



COURSE DESCRIPTION

The *Veritas InfoScale Storage 7.3 for UNIX/Linux: Advanced Administration* course, discusses how to integrate, manage, operate, and utilize Veritas InfoScale Storage advanced features, which include Dynamic Multi-Pathing, Smart Tiering, Docker support, Performance Tuning, and Snapshots - in a UNIX environment.

You learn how to manage the VxVM Private Region and understand different disk layouts, disk group management, and how to build volumes from scratch. You also learn about disk group split, move and joins, volume relayout, volume sets, multivolume file systems, online file system administration, remote mirroring across sites, offline and off-host processing using volume snapshots and storage checkpoints, and dynamic storage tiering.

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

By the completion of this course, you will be able to:

- Manage the advanced features of Veritas Storage Foundation.
- Configure and manage disks, disk groups, and volumes.
- Administer Veritas File System advanced features.
- Manage the Dynamic Multi-Pathing feature.
- Apply performance tuning principles to Veritas Volume Manager, Veritas File System and Dynamic Multi-Pathing.
- Monitor VxVM and change volume layouts to improve performance.
- Create and manage point-in-time copies for off-host and on-host processing.
- Manage LUN snapshots.
- Remotely mirror your data across different sites.
- Use dynamic storage tiering for optimal storage allocation.
- Provision storage in a Docker environment.

Who Should Attend

This course is for UNIX system or network administrators, system engineers, technical support personnel, and system integration/development staff who will be administering Veritas Storage Foundation advanced features.

Prerequisites

Veritas InfoScale Storage 7.3 for UNIX Knowledge of UNIX system administration.

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

Volume Manager Overview

- Supported upgrade paths
- Upgrade considerations
- Operating system storage devices and virtual data storage

Labs

- Exercise A: Installing Storage Foundation
- Exercise B: Upgrading from Storage Foundation to InfoScale Storage
- Exercise C: Creating disks with different disk types and formats

Managing VxVM Components

- Managing components in the VxVM architecture
- Volume Manager storage objects
- Volume layouts
- Viewing object attributes

Labs

- Exercise A: Creating a disk group containing non-cds disks
- Exercise B: Converting non-cds disks in a disk group to the CDS disk format
- Exercise C: Creating volumes with different layouts
- Exercise D: Creating layered volumes
- Exercise E: Creating volumes with user defaults

Advanced Disk Group Operations

- Disk group information
- Disk group split, move, and join
- Disk group backup/restore
- Advanced Volume Operations
- Using vxmaketo create volume manager objects
- Changing the volume layout
- Online relayout process
- Managing volume tasks
- Securing data at rest

Labs

- Exercise A: Preparing for disk group split/move/join operations
- Exercise B: Performing vxdbg split and join operations specifying volume objects
- Exercise C: Performing vxdbg split and join operations specifying disk objects
- Exercise D: Performing vxdbg join operations when conflicting objects exist
- Exercise E: Performing vxdbg move operations
- Exercise F: Performing configuration backups

File System Architecture

- VxFS layout versions
- Components and attributes of Veritas File System

Labs

- Exercise A: Viewing the file system metadata

File System Advanced Features

- Compressing files and directories with VxFS
- Using the FileSnap feature
- Deduplicating VxFS data
- Migrating a native file system to VxFS

Labs

- Exercise A: Compressing files and directories with VxFS
- Exercise B: Deduplicating VxFS data
- Exercise C: Using the FileSnap feature
- Exercise D: Migrating a native file system to VxFS

Dynamic Multi-Pathing Administration

- DMP/DDP overview
- Event Source Daemon
- ASL/APM administration
- DDL/DMP CLI administration

Labs

- Exercise A: Perform DMP testing using the vxdmpadm command
- Exercise B: Perform DMP testing using the vxcheckasl command
- Exercise C: Perform DMP testing using the vxdisk command
- Exercise D: Perform DMP testing using the vxddladm command

Dynamic Multi-Pathing Advanced Operations

- Subpath failover groups
- Array/enclosure management
- Online dynamic LUN reconfiguration
- DDL/DMP enhancements

Labs

- Exercise A: Listing Subpath Failover Groups (SFG)
- Exercise B: Tuning the Low Impact Path Probing (LIPP) attributes
- Exercise C: Differentiating manually disabled paths

Volume Sets and MVFS Management

- Creating and managing volume sets
- Creating and managing multi-volume file systems
- Volume device visibility
- Administering raw device access

Labs

- Exercise A: Configuring a volume set with a multi-volume file system
- Exercise B: Configuring device visibility

Implementing SmartTier (ST)

- Introducing SmartTier
- Defining the SmartTier concepts

- Creating storage tiers
- Implementing file placement policies

Labs

- Exercise A: Configuring a multi-volume file system and SmartTier
- Exercise B: Testing SmartTier

Co-existence with Array-based Snapshots

- Understanding snapshot technologies
- Identifying hardware snapshots using Volume Manager
- Managing clone disks
- Using disk tags

Labs

- Exercise A: LUN snapshots setup
- Exercise B: Importing clone disk groups

Using Full-Copy Volume Snapshots

- Creating and managing full-copy volume snapshots
- Using volume snapshots for off-host processing

Labs

- Exercise A: Full-sized instant snapshots
- Exercise B: Off-host processing using split-mirror volume snapshots
- Exercise C: Traditional volume snapshots

Using Copy-on-Write SF Snapshots

- Creating and managing space-optimized volume snapshots
- Creating and managing storage checkpoints
- Serving business requirements

Labs

- Exercise A: Using space-optimized instant volume snapshots
- Exercise B: Restoring a file system using storage checkpoints
- Exercise C: Examining storage checkpoint behavior

Performance Monitoring and Management

- Performance benchmarking tools
- Ensuring quality of service

Labs

- Exercise A: Using vxbench and vxstat
- Exercise B: Tracing I/O
- Exercise C: Maintaining quality of service

Performance Tuning

- Understanding the environment
- VxVM tunables and volume best practices
- VxFS tunables, inode cache and cache advisories
- DMP tunables

Labs

- Exercise A: Benchmarking
- Exercise B: Isolating performance issues

Using Site Awareness with Mirroring

- Introducing remote mirroring and site awareness
- Configuring site awareness
- Recovering from failures with remote mirrors

- Verifying a site-aware environment

Labs

- Exercise A: Configuring site awareness
- Exercise B: Analyzing the volume read policy
- Exercise C: Analyzing the impact of disk failure in a site-consistent environment
- Exercise D: A manual fire drill operation with remote mirroring

Support for Docker Deployments

- Docker overview
- Introducing support for Docker deployments
- Provisioning storage to Docker containers
- Additional features and limitations

Labs

- Exercise A: Preparing the Docker environment
- Exercise B: Creating volumes for use with Docker containers
- Exercise C: Moving Docker containers