

Just Technical Training

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Enterprise Linux Systems Administration

**Length: 5 days Price (Excl. GST):
\$2750.00 per person**

Intended for students already comfortable with working in the Unix environment, this in-depth course helps students acquire the variety of skills needed to set up and maintain Unix computers. The class covers subjects ranging from initial installation of Linux to day-to-day administrative tasks such as management of user accounts and disk space, and even imparting the troubleshooting skills future system administrators will need to cope with unexpected behavior. Prerequisites: Individuals wishing to take this class should already have a solid grounding in UNIX concepts. Fundamentals such as an understanding of the Linux filesystem, process management, and the ability to manipulate and edit files is considered a must and will not be covered in class. An understanding of network concepts, and the TCP/IP protocol suite is helpful.

Course Content

Linux Installation

- Pre-Installation Considerations

- Hardware Compatibility
- Multi-OS Booting
- Partition Considerations
- Partition Planning
- Filesystem Considerations
- Journaled Filesystems
- Installation Choices
- CD-ROM Installation
- Network Installation
- Local Hard Drive Installation
- FC Personal Desktop Class
- FC Workstation Class
- FC Server Class
- FC Custom Class
- Install Program Interface
- Installation Diagnostics
- Language Selection
- Keyboard Configuration
- Fedora Install Options
- Automatic Partitioning
- Partitioning with Disk Druid
- Installing a Boot Loader
- Network Configuration
- Security Configuration
- Language Support Selection

Tel: (08) 9295 4744

E-mail: tim@justtechtraining.com

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- Root Password Configuration
- Time Zone Configuration
- Package Group Selection
- Installing Packages
- Install Finished
- First Boot
- Finalizing GUI Configuration
- Video Card Configuration
- Monitor Configuration
- Authentication Configuration
- Perform a GUI network NFS based workstation install
- Configure LVM and Software RAID at installation time

PC Hardware and Linux

- Kudzu
- PC System Hardware
- USB Devices and Configuration
- Linux Device Files
- Configuring New Hardware
- Kernel Modules
- Handling Module Dependencies
- Configuring Kernel via /proc
- Kernel Hardware Info - /sys/
- /sys/ structure

- Enable the Magic-SysReq key

Post-Install System Configuration

- Configuration Utilities and Files
- Network Services
- Managing System Time and Network-Wide Time
- Continual Time Sync - NTP
- Configuring NTP Clients
- Managing Software
- RPM Features, Architecture, and Package Files
- Working With RPMs
- Querying and Verifying with RPM
- Package Dependencies
- Intro to YUM
- Using the YUM command
- Configuring YUM
- YUM Repositories and Resources
- Configuring Printers
- Common UNIX Printing System
- Defining a Printer
- Kickstart
- Creating Kickstart Files
- Using Kickstart files
- Answer some questions about the system

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using RPM queries

- Install zsh using RPM
- Troubleshoot and repair a package using RPM verification
- Upgrade the kernel using RPM
- Install the XFCE desktop environment using YUM
- Create and test a custom YUM repository
- Create a custom YUM repository for installing software
- Setup CUPS print queues using: system-config-printer, lpadmin, and the CUPS web interface
- Modify a kickstart file using a text editor
- Create a kickstart file using ksconfig

Boot Process and SysV Init

- Booting Linux on PCs
- LILO Options
- GRUB Configuration
- Kernel Boot Parameters
- /sbin/init
- System init Styles
- /etc/inittab
- rc.sysinit
- /etc/init.d and /etc/rcX.d
- rc

- Typical SysV Init Script
- The rc.local file
- Managing Daemons
- Controlling Startup Services
- Shutdown and Reboot
- Use GRUB to boot into single user mode
- Modify kernel/init parameters in GRUB
- Explore the GRUB interface
- Attach to the /boot filesystem and display the contents of the grub/grub.conf file
- Set a GRUB password

User/Group Administration and NFS

- User/Group Concepts
- User Private Group Scheme
- User Administration
- Modifying Accounts
- Group Administration
- Password Aging
- Default User Files
- Controlling Logins
- PAM, PAM Services, and PAM Control Statements
- su, Wheel, and sudo
- DS Client Configuration
- File Sharing via NFS

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- NFS Server Configuration
- NFS Clients
- Automounting Filesystems
- Customize /etc/skel
- Add new users and manage password aging
- Set up wheel group behavior for su
- Configure a project directory to take advantage of the user private group scheme
- Configure autofs to access an NFS export
- Configure NIS client as part of the domain
- Configure autofs to mount home directories
- Switch to using LDAP for authentication

Filesystem Administration

- Partition Tables
- File System Creation
- Mounting File Systems
- Filesystem Maintenance
- Persistent Block Devices
- udev
- Resizing Filesystems
- File Deletion and Undeletion
- Swap

- Disk Usage
- Configuring Disk Quotas
- Checking Disk Quotas
- Filesystem Attributes
- File Access Control Lists
- Manipulating ACLs
- Viewing ACLs
- Backing Up ACLs
- Backup Hardware, Software, and Examples
- Tape Libraries
- Create and activate additional swap space
- Configure and test disk quotas on the /tmp filesystem
- Backup files using tar and cpio over ssh
- Backup files using rsync over ssh
- Backup and restore files with dump and restore

LVM and Raid

- Logical Volume Management
- Implementing LVMs
- Manipulating VGs and LVs
- Advanced LVM Concepts
- Graphical LVM Tool
- RAID Concepts, Tools, and

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Implementation

- RAID Monitoring/Control
- Use command line tools to partition free space
- Configure software RAID-5 with a hot spare
- Fail a member device of the array, examine the automatic recovery using the hot-spare
- Fail another member device testing RAID-5
- Remove failed member devices, add new devices to array, examine the recovery of array
- Partition the drive and create LVM Physical Volumes
- Create a LVM Volume Group and Logical Volume to hold website content
- Verify the operation of LVM snapshots

Task Automation & Process Accounting

- Automating Tasks
- at / batch
- at Access Control
- cron, crontab, and crontab Format
- /etc/cron.* Directories
- anacron

- Viewing Processes
- Managing Processes
- System Logging
- /etc/syslog.conf
- Log Management
- Log Anomaly Detector
- Process Accounting
- Using Process Accounting
- Limiting System Resources
- System Status - Memory, I/O, and, CPU
- sar
- Create and edit user cron jobs
- Add a system-wide cron task to /etc/cron.hourly
- Install and configure process accounting
- Enable and set process limits

Client Networking

- Linux Network Interfaces
- Ethernet Hardware Tools
- Runtime configuration change
- Configuring Routing Tables
- ARP
- Advanced Configuration
- Starting and Stopping Interfaces

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- Virtual IP Interfaces
- Enabling IPv6
- Interface Bonding
- 802.1q VLANS
- Network Profiles and ifup
- IP Stack Configuration
- DNS Clients
- Network Services via DHCP
- DHCP Clients
- dhcpd.conf Syntax
- Red Hat Configuration Tools
- Network Diagnostics
- Point-to-Point Protocol
- PPP Configuration Files, Chat, and Secrets Files
- Enable static configuration
- Configure a virtual interface and verify connectivity through the new interface
- Verify Link-Local IPv6 connectivity

The X Window System

- The X Window System
- Xorg
- Configuring X
- X Fonts
- Using Fonts

- Display Manager Selection
- XDMCP
- Using Unix Remotely
- X Security
- Specialized X Servers
- Starting X Apps Automatically
- Change your display manager to gdm
- Enable XDMCP to support remote desktop login
- Configure VNC to accept incoming connections
- Launch a program by creating a script in the /etc/X11/xinit/xinitrc.d/ directory
- Start a custom X session by modifying the ~/.xinitrc file
- Secure X for use in a public kiosk

Security Concepts

- Security Concepts
- Tightening Default Security
- Staying Current
- Using up2date
- Security Advisories
- SELinux Security Framework
- Choosing a SELinux Policy
- SELinux Commands

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- Booleans
- Graphical Policy Tools
- inetd / xinetd
- Xinetd Features
- TCP Wrappers
- hosts.allow & hosts.deny
- hosts.* Syntax Shortcuts
- Advanced TCP Wrappers
- Basic Firewall Activation
- Stateful Packet Filter: iptables
- Netfilter Rule Syntax
- Targets
- Common match_specs
- Stateless Firewall Example
- Connection Tracking
- Stateful Firewall Example
- Examine current system
- Configure Xinetd to provide a variety of limits for connecting to services
- Configure a sensor to log connection attempts
- Use TCP Wrappers to secure various services

Linux Kernel Compilation

- Why Compile?
- Getting Kernel Source
- Preparing to Compile
- Configuring the Kernel
- General Options
- Disk Configuration
- Network Configuration
- Expansion Port Configuration
- Multimedia Configuration
- Kernel Documentation
- RH 2.4 Kernel Extensions
- Compiling the Kernel
- Compile and Install Modules
- Installing the Kernel
- Tips and Tricks
- Build, test, and install a new driver for the currently running kernel
- Patch the Linux kernel source to add support for a new device

Troubleshooting

- Basic Troubleshooting
- Gathering Information
- Information from df and mount
- Information from Log Files

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- Information Regarding Network Settings
- Information from ps, chkconfig, dmesg, w, and netstat
- Useful Debugging Aids
- Common Problems
- Incorrect File Permissions
- Inability To Boot
- Corrupt File Systems
- Typos in Configuration Files
- Disks Full?
- Runaway Processes
- Shared Libraries
- The Rescue Environment
- Explore troubleshooting and disaster recovery on non-mission-critical machines