

Oracle Solaris 11 System Administration

Course Summary

Length: 5 Days

Prerequisite: Solaris fundamentals course

Recommendation Statement:

It is assumed that the student has an understanding of UNIX. You must be familiar with basic UNIX commands, and the VI editor. The Solaris fundamentals course or an equivalent Unix SVR4 fundamentals course is recommended.

Course Description:

This course teaches basic topics in Solaris system administration. The operating system will be Oracle Solaris 11.2. Both SPARC-based and x86-based versions of Solaris are covered in this course. Students will have access to both SPARC and x86-based Solaris servers to perform their labs.

This course prepares the student for the Oracle Certified Associate, Oracle Solaris 11 System Administrator Certification Exam (1Z0-821), including the Upgrade to Oracle Solaris 11 System Administrator Exam (1Z0-820).

Upon completion of this course, you should be able to:

- Perform system boot and shutdown procedures (SPARC and x86 architectures)
- Administer the Service Management Facility (SMF)
- Manage and Update software with the Image Packaging System (IPS)
- Understand Boot Environments
- Administer storage devices
- Understand to ZFS File Systems
- Perform Advanced ZFS Management tasks
- Install the Solaris 11 Operating environment
- Create and administer user accounts
- Manage system processes
- Understand how to secure the system
- Perform OS backups and restorations
- Configure the network interface, setup virtual network components and network services
- Understand Solaris virtualization concepts (Zones, Containers, Logical Domains and Partitions)
- Administering Solaris Zones
- Setup a virtual network between Zones
- Manage crash dumps and core files
- Troubleshoot Solaris systems

Oracle Solaris 11 System Administration
Detailed Course Outline

Overview of the Solaris 11 Operating Environment

- Solaris 11 System concepts and features
- Describe the Solaris 11 Directory Hierarchy

System Startup and Shutdown Procedures – SPARC-Based Systems

- Understand all of the phases of the boot process on a SPARC system
- Booting to a ZFS boot disk
- OpenBoot commands and options for Solaris boot environments
- The Integrated Lights Out Manager (ILOM)
- Understanding OpenBoot and how to control the boot process
- Understand the various shutdown procedures including interrupting an unresponsive system

System Startup and Shutdown Procedures – x86/x64-Based Systems

- Understand phases of the boot process – x86-based systems
- The BIOS, Boot archive, and GRUB
- Booting to a ZFS boot disk
- Configuring the video display
- Understand the pros and cons of the various shutdown procedures

GRUB – Grand Unified Bootloader (x86/x64 platform)

- Introduction to GRUB and the GRUB boot process
- Modifying boot behavior with GRUB
- Use the eeprom and kernel commands
- GRUB device naming conventions
- Interrupting and unresponsive system

Service Management Facility (SMF)

- Understand the role of the SMF and the phases of the boot process
- Administer services and service instances
- Understand the Fault Management Resource Identifier (FMRI)
- Service dependencies
- SMF command line administration utilities
- Display information about services
- Understand and Modify the SMF repository including recovering a corrupt database
- Starting and stopping services using SMF
- Create SMF Manifests and Profiles
- Modifying services and service properties
- Creating custom services
- Understand Milestones and Run Levels
- SMF message logging
- Using run control scripts to stop / start legacy services
- Understand the Fault Management Architecture
- Configure SMF notifications
- Diagnose SMF and FMA errors

Installing the Solaris 11 Software

- Understand the requirements for installing the Solaris 11 software
- Understand the methods of installing the Solaris 11 software
- Install the OS using the Text Installer
- Verify updates and OS level

Managing and Updating Software with IPS

- Understand the Image Packaging System (IPS)
- Understand the IPS repository and software publishers
- Update the OS by using IPS
- Install and manage software packages

- Understand boot environments (BE's)
- Create boot environments (BE's)
- Administer boot environments (BE's)
- Troubleshoot software update issues

Administering Storage Devices

- Describe Solaris device naming conventions and location of device drivers and modules
- Understand physical, logical, block, and character devices
- Understand how to trace devices from the OS device to the hardware component
- Troubleshooting access to devices
- Reconfiguring devices
- Administering LUNs and SAN storage devices

Managing File Systems

- Understand differences between Solaris file systems: ZFS, SVM, UFS , VxFS
- Disk label (EFI vs. SMI labels)
- Formatting disks
- Understand the root file system including backup and recovery techniques
- Displaying disk configuration information

Introduction to the ZFS File System

- Introduction to ZFS
 - ZFS Terms
 - Hardware and Software requirements for ZFS
 - What is Self-Healing?
- ZFS RAID configurations
- ZFS Components
 - Disks, Files, Virtual Devices
 - Naming conventions
- Create a ZFS file system
 - Rename a ZFS file system
 - Listing the ZFS file systems
- Using ZFS on the boot disk
 - Creating a mirrored root pool
 - Booting a ZFS root file system
 - ZFS related OpenBoot commands
 - Multiple ZFS boot environments
 - Booting and recovering a ZFS file system
 - Replacing a disk in a ZFS root pool
 - Boot from an Alternate Disk in a Mirrored ZFS Root Pool
 - Creating root pool snapshots
 - Recreate a ZFS Root Pool and Restore Root Pool Snapshots
 - Roll Back Root Pool Snapshots
- Remove a ZFS file system
- Remove a ZFS Storage Pool
- Using disks in a ZFS storage pool
- Using files in a ZFS storage pool
- Mirrored storage pools
 - Converting a non-redundant pool to a mirrored pool
 - Detach a device from a mirrored pool
- RAID-Z storage pools
- Displaying ZFS storage pool information
- Adding devices to a ZFS storage pool
- Attaching and Detaching devices in a storage pool
- Taking storage pool devices offline and online
- ZFS history
- ZFS properties
 - Native and settable properties
 - Setting ZFs properties

ZFS quotas
Mounting ZFS file systems
Legacy mount points
Encrypted ZFS file systems
ZFS Web-based management GUI

- ZFS snapshots
 - Creating snapshots
 - Listing snapshot information
 - Saving and Restoring a ZFS snapshot
 - Renaming a ZFS snapshot
 - Rolling back a ZFS snapshot
 - Save/Restore to a remote system
- ZFS Clones
 - Creating and destroying ZFS clones
 - Replacing a ZFS file system with a ZFS clone
- Zpool scrubbing
- Replacing Devices in a Storage Pool
- Using ZFS with Solaris Zones
 - Adding a ZFS dataset to a non-global zone
 - Delegating a ZFS dataset to a non-global zone
- Emulated volumes
 - Using ZFS as a swap or dump device
- Designating hot spares in a storage pool
- Understand ZFS shadow migration and how to migrate a UFS filesystem to ZFS

Administering an Oracle Solaris Zone

- Describe the advantages of Zones
- Understand Zones and Containers
- Solaris Zones
 - Types of Zones
 - solaris10 brand zones
 - Configuring/Installing solaris10 zones on a Solaris 11 host
 - Immutable Zones
- Zone States
- Zone Features
- Zone Resource Allocation
- Understand Virtual networks in a Solaris zone
- Non-global Zone Root
- Networking in a Zone Environment
- Zone Daemons
- Configuring a Zone
 - The “zonecfg” command and subcommands
 - Zonecfg resource types
 - Creating a whole root Zone
 - Creating a sparse root zone
 - Using a profile when configuring a zone
- Viewing the Zone Configuration File
- Installing a Zone
- Booting a Zone
- Halting a Zone
- Rebooting a Zone
- Uninstalling a Zone
- Deleting a Zone
- Making modifications to an existing zone
- Moving a Zone
- Cloning a zone
- Migrating a zone
- Backing up a zone
- Restore a zone
- Zone Login
 - Initial Zone Login
 - Logging in to the Zone Console
 - Logging in to a Zone
 - Running a Command in a Zone

- Security Considerations when Using Solaris Containers
- Introduction to Solaris Resource Manager
 - Resource controls
 - Using resource controls to contain zones
- Upgrade the Solaris OS with installed Zones
- Patch the Solaris OS with installed Zones
 - Patch the global zone
 - Patching non-global zones
- Assessing a zone configuration
- Monitoring a zone
- Zone Security with immutable zones

The Solaris Network Environment

- Understand and Administer Datalinks
- Configure Network interfaces
- Configuring Network Services
- Verify Network Connectivity and Troubleshooting
- Understand Solaris virtual networking
- Configure virtual network components and virtual networks
- Configure a virtual network between zones

System Security

- Control system and root access from the ILOM level, OpenBoot level and OS level
- Understand where how to protect user account information
- Control file access
- Audit users and activity
- Understand how to secure network services
- Secure root access
- Setup root as a role
- Secure OS services in the Service Management Facility
- The secure shell (SSH)
- Secure file system data

Administering User Accounts

- Describe user administration fundamentals
- Adding, modifying, and deleting user and group accounts from the command line
 - Setting up and customizing the user's shell
- Managing initialization files
- Setting user disk quotas
- Understand the root role

Controlling System Processes

- Viewing system processes
- Commands used to monitor system resources and processes
- Use Dtrace to view details about a process
- Monitor swap space

Backup and Recovery

- Understand ZFS backup and recovery procedures in Solaris 11
- Backup the boot disk (/)
- How to boot a system to repair a damaged root pool
- Recovering root (/)
- Backing up a mounted file system
- Creating a ZFS snapshot
- Backing up ZFS snapshots
- Rolling back and restoring data from a ZFS snapshot
- Backup and Recovery techniques used on production systems

Monitoring System Logs and Crash Recovery Files

Understand Solaris 11 system logs and where they are located
Configure crash dump files
Configure core dump files

Perform Basic Troubleshooting

Troubleshoot system installation issues
Troubleshoot boot issues
Troubleshoot Network connectivity
Troubleshoot login issues
Troubleshoot file systems