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# **LPIC-1**

# **LPI Exam 101**



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# **LPI Exam 101**

**current 101 objectives valid  
effective 2009-04-01**



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**101**

**System  
Architecture**

- **101 System Architecture**
  - **101.1 Determine and configure hardware settings**
    - **Weight: 2**
    - **Description: Candidates should be able to determine and configure fundamental system hardware**



- **101 System Architecture**

- **101.1 Determine and configure hardware settings**

- **Key Knowledge Areas (1):**

- Enable and disable integrated peripherals.
      - Configure systems with or without external peripherals such as keyboards.
      - Differentiate between the various types of mass storage devices.
      - Set the correct hardware ID for different devices, especially the boot device.

- **101 System Architecture**
  - **101.1 Determine and configure hardware settings**
    - **Key Knowledge Areas (2):**
      - Know the differences between coldplug and hotplug devices.
      - Determine hardware resources for devices.
      - Tools and utilities to list various hardware information (e.g. lsusb, lspci, etc.).
      - Tools and utilities to manipulate USB devices.
      - Conceptual understanding of sysfs, udev, hald, dbus.

- **101 System Architecture**
  - **101.1 Determine and configure hardware settings**
    - **The following is a partial list of the used files, terms and utilities (1):**
      - /sys
      - /proc
      - /dev

- **101 System Architecture**
  - **101.1 Determine and configure hardware settings**
    - **The following is a partial list of the used files, terms and utilities (2):**
      - modprobe
      - lsmod
      - lspci
      - lsusb





- **101 System Architecture**
  - **101.2 Boot the system**
    - **Weight: 3**
    - **Description: Candidates should be able to guide the system through the booting process.**



- **101 System Architecture**

- **101.2 Boot the system**

- **Key Knowledge Areas:**

- Provide common commands to the boot loader and options to the kernel at boot time.
      - Demonstrate knowledge of the boot sequence from BIOS to boot completion.
      - Check boot events in the log files.

- **101 System Architecture**
  - **101.2 Boot the system**
    - **The following is a partial list of the used files, terms and utilities:**
      - /var/log/messages
      - dmesg
      - BIOS
      - bootloader
      - kernel
      - init



- **101 System Architecture**
  - **101.3 Change runlevels and shutdown or reboot system**
    - **Weight: 3**
    - **Description (1): Candidates should be able to manage the runlevel of the system. This objective includes changing to single user mode, shutdown or rebooting the system.**

- **101 System Architecture**
  - **101.3 Change runlevels and shutdown or reboot system**
    - **Weight: 3**
    - **Description (2): Candidates should be able to alert users before switching runlevel and properly terminate processes. This objective also includes setting the default runlevel.**

- **101 System Architecture**
  - **101.3 Change runlevels and shutdown or reboot system**
    - **Key Knowledge Areas:**
      - Set the default runlevel.
      - Change between run levels including single user mode.
      - Shutdown and reboot from the command line.
      - Alert users before switching runlevels or other major system events.
      - Properly terminate processes.

- **101 System Architecture**
  - **101.3 Change runlevels and shutdown or reboot system**
    - **The following is a partial list of the used files, terms and utilities:**
      - /etc/inittab
      - shutdown
      - init
      - /etc/init.d
      - telinit



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**102**

# **Linux Installation and Package Management**



- **102 Linux Installation and Package Management**
  - **102.1 Design hard disk layout**
    - **Weight: 2**
    - **Description: Candidates should be able to design a disk partitioning scheme for a Linux system.**

- **102 Linux Installation and Package Management**

- **102.1 Design hard disk layout**

- **Key Knowledge Areas:**

- Allocate filesystems and swap space to separate partitions or disks.
      - Tailor the design to the intended use of the system.
      - Ensure the /boot partition conforms to the hardware architecture requirements for booting.

- **102 Linux Installation and Package Management**

- **102.1 Design hard disk layout**

- **The following is a partial list of the used files, terms and utilities:**

- / (root) filesystem
      - /var filesystem
      - /home filesystem
      - swap space
      - mount points
      - partitions

- **102 Linux Installation and Package Management**
  - **102.2 Install a boot manager**
    - **Weight: 2**
    - **Description: Candidates should be able to select, install and configure a boot manager.**

- **102 Linux Installation and Package Management**
  - **102.2 Install a boot manager**
    - **Key Knowledge Areas:**
      - Providing alternative boot locations and backup boot options.
      - Install and configure a boot loader such as GRUB.
      - Interact with the boot loader.

- **102 Linux Installation and Package Management**

- **102.2 Install a boot manager**

- **The following is a partial list of the used files, terms and utilities:**

- /boot/grub/menu.lst
      - grub-install
      - MBR
      - superblock
      - /etc/lilo.conf
      - lilo

- **102 Linux Installation and Package Management**
  - **102.3 Manage shared libraries**
    - **Weight: 1**
    - **Description: Candidates should be able to determine the shared libraries that executable programs depend on and install them when necessary.**

- **102 Linux Installation and Package Management**
  - **102.3 Manage shared libraries**
    - **Key Knowledge Areas:**
      - Identify shared libraries.
      - Identify the typical locations of system libraries.
      - Load shared libraries.



- **102 Linux Installation and Package Management**
  - **102.3 Manage shared libraries**
    - **The following is a partial list of the used files, terms and utilities:**
      - ldd
      - ldconfig
      - /etc/ld.so.conf
      - LD\_LIBRARY\_PATH

- **102 Linux Installation and Package Management**
  - **102.4 Use Debian package management**
    - **Weight: 3**
    - **Description: Candidates should be able to perform package management using the Debian package tools.**

- **102 Linux Installation and Package Management**

- **102.4 Use Debian package management**

- **Key Knowledge Areas:**

- Install, upgrade and uninstall Debian binary packages.
      - Find packages containing specific files or libraries which may or may not be installed.
      - Obtain package information like version, content, dependencies, package integrity and installation status (whether or not the package is installed).

- **102 Linux Installation and Package Management**

- **102.4 Use Debian package management**

- **The following is a partial list of the used files, terms and utilities:**

- /etc/apt/sources.list

- dpkg

- dpkg-reconfigure

- apt-get

- apt-cache

- aptitude

- **102 Linux Installation and Package Management**
  - **102.5 Use RPM and YUM package management**
    - **Weight: 3**
    - **Description: Candidates should be able to perform package management using RPM and YUM tools.**

- **102 Linux Installation and Package Management**

- **102.5 Use RPM and YUM package management**

- **Key Knowledge Areas:**

- Install, re-install, upgrade and remove packages using RPM and YUM.
      - Obtain information on RPM packages such as version, status, dependencies, integrity and signatures.
      - Determine what files a package provides, as well as find which package a specific file

- **102 Linux Installation and Package Management**

- **102.5 Use RPM and YUM package management**

- **The following is a partial list of the used files, terms and utilities:**

- rpm
      - rpm2cpio
      - /etc/yum.conf
      - /etc/yum.repos.d/
      - yum
      - yumdownloader



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**103**

# **GNU and Unix Commands**



- **103 GNU and Unix Commands**
  - **103.1 Work on the command line**
    - **Weight: 4**
    - **Description: Candidates should be able to interact with shells and commands using the command line. The objective assumes the bash shell.**

- **103 GNU and Unix Commands**
  - **103.1 Work on the command line**
    - **Key Knowledge Areas:**
      - Use single shell commands and one line command sequences to perform basic tasks on the command line.
      - Use and modify the shell environment including defining, referencing and exporting environment variables.
      - Use and edit command history.
      - Invoke commands inside and outside the defined path.

- **103 GNU and Unix Commands**
  - **103.1 Work on the command line**
    - **The following is a partial list of the used files, terms and utilities (1):**
      - .
      - bash
      - echo
      - env
      - exec
      - export
      - pwd

- **103 GNU and Unix Commands**
  - **103.1 Work on the command line**
    - **The following is a partial list of the used files, terms and utilities (2):**
      - set
      - unset
      - man
      - uname
      - history



- **103 GNU and Unix Commands**
  - **103.2 Process text streams using filters**
    - **Weight: 3**
    - **Description: Candidates should be able to apply filters to text streams.**

- **103 GNU and Unix Commands**

- **103.2 Process text streams using filters**

- **Key Knowledge Areas:**

- Send text files and output streams through text utility filters to modify the output using standard UNIX commands found in the GNU textutils package.



- **103 GNU and Unix Commands**
  - **103.2 Process text streams using filters**
    - **The following is a partial list of the used files, terms and utilities (1):**
      - cat
      - cut
      - expand
      - fmt
      - head
      - od
      - join

- **103 GNU and Unix Commands**
  - **103.2 Process text streams using filters**
    - **The following is a partial list of the used files, terms and utilities (2):**
      - nl
      - paste
      - pr
      - sed
      - sort
      - split
      - tail





- **103 GNU and Unix Commands**
  - **103.2 Process text streams using filters**
    - **The following is a partial list of the used files, terms and utilities (3):**
      - tr
      - unexpand
      - uniq
      - wc



- **103 GNU and Unix Commands**
  - **103.3 Perform basic file management**
    - **Weight: 4**
    - **Description: Candidates should be able to use the basic Linux commands to manage files and directories.**

- **103 GNU and Unix Commands**

- **103.3 Perform basic file management**

- **Key Knowledge Areas:**

- Copy, move and remove files and directories individually.
      - Copy multiple files and directories recursively.
      - Remove files and directories recursively.
      - Use simple and advanced wildcard specifications in commands.
      - Using find to locate and act on files based on type, size, or time.
      - Usage of tar, cpio and dd.

- **103 GNU and Unix Commands**
  - **103.3 Perform basic file management**
    - **The following is a partial list of the used files, terms and utilities (1):**
      - cp
      - find
      - mkdir
      - mv
      - ls
      - rm
      - rmdir
      - touch

- **103 GNU and Unix Commands**
  - **103.3 Perform basic file management**
    - **The following is a partial list of the used files, terms and utilities (2):**
      - tar
      - cpio
      - dd
      - file
      - gzip
      - gunzip
      - bzip2
      - file globbing

- **103 GNU and Unix Commands**
  - **103.4 Use streams, pipes and redirects**
    - **Weight: 4**
    - **Description (1): Candidates should be able to redirect streams and connect them in order to efficiently process textual data.**



- **103 GNU and Unix Commands**
  - **103.4 Use streams, pipes and redirects**
    - **Weight: 4**
    - **Description (2): Tasks include redirecting standard input, standard output and standard error, piping the output of one command to the input of another command, using the output of one command as arguments to another command and sending output to both stdout and a file.**

- **103 GNU and Unix Commands**
  - **103.4 Use streams, pipes and redirects**
    - **Key Knowledge Areas:**
      - Redirecting standard input, standard output and standard error.
      - Pipe the output of one command to the input of another command.
      - Use the output of one command as arguments to another command.
      - Send output to both stdout and a file.



- **103 GNU and Unix Commands**
  - **103.4 Use streams, pipes and redirects**
    - **The following is a partial list of the used files, terms and utilities:**
      - tee
      - xargs



- **103 GNU and Unix Commands**
  - **103.5 Create, monitor and kill processes**
    - **Weight: 4**
    - **Description: Candidates should be able to perform basic process management.**

- **103 GNU and Unix Commands**

- **103.5 Create, monitor and kill processes**

- **Key Knowledge Areas:**

- Run jobs in the foreground and background.
      - Signal a program to continue running after logout.
      - Monitor active processes.
      - Select and sort processes for display.
      - Send signals to processes.

- **103 GNU and Unix Commands**
  - **103.5 Create, monitor and kill processes**
    - **The following is a partial list of the used files, terms and utilities (1):**
      - &
      - bg
      - fg
      - jobs
      - kill
      - nohup

- **103 GNU and Unix Commands**
  - **103.5 Create, monitor and kill processes**
    - **The following is a partial list of the used files, terms and utilities (2):**
      - ps
      - top
      - free
      - uptime
      - killall

- **103 GNU and Unix Commands**
  - **103.6 Modify process execution priorities**
    - **Weight: 2**
    - **Description: Candidates should be able to manage process execution priorities.**

- **103 GNU and Unix Commands**

- **103.6 Modify process execution priorities**

- **Key Knowledge Areas:**

- Know the default priority of a job that is created.
      - Run a program with higher or lower priority than the default..
      - Change the priority of a running process.

- **103 GNU and Unix Commands**
  - **103.6 Modify process execution priorities**
    - **The following is a partial list of the used files, terms and utilities:**
      - nice
      - ps
      - renice
      - top



- **103 GNU and Unix Commands**
  - **103.7 Search text files using regular expressions**
    - **Weight: 2**
    - **Description (1): Candidates should be able to manipulate files and text data using regular expressions. This objective includes creating simple regular expressions containing several notational elements.**



- **103 GNU and Unix Commands**
  - **103.7 Search text files using regular expressions**
    - **Weight: 2**
    - **Description (2): It also includes using regular expression tools to perform searches through a filesystem or file content.**

- **103 GNU and Unix Commands**
  - **103.7 Search text files using regular expressions**
    - **Key Knowledge Areas:**
      - Create simple regular expressions containing several notational elements.
      - Use regular expression tools to perform searches through a filesystem or file content.

- **103 GNU and Unix Commands**
  - **103.7 Search text files using regular expressions**
    - **The following is a partial list of the used files, terms and utilities:**
      - grep
      - egrep
      - fgrep
      - sed
      - regex(7)

- **103 GNU and Unix Commands**
  - **103.8 Perform basic file editing operations using vi**
    - **Weight: 3**
    - **Description: Candidates should be able to edit text files using vi. This objective includes vi navigation, basic vi modes, inserting, editing, deleting, copying and finding text.**



- **103 GNU and Unix Commands**
  - **103.8 Perform basic file editing operations using vi**
    - **Key Knowledge Areas:**
      - Navigate a document using vi.
      - Use basic vi modes.
      - Insert, edit, delete, copy and find text.

- **103 GNU and Unix Commands**
  - **103.8 Perform basic file editing operations using vi**
    - **The following is a partial list of the used files, terms and utilities:**
      - vi
      - /, ?
      - h, j, k, l
      - i, o, a
      - c, d, p, y, dd, yy
      - ZZ, :w!, :q!, :e!



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**104**

**Devices, Linux  
Filesystems,  
Filesystem  
Hierarchy Standard**





- **104 Devices, Linux Filesystems, Filesystem Hierarchy Standard**
  - **104.1 Create partitions and filesystems**
    - **Weight: 2**
    - **Description: Candidates should be able to configure disk partitions and then create filesystems on media such as hard disks. This includes the handling of swap partitions.**

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.1 Create partitions and filesystems**
    - **Key Knowledge Areas:**
      - Use various mkfs commands to set up partitions and create various filesystems such as:
        - ext2
        - ext3
        - xfs
        - reiserfs v3
        - vfat

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.1 Create partitions and filesystems**
    - **The following is a partial list of the  
used files, terms and utilities:**
      - fdisk
      - mkfs
      - mkswap

- **104 Devices, Linux Filesystems, Filesystem Hierarchy Standard**
  - **104.2 Maintain the integrity of filesystems**
    - **Weight: 2**
    - **Description: Candidates should be able to maintain a standard filesystem, as well as the extra data associated with a journaling filesystem.**

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.2 Maintain the integrity of filesystems**
    - **Key Knowledge Areas:**
      - Verify the integrity of filesystems.
      - Monitor free space and inodes.
      - Repair simple filesystem problems.

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.2 Maintain the integrity of filesystems**
    - **The following is a partial list of the  
used files, terms and utilities (1):**
      - du
      - df
      - fsck
      - e2fsck
      - mke2fs

- **104 Devices, Linux Filesystems, Filesystem Hierarchy Standard**
  - **104.2 Maintain the integrity of filesystems**
    - **The following is a partial list of the used files, terms and utilities (2):**
      - debugfs
      - dumpe2fs
      - tune2fs
      - xfs tools (such as xfs\_metadump and xfs\_info)



- **104 Devices, Linux Filesystems, Filesystem Hierarchy Standard**
  - **104.3 Control mounting and unmounting of filesystems**
    - **Weight: 3**
    - **Description: Candidates should be able to configure the mounting of a filesystem.**



- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.3 Control mounting and unmounting of  
filesystems**
    - **Key Knowledge Areas:**
      - Manually mount and unmount filesystems.
      - Configure filesystem mounting on bootup.
      - Configure user mountable removeable  
filesystems.



- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.3 Control mounting and unmounting of  
filesystems**
    - **The following is a partial list of the  
used files, terms and utilities:**
      - /etc/fstab
      - /media
      - mount
      - umount



- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.4 Manage disk quotas**
    - **Weight: 1**
    - **Description: Candidates should be able to manage disk quotas for users**

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.4 Manage disk quotas**
    - **Key Knowledge Areas:**
      - Set up a disk quota for a filesystem.
      - Edit, check and generate user quota reports.

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.4 Manage disk quotas**
    - **The following is a partial list of the  
used files, terms and utilities:**
      - quota
      - edquota
      - repquota
      - quotaon



- **104 Devices, Linux Filesystems, Filesystem Hierarchy Standard**
  - **104.5 Manage file permissions and ownership**
    - **Weight: 3**
    - **Description: Candidates should be able to control file access through the proper use of permissions and ownerships.**

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.5 Manage file permissions and ownership**
    - **Key Knowledge Areas (1):**
      - Manage access permissions on regular and special files as well as directories.
      - Use access modes such as `suid`, `sgid` and the sticky bit to maintain security.

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.5 Manage file permissions and  
ownership**
    - **Key Knowledge Areas (2):**
      - Know how to change the file creation mask.
      - Use the group field to grant file access to  
group members.



- **104 Devices, Linux Filesystems, Filesystem Hierarchy Standard**
  - **104.5 Manage file permissions and ownership**
    - **The following is a partial list of the used files, terms and utilities:**
      - chmod
      - umask
      - chown
      - chgrp

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.6 Create and change hard and symbolic links**
    - **Weight: 2**
    - **Description: Candidates should be able to create and manage hard and symbolic links to a file.**

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.6 Create and change hard and symbolic links**
    - **Key Knowledge Areas:**
      - Create links.
      - Identify hard and/or softlinks.
      - Copying versus linking files.
      - Use links to support system administration tasks.

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.6 Create and change hard and symbolic  
links**
    - **The following is a partial list of the  
used files, terms and utilities:**
      - In



- **104 Devices, Linux Filesystems, Filesystem Hierarchy Standard**
  - **104.7 Find system files and place files in the correct location**
    - **Weight: 2**
    - **Description: Candidates should be thoroughly familiar with the Filesystem Hierarchy Standard (FHS), including typical file locations and directory classifications.**

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.7 Find system files and place files in the correct location**
    - **Key Knowledge Areas:**
      - Understand the correct locations of files under the FHS.
      - Find files and commands on a Linux system.
      - Know the location and purpose of important files and directories as defined in the FHS.

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.7 Find system files and place files in the  
correct location**
    - **The following is a partial list of the  
used files, terms and utilities (1):**
      - find
      - locate
      - updatedb
      - whereis

- **104 Devices, Linux Filesystems,  
Filesystem Hierarchy Standard**
  - **104.7 Find system files and place files in the  
correct location**
    - **The following is a partial list of the  
used files, terms and utilities (2):**
      - which
      - type
      - /etc/updatedb.conf