

Course Objective: LPIC-2 is the second certification in the multi-level professional certification program. This is the first part of the two-set course LPIC-2. This course will help you perform advanced system administration, including common tasks regarding the Linux kernel, system startup and maintenance, management of block storage and file systems as well as networking.

Duration: 4 Days

Topic 200: Capacity Planning

200.1 Measure and Troubleshoot Resource Usage

- Measure CPU usage.
- Measure memory usage.
- Measure disk I/O.
- Measure network I/O.
- Measure firewalling and routing throughput.
- Map client bandwidth usage.
- Match / correlate system symptoms with likely problems.
- Estimate throughput and identify bottlenecks in a system including networking.

200.2 Predict Future Resource Needs

- Use monitoring and measurement tools to monitor IT infrastructure usage.
- Predict capacity break point of a configuration.
- Observe growth rate of capacity usage.
- Graph the trend of capacity usage.
- Awareness of monitoring solutions such as Icinga2, Nagios, collectd, MRTG and Cacti

Topic 201: Linux Kernel

201.1 Kernel components

- Kernel 2.6.x, 3.x and 4.x documentation

201.2 Compiling a Linux kernel (weight: 3)

- /usr/src/linux/
- Kernel Makefiles
- Kernel 2.6.x, 3.x and 4.x make targets
- Customize the current kernel configuration.
- Build a new kernel and appropriate kernel modules.
- Install a new kernel and any modules.
- Ensure that the boot manager can locate the new kernel and associated files.
- Module configuration files
- Use DKMS to compile kernel modules.
- Awareness of dracut

201.3 Kernel runtime management and troubleshooting

- Use command-line utilities to get information about the currently running kernel and kernel modules.
- Manually load and unload kernel modules.
- Determine when modules can be unloaded.
- Determine what parameters a module accepts.
- Configure the system to load modules by names other than their file name.
- /proc filesystem
- Content of /, /boot/, and /lib/modules/
- Tools and utilities to analyse information about the available hardware
- udev rules

Topic 202: System Startup

202.1 Customising system startup

- Systemd
- SysV init
- Linux Standard Base Specification (LSB)

202.2 System recovery

- BIOS and UEFI
- NVMe booting
- GRUB version 2 and Legacy
- grub shell
- boot loader start and hand off to kernel
- kernel loading
- hardware initialisation and setup
- daemon/service initialisation and setup
- Know the different boot loader install locations on a hard disk or removable device.
- Overwrite standard boot loader options and using boot loader shells.
- Use systemd rescue and emergency modes.

202.3 Alternate Bootloaders

- SYSLINUX, ISOLINUX, PXELINUX
- Understanding of PXE for both BIOS and UEFI
- Awareness of systemd-boot and U-Boot

Topic 203: Filesystem and Devices

203.1 Operating the Linux filesystem

- The concept of the fstab configuration
- Tools and utilities for handling swap partitions and files
- Use of UUIDs for identifying and mounting file systems
- Understanding of systemd mount units

203.2 Maintaining a Linux filesystem

- Tools and utilities to manipulate and ext2, ext3 and ext4
- Tools and utilities to perform basic Btrfs operations, including subvolumes and snapshots
- Tools and utilities to manipulate XFS
- Awareness of ZFS

203.3 Creating and configuring filesystem options

- autofs configuration files
- Understanding of automount units
- UDF and ISO9660 tools and utilities
- Awareness of other CD-ROM filesystems (HFS)
- Awareness of CD-ROM filesystem extensions (Joliet, Rock Ridge, El Torito)
- Basic feature knowledge of data encryption (dm-crypt / LUKS)

Topic 204: Advanced Storage Device Administration

204.1 Configuring RAID

- Software RAID configuration files and utilities

204.2 Adjusting Storage Device Access

- Tools and utilities to configure DMA for IDE devices including ATAPI and SATA
- Tools and utilities to configure Solid State Drives including AHCI and NVMe
- Tools and utilities to manipulate or analyse system resources (e.g., interrupts)
- Awareness of sdparm command and its uses
- Tools and utilities for iSCSI
- Awareness of SAN, including relevant protocols (AoE, FCoE)

204.3 Logical Volume Manager

- Tools in the LVM suite
- Resizing, renaming, creating, and removing logical volumes, volume groups, and physical volumes
- Creating and maintaining snapshots
- Activating volume groups

Topic 205: Networking Configuration

205.1 Basic networking configuration

- Utilities to configure and manipulate ethernet network interfaces
- Configuring basic access to wireless networks

205.2 Advanced Network Configuration

- Utilities to manipulate routing tables
- Utilities to configure and manipulate ethernet network interfaces
- Utilities to analyse the status of the network devices

- Utilities to monitor and analyse the TCP/IP traffic

205.3 Troubleshooting network issues

- Location and content of access restriction files
- Utilities to configure and manipulate ethernet network interfaces
- Utilities to manage routing tables
- Utilities to list network states.
- Utilities to gain information about the network configuration
- Methods of information about the recognised and used hardware devices
- System initialisation files and their contents (Systemd and SysV init)
- Awareness of NetworkManager and its impact on network configuration

Topic 206: System Maintenance

206.1 Make and install programs from source

- Unpack source code using common compression and archive utilities.
- Understand basics of invoking make to compile programs.
- Apply parameters to a configure script.
- Know where sources are stored by default.

206.2 Backup operations

- Knowledge about directories that have to be included in backups
- Awareness of network backup solutions such as Amanda, Bacula, Bareos and BackupPC
- Knowledge of the benefits and drawbacks of tapes, CDR, disk or other backup media
- Perform partial and manual backups.
- Verify the integrity of backup files.
- Partially or fully restore backups.

206.3 Notify users on system-related issues

- Automate communication with users through logon messages.
- Inform active users of system maintenance