

Version : **2022.01**

Last updated : 2021/12/18 10:11

# LCE500 - Course Presentation

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  - Prerequisites
  - Training Program

## Prerequisites

### Hardware

- A computer running either MacOS, Linux, Windows™ or Solaris™ ,
- QWERTY US Keyboard,
- 4 GB of RAM,
- Headphones,
- A mic (optional).

### Software

- Web Chrome version 72+ or
  - Microsoft Edge version 79+ or
  - Firefox version 65+.
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## Internet

- A fast, **direct** (no proxy or VPN), Internet connection (4G minimum),
- Access to : <https://itraining.network> and subdomains thereof.
- Accessible ports : 80, 443.

## Training Program

- **LCE500 - CentOS 8 Linux (RHEL 8 / Oracle Linux 8) - System Administrator**
  - Prerequisites
  - Training Program
- **LCE501 - Managing Users and Groups**
  - Presentation
    - /etc/nsswitch.conf
    - The getent Command
    - The /etc/group and /etc/gshadow files
    - The /etc/passwd and /etc/shadow files
  - Commands
    - Groups
      - groupadd
      - groupdel
      - groupmod
      - newgrp
      - gpasswd
    - Users
      - useradd
      - userdel
      - usermod
      - passwd
      - chage
  - Configuration

- LAB #1 - Managing Users and Groups
- LAB #2 - su and su -
- sudo

- **LCE502 - Package Management**

- LAB #1 - Compiling Software
  - 1.1 - ./configure
  - 1.2 - make
  - 1.3 - make check
  - 1.4 - make install
- LAB #2 - The rpm Command
  - 2.1 - Configuration
  - 2.2 - Usage
- LAB #3 - The dnf Command
  - 3.1 - Presentation
  - 3.2 - Configuration
  - 3.3 - Repositories
  - 3.4 - Searching for Packages
  - 3.5 - Viewing Information on and Downloading a Package
  - 3.6 - Installing a Package
  - 3.7 - Updating Packages
  - 3.8 - Deleting Packages
- Shared Libraries
  - Presentation
    - Introduction
    - Shared Object Locations
    - ld-linux.so.2
  - The ldd Command
  - The /etc/ld.so.conf File
  - The ldconfig Command

- **LCE503 - Managing File Permissions**

- Presentation
  - Preparation
  - LAB #1 - Basic Unix File Permissions
-

- 1.1 - Changing Permissions with chmod
  - Symbolic Mode
  - Octal Mode
  - The umask Command
- 1.2 - Changing the Owner or the Group with chown and chgrp
  - The chown Command
  - The chgrp Command
- LAB #2 - Advanced Unix Permissions
  - 2.1 - SUID/SGID bit
  - 2.2 - Inheritance Flag
  - 2.3 - Sticky bit
- LAB #3 - Extending Linux Permissions using ACLs and Attributes
  - 3.1 - ACLs
  - 3.2 - Attributes

- **LCE504 - Managing Disks and Filesystems**

- Peripherals
  - Partitions
  - Partitioning
    - LAB #1 - Partitioning your Disk with the fdisk Command
    - LAB #2 - Modifier les Drapeaux des Partitions avec fdisk
  - Logical Volume Manager (LVM)
    - LAB #3 - Linear Logical Volumes
      - Physical Volumes (PV)
      - Volume Groups (VG) and Physical Extents (PE)
      - Logical Volumes (LV)
    - LAB #4 - Grow a Volume
    - LAB #5 - Snapshots
    - LAB #6 - Deleting Volumes
    - LAB #7 - Mirrored Volumes
    - LAB #8 - Changing LVM Attributes
    - LAB #9 - Striped Volumes
    - LAB #10 - Managing Meta-data
  - Journalled Filesystems
-

- Ext3
    - Managing Ext3
    - LAB #11 - Converting Ext3 to Ext2
    - LAB #12 - Converting Ext2 to Ext3
    - LAB #13 - Using another PArtition for the Journal
    - LAB #14 - Changing the File System Check interval on an ext3 Filesystem
  - Ext4
    - LAB #15 - Creating an Ext4 Filesystem
    - LAB #16 - Adding a Label to an Ext4 Filesystem
    - LAB #17 - Converting Ext3 to Ext4
  - XFS
    - LAB #18 - Creating an XFS Filesystem
    - LAB #19 - Adding a Label to an XFS Filesystem
  - **LCE505 - Process Scheduling**
    - cron
      - The /etc/crontab file
      - Time Fields
      - User Crontabs
    - anacron
    - at
  - **LCE506 - Archiving and Compression**
    - Traditional Backup Tools
      - Preparation
      - The tar Command
        - Presentation
        - LAB #1 - Working with the tar Command
        - The GPL tar Commande and Compression
      - The cpio Command
        - Presentation
        - LAB #2 - Working with the cpio Command
      - The dd Command
        - Presentation
        - LAB #3 - Working with the dd Command
-

- The dump et restore Commands
    - Presentation
  - LAB #4 - System Backups
    - Backing up the Installed Package List
    - Backing up the Disk Structure
    - Backing up Mount Points
    - Backing up the Boot Loader
      - GRUB Legacy
      - GRUB 2 on BIOS
      - GRUB 2 on EFI
    - Backing up User Files
  - Rsync
    - Presentation
    - LAB #5 - Working with the rsync Command
  - Compression
    - The gzip Command
      - Presentation
      - LAB #4 - Working with the gzip Command
    - The bzip2 Command
      - Presentation
      - LAB #5 - Working with the bzip2 Command
    - The xz Command
      - Presentation
      - LAB #6 - Working with the xz Command
    - Other Compression Utilities
  - **LCE507 - Process Management**
    - Presentation
    - Process Types
    - Process Commands
      - The ps Command
      - The pgrep Command
      - The pstree Command
      - The top Command
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- The fg, bg and jobs Commands
- The wait Command
- The nice Command
- The renice Command
- The nohup Command
- The kill Command
- The pkill Command

- **LCE508 - Managing Logs**

- Presentation
- The dmesg Command
- Security Logging
  - The last Command
  - The lastlog Command
  - The lastb Command
  - The /var/log/secure File
- The /var/log/audit/audit.log File
  - Managing Audit Events
    - auditd
    - auditctl
  - Viewing Audit Events
    - The aureport Command
    - The ausearch Command
- The /var/log/messages File
- Applications
- rsyslog
  - Priorities
  - Facilities
  - The /etc/rsyslog.conf File
    - Modules
    - Global Directives
    - Rules
      - Facility.Priority
      - Facility!Priority

- Facility=Priority
- Using the \* Wildcard
- n Facilities with Identical Priorities
- n Selectors with Identical Actions
- The logger Command
- The logrotate Command
- journald
  - Using Journald
    - Application Specific Messages
    - Boot Messages
    - Priority Specific Messages
    - Messages from a Specific Date Range
    - Real Time Messages
    - Searching with Key Words

- **LCE509 - Printer Management**

- Cups
  - Protocols
  - Packages
  - Daemon
  - The /etc/cups/cupsd.conf File
  - Filters
  - Backends
  - Logs
  - Printers
  - Administration
    - The lpstat Command
    - The lpadmin Command
    - The accept et cupsenable Commands
    - Classes
    - The /etc/cups/printers.conf File
    - The /etc/cups/classes.conf File
    - The cancel Command
    - The lpmove Command

- Web Interface

- **LCE510 - System Startup and Shutdown**

- System Startup
  - Boot Loader
    - BIOS Systems
    - EFI Systems
    - GRUB 2
      - The /boot/grub/grub.cfg File
      - The /etc/default/grub file
      - Files in the /etc/grub.d directory
  - Initramfs
    - The init Script
  - Kernel Booting Process
- Systemd
  - LAB #1 - The systemctl Command
  - LAB #2 - Configuration Files
    - 2.1 - Default Configuration Files
    - 2.1 - Overloading Default Configuration Files
  - LAB #3 - The systemd-analyze Command
  - LAB #4 - Targets
    - 4.1 - Checking the Target Dependencies
    - 4.2 - The Default Target
      - Checking the Default Target
      - Changing the Default Target
      - Changing the Default Target for the Current Session
  - LAB #5 - Managing Services
    - 5.1 - Single Service Instances
    - 5.2 - Multiple Instance Services
    - 5.3 - Disallowing Modifications to a Service Status
- LAB #6 - System Shutdown
  - 6.1 - The shutdown Command
  - 6.2 - The reboot Command
  - 6.3 - The halt Command

- 6.4 - The poweroff Command

- **LCE601 - Managing Integrated Peripherals**

- Special Files
  - LAB #1 - Commands
    - 1.1 - The lspci Command
    - 1.2 - The lsusb Command
    - 1.3 - The dmidecode Command
  - LAB #2 - The sysctl Command
    - 2.1 - The /proc Directory
      - Files
        - /proc/cpuinfo
        - /proc/interrupts
        - /proc/dma
        - /proc/ioports
        - /proc/devices
        - /proc/module
        - /proc/diskstats
        - /proc/partitions
        - /proc/swaps
        - /proc/loadavg
        - /proc/meminfo
        - /proc/version
      - Directories
        - ide/scsi
        - acpi
        - bus
        - net
        - sys
    - 2.2 - Using the sysctl Command
  - LAB #3 - Interpreting Information in /proc
    - 3.1 - free
    - 3.2 - uptime ou w
    - 3.3 - iostat
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- 3.4 - hdparm
  - 3.5 - vmstat
  - 3.6 - mpstat
  - 3.7 - sar
  - USB Modules
  - udev
    - The udevadm Command
  - The /sys Filesystem
  - LAB #4 - Limiting Resources
    - 4.1 - ulimit
    - 4.2 - CGroups
      - Limiting Memory Usage
      - The cgcreate Command
      - The cgdelete Command
      - The /etc/cgconfig.conf File
      - The cgconfigparser Command
  - **LCE602 - Compiling the Kernel and Managing Quotas**
    - The Linux Kernel
    - LAB #1 - Modules
    - LAB #2 - Compiling and Installing a Kernel and Modules
      - 2.1 - Move /home
      - 2.2 - Preparing the Environment
      - 2.3 - Preparing the Kernel Source Tree
        - The .config file
        - The Makefile file
      - 2.4 - Configuring the Kernel
      - 2.5 - Compiling the Kernel
      - 2.6 - Installing the Kernel
    - LAB #3 - Managing Quotas
      - 3.1 - The quotacheck Command
      - 3.2 - The edquota Command
      - 3.3 - The quotaon Command
      - 3.4 - The repquota Command
-

- 3.5 - The quota Command
- 3.6 - The warnquota Command

- **LCE603 - Managing the Network**

- Presentation
  - The nmcli Command
- LAB #1 - Configuring the Network
  - 1.1 - Connections and Profiles
  - 1.2 - Name Resolution
  - 1.3 - Adding a Second IP Address to a Profile
  - 1.4 - The hostname Command
  - 1.5 - The ip Command
  - 1.6 - Manually Activating and Deactivating a Device
  - 1.7 - Static Routing
    - The ip Command
    - Deactivating/Activating Internal Routing on a Server
- LAB #2 - Diagnostics
  - 2.1 - The ping Command
  - 2.2 - The netstat Command
  - 2.3 - The traceroute Command
- LAB #3 - SSH
  - 3.1 - Presentation
    - SSH-1
    - SSH-2
  - 3.2 - Configuring the Server
  - 3.3 - Configuring the Client
  - 3.4 - SCP
    - Presentation
    - Usage
  - 3.5 - Authentication with Asymmetric Keys

- **LCE511 - Training Validation**

- Course Materials
  - Reminder of the Training Program
    - Day #1
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- Day #2
  - Day #3
  - Day #4
  - Training Evaluation
  - Exam - Acquired knowledge
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