Creating InfoScale Storage Support for S3 Connector
- Exercise D: (Optional) Creating FSS and SmartIO Type Storage and Backing Up Data to the S3 Server
- Exercise E: Adding VIOM Management Server in the Global Reports Perspective
- Exercise F: Generating VIOM Reports

Appendix A: Working with Erasure coding

- Erasure Coded: Overview
- Erasure Coded Architecture
- Erasure Coded Volume Enhancements: InfoScale 7.4
- Erasure Coded Performance Comparison

Challenge Lab (Linux)

- Task A: Creating a 4-Node Storage Cluster (CVM Type)
- Task B: Creating a Local Mount Point (VxFS Type) and Backing Up Data to S3 Server
- Task C: Creating an FSS Storage Type Cluster Mount Point and Backing Up Data to S3 Server