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# LCE500 - CentOS 8 Linux (RHEL 8 / Oracle Linux 8) - System Administrator

## Presentation

**Objectives:** Master CentOS 8 / RHEL 8 / Oracle Linux 8 System Administration.

**Who can benefit:** Linux users, Administrators of other operating systems.

**Prerequisites:** Taken the LCE400 - CentOS 8 Linux (RHEL 8 / Oracle Linux 8) - Fundamentals course or possess equivalent skills.

**Learning technique:** Clear, theoretical course content divided into lessons and extensive LABS.

**Student Progression:** Student progression is monitored in terms of comprehension using self-assessment tests.

**Duration:** 4 days (28 hours).

## Prerequisites

### Hardware

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

### Software

- Chrome, Edge or Firefox web browser.

### Internet

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

## Training Program

- **LCE500 - CentOS 8 Linux (RHEL 8 / Oracle Linux 8) - System Administrator**
  - Prerequisites

- Hardware
- Software
- Internet
- Using our infrastructure
- Training Program
- Skills Assessment

- **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 Command 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
- **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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