Solaris 10 ZFS Administration

Course Summary

Length: 3 days

Prerequisite: Solaris System Administration Part 1 or equivalent experience

Recommendation Statement:
The student should have completed the Solaris 10 System Administration Part 1 course or should have five months of experience administering the Solaris operating system.

Course Description:
This course teaches the student how to create, administer and utilize ZFS file systems. You'll understand when and where to use ZFS file systems over traditional UNIX file systems. The course will teach you how to plan, configure and administer ZFS file systems in the Solaris operating environment.

Upon completion of this course, you will have an:

- Understanding of ZFS terms and concepts.
- Understand how to plan a ZFS environment for real world environments.
- Understand when to use ZFS file systems over traditional file systems and logical volumes.
- Understand how to create and manage ZFS storage pools and file systems.
- Understand how to migrate SVM and UFS file systems to ZFS
- Understand how to create bootable ZFS pools.
- Understand how to create a ZFS root file system during the installation of the Solaris OS.
- Understand how to troubleshoot ZFS failures and perform data recovery operations.
- Understand how to create ZFS snapshots and clones
- Understand the methods used to backup ZFS file systems and snapshots
- Using ZFS with Solaris Zones
- Understand best practices when tuning ZFS
- Troubleshooting ZFS and recovering storage pools

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Detailed Course Outline

Introduction to the ZFS File System

- Understand ZFS: features and benefits
- ZFS Terms and components
- Hardware and Software requirements
- Choosing a file system: Comparing ZFS, UFS, SVM and Veritas

Getting Started with ZFS

- Create a basic ZFS file system
- Create a ZFS storage pool
- ZFS file system hierarchy
- Hardware requirements
- Overview of ZFS versions

How Does ZFS Differ from a UFS File System (and Solaris Volume Manager)

- File system granularity
- ZFS space accounting
- Mounting ZFS file systems
- Volume management

Protecting ZFS files with ACLs

- The Solaris ACL model
- Setting and Displaying ACLs on ZFS files

Using a ZFS File System on the Boot Disk (includes a discussion on Live Upgrade)

- Requirements for using ZFS on the root (boot) disk
- Understand the advantages of using ZFS on the boot disk
- Installing a ZFS root file system during an initial installation
- Installing a ZFS root file system during a JumpStart installation
- Migrating a UFS root file system to a ZFS root file system with Solaris Live Upgrade
- Migrating an SVM based root file system to a ZFS root file system with Solaris Live Upgrade
- Using ZFS for swap and dump devices
- Booting from a ZFS root file system

Managing ZFS Storage Pools

- Describe the Components of a ZFS Storage Pool
- Replication Features of a ZFS Storage Pool: non-redundant stripes, mirroring, RAID-Z
- Creating and Destroying non-redundant striped, mirrored, RAIDZ (single, double and triple parity) ZFS Storage Pools
- Managing Devices in ZFS Storage Pools
- Understand EFI and SMI disk labels
- Managing ZFS Storage Pool Properties
- Querying ZFS Storage Pool Status
- Migrating ZFS Storage Pools
- Upgrading ZFS storage pools
- Splitting mirrored ZFS storage pools

Managing ZFS File Systems

- Creating and Destroying ZFS File Systems
- Understanding and Utilizing ZFS Properties
- Querying ZFS File System Information
- Managing ZFS Properties
- Mounting and Sharing ZFS File Systems
- ZFS Quotas and Reservations

Working with ZFS Snapshots and Clones

- Overview of creating and managing ZFS Snapshots
- Overview of ZFS Clones
- Sending and Receiving ZFS Data Streams for backing up live file systems
- Rolling back a snapshot
- Replacing a ZFS file system with a clone (promoting clones)

ZFS: Delegated Administration

- Overview of ZFS Delegated Administration
- Delegating ZFS Permissions
- Displaying ZFs Delegate permissions
- Using ZFS Delegated Administration
- Removing ZFS Permissions
- Delegating ZFS administration to a Zone

ZFS and Zones

- Adding ZFS volumes and file systems to a non-global zone
- Delegating datasets to non-global zones
- Using ZFs storage pools in a zone
- Managing ZFS properties in a zone

ZFS: Advanced topics

- ZFS Volumes
- Using ZFS on a Solaris 10 System when Zones are Installed
- Using ZFS Alternate Root Pools
- Booting to alternate root pools
- ZFS Rights Profiles
- Patching ZFS Root Pools
- ZFS monitoring tools
- ZFS web-based management
- Understand the ZFS intent log (ZIL)

ZFS Tuning

- ZFS Best practices
- ZFS Tunables (ARC Cache, Checksums, tune Database performance)

ZFS: Troubleshooting and Data Recovery

- Identify ZFS Problems and Failures
- Determine the type of device failure
- Checking the integrity of the ZFS Data
- Repairing a Damaged ZFS Configuration
- Resolving a missing device
- Replacing disks in a ZFS pool
- Troubleshooting and repairing the ZFS boot disk
- Recovering data in a damaged ZFS file system
- Repairing an unbootable system
- ZFS Storage pool recovery
- Understand zpool status output
- Understand system reporting of ZFS error messages and syslogd