Future Cert

LPIC-2: Linux Network Professional Certification

LPIC-2 Exam 201

LPIC-2 is the second certification in LPI's multi-level professional certification program. The LPIC-2 will validate your ability to administer small to medium–sized mixed networks. You must have an active LPIC-1 certification to receive LPIC-2 certification, but the LPIC-1 and LPIC-2 exams may be taken in any order.

To pass LPIC-2, you should be able to:

- Administer a small to medium-sized site
- Plan, implement, maintain, keep consistent, secure, and troubleshoot a small mixed (MS, Linux) network, including a:
  - LAN server (Samba, NFS, DNS, DHCP, client management)
  - Internet Gateway (firewall, VPN, SSH, web cache/proxy, mail)
  - Internet Server (web server and reverse proxy, FTP server)
- Supervise assistants
- Advise management on automation and purchases

TOPIC 200: CAPACITY PLANNING

200.1 Measure and Troubleshoot Resource Usage (6)

Candidates should be able to measure hardware resource and network bandwidth, identify and troubleshoot resource problems.

Key knowledge areas:

- 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 (2)

Candidates should be able to monitor resource usage to predict future resource needs.

Key knowledge areas:

- Use collectd 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 Nagios, MRTG and Cacti

TOPIC 201: LINUX KERNEL

201.1 Kernel Components (2)

Candidates should be able to utilize kernel components that are necessary to specific hardware, hardware drivers, system resources and requirements. This objective includes implementing different types of kernel images, identifying stable and development kernels and patches, as well as using kernel modules.

Key knowledge areas:

- Kernel 2.6.x documentation
- Kernel 3.x documentation

201.2 Compiling a kernel (3)

Candidates should be able to properly configure a kernel to include or disable specific features of the Linux kernel as necessary. This objective includes compiling and recompiling the Linux kernel as needed, updating and noting changes in a new kernel, creating an initrd image and installing new kernels.

Key knowledge areas:

- /usr/src/linux/
- Kernel Makefiles
- Kernel 2.6.x/3.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
- Awareness of dracut

201.3 Kernel runtime management and troubleshooting (4)

Candidates should be able to manage and/or query a 2.6.x or 3.x kernel and its loadable modules. Candidates should be able to identify and correct common boot and run time issues. Candidates should understand device detection and management using udev. This objective includes troubleshooting udev rules.

Key knowledge areas:

- 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 analyze information about the available hardware
- udev rules

TOPIC 202: SYSTEM STARTUP

202.1 Customizing SysV-init system startup (3)

Candidates should be able to query and modify the behaviour of system services at various run levels. A thorough understanding of the init structure and boot process is required. This objective includes interacting with run levels.

Exam Objectives Version: Version 4.0 (last major update: November 1st, 2013, last minor formatting update: December 4th, 2014)

Exam Covered: LPIC-2 (LPI-201); Exam 1 of 2 to obtain LPIC-2 Linux Network Professional certification

Objectives Reflected in Published Exam: November 1st, 2013

Required Prerequisite: Successfully pass LPIC-1 101 and 102 exams

About objective weights: Each objective is assigned a weighting value (x). The weights range roughly from 1 to 10 and indicate the relative importance of each objective. Objectives with higher weights will be covered in the exam with more questions.

Key knowledge areas:
- Linux Standard Base Specification (LSB)
- SysV init environment

202.2 System Recovery (4)
Candidates should be able to properly manipulate a Linux system during both the boot process and during recovery mode. This objective includes using both the init utility and init-related kernel options. Candidates should be able to determine the cause of errors in loading and usage of bootloaders. GRUB version 2 and GRUB Legacy are the bootloaders of interest.

Key knowledge areas:
- GRUB version 2 and Legacy
- Grub shell
- Boot loader start and hand off to kernel
- Kernel loading
- Hardware initialization and setup
- Daemon/service initialization and setup
- Know the different boot loader install locations on a hard disk or removable device
- Overwriting standard boot loader options and using boot loader shells
- Awareness of UEFI

2.3 Alternate Bootloaders (2)
Candidates should be aware of other bootloaders and their major features.

Key knowledge areas:
- LILO
- SYSLINUX, ISOLINUX, PXELINUX
- Understanding of PXE

TOPIC 203: FILESYSTEM AND DEVICES

203.1 Operating the Linux filesystem (4)
Candidates should be able to properly configure and navigate the standard Linux filesystem. This objective includes configuring and mounting various filesystem types.

Key knowledge areas:
- The concept of the fstab configuration
- Tools and utilities for handling SWAP partitions and files
- Use of UUIDs

203.2 Maintaining a Linux filesystem (3)
Candidates should be able to properly maintain a Linux filesystem using system utilities. This objective includes manipulating standard filesystems and monitoring SMART devices.

Key knowledge areas:
- Tools and utilities to manipulate and ext2, ext3 and ext4
- Tools and utilities to manipulate xfs
- Awareness of Btrfs

203.3 Creating and configuring filesystem options (2)
Candidates should be able to configure automount filesystems using AutoFS. This objective includes configuring automount for network and device filesystems. Also included is creating filesystems for devices such as CD-ROMs and a basic feature knowledge of encrypted filesystems.

Key knowledge areas:
- autofs configuration files
- UDF and ISO9660 tools and utilities
- Awareness of CD-ROM filesystems (UDF, ISO9660, HFS)
- Awareness of CD-ROM filesystem extensions (Joliet, Rock Ridge, El Torito)
- Basic feature knowledge of encrypted filesystems

Topic 204: Advanced Storage Device Administration (3)
Candidates should be able to configure and implement software RAID. This objective includes using and configuring RAID 0, 1 and 5.

Key knowledge areas:
- Software raid configuration files and utilities

204.2 Adjusting Storage Device Access (2)
Candidates should be able to configure kernel options to support various drives. This objective includes software tools to view & modify hard disk settings including iSCSI devices.

Key knowledge areas:
- Tools and utilities to configure DMA for IDE devices including ATAPI and SATA
- Tools and utilities to manipulate or analyze system resources (e.g. interrupts)
- Awareness of sdparm command and its uses
- Tools and utilities for iSCSI

204.3 Logical Volume Manager (3)
Candidates should be able to create and remove logical volumes, volume groups, and physical volumes. This objective includes snapshots and resizing logical volumes.

Key knowledge areas:
- 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: NETWORK CONFIGURATION

205.1 Basic networking configuration (3)
Candidates should be able to configure a network device to be able to connect to a local, wired or wireless, and a wide-area network. This objective includes being able to communicate between various subnets within a single network including both IPv4 and IPv6 networks.

Key knowledge areas:
- Utilities to configure and manipulate ethernet network interfaces
- Configuring basic access to wireless networks with iw, iwconfig and iwlist

205.2 Advanced Network Configuration and Troubleshooting (4)
Candidates should be able to configure a network device to implement various network authentication schemes. This objective includes configuring a multi-homed network device and resolving communication problems.

Key knowledge areas:
- Utilities to manipulate routing tables
- Utilities to configure and manipulate ethernet network interfaces
- Utilities to analyze the status of the network devices
- Utilities to monitor and analyze the TCP/IP traffic

205.3 Troubleshooting Network Issues (4)
Candidates should be able to identify and correct common network setup issues, to include knowledge of locations for basic configuration files and commands.

Key knowledge areas:
- 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 recognized and used hardware devices
- System initialization files and their contents (SysV init process)
- Awareness of NetworkManager and its impact on network configuration

TOPIC 206: SYSTEM MAINTENANCE

206.1 Make and install programs from source (2)
Candidates should be able to build and install an executable program from source. This objective includes being able to unpack a file of sources.

Key knowledge areas:
- 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 (3)
Candidates should be able to use system tools to back up important system data.

Key knowledge areas:
- Knowledge about directories that have to be include in backups
- Awareness of network backup solutions such as Amanda, Bacula 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 issue (1)
Candidates should be able to notify the users about current issues related to the system.

Key knowledge areas:
- Automate communication with users through logon messages
- Inform active users of system maintenance