

Sun Learning Services Training Day 24 September, 2008

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Agenda

- 09:30-10:45** **Solaris Course Content & Certification**
- 10:45-11:15** **Coffee Break**
- 11:15-12:30** **Solaris 10 New Features & Demos**
- 12:30-13:30** **Lunch Break**
- 13:30-14:45** **Java Course Content & Certification**
- 14:45-15:15** **Coffee Break**
- 15:15-16:30** **Advanced Java Courses & Demos**

Background

Tahsin Demiral

87-91 BSc ITU Computer Engineering

92-95 MSc RPI NewYork, Neural Networks

95-98 TA ITU Computer Engineering

98-02 Education Director, Tema Bilişim, Gantek

02-06 Sun/Linux Team Leader, KoçBryce

06- General Manager, Omega Training

Sun Solaris Courses and Certifications

- **System**

- SA-100 Fundamentals
- SA-200 Admin I
- SA-202 Admin II
- SA-300 Networking
- SC-301 Security
- SA-400 Performance

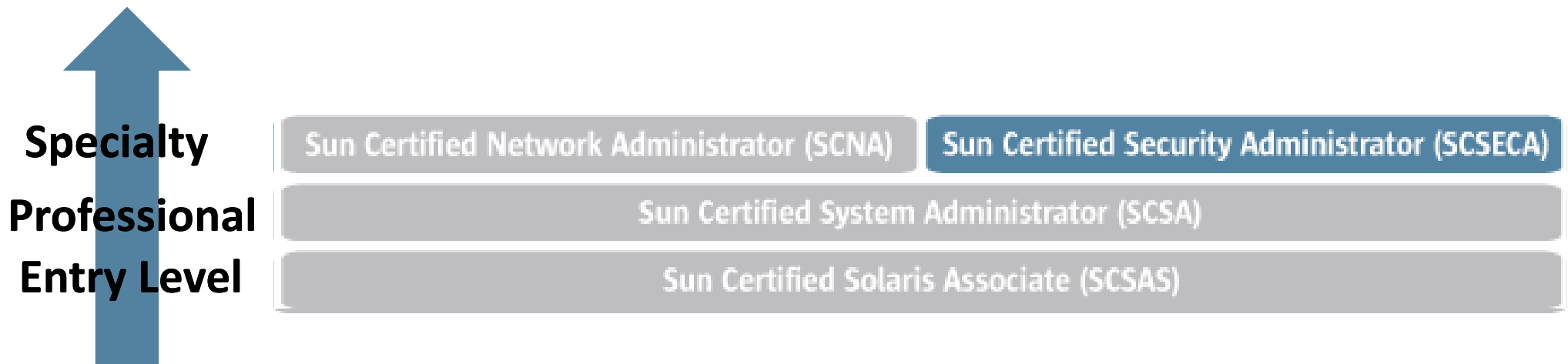
- **Programming**

- SA-245 Shell
- DTP250 Perl

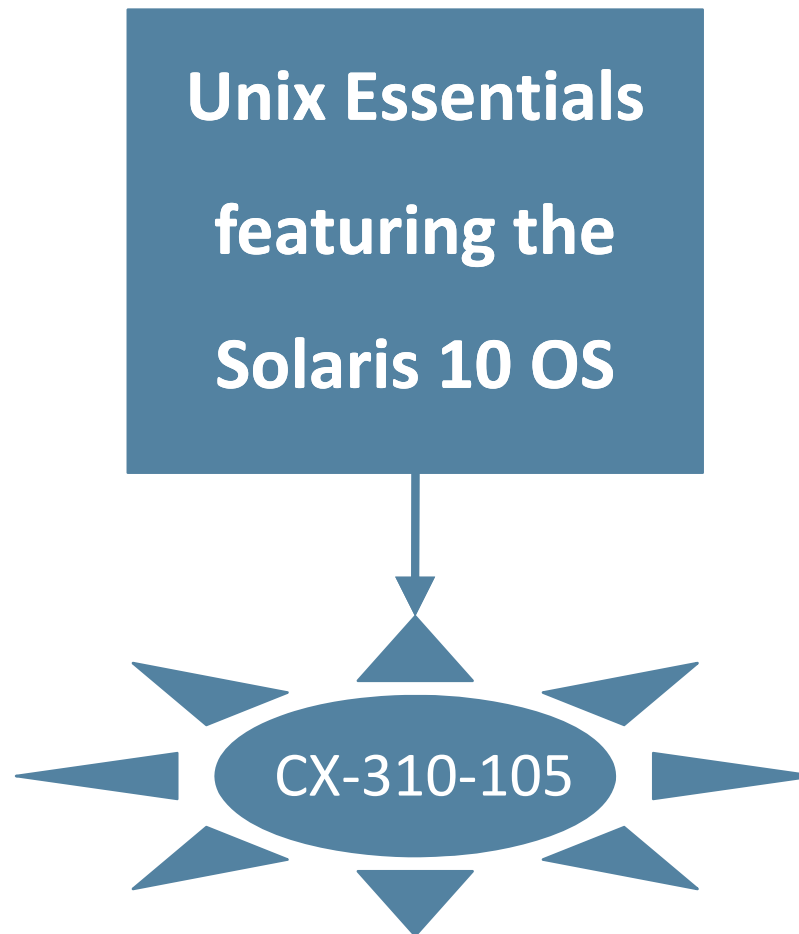
- **New**

- SA-229 ZFS
- SA-327 Dtrace
- SA-355 Zones
- SA-345 LDoms

Certification Path



SCSAS – Sun Certified Solaris Associate



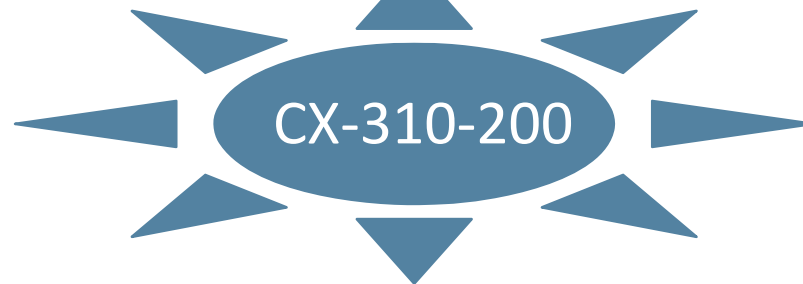
*Become
Sun Certified
Solaris Associate*

SCSA – Sun Certified System Administrator

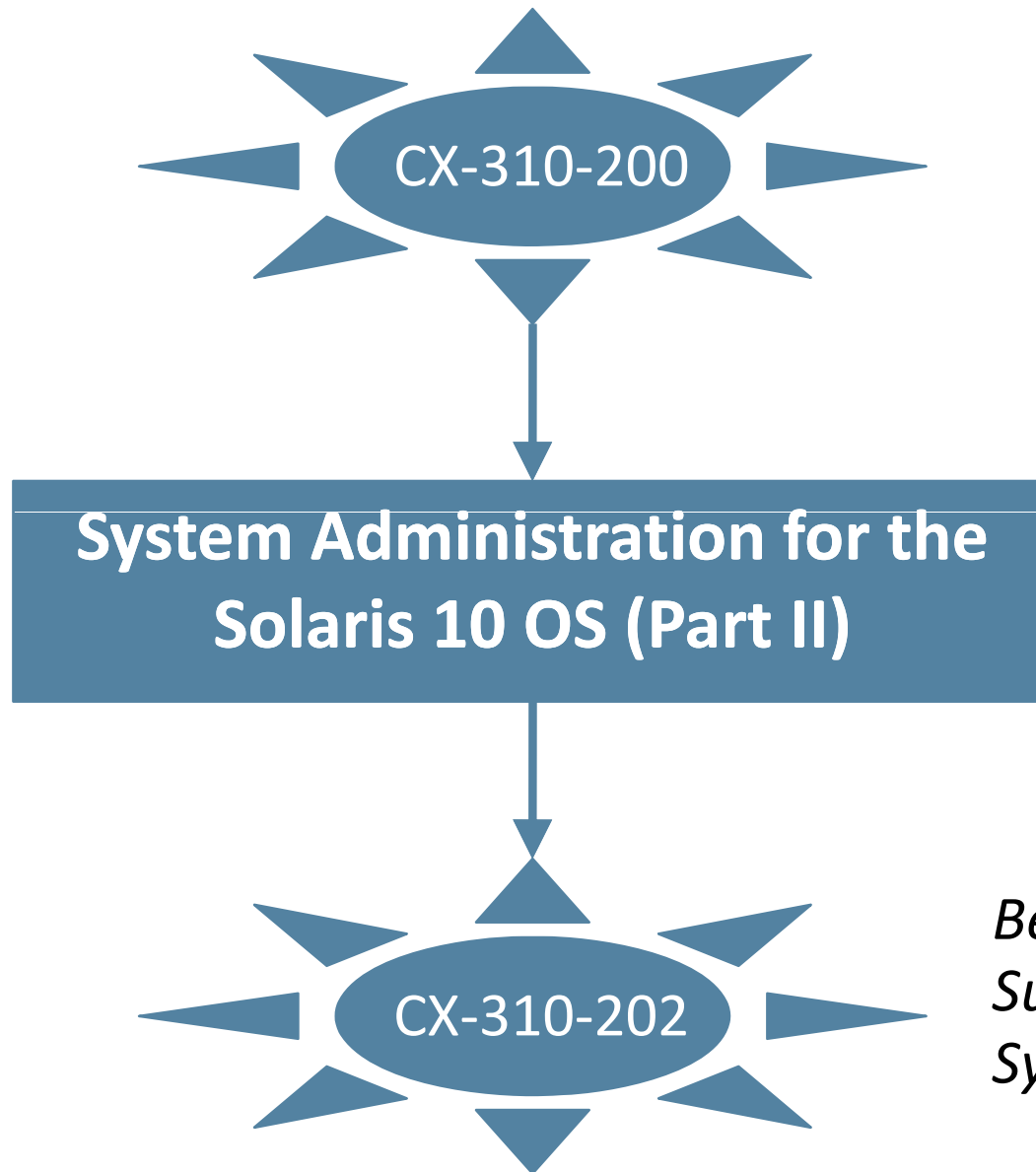
**Unix Essentials featuring the
Solaris 10 OS**



**System Administration for the
Solaris 10 OS (Part I)**

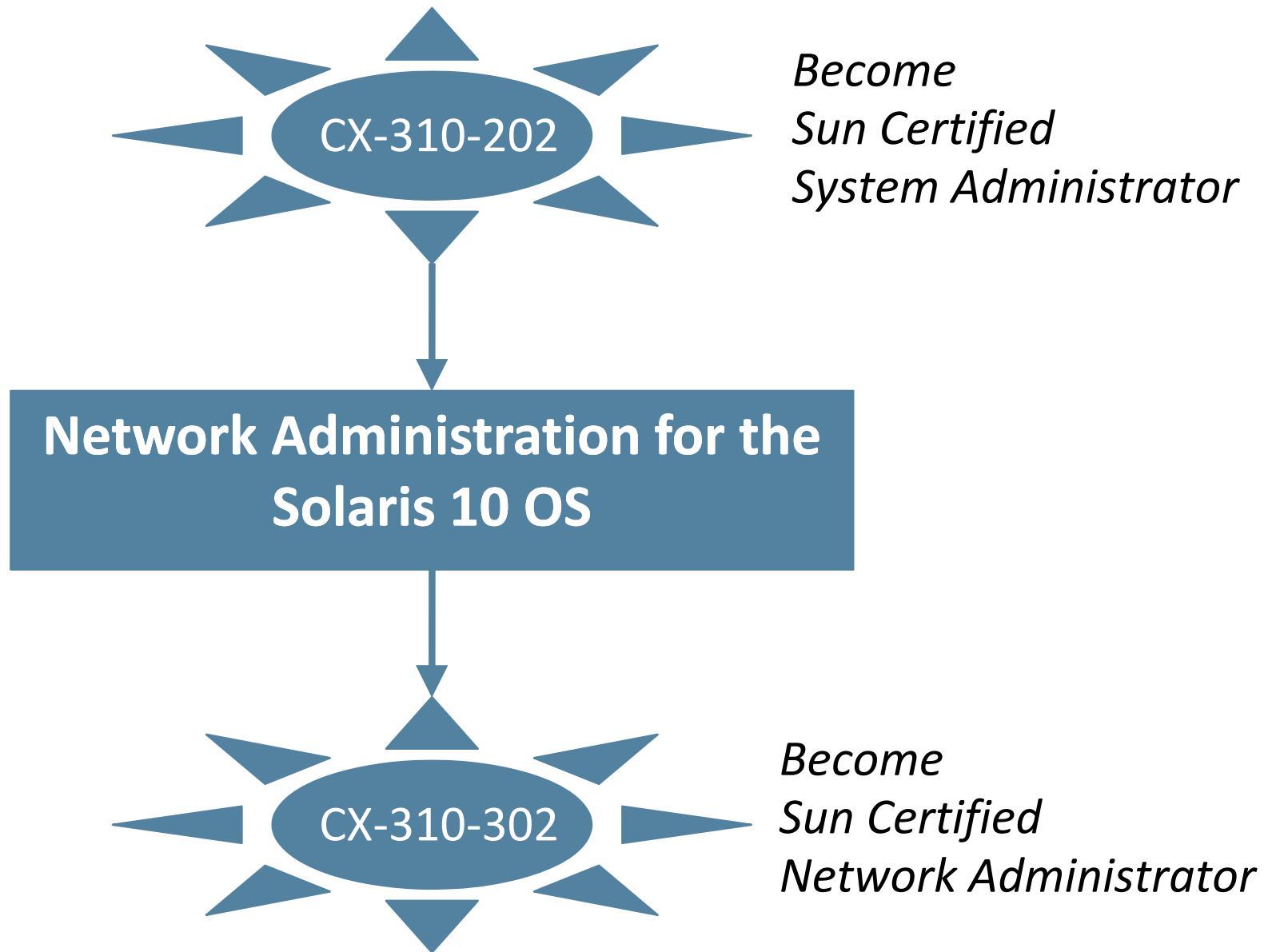


SCSA – Sun Certified System Administrator



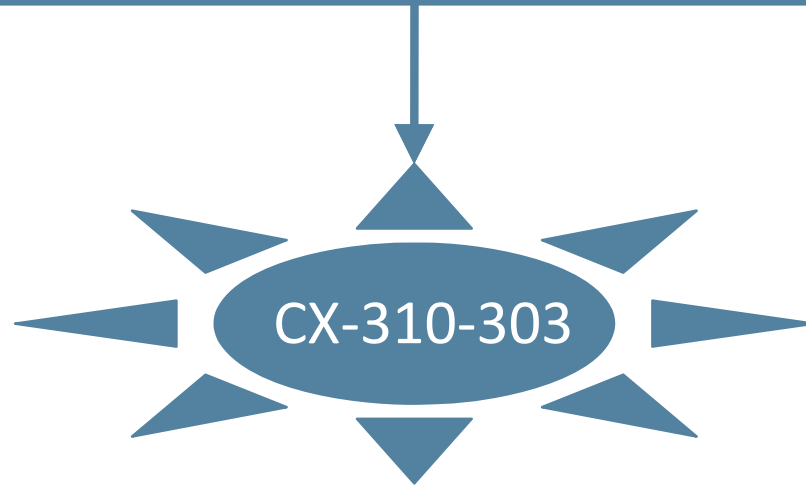
*Become
Sun Certified
System Administrator*

SCNA – Sun Certified Network Administrator



SCSECA – Sun Certified Security Administrator

Personalizing Security for the
Solaris 10 OS



*Become
Sun Certified
Security Administrator*

Resources

www.omegaegitim.com/seminar2008.html

Complete List of Sun Courses

<http://www.sun.com/training/catalog/courses/?sort=code>

Solaris and Java Certifications

<http://www.sun.com/training/certification/resources/paths.html>

Learning Center for Demos about ZFS, Virtualization, Security, ...

http://www.sun.com/software/solaris/learning_centers.jsp

HOWTO Guides

http://www.sun.com/software/solaris/howto_guides.jsp

Latest Solaris 10 Download Page

<http://www.sun.com/software/solaris/get.jsp>

SA100 - Solaris Essentials

Featuring the Solaris 10 OS

Before: None, After: SA200 Admin I or SA245 Shell

Certification: Sun Certified Solaris Associate (SCSAS)

Module 1 - Using the Desktop in the Solaris 10 Operating System

Module 2 - Using Command-Line Features and Online Help Resources

Module 3 - Viewing Directories and Files

Module 4 - Changing the Solaris OS Directory Contents

Module 5 - Using the vi Editor

Module 6 - Using Commands Within the Shell

Module 7 - Using Basic File Permissions

Module 8 - Configure Access Control Lists (ACLs)

Module 9 - Searching Files and Directories

Module 10 - Performing Basic Process Control

Module 11 - Advanced Shell Functionality

Module 12 - Reading Shell Scripts

Module 13 - Creating Archives

Module 14 - Compressing, Viewing, and Uncompressing Files

Module 15 - Performing Remote Connections and File Transfers

SA200 - System Administration for the Solaris 10 Operating System Part I

Before: SA100 Fundamentals After: SA202 Admin II or SA245 Shell

Certification: Sun Certified System Administrator (SCSA) - Part I

Module 1 - Introducing the Solaris 10 OS Directory Hierarchy

Module 2 - Managing Local Disk Devices

Module 3 - Managing Solaris OS File Systems

Module 4 - Performing Mounts and Unmounts

Module 5 - Installation Requirements for the Solaris 10 OS

Module 6 - Performing Solaris 10 OS Package Administration

Module 7 - Managing Software Patches on the Solaris 10 OS

Module 8 - Executing Boot PROM Commands

Module 9 - Using GRUB

Module 10 - Performing Boot and Shutdown Procedures

Module 11 - Performing User Administration

Module 12 - Introducing System Security

Module 13 - Configuring and Using Printer Services

Module 14 - Controlling System Processes

Module 15 - Performing File System Backups

Module 16 - Performing File System Restores

Module 17 - Backing Up a Mounted File System With a UFS Snapshot

SA202 - System Administration for the Solaris 10 Operating System Part II

Before: SA200 Admin I After: SA300 Networking

Certification: Sun Certified System Administrator (SCSA) - Part II

Module 1 - Describing Interface Configuration

Module 2 - Describing the Client-Server Model

Module 3 - Introducing Sun Connection Services

Module 4 - Managing Swap Configuration

Module 5 - Managing Crash Dumps and Core Files

Module 6 - Configuring NFS

Module 7 - Configuring AutoFS

Module 8 - Describing RAID and the Solaris Volume Manager Software

Module 9 - Configuring Solaris Volume Manager Software

Module 10 - Configuring Role-Based Access Control (RBAC)

Module 11 - Configuring System Messaging

Module 12 - Using Name Services

Module 13 - Configuring Name Service Clients

Module 14 - Configuring the Network Information Service (NIS)

Module 15 - Introduction to Zones

Module 16 - Introduction to the ZFS File System

SA245 - Shell Programming for System Administrators

Before: SA100 Fundamentals After: DTP250 Perl

Module 1 - UNIX Shells and Shell Scripts

Module 2 - Writing and Debugging Scripts

Module 3 - The Shell Environment

Module 4 - Regular Expressions and the grep Command

Module 5 - The sed Editor

Module 6 - The nawk Programming Language

Module 7 - Conditionals

Module 8 - Interactive Scripts

Module 9 - Loops

Module 10 - Advanced Variables, Parameters, and Argument Lists

Module 11 - Functions

Module 12 - Traps

DTP250 - Perl Programming

Before: SA245 Shell After: Java Courses

Module 1 - The Perl Programming Language

Module 2 - Scalars

Module 3 - Control Structures

Module 4 - Arrays

Module 5 - Hashes

Module 6 - Basic I/O and Regular Expressions

Module 7 - Filehandles and Files

Module 8 - Subroutines and Modules

Module 9 - File and Directory Operations

Module 10 - Overview of CGI Programming

SA300 - Network Administration for the Solaris 10 Operating System

Before: SA202 Admin II After: SC301 Security

Certification: Sun Certified Network Administrator (SCNA)

Module 1 - Introducing the TCP/IP Model

Module 2 - Introducing LANs and Their Components

Module 3 - Describing Ethernet Interfaces

Module 4 - Describing ARP and RARP

Module 5 - Configuring IP

Module 6 - Configuring IP Network Multipathing

Module 7 - Configuring Routing

Module 8 - Configuring IPv6

Module 9 - Describing the Transport Layer

Module 10 - Configuring DNS

Module 11 - Configuring DHCP

Module 12 - Configuring NTP

Module 13 - Configuring the Solaris IP Filter Firewall

SC301 - Personalizing Security on the Solaris 10 Operating System

Before: SA200, SA202, SA300 After: SA400 Performance

Certification: Sun Certified Security Administrator (SCSECA)

Module 1 - Describing Basic Security Principles

Module 2 - Listing Applicable Solaris 10 Security Features

Module 3 - Describing Minimization

Module 4 - Managing Patches

Module 5 - Performing Hardening

Module 6 - Implementing Process Rights Management

Module 7 - Implementing User Rights Management

Module 8 - Utilizing the Solaris Cryptographic Framework

Module 9 - Managing File system Security

Module 10 - Using the Service Management Facility

Module 11 - Securing Networks

Module 12 - Implementing IPsec

Module 13 - Performing Auditing and Logging

Module 14 - Implementing Security in Solaris Zones

Module 15 - How Security Components Work Together

SA400 - Solaris System Performance Management

Before: SA200, SA202, SA300, SC301 After: New Courses

Module 1 - Introducing Performance Management

Module 2 - Using the Solaris OS Monitoring Tools

Module 3 - Viewing and Setting Tuning Parameters

Module 4 - Monitoring Processes and Threads

Module 5 - Managing CPU Scheduling

Module 6 - Monitoring System Caches

Module 7 - Performing Memory Tuning

Module 8 - Managing Systems Buses

Module 9 - Performing I/O Tuning

Module 10 - Tuning UFS

Module 11 - Monitoring Network Performance

Module 12 - Maintaining System Performance

SA229 - Solaris 10 ZFS Administration

Before: SA200, SA202 After: New Courses

Module 1 - Introduction

Module 2 - Getting Started

Module 3 - Differences from Traditional File Systems

Module 4 - Managing Storage Pools

Module 5 - Managing File Systems

Module 6 - Working With ZFS Snapshots and Clones

Module 7 - Using ACLs to Protect ZFS Files

Module 8 - Advanced Topics

Module 9 - Troubleshooting and Data Recovery

SA327 - Dynamic Performance Tuning and Troubleshooting With DTrace

Before: SA200, SA202 After: New Courses

Module 1 - DTrace Fundamentals

Module 2 - Using DTrace

Module 3 - Debug Applications with DTrace

Module 4 - Finding System Problems with DTrace

Module 5 - Troubleshooting DTrace Problems

SA355 - Sun Virtualization: Solaris 10 Containers Administration

Before: SA200, SA202 After: New Courses

Module 1 - Virtualization Trends in the Datacenter

Module 2 - Describing Solaris Zones and Containers

Module 3 - Creating, Installing, and Booting Zones

Module 4 - Connect Storage to Zones

Module 5 - Managing Packages and Patches Within Zones

Module 6 - Configuring Persistent Resource Pools

Module 7 - Configuring Resource Management With Zones

Module 8 - Performing Zone Advanced Network Management

Module 9 - Renaming, Moving, Cloning and Migrating Zones

Module 10 - Performing Zone Backups and Restores

Module 11 - Configuring the lx Branded Zone

SA345 - Sun Virtualization: Solaris 10 Logical Domains Administration

Before: SA200, SA202 After: New Courses

Module 1 - Virtualization Trends in the Datacenter

Module 2 - Solaris Logical Domains Fundamentals

Module 3 - Preparing a System for Logical Domains

Module 4 - Creating a Control and Service Logical Domain

Module 5 - Creating Guest Logical Domains

Module 6 - Advanced Logical Domain Administration

New Features of Solaris 10

New Features

What's new in Solaris 10/08

www.sun.com/software/solaris/gallery/index.xml?p=1&s=1

- ZFS - Zettabyte Filesystem
- SMF - Service Management Facility
- SCF - Solaris Cryptographic Framework
- Virtualization
- Dtrace

ZFS - Zettabyte Filesystem

Kilobyte	Zettabyte
Megabyte	Yottabyte
Gigabyte	Xonabyte
Terabyte	Wekabyte
Petabyte	Vundabyte
Exabyte	Udabyte

Total Digital Data in the world ~ 1ZB

ZFS Addresses 256 quadrillion Zettabytes or 256 Udabytes

ZFS - Zettabyte Filesystem

- Simplified Administration
- Pooled Storage
- Transactional Semantics (COW)
- Error Detection and Correction
- Snapshots, Clones
- **DEMO**

```
# zpool list; zfs list
```

```
# zpool create mypool mirror c0d1s3 c0d1s4
```

```
# zpool status
```

```
# zfs create mypool/ali
```

```
# zfs create mypool/veli
```

ZFS - Zettabyte Filesystem

```
# zpool list; zfs list
```

```
# zpool create mypool mirror c0d1s3 c0d1s4
```

```
# zpool status
```

```
# zfs create mypool/ali
```

```
# zfs create mypool/veli
```

```
# tar cfk /mypool/testfile1 102400 /usr/lib
```

```
# zfs list
```

```
# cp /mypool/testfile1 /mypool/ali ; zfs list
```

```
# zpool add mypool mirror c0d1s5 c0d1s6 ; zfs list
```

```
# zfs get all mypool
```

```
# zfs set compression=on mypool/ali
```

ZFS - Zettabyte Filesystem

```
# zfs get -r compression,compressratio mypool
# cp /mypool/ali/testfile1 /mypool/ali/testfile2
# cp /mypool/ali/testfile1 /mypool/veli ; zfs list
# ls -lh /mypool/ali/* ; du -h /mypool/ali/*
# zfs set quota=500m mypool/veli ; zfs list
# zfs set reservation=250m mypool/veli ; zfs list
# zfs snapshot mypool/ali@monday
# cp /mypool/ali/testfile1 /mypool/ali/testfile3
# zfs snapshot mypool/ali@tuesday ; zfs list
# ls -lh /mypool/ali/.zfs/snapshot/monday
# rm /mypool/ali/test*
```

ZFS - Zettabyte Filesystem

```
# zfs rollback mypool/ali@tuesday  
# ls -lh /mypool/ali  
# zfs clone mypool/ali@tuesday mypool/newali  
# touch /mypool/newali/file1  
# zfs destroy mypool/veli  
# zpool destroy mypool  
# zpool list  
# zfs list
```

SMF - Service Management Facility

```
# svcs -a
```

```
# svcadm -v enable/disable <SERVICE>
```

```
# svcs -d <SERVICE>
```

```
# svcs -D <SERVICE>
```

```
# svcs -x <SERVICE>
```

SCF - Solaris Cryptographic Framework

MD5 passwords (256 Chars)

```
# vi /etc/security/policy.conf
```

```
CRYPT_DEFAULT=md5 (default DES is __unix__ )
```

```
# useradd bob
```

```
# passwd bob
```

```
# cat /etc/shadow | egrep 'root|bob'
```

Encryption-Decryption

```
# encrypt -l
```

```
# encrypt -a aes -i /usr/dict/words -o /tmp/sozluk.enc
```

```
# decrypt -a aes -i /tmp/sozluk.enc -o /tmp/sozluk.txt
```

Virtualization



Trend to Flexibility

Trend to Isolation

Virtualization

- Migration 8 to 10

www.sun.com/software/solaris/containers/gallery/index.xml?p=1&s=2

- DEMO

```
# zoneadm list -cv
```

```
# zonecfg -z zone1 info
```

```
# mkdir /export/zone2 ; chmod 700 /export/zone2
```

```
# zonecfg -z zone2
```

```
➤ create
```

```
➤ set zonepath=/export/zone2
```

```
➤ set autoboot=true
```

```
➤ add net
```

```
➤ set physical=vmxnet0
```

Virtualization

- set address=192.168.2.44
- end
- commit
- info
- exit

```
# zoneadm -z zone2 install
```

```
# zoneadm list -cv
```

```
# du -sh /export/zone2
```

```
# zoneadm -z zone2 boot
```

```
# zlogin -C zone2
```

```
# zonecfg -z zone1 set cpu-shares=5
```

```
# zonecfg -z zone2 set cpu-shares=10
```

```
# zoneadm -z zone2 halt/uninstall
```

Dtrace

- Thousands of Probes within live Kernel!
www.opensolaris.org/os/community/dtrace/
- Quadruple Provider:Module:Function:Name
- syscall, vminfo, sysinfo, io, fbt, pid
- **DEMO**

```
# dtrace -l
```

```
# dtrace -n 'syscall::exec*:return { trace(execname); } '
```

(Trace all executables in the system online)

```
# dtrace -qn 'syscall::exec*:return { printf("%-20Y %6d  
%s\n", walltimestamp,pid,execname); } '
```

Dtrace

```
# dtrace -n 'sysinfo:::readch { @bytes[execname]=sum(arg0); } '
```

```
# dtrace -n 'sysinfo:::writech { @bytes[execname]=sum(arg0); } '
```

(Total read/write in bytes by execname. avg, min, max)

```
# wc /usr/dict/words (Compare output with ls -l)
```

```
# dtrace -wn 'syscall::exec*:return /execname == "cal" /  
  { raise(9); } '
```

(If execname is cal then kill -9! w option is destructive)