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LCE500 - Course Presentation

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- **LCE500 - Course Presentation**
 - Contents
 - 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+.

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
- Journaled 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

- 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

- 3.4 - hdparm
 - 3.5 - vmstat
 - 3.6 - mpstat
 - 3.7 - sar
- USB Modules
- udev
 - The udevadm Command
- The /sys Filesystem
- LAB #4 - Limiting Ressources
 - 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 Disactivating a Device
 - 1.7 - Static Routing
 - The ip Command
 - Disactivating/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

- Day #2
 - Day #3
 - Day #4
 - Training Evaluation
 - Exam - Acquired knowledge
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