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 or Linux 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 software with the Image Packaging System (IPS)
- Understand Solaris updates and CVE's
- Manage the Image Packaging System (IPS), Packages and Repositories
- Update the IPS repository and the OS
- Understand and manage Boot Environments (BEs)
- 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
- Monitor system processes
- Using the Web Dashboard to monitor system health
- Securing the network
- Backup and Restore the operating system
- Configure the network interface and manage network services
- Understand Solaris virtualization concepts (non-global Zones, kernel zones and Logical Domains)
- Create and manage Solaris non-global zones
- Setup a virtual network between zones
- Troubleshoot Solaris system faults
- Configure syslog to route system messages

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 the Network Interface
    Configuring Network Services (DNS client, LDAP client)
    Verify Network Connectivity and Troubleshooting
    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

Perform Basic Troubleshooting
    Troubleshoot system installation issues
    Troubleshoot boot issues
    Troubleshoot Network connectivity
    Troubleshoot login issues
    Troubleshoot file systems