Linux System Administration

Presentation

Objectives: Learn Basic System Administration on Linux.
Delivery mechanism: **Classroom Training**
Who can benefit: Windows™, Mac and Unix users/administrators.
Prerequisites: Computer literacy.
Learning technique: Clear, theoretical course content divided into lessons and extensive LABS both available on-line 24/24 7/7 and downloadable in PDF format.
Student Progression: Student progression is monitored both in terms of effective course duration and in terms of student comprehension using self-assessment tests.
Operating Systems covered by this course: CentOS/Redhat, Debian, openSUSE.
Duration: 35 hours over 5 days.

Contents

                - Command Line Switches
            - gpasswd
                - Command Line Switches
        - Users
            - useradd
                - Command Line Switches
            - userdel
                - Command Line Switches
            - usermod
                - Command Line Switches
            - passwd
                - Command Line Switches
    - Configuration
    - LAB #1 - Managing Groups and Users
    - su et su -
    - sudo
    - **Commands** : grpck, grpconv, grpunconv, pwck, pwconv, pwunconv, groupadd, groupdel, groupmod, newgrp, gpasswd, useradd, userdel, usermod, passwd, id, groups, su, sudo.

- **Package Management**
    - Compiling Software the Old Way
        - ./configure
        - make
        - make check
        - make install
    - The rpm Command with Red Hat and OpenSUSE
    - Yellow Dog Updater Modified and Red Hat
        - Configuration
        - Repositories
        - Usage
        - LAB #1 - Working with Yum
    - Zypper and OpenSUSE
        - Configuration
        - Repositories

        - Usage
        - LAB #2 - Working with Zypper
    - The dpkg Command
    - Advanced Package Tool and Debian
        - Configuration
        - Repositories
        - Usage
        - LAB #1 - Working with Apt
    - Shared Libraries
        - Presentation
            - Introduction
            - Shared Object Locations
            - ld-linux.so.2
            - The ldd Command
            - The /etc/ld.so.conf File
            - The ldconfig Command
    - **Commands** : rpm, yum, dpkg, apt-get, apt-cache, zypper, mc, wget, configure, make, ldd, ldconfig.

- **Managing File Permissions**
    - Preparation
    - Basic Unix File Permissions
        - Changing Permissions with chmod
            - Symbolic Mode
            - Octal Mode
            - Command Line Switches
    - The umask command
        - Commande Line Switches
    - Changing the Owner or the Group with chown and chgrp
        - Commande Line Switches
    - Advanced Unix Permissions
        - SUID/SGID bit
        - Inheritance Flag
        - Sticky bit
    - ACLs

        - Commande Line Switches
    - Ext2/Ext3/Ext4 Attributes
    - **Commands** : chmod, umask, chown, chgrp, setfacl, getfacl, chattr, lsattr.

- **Managing Disks and Swap Space**
    - Block Devices
    - Partitions
        - Master Boot Record
        - Apple Partition Map
        - GUID Partition Table
    - Partitioning
        - LAB #1 - Using fdisk
    - Journaled Filesystems
        - Presentation
        - Ext3
        - Ext4
        - ReiserFS
        - XFS
        - JFS
    - Swap Space
        - Swap Size
        - Swap Partitions
        - The swapon Command
            - Command Line Switches
        - The swapoff Command
            - Command Line Switches
    - The /etc/fstab file
    - Swap Files
    - **Commands** : fdisk, mke2fs, tune2fs, dumpe2fs, mkfs.xfs, xfs_info, xfs_admin, mkfs.reiserfs, debugreiserfs, reiserfstune, mkfs.jfs, jfs_tune, mkswap, swapon, swapoff.

- **Process Scheduling**
    - cron
    - anacron
    - at

- **Commands** : cron, anacron, at.

- **Archiving and Compression**
  - Archiving
    - tar
      - Presentation
      - Command Line Switches
      - LAB #1 - Exercises
    - cpio
      - Presentation
      - Command Line Switches
      - LAB #2 - Exercises
    - dd
      - Presentation
      - Command Line Switches
      - LAB #3 - Exercises
    - dump and restore
      - Presentation
  - Compression
    - gzip
      - Presentation
      - Command Line Switches
      - LAB #4 - Exercises
    - bzip2
      - Presentation
      - Command Line Switches
      - LAB #5 - Exercises
    - Other Tools
  - **Commands** : tar, cpio, dd, dump, restore, gzip, gunzip, bzip2, bunzip2, xz, compress, uncompress, rar, unrar, zip, unzip.

- **Process Management**
  - Process Types
  - Process Commands
    - The ps Command
      - Command Line Switches

        - The pstree Command
            - Command Line Switches
        - The top Command
        - The fg and bg Commands
            - Command Line Switches
        - The wait Command
        - The nice Command
            - Command Line Switches
        - The renice Command
            - Command Line Switches
        - The nohup Command
            - Command Line Switches
        - The kill Command
    - **Commands** : ps, pstree, top, fg, bg, wait, nice, renice, nohup, kill.

- **Managing Logs**
    - The /var/log/messages file
    - The /bin/dmesg Command
    - The /var/log/audit/audit.log file
        - Managing Audit Events
            - auditd
            - auditctl
                - Command Line Switches
            - audispd
        - Viewing Audit Events
            - The aureport Command
                - Command Line Switches
            - The ausearch Command
                - Command Line Switches
    - Applications
    - rsyslog
        - Priorities
        - Facilities
        - /etc/rsyslog.conf

                - Modules
                - Global Directives
                - Rules
                    - Facility.Priority
                    - Facility!Priority
                    - Facility=Priority
                    - Using the * Wildcard
                    - n Facilities with Identical Priorities
                    - n Selectors with Identical Actions
        - /usr/bin/logger
            - Command Line Switches
        - **Commands** : dmesg, auditd, auditctl, audoispd, aureport, ausearch, rsyslog, logger, logrotate.

- **Printer Management**
    - Introduction
        - Protocols
        - Daemon
    - Configuration
        - /etc/cups/cupsd.conf
        - Filters
        - Backends
        - Logs
        - Printers
    - Administration
        - The lpstat Command
        - The lpadmin Command
        - The accept and cupsenable Commands
        - Setting Up the Default Printer
        - Using a .ppd File to Add a Printer
        - Classes
        - The /etc/cups/printers.conf File
        - The /etc/cups/classes.conf File
        - The cancel Command
        - The lpmove Command

        - Destroying a Class
    - Web Interface
    - Graphical Interface
    - **Commands** : lpadmin, accept, reject, cupsenable, cupsdisable, lpstat, cancel, lpmove, lpinfo, lppasswd, lp.

- **System Startup and Shutdown**
    - System Startup
        - Boot Loader
            - BIOS Systems
            - EFI Systems
    - GRUB
        - GRUB LEGACY on Red Hat/CentOS
        - GRUB LEGACY on OpenSUSE
        - GRUB 2 on Debian Squeeze
            - The /boot/grub/device.map file
            - The /etc/default/grub file
            - Files in the /etc/grub.d directory
    - Initramfs
        - Initramfs on Redhat / CentOS
            - The init Script
            - The dracut Command
        - Initramfs on Debian Squeeze
            - The init Script
            - The mkinitramfs Command
        - Initramfs on openSUSE
            - The init Script
            - The mkinitrd Command
    - Kernel Booting Process
    - The Init Process
    - RUNLEVELS
    - Unix System V Startup Scripts
        - Debian Squeeze
            - Inittab
            - The /etc/init.d directory

        - Le script rc.S
        - The /etc/rcX.d Directories
        - The update-rc.d Command
        - The chkconfig Command
      - openSUSE
    - Upstart Startup Scripts
      - Red Hat/CentOS 6
        - System Initialisation
        - Runlevels
        - [CTL]-[ALT]-[DEL]
        - mingetty
        - rc.sysinit
        - The /etc/rc.d/init.d Directory
        - The /etc/rc.d/rcX.d Directories
        - La commande chkconfig
    - System Shutdown
      - The shutdown Command
      - The reboot command
      - The halt Command
      - The poweroff Command
    - **Commands** : grub_install, runlevel, init, telinit, chkconfig, update-rc.d, dracut, mkinitramfs, mkinitrd, shutdown, halt, reboot, poweroff.

- **Managing Integrated Peripherals**
  - Special Files
  - Commands
    - The lspci Command
      - Command Line Switches
    - The lsusb Command
      - Command Line Switches
    - The dmidecode Command
      - Command Line Switches
  - The /proc Directory
    - Sub-directories
      - ide/scsi

        - acpi
        - bus
        - net
        - sys
        - The sysctl Command
            - Command Line Switches
    - Files
        - /proc/cpuinfo
        - /proc/interrupts
        - /proc/dma
        - /proc/ioports
        - /proc/devices
        - /proc/modules
        - /proc/diskstats
        - /proc/partitions
        - /proc/swaps
        - /proc/loadavg
        - /proc/meminfo
        - /proc/version
    - Interpreting Information in /proc
        - Commands
            - free
            - uptime or w
            - iostat
            - vmstat
            - mpstat
            - sar
        - Production Environements
            - Identifying a System with a CPU Bottleneck
            - Identifying a Memory Problem
            - Identifying I/O Bottlenecks
- USB Modules
- udev
    - The udevadm Command

                - Command Line Switches
        - The /sys Filesystem
        - Limiting Resources
        - **Commands**: lspci, lsusb, dmidecode, free, uptime, w, iostat, vmstat, mpstat, sar, udevadm.

- **Managing a TCPv4 Network**
    - Communication models
        - OSI
            - NDIS and ODI
        - TCP/IP
            - Messages, Datagrams and Segments
            - Establishing a TCP connection
            - The TCP header
            - The UDP header
            - Fragmentation and Re-encapsulation
            - TCPv4 Classes
            - Subnet Masks
                - Variable Length Subnet Masks - VLSM
            - Ports and sockets
    - Configuring a Network Client under Linux
        - /etc/services
        - Ethernet address resolution with arp
            - Command Line Switches
    - Configuring TCP/IP v4
        - Red Hat
            - DHCP
                - /etc/sysconfig/network
                - /etc/sysconfig/network-scripts/ifcfg-ethX (où X=0,1 ...)
            - Fixed IP Address
                - /etc/sysconfig/network
                - /etc/sysconfig/network-scripts/ifcfg-ethX (où X=0,1 ...)
        - Debian
            - DHCP
                - /etc/network/interfaces

        - Fixed IP Address
            - /etc/network/interfaces
    - openSUSE
        - DHCP
            - /etc/sysconfig/network/config
            - /etc/sysconfig/network/dhcp
            - /etc/sysconfig/network/ifcfg-ethX (où X=0,1 ...)
        - Fixed IP Address
            - /etc/sysconfig/network/ifcfg-ethX (où X=0,1 ...)
- The /etc/networks file
- IP address resolution
    - /etc/resolv.conf
    - /etc/nsswitch.conf
    - /etc/hosts
- Network Services
    - xinetd
    - TCP Wrapper
- Basic Networking Commands
    - hostname
        - Command Line Switches
    - ifconfig
        - Command Line Switches
    - ping
        - Command Line Switches
    - netstat -i
        - Command Line Switches
- Static Routing Tables
    - The route Command
        - Command Line Switches
    - The netstat Command
        - Command Line Switches
    - The traceroute Command
        - Command Line Switches
- Turning routing ON/OFF

- Manually bringing up and down a network interface
- Remote Administration
  - Telnet
    - Command Line Switches
  - ssh
    - Command Line Switches
  - wget
    - Command Line Switches
  - ftp
    - Command Line Switches
  - scp
    - Command Line Switches
- **Commands**: netstat, arp, nslookup, dig, ifconfig, ifup, ifdown, ifstatus, NetworkManager, hostname, uname, ping, tcpd, xinetd, route, traceroute, telnet, ssh, wget, ftp, scp.

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