

ITSC 1040

Course Syllabus

1. Name of Course: Solaris[tm] 10 Operating Environment System Administration I

2. Number of Clock Hours: 40 hours

3. Course Description:

The Solaris[tm] 10 Operating Environment System Administration I course provides students with the necessary knowledge and skills to perform these essential system administration tasks in the Solaris 10 Operating Environment. Instructional topics include the essential tasks of standalone installation, file system management, backup procedures, process control, user administration, and device management.

4. Course Objectives

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

- Discuss the client-server environment at Sun Microsystems and other important system administration terms and concepts
- Add users to the system using both admintool and command-line methods
- Configure user initialization files to provide a consistent login environment
- Implement basic system security
- Identify the function of root directory components
- Properly set file permissions using access control lists (ACLs)
- Use the Solaris 10 Operating Environment device naming conventions to configure and name devices
- Manage disk devices
- Use the format utility to display information and set up disk partitions
- Monitor and mount file systems including CD-ROM and PC diskette devices
- Perform maintenance on corrupted file systems
- Manage processes
- Configure print services
- Understand boot protocols and options and modify electronically erasable, programmable, read-only memory (EEPROM) boot parameters
- Understand and perform booting and shutdown procedures and options
- Understand and change system states on the Solaris Operating Environment server
- Install the Solaris Operating Environment on a standalone system, including update patches
- Use the pkgadd command to add software packages
- Perform file system backups and recovery procedures

5. Rationale:

Upon completion of this course, students will have a better understanding of Sun Solaris, a powerful and popular operating system.

6. Required Materials:

Sun Academic Initiative courseware included.

7. Evaluation

Those who participate in class discussions, complete course lab work, and miss no more than three class meetings will be awarded 4.0 continuing education units.

8. Course Outline

Module 1: Introducing the Solaris 10 Operating Environment Administration

- Define the roles of a Solaris Operating Environment system administrator
- Define common system administration terms

Module 2: Adding Users

- Create and manage user accounts on the local system using the admintool utility
- Describe the format of the files `/etc/passwd` and `/etc/shadow` for securing login access
- Describe the format of the `/etc/group` file for maintaining shared and restricted access to files and directories
- Add, modify, and delete user accounts on the local system with the commands `useradd`, `usermod`, and `userdel`
- Add, modify, and delete group accounts for the local system with the commands `groupadd`, `groupmod`, and `groupdel`
- Define the two different types of shell initialization files
- Describe the shell startup activities during login for the three main Solaris Operating Environment shells
- List the shell initialization files used to set up a user's work environment at login
- Describe the purpose of the `/etc/skel` directory
- Modify the initialization files to customize a user's work environment

Module 3: System Security

- Create the `/var/adm/loginlog` file to save failed login attempts
- Monitor system usage with the commands `finger`, `last`, and `rusers`
- Use the `su` command to become the root user or another user on the system
- Modify the `/etc/default/login` file to restrict root access
- Use the commands `id` and `groups` to identify users and their group memberships
- Change a file's owner or a file's group using the commands `chown` and `chgrp`, respectively
- Explain how the special permissions `setuid`, `setgid`, and the Sticky Bit can affect system security
- Create, modify, and delete ACLs on files
- Control remote login access by maintaining three basic files: `/etc/host.equiv`, `$HOME/.rhosts`, and `/etc/ftpusers`

Module 4: The Directory Hierarchy

- Identify the four main file types in the Solaris Operating Environment
- Describe the functions provided by regular files, directories, symbolic links, device files, and hard links
- Define the function of each subdirectory found directly within the root directory

Module 5: Device Configuration

- Describe the disk components: sectors, tracks, and cylinders
- Define the term disk slice
- Identify a disk device by its logical device name, physical device name, and instance name
- Describe the purpose of the `/etc/path_to_inst` file
- List a system's device configuration information using the `prtconf` command
- Display the system's current disk configuration using the `format` command
- Show how to invoke a reconfiguration boot after adding a peripheral device to the system
- Describe how devices are reconfigured using the `devfsadm` command

Module 6: Disks, Slices, and Format

- Explain the term disk slice
- Describe and create a disk label
- Define and modify a partition table using the `format` utility
- Describe the purpose of the `/etc/format.dat` file
- Use the `format` utility to save and retrieve customized partition tables
- Demonstrate how to view the disk's volume table of contents (VTOC) using two different commands: `verify` and `prtvtoc`
- Use the `fmthard` command to update the VTOC on a disk

Module 7: The Solaris Operating Environment ufs File Systems

- Describe the three different types of file systems in the Solaris Operating Environment
- Define the term file system
- List the components that are contained in the structure of a file system
- Create a new ufs file system using the `newfs` command

Module 8: Mounting File Systems

- Define the term mount point
- Identify mounted and unmounted file systems
- Mount file systems using the commands `mount` and `mountall`
- Describe some of the commonly used options of the `mount` command: `noatime`, `nolargefiles`, and `logging`
- Describe the purpose and format of the `/etc/mnttab` and `/etc/vfstab` files
- Define the procedure for mounting different types of file systems
- List the system files used to determine a file system's type
- Unmount local and remote file systems using the commands `umount` and

umountall

- Forcibly unmount a busy file system
- Describe how to mount and access file systems residing on removable media devices, such as diskettes and CD-ROMs

Module 9: Maintaining File Systems

- Describe why fsck is necessary
- Describe how to check and repair a file system
- Display disk space usage by file systems
- Display disk usage of a directory
- Display disk usage by user name
- Demonstrate how to repair the /etc/vfstab file when the system fails to boot completely

Module 10: Scheduled Process Control

- Start the Common Desktop Environment (CDE) Process Manager to monitor and control active processes
- Report active process statistics using the prstat command
- Schedule the automatic execution of commands, programs, or scripts using the commands at and crontab
- Define the files used to control user access to the commands at and crontab
- Create and execute an at job
- Describe the location and format of a crontab file
- Demonstrate the steps to create, view, edit, and remove a crontab file

Module 11: The Solaris Operating Environment LP Print Service

- Describe the basic functions of the Solaris Operating Environment LP print service
- Define the important LP print service directories, files, and daemons
- Describe the function of a print server and a print client
- Define the terms local printer, network printer, and remote printer
- Use the Solaris 10 Print Manager to configure a network printer
- List the resources used by the print service to locate the destination printer
- Discuss the differences between the local printing process and a remote printing process
- Use the print service administration commands: accept, reject, enable, disable, and lpmove
- Configure the LP print services from the command line using lpadmin

Module 12: The Boot PROM

- Describe the main functions of the boot programmable read-only memory (PROM) chip and the nonvolatile random access memory (NVRAM) chip
- Explain the basic elements of the power-on self-test (POST) and the purpose of the Stop key to control the POST
- Invoke some common boot PROM commands from the ok prompt to

customize how the system boots

- Use boot command options to boot a system in different situations
- Demonstrate how to display the device tree to list all the configured devices using the show-devs command
- Use the probe- commands to identify what peripheral devices (disks, tape drives, or CD-ROMs) are currently connected to the system
- Determine a system's default boot device using the devalias command
- Create a custom device alias name for a new boot device using the nvalias or nvedit commands
- Delete a custom device alias name with the nvunalias command.
- Use the eeprom command within the Solaris Operating Environment to view or change the values of NVRAM parameters
- Demonstrate the steps to interrupt an unresponsive system

Module 13: The System Boot Process

- Describe the four phases of the boot process
- Identify the directories that contain the kernel and its loadable modules
- Modify the kernel's configuration file
- Describe the eight Solaris Operating Environment run levels
- Define a system's current run level using the who -r command
- Explain the purpose of the /etc/inittab file
- Describe the steps in the init process to bring a system to multiuser mode
- List the directories that hold the run control scripts used to stop and start system processes and services
- Describe the steps to add a new run control script
- Use the following commands to shut down the system: init, shutdown, halt, poweroff, and reboot

Module 14: Installing the Solaris 10 Operating Environment on a Standalone System

- State the different installation methods available for the Solaris 10 Operating Environment software
- Explain the hardware requirements for a Solaris 10 Operating Environment installation
- Identify the different Solaris 10 Operating Environment software CD-ROM editions
- List the five Solaris Software Groups
- Demonstrate how to install the Solaris 10 Operating Environment software on a networked, standalone system using Solaris Web Start

Module 15: Administering Software Packages

- Describe a software package
- View software package information using the pkginfo command
- Add a software package from the Solaris Software CD-ROM using the pkgadd command
- Verify the attributes and contents of a software package using the pkgchk command
- Remove a software package installed on the disk using the pkgrm

command

- View, add, and remove software packages using admintool
- Add and remove a software package from a spool directory using pkg add and pkgrm

Module 16: Managing Software Patches

- List the locations to access patches
- Explain how to access patches from the World Wide Web and anonymous ftp
- Describe the different patch formats
- Prepare a patch for installation
- Install a patch using the patchadd command
- Demonstrate how to verify what patches are currently installed
- Remove a patch using the patchrm command

Module 17: Backup and Recovery

- Identify the logical device names for tape drives
- Define the two different types of file system backups
- Back up a file system to tape using the ufsdump command
- Describe how to backup a file system to a remote tape drive
- Explain the purpose of the /etc/dumpdates file
- Restore a file system from tape using the ufsrestore command
- Describe the procedure for recovering file systems
- Use the tar command to manage multiple archives
- Use the mt command to control the actions of the tape drive
- Use the fssnap command to create a ufs snapshot of a mounted file system for backup purposes.