

LINUX COURSE SYLLABUS

Linux Essential

- ✓ Introduction
- ✓ Evolution of Linux

Linux Installation

Installation covers most flavors of Linux distribution such as Red hat Linux and Fedora Linux and Suse Linux

- ✓ First Stage: Starting the Installation
- ✓ First Stage: Boot Media
- ✓ Accessing the Installer
- ✓ First Stage: Installation Method
- ✓ Network Installation Server
- ✓ Second Stage: Installation Overview
- ✓ Configuring File Systems
- ✓ Advanced Partitioning
- ✓ Package Selection
- ✓ First Boot: Post-Install Configuration
- ✓ Starting a Kickstart Installation
- ✓ Anatomy of a Kickstart File

Linux System Administration - Managing Startup

Command line:

- ✓ Introduction to Bash Shell
- ✓ Basic Commands (ls,cd,tail,cat,mkdir)
- ✓ Commands to work with file(mv,cp,rm)
- ✓ Text editor (vim)
- ✓ Stream text editor (grep, sed, and awk)
- ✓ STDERR,STDOUT,STDIN
- ✓ Compression Tar,zip and bzip2
- ✓ Easily accessible tools in linux.

System Initialization

- ✓ Boot Sequence Overview
- ✓ Troubleshooting boot issues
- ✓ What is GRUB and grub.conf
- ✓ Starting the Boot Process: GRUB
- ✓ Kernel Initialization
- ✓ init Initialization (init 0,1,2,3,4,5)
- ✓ Run Levels
- ✓ /etc/rc.d/rc.sysinit

- ✓ /etc/rc.d/rc
- ✓ System V run levels
- ✓ /etc/rc.d/rc.local
- ✓ Controlling Services(service,init.d,chkconfig)

Booting and run levels

- ✓ The boot process: from BIOS to kernel then to user space
- ✓ Setting kernel parameters
- ✓ Run levels and init scripts
- ✓ Configuring services to run at boot
- ✓ Securing single-user mode (su login)
- ✓ Shutting down and rebooting the system

Package Management - Working with packages>

- ✓ RPM Package Manager
- ✓ Installing and Removing Software
- ✓ Updating a Kernel RPM
- ✓ rpm Queries
- ✓ rpm Verification
- ✓ About yum
- ✓ Using yum
- ✓ Searching packages/files
- ✓ Configuring Additional Repositories
- ✓ Creating a private repository
- ✓ Red Hat Network
- ✓ Red Hat Network Server
- ✓ Entitlements
- ✓ Red Hat Network Client

Kernel Services - Configuring the kernel

- ✓ The Linux Kernel
- ✓ Kernel Images and Variants
- ✓ Kernel Modules
- ✓ Kernel Module Utilities
- ✓ Managing the initrd Image
- ✓ Accessing Drivers Through /dev
- ✓ Device Node Examples
- ✓ Managing /dev With udev
- ✓ Adding Files Under /dev
- ✓ Kernel Configuration With /proc
- ✓ /proc Examples
- ✓ sysctl : Persistent Kernel Configuration
- ✓ Exploring Hardware Devices (hwinfo)
- ✓ Monitoring Processes and Resources(kill,ps,pstree,top)

System Services – Linux System Services

- ✓ Network Time Protocol
- ✓ System Logging

- ✓ syslog Configuration
- ✓ XOrg: The X11 Server
- ✓ XOrg Server Configuration
- ✓ XOrg in runlevel 3
- ✓ XOrg in runlevel 5
- ✓ Remote X Sessions
- ✓ SSH: Secure Shell
- ✓ VNC: Virtual Network Computing
- ✓ cron
- ✓ Controlling Access to cron
- ✓ System crontab Files
- ✓ Daily Cron Jobs
- ✓ The anacron System
- ✓ CUPS

User Administration

- ✓ Adding a New User Account
- ✓ User Private Groups
- ✓ Modifying / Deleting User Accounts
- ✓ Group Administration
- ✓ Password Aging Policies
- ✓ Switching Accounts
- ✓ sudo
- ✓ Network Users
- ✓ Authentication Configuration
- ✓ Example: NIS Configuration
- ✓ Example: LDAP Configuration
- ✓ SUID and SGID Executables
- ✓ SGID Directories
- ✓ The Sticky Bit
- ✓ Default File Permissions
- ✓ Access Control Lists (ACLs)
- ✓ SELinux
- ✓ SELinux: Targeted Policy
- ✓ SELinux: Management

File system Management

- ✓ Adding New File systems to the File system Tree
- ✓ Device Recognition
- ✓ Disk Partitioning
- ✓ Managing Partitions
- ✓ Making Filesystems
- ✓ Difference between ext3 and ext4
- ✓ Filesystem Labels
- ✓ tune2fs
- ✓ Mount Points and /etc/fstab
- ✓ Mounting Filesystems with mount
- ✓ Unmounting Filesystems

- ✓ mount By Example
- ✓ Handling Swap Files and Partitions
- ✓ Mounting NFS Filesystems
- ✓ Automounter
- ✓ Direct Maps
- ✓ gnome-mount
- ✓ Checking available free space and space used by files (df,du)
- ✓ Checking and correcting the integrity of filesystems (fsck)

File system security

- ✓ Users and groups
- ✓ The 'root' user or superuser
- ✓ Changing file ownership (chown)
- ✓ Changing file group ownership (chgrp)
- ✓ Permissions on files
- ✓ Permissions on directories
- ✓ How permissions are applied
- ✓ Changing permissions (chmod)

Filesystem concepts and use

- ✓ The unified UNIX filesystem
- ✓ Special file types
- ✓ Symbolic links (ln -s)
- ✓ Inodes and directory entries
- ✓ Hard links
- ✓ Preserving links while copying and archiving

Processes and jobs

- ✓ What processes are ?
- ✓ The properties of a process
- ✓ Parent processes and child processes
- ✓ Killing processes and sending signals to a process (kill, killall, xkill)

Advanced File system Management

- ✓ Configuring the Quota System
- ✓ Setting Quotas for Users
- ✓ Reporting Quota Status
- ✓ What is Software RAID?
- ✓ Software RAID Configuration
- ✓ Software RAID Testing and Recovery
- ✓ What is Logical Volume Manager (LVM)?
- ✓ Creating Logical Volumes
- ✓ Resizing Logical Volumes
- ✓ Logical Volume Manager Snapshots
- ✓ Using LVM Snapshots
- ✓ Archiving tools: tar
- ✓ Archiving Tools: dump/restore
- ✓ Archiving Tools: rsync:

Linux Network Administration – Managing Network

Network Setup and Configuration

- ✓ Network Interfaces
- ✓ Driver Selection
- ✓ Speed and Duplex Settings
- ✓ IPv4 Addresses
- ✓ Dynamic IPv4 Configuration
- ✓ Static IPv4 Configuration
- ✓ Device Aliases
- ✓ Routing Table
- ✓ Default Gateway
- ✓ Configuring Routes
- ✓ Verify IP Connectivity
- ✓ Defining the Local Host Name
- ✓ Local Resolver
- ✓ Remote Resolvers
- ✓ Verify DNS Connectivity
- ✓ Network Configuration Utilities
- ✓ Transparent Dynamic Configuration
- ✓ Implementing IPv6
- ✓ IPv6: Dynamic Interface Configuration
- ✓ IPv6: Static Interface Configuration
- ✓ IPv6: Routing Configuration
- ✓ New and Modified Utilities

Basic networking configuration

- ✓ Configure a network device to connect to a local network
- ✓ Configure a network device to connect to a wide-area network
- ✓ Communicate between subnets within a single network
- ✓ Configure a network device to implement authentication
- ✓ Configuring a multi-homed network device
- ✓ Resolving networking and communication problems
- ✓ /sbin/route
- ✓ /sbin/ifconfig
- ✓ /bin/netstat
- ✓ /bin/ping
- ✓ /sbin/arp
- ✓ /usr/sbin/arpwatch
- ✓ /usr/sbin/tcpdump
- ✓ /usr/sbin/lsof
- ✓ /usr/bin/nc

Troubleshooting network issues

- ifconfig
- route
- netstat
- /etc/network and /etc/sysconfig/network - scripts/
- System log files
- ping
- /etc/resolv.conf
- /etc/hosts
- /etc/hosts.allow and /etc/hosts.deny
- /etc/hostname and /etc/HOSTNAME
- traceroute
- nslookup and dig
- dmesg

Organizing Networked Systems

- Host Name Resolution
- DNS-Specific Resolvers
- Trace a DNS Query with dig
- Exploring DNS with host
- Service Profile: DNS
- Getting Started with BIND
- bind-chroot Package
- caching-nameserver Package

Network File Sharing Services

- NFS server and NFS Client
- NFS share for group collaboration

SMB

- Samba server and samba client connections
- Samba share for group collaboration

Linux Server Administration – Managing Servers

Mail server - Sendmail Configuration

- Managing sendmail
- E-mail aliases
- Mail quotas
- Virtual mail domains
- Configuring internal mail relays
- Monitoring SMTP servers
- /etc/aliases
- sendmail.cw

DNS - BIND configuration

- Configure BIND to function as a caching-only DNS server
- Configure a caching-only name server to forward DNS queries
- Format, and reload the DNS by using kill or ndc
- Configuring DNS logging
- Configuring BIND options
- Configuring directory location for zone files
- /etc/named.conf
- /usr/sbin/ndc
- /usr/sbin/named-bootconf
- kill

Web Proxy - Squid Configuration

- Install a proxy server using Squid
- Configure a proxy server using Squid
- Implementing access policies
- Setting up authentication
- Utilizing memory usage
- Squid.conf
- acl
- http_access

DHCP configuration

- What is DHCP?
- Static hosts
- Dynamic hosts
- dhcpd.conf
- dhcpd.leases

Web server - Apache Configuration

- Apache Overview
- Apache Server Configuration
- Virtual Hosts
- Apache Access Configuration
- Deploy a basic CGI application
- Configure group-managed content
- Configure private directories
- Monitoring Apache load and performance
- Restricting client user access
- Configuring mod_php and PHP support
- Setting up client user authentication
- Configuring Apache server options
- access.log
- .htaccess
- httpd.conf
- htpasswd

Security tasks

- Auditing source code
- Securing SSH
- Getting security alerts
- Open mail relays
- Installing Intrusion Detection Systems
- Port scanning with nmap
- Firewall using IP Tables
- Filter and NAT Rules
- SMTP Overview and Implementations
- Connections and Relays
- SMTP AUTH & StartTLS/SSL
- Password Security and PAM
- Security Considerations
- Activating and Interfacing with SELinux
- SELinux commands and Roles
- Location & Access
- Boot level security (GRUB)
- Security need for TCP wrappers
- /etc/inetd.conf
- /etc/hosts.allow and /etc/hosts.deny
- xinetd
- Net filter Overview
- Rules: General Considerations
- Connection Tracking
- Network Address Translation (NAT)
- IP tables
- /proc/sys/net/ipv4

Introduction to Shell Script

- Different type of shell
- Shell script basics
- Executing shell scripts.
- Header, comments on script
- Redirection
- Variables
- Conditions
- Loops
- Eg: Backup script and scheduling the script

Storage

- Configure a system as an iSCSI initiator that persistently mounts an iSCSI target