

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 11.4. 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)
- Manage Services and Administer the Service Management Facility (SMF)
- Manage and Update software with the Image Packaging System (IPS)
- Manage the Image Packaging System (IPS), Packages and Repositories
- Understand and Manage Boot Environments
- Administer storage devices
- Create and Manage 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)
- Administer Solaris Zones
- Setup a virtual network between Zones
- Manage crash dumps and core files
- Troubleshoot Solaris systems

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Detailed Course Outline

Overview of the Solaris 11 Operating Environment

- Solaris 11 Operating Environment 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
- Understand how to Access and Operate the Integrated Lights Out Manager (ILOM) Environment
- Understand 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
- Configure 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
- Interrupt an 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
- Enable and Disable services using SMF
- Create SMF Manifests and Profiles
- Modify services and service properties
- Create 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

Install 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

Manage and Update Software with IPS

- Understand the Image Packaging System (IPS)
- Understand the IPS repository and software publishers
- Create and Update a local software repository
- Update the Solaris Operating Environment on a Live system
- Install and manage software packages
- Troubleshoot software update issues
- Keep the system secure with Security Updates
- Use the `solaris-11-cpu` package to administer CVE updates
- Obtain and Install Support Repository Updates (SRUs)
- Manage CPU, CVE, SRU, Firmware and Solaris “dot” releases updates

Manage the Image Packaging System (IPS), Packages and Repositories

- Create and Manage a Network Repository
- Manage multiple local repositories
- Customize a Repository
- Create a mirrored repository
- Configure publisher stickiness, rankings, and search order

Manage Solaris 11 Boot Environments (BE)

- Understand Solaris BE's
- Create a new boot environment on the SPARC and x86 platforms
- Mount and unmount an inactive BE
- Create a backup of a BE
- Install and uninstall a package on an inactive mounted BE
- Update a BE
- Modify a BE
- Create a BE from a backup
- Activate a BE on the SPARC and x86 platforms
- Manage multiple BE's
- Utilize BEs in zones

Administer ZFS File System

- Introduction to ZFS and the Advantages of using ZFS over conventional UNIX filesystems
- Understand ZFS RAID configurations
- Understand ZFS Components (Disks, Files, Virtual Devices, Naming conventions and Terminology)
- Create a ZFS file system
- Rename a ZFS file system
- List the ZFS file systems
- Understand ZFS on the boot disk
 - Create a mirrored root pool
 - Understand the Boot Process when booting to a ZFS disk
 - ZFS related OpenBoot commands
 - Understand how ZFS is used to build boot environments
 - Recovery techniques for repairing a failed a ZFS file system and boot drive
 - Replacing a disk in a ZFS filesystem and a ZFS root pool
 - Boot from an Alternate Disk in a Mirrored ZFS Root Pool
 - Create and store 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 and 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
- Display and interpret ZFS storage pool information

- Add devices to a ZFS storage pool
- Attach and Detach devices in a storage pool
- Take storage pool devices offline and online
- Display ZFS history
- Understand the types of ZFs Storage Pools and Filesystem properties
 - Setting ZFS properties
- Set ZFS quotas and space reservations
- Mount ZFS file systems
- Legacy mount points
- Create and manage Encrypted ZFS file systems
- Create/List/Save/Restore/Rollback ZFS snapshots
- Create, Destroy and Promote ZFS clones
- Preventative maintenance on ZFS storage pools
- Replace Devices in a Storage Pool
- Use ZFS with Solaris Zones
- Create and Manage Emulated volumes
- Designate hot spares in a storage pool
- Understand ZFS shadow migration and how to migrate a UFS filesystem to ZFS

Administer Oracle Solaris Zones

- Describe the advantages of Zones
- Understand non-global Zones, Kernel Zones and Containers
- Solaris Zones
 - Types of Zones
 - solaris10 brand zones
 - Configuring/Installing solaris10 zones on a Solaris 11 host
- Display and interpret Zone States
- Zone Resource Allocation
- Configure the network in a Zone
- Configure a Virtual Network between Solaris zones
- Understand Zone Daemons
- Configure a Zone and Zone Resources
- Use a configuration profile when configuring a zone
- View and interpret the Zone Configuration File
- Install a Zone
- Boot a Zone
- Halt a Zone
- Reboot a Zone
- Uninstall a Zone
- Delete a Zone
- Modify a Zone
- Move a Zone
- Clone a zone
- Back up a zone
- Restore a zone
- Zone Login
- Using resource controls to contain zones
- Upgrade software and the OS on the global and non-global Zones
- Monitor a Zone and the processes associated with each Zone
- Implement Zone Security using immutable zones
- Implement global zone security using an immutable global zone
- Understand trusted path

Administer the Solaris Network Environment

- Understand and Administer Datalinks
- Configure Network interfaces
- Configuring Network Services (DNS client, LDAP client)
- 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 with RBAC roles and authorizations
- Setup root as a role
- Secure OS services in the Service Management Facility
- The secure shell (SSH)
- Secure file system data
- Manage Common Vulnerabilities and Exposures (CVE) updates

Administer User Accounts

- Describe user administration fundamentals
- Add, modify, and delete user and group accounts from the command line
- Set up and customize the user's shell
- Manage initialization files
- Set user and group storage space quotas
- Understand the root role
- Set and manage userquotas and groupquotas
- User the `useradm` utility to manage accounts

Control System Processes

- Viewing system processes
- Learn Commands used to monitor system resources and processes
- Use Dtrace to view details about a process
- Manage dump and 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 (/)
- Creating and backing up ZFS snapshots
- Rolling back and restoring data from a ZFS snapshot
- Backup and Recovery techniques used on production systems
- Utilize Unified Archives to backup, restore and clone systems

Monitor 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