

Course Name: Intermediate System Administration for the Solaris 10 Operating Environment

Length: 4 1/2 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 Solaris 10 (SunOS 5.10)- Sun's implementation of SystemV release4. The course is taught on a Sun workstation. The objective is to prepare the student for the Certified Solaris System Administrator Examination – Part 1 (CX-310-200).

Note: This course is also available for Solaris 9, 8, 7, and Solaris 2.6

Upon completion of this course the student will be able to:

- Discuss Sun's client-server environment and other important system administration terms and concepts.
- Understand boot protocols and options and modify EEPROM boot parameters
- Understand the OpenBoot (Boot PROM) environment
- Understanding and administering the Service Management Facility (SMF)
- Start up, change run levels, and shut down a system (shutdown, init, halt, reboot).
- Understanding and controlling processes
- Understand the root (/) and /usr directory components.
- Use data access control to enhance file security (chmod).
- Set file permissions using ACLs (access control lists)
- Use maintenance commands to simplify system administration (find, cron, at).
- Send mail from the command line.
- Use Administration Tool and the command line to add user accounts and groups, and to add and manage local and remote printers.
- Customizing the user environment (local and global)
- Configure and manage print services
- Print text files using the command line interface .
- Understand the Solaris 10 device naming conventions
- Manage disk devices
- Understanding file systems
- Monitor and mount file systems
- Identify partitions and monitor disk space usage.
- Setup and verify partitions on disks using the format utility.
- Install the Solaris Operating Environment on a standalone system
- Install and verify OS update patches
- Compress and send binary files (tar, compress, zip, etc.).
- Perform Solaris 10 Package Administration.
- Maintain file systems (fsck).
- Setup system security.
- Auditing users
- Perform backup and restore procedures (ufsdump,ufsrestore, tar, cpio, pax).
- Creating a UFS snapshot / Backing up the snapshot file

Intermediate System Administration For the Solaris 10 Operating Environment

Course Outline

Solaris 10 Overview

- History of the Solaris operating system
- System concepts
 - The main parts of the Solaris OS
 - Kernel and shells
 - The common desktop environment
- Virtual memory and daemons
- Solaris 10 Capabilities
 - Terminology
 - The Client/Server environment
- Describe the role of the system administrator
- Describe the Solaris 10 Directory Hierarchy
 - Describe Solaris 10 file types
 - Describe hard links

System Startup and Shutdown Procedures

- Describe phases of the boot process
- Booting the system
 - Power on
- Boot PROM and program phases
 - Kernel initialization phase
 - The boot command
 - System milestones
 - Swapper
- Service Management Facility (SMF)
 - Describe features of the SMF
 - Identify rrun level fundamentals
 - Compare run levels and SMF milestones
 - Identify phases of the boot process
 - Administering the SMF
 - Control boot processes
 - Describe run level fundamentals
- Using run control scripts to stop / start legacy services
 - Adding scripts to the run control directories
- System shutdown
- Shutting down the system
 - /usr/sbin/shutdown
 - /sbin/init
 - /usr/sbin/halt
 - /usr/sbin/reboot
 - /usr/sbin/poweroff
- Stopping the system for recovery purposes (Interrupting an unresponsive system)
- Turning off the power

OpenBoot

- Identify boot programmable read-only memory (PROM) fundamentals
- OpenBoot Environment
 - Accessing the OpenBoot Environment
 - OpenBoot Firmware tasks

- OpenBoot Architecture
- OpenBoot interface
 - The restricted monitor
 - The forth monitor
- Getting help in OpenBoot
- Identify the system's boot device
 - Create and remove custom device aliases
- PROM Full Device Names
 - OpenBoot device aliases
- OpenBoot non-volatile RAM (NVRAM)
- OpenBoot Security
- Openboot Diagnostics
- Input Output control
- boot
- kernel

Installing the Solaris 10 Software

- Requirements and preparation for installing the Solaris 10 software
 - Supported architectures
 - Minimum system requirements
- Software Terminology: Packages, Groups (Clusters), and Configuration Groups
 - Software package
 - Software groups and configuration groups
- Upgrade vs. Initial installation
- Disk storage systems
 - Considerations for planning partition sizes
 - Partition arrangements on multiple disks
- Methods of installing the Solaris 10 software
 - Interactive
 - Custom JumpStart
 - Flash Archive
 - Installing over the network
- The Solaris installation process

Managing Local Disk Devices

- Describe disk architecture
- Describe device naming conventions
 - Physical device name
 - Instance name
 - Logical device name
 - Block and character device files
- Tools to list devices
- Reconfiguring devices
- Describe the format utility
 - Perform disk partitioning using the format utility
- Describe the Solaris Management Console (SMC)
 - Perform disk partitioning using the Solaris Management Console (SMC)

Managing File Systems

- A file system defined
- Defining a disk's geometry
 - Disk controller

- Defect list
- Disk label
- Partition table
- Solaris file system types
 - Disk-based file systems (UFS, HSFS, PCFS)
 - Network-based file systems
 - Virtual file systems (SWAPFS, PROCFS, LOFS, CacheFS, TMPFS)
- Disk slices
- Displaying disk configuration information
- Using format
- Logical volumes
- Parts of a UFS file system
 - The bootblock
 - The superblock
 - The inode
 - The storage block
 - Free blocks
- Creating a UFS file system
- Understanding custom file system parameters
- File system operations
 - Synchronizing a file system
 - Repairing file systems
 - Using fsck
- Mounting file systems
 - The /etc/vfstab file
 - Using the mount command
 - Displaying mounted file systems
 - Mounting a file system with large files
 - Mounting a file system with UFS logging enabled
 - The /etc/mnttab file
- Displaying a file system's disk space usage
- Displaying directory size information
- Controlling user disk space usage
- Constructing a file system
 - The labelit command
 - The volcopy command
- Tuning file systems
 - The tunefs command
 - The fstyp command
- Large vs. Small files
- Unmounting a file system
 - The fuser command
- Volume manager (vold)
 - Troubleshooting volume manager
 - Using fdformat
- Information on file systems

System Security

- Physical security
- Controlling system access
- User account information
- Restricted shells

- Controlling file access
 - umask
 - Sticky bit
 - Setting the correct PATH
 - setuid / setgid programs
- Auditing users
 - Monitoring users and system usage
 - Checking who's logged in
 - The whodo command
 - The last command
- Network security
 - Securing superuser access
 - Automated security enhancement tool (ASET)
 - Common sense security techniques

Administering User Accounts

- Describe user administration fundamentals
- Adding, modifying, and deleting a user account from the command line and SMC
- Adding a group from the command line and SMC
- Setting up and customizing the user's shell
- Managing initialization files
- The /home directory
- Name services

Software Package Administration

- Describe fundamentals of package administration
- Tools for managing software from the command line and from the system GUI tools
 - Adding and removing software packages
 - Listing and verifying installed packages
- The fundamentals of patch administration
 - Installing / verifying / removing a patch

The LP Print Service

- The Solaris print service
 - The print spooler
 - The print daemon
- Setting up the hardware
 - Ethernet, parallel, serial connections
- Setting up the software
 - BSD vs. SVR4
 - Print server vs. Print client
 - Configuring software for a Solaris printer
- Administering printers
 - Deleting printers and managing printer access
 - Creating printer classes
 - Checking printer status
 - Managing printer queues
 - Modifying, deleting, and canceling print requests
 - Limiting user access
 - Accepting or rejecting print requests
 - Restarting the print scheduler
- Setting up a user's default printer

Modifying the printer queue

Process Control

Viewing system processes

Using signals

 The kill command

Scheduling processes

 Scheduling and changing process priorities

 The nice and prioctl commands

Clear frozen and "zombie" processes

Using the Solaris batch-processing facility to schedule execution of commands

 Configuring crontab

 Using the at command

Backup and Recovery

Backup and recovery fundamentals

Solaris backup and restoration utilities

 Using the tar, dd, cpio, and pax utilities

 Using ufsdump and ufsrestore

Recovering the root (/) and /usr file system

Backing up a mounted file system

 Creating a UFS snapshot

 Backing up the snapshot file

Overview of the Solaris Certified System Administrator Certification Process

Why become certified?

Overview of the testing process

How to prepare for the CX-310-200 exam

What to expect on the exams

Each Student will receive a complimentary UnixEd Practice Exam - 310-200A