

# Linux Administration (NI201)

32 Hours

## Outline

This intensive hands-on course will teach one, proper ways to operate fundamentally the GNU/Linux operating system. The course will introduce the various methods; tools and techniques for easily work in environments built on Linux shell. This course provides intensive hands-on exercises using real world applications.

## Objectives

The objectives of the course are to teach our student solid knowledge and mostly hands-on experience to enable a working person to feel him/herself comfortable working with shell environment of Linux/Unix based system

## Target Audience

- Members of the System/DevOps teams.
- System personal who would like to gain knowledge in Linux/Unix systems.

## Prerequisites

- Go through Linux Fundamentals course or gain equivalent knowledge.
- Go through Linux Network course or gain equivalent knowledge.
- Go through Linux Shell Scripting course or gain equivalent knowledge.

# Contents

## Day 1:

- Process management:
  - Terminology
  - Basic process management.
  - Signaling processes
  - Priority and nice values
  - Background processes
  
- Disk management
  - Terminology.
  - Device naming.
  - Discovering disk devices
  - Erasing a hard disk
  - Advanced hard disk settings
  - About partitions
  - Discovering partitions.
  - Partitioning new disks.
  - About the partition table.
  - GUID partition table.
  - Labeling.
  
- File systems
  - About file systems.
  - Common file systems.
  - Putting a file system on a partition.
  - Tuning a file system.
  - Checking a file system
  
- Mounting
  - Mounting local file systems.
  - Displaying mounted file systems.
  - From start to finish.
  - Permanent mounts
  - Securing mounts
  - Mounting remote file systems

- Troubleshooting Tools.
  - lsof
  - fuser
  - Chroot.
  - lostat.
  - ltop
  - Vmstat ...
  
- Introduction to UUID's.
  - About unique objects.
  - Tune2fs.
  - UUID.
  - UUID in /etc./fstab
  - UUID as a boot device.
  
- Logical volume management.
  - Introduction to LVM
  - LVM terminology ...
  - Using LVM
  - Extend a logical volume
  - verifying existing physical volumes
  - Verifying existing volume groups.
  - Verifying existing logical volumes.
  - Manage physical volumes...
  - Manage volume groups ...
  - Manage logical volumes....
  
- ISCSI devices.
  - ISCSI terminology
  - ISCSI Target.
  - ISCSI Initiator
  - Using iSCSI devices...
  - ISCSI Target.
  - ISCSI Initiator.

- introduction to multipathing
  - Install multipath...
  - Configure multipath.
  - Network.
  - Start multipathd and iSCSI
  - Multipath list.
  - Using the device.

## Day 2:

- Boot Management:
  - Boot terminology.
  - Grub.
  - Grub2.
  - Lilo
- Init and Runlevels
  - system initialization)
  - Daemon or demon?
  - Starting and stopping daemons
  - Chkconfig
  - Bum
  - Runlevels
  - Systemd
- System Management
- Scheduling
  - At
  - Cron
- Logging.
  - Login logging.
  - Syslogd.
  - Logger.
  - Watching logs.
  - Rotating logs.

- Memory Management
  - Displaying memory and cache.
  - Managing swap space.
  - Monitoring memory with Vmstat.
  
- Resource Monitoring
  - Four basic resources
  - "Free"
  - "Watch"
  - "Vmstat."
  - "Iostat."
  - "Mpstat"
  - "SADC" and "SAR".
  - "Ntop"
  - "Iftop"
  - "IPTraf"
  - "Nmon".
  - "htop"
  
- Package Management
  - "package terminology"
  - "Rpm".
  - "Yum"
  - "Alien"
  - downloading software outside the repository
  - compiling software

### Day 3:

- Network management:
  - Interface configuration.
  - GUI NIC configuration
  - NIC configuration.
  - "Ifconfig".
  - "IP".
  - "Dhclient".
  - "Hostname".
  - "ARP".
  - "Route".
  - "Ping".
  
- binding and bonding
  - Binding.
  - Bonding.
  
- Backup management
  - Backup.
  - Compression.
  - "Tar".
  - Backup Types
  - "Dump" and "restore".
  - "Cpio"
  - "DD"
  - Split.

## Day 4:

- Kernel management:
  - The Linux kernel.
  - About the Linux kernel.
  - Linux kernel source.
  - Kernel boot files.
  - Linux kernel modules.
  - Compiling a kernel.
  - Compiling one module.
  
- Library management.
  - Introduction.
  - /lib and /USR/lib.
  - LDD.
  - Ltrace.
  - Rpm - QF and rpm -V.
  - Tracing with strace.