



**Linux
Professional
Institute**

LPIC-1

Exam LPI 102



**Linux
Professional
Institute**

LPI Exam 102

current 102 objectives

valid effective 2009-04-01



**Linux
Professional
Institute**

105

**Shells, Scripting
and Data
Management**

- **105 Shells, Scripting and Data Management**
 - **105.1 Customize and use the shell environment**
 - **Weight: 4**
 - **Description: Candidates should be able to customize shell environments to meet users' needs. Candidates should be able to modify global and user profiles.**

- **105 Shells, Scripting and Data Management**
 - **105.1 Customize and use the shell environment**
 - **Key Knowledge Areas:**
 - Set environment variables (e.g. PATH) at login or when spawning a new shell.
 - Write BASH functions for frequently used sequences of commands.
 - Maintain skeleton directories for new user accounts.
 - Set command search path with the proper directory.

- **105 Shells, Scripting and Data Management**
 - **105.1 Customize and use the shell environment**
 - **The following is a partial list of the used files, terms and utilities (1):**
 - /etc/profil
 - env
 - export
 - set
 - unset

- **105 Shells, Scripting and Data Management**
 - **105.1 Customize and use the shell environment**
 - **The following is a partial list of the used files, terms and utilities (2):**
 - ~/.bash_profile
 - ~/.bash_login
 - ~/.profile
 - ~/.bashrc
 - ~/.bash_logout



- **105 Shells, Scripting and Data Management**
 - **105.1 Customize and use the shell environment**
 - **The following is a partial list of the used files, terms and utilities (3):**
 - function
 - alias
 - lists

- **105 Shells, Scripting and Data Management**
 - **105.2 Customize or write simple scripts**
 - **Weight: 4**
 - **Description: Candidates should be able to customize existing scripts, or write simple new BASH scripts.**

- **105 Shells, Scripting and Data Management**
 - **105.2 Customize or write simple scripts**
 - **Key Knowledge Areas (1):**
 - Use standard sh syntax (loops, tests).
 - Use command substitution.
 - Test return values for success or failure or other information provided by a command.

- **105 Shells, Scripting and Data Management**
 - **105.2 Customize or write simple scripts**
 - **Key Knowledge Areas (2):**
 - Perform conditional mailing to the superuser.
 - Correctly select the script interpreter through the shebang (!) line.
 - Manage the location, ownership, execution and suid-rights of scripts.

- **105 Shells, Scripting and Data Management**
 - **105.2 Customize or write simple scripts**
 - **The following is a partial list of the used files, terms and utilities:**
 - for
 - while
 - test
 - if
 - read
 - seq

- **105 Shells, Scripting and Data Management**
 - **105.3 SQL data management**
 - **Weight: 2**
 - **Description: Candidates should be able to query databases and manipulate data using basic SQL commands. This objective includes performing queries involving joining of 2 tables and/or subselects.**

- **105 Shells, Scripting and Data Management**
 - **105.3 SQL data management**
 - **Key Knowledge Areas:**
 - Use of basic SQL commands.
 - Perform basic data manipulation.

- **105 Shells, Scripting and Data Management**
 - **105.3 SQL data management**
 - **The following is a partial list of the used files, terms and utilities (1):**
 - insert
 - update
 - select
 - delete
 - from

- **105 Shells, Scripting and Data Management**
 - **105.3 SQL data management**
 - **The following is a partial list of the used files, terms and utilities (2):**
 - where
 - group by
 - order by
 - join



**Linux
Professional
Institute**

106

User Interfaces and Desktops



- **106 User Interfaces and Desktops**
 - **106.1 Install and configure X11**
 - **Weight: 2**
 - **Description: Candidates should be able to install and configure X11.**

- **106 User Interfaces and Desktops**

- **106.1 Install and configure X11**

- **Key Knowledge Areas:**

- Verify that the video card and monitor are supported by an X server.
 - Awareness of the X font server.
 - Basic understanding and knowledge of the X Window configuration file.

- **106 User Interfaces and Desktops**
 - **106.1 Install and configure X11**
 - **The following is a partial list of the used files, terms and utilities:**
 - /etc/X11/xorg.conf
 - xhost
 - DISPLAY
 - xwininfo
 - xdpyinfo
 - X



- **106 User Interfaces and Desktops**
 - **106.2 Setup a display manager**
 - **Weight: 2**
 - **Description: Candidates should be able setup and customize a display manager. This objective covers the display managers XDM (X Display Manger), GDM (Gnome Display Manager) and KDM (KDE Display Manager).**

- **106 User Interfaces and Desktops**
 - **106.2 Setup a display manager**
 - **Key Knowledge Areas:**
 - Turn the display manager on or off.
 - Change the display manager greeting.
 - Change default color depth for the display manager.
 - Configure display managers for use by X-stations.

- **106 User Interfaces and Desktops**
 - **106.2 Setup a display manager**
 - **The following is a partial list of the used files, terms and utilities:**
 - /etc/inittab
 - xdm configuration files
 - kdm configuration files
 - gdm configuration files

- **106 User Interfaces and Desktops**
 - **106.3 Accessibility**
 - **Weight: 1**
 - **Description: Demonstrate knowledge and awareness of accessibility technologies.**

- **106 User Interfaces and Desktops**
 - **106.3 Accessibility**
 - **Key Knowledge Areas:**
 - Keyboard Accessibility Settings (AccessX?)
 - Visual Settings and Themes
 - Assistive Technology (ATs)

- **106 User Interfaces and Desktops**
 - **106.3 Accessibility**
 - **The following is a partial list of the used files, terms and utilities (1):**
 - Sticky/Repeat Keys
 - Slow/Bounce/Toggle Keys
 - Mouse Keys
 - High Contrast/Large Print Desktop Themes
 - Screen Reader
 - Braille Display

- **106 User Interfaces and Desktops**
 - **106.3 Accessibility**
 - **The following is a partial list of the used files, terms and utilities (2):**
 - Screen Magnifier
 - On-Screen Keyboard
 - Gestures (used at login, for example gdm)
 - Orca
 - GOK
 - emacspeak



**Linux
Professional
Institute**

107

Administrative Tasks

- **107 Administrative Tasks**
 - **107.1 Manage user and group accounts and related system files**
 - **Weight: 5**
 - **Description: Candidates should be able to add, remove, suspend and change user accounts.**



- **107 Administrative Tasks**
 - **107.1 Manage user and group accounts and related system files**
 - **Key Knowledge Areas:**
 - Add, modify and remove users and groups.
 - Manage user/group info in password/group databases.
 - Create and manage special purpose and limited accounts.

- **107 Administrative Tasks**
 - **107.1 Manage user and group accounts and related system files**
 - **The following is a partial list of the used files, terms and utilities (1):**
 - /etc/passwd
 - /etc/shadow
 - /etc/group
 - /etc/skel
 - chage
 - groupadd

- **107 Administrative Tasks**
 - **107.1 Manage user and group accounts and related system files**
 - **The following is a partial list of the used files, terms and utilities (2):**
 - groupdel
 - groupmod
 - passwd
 - useradd
 - userdel
 - usermod

- **107 Administrative Tasks**
 - **107.2 Automate system administration tasks by scheduling jobs**
 - **Weight: 4**
 - **Description: Candidates should be able to use cron or anacron to run jobs at regular intervals and to use at to run jobs at a specific time.**

- **107 Administrative Tasks**
 - **107.2 Automate system administration tasks by scheduling jobs**
 - **Key Knowledge Areas:**
 - Manage cron and at jobs.
 - Configure user access to cron and at services.

- **107 Administrative Tasks**
 - **107.2 Automate system administration tasks by scheduling jobs**
 - **The following is a partial list of the used files, terms and utilities (1):**
 - /etc/cron.{d,daily,hourly,monthly,weekly}
 - /etc/at.deny
 - /etc/at.allow
 - /etc/crontab
 - /etc/cron.allow
 - /etc/cron.deny

- **107 Administrative Tasks**
 - **107.2 Automate system administration tasks by scheduling jobs**
 - **The following is a partial list of the used files, terms and utilities (2):**
 - /var/spool/cron/*
 - crontab
 - at
 - atq
 - atrm

- **107 Administrative Tasks**
 - **107.3 Localisation and internationalisation**
 - **Weight: 3**
 - **Description: Candidates should be able to localize a system in a different language than English. As well, an understanding of why LANG=C is useful when scripting.**



**Linux
Professional
Institute**

LPIC-1, Exam LPI 102

- **107 Administrative Tasks**
 - **107.3 Localisation and internationalisation**
 - **Key Knowledge Areas:**
 - Locale settings.
 - Timezone settings.

- **107 Administrative Tasks**
 - **107.3 Localisation and internationalisation**
 - **The following is a partial list of the used files, terms and utilities (1):**
 - /etc/timezone
 - /etc/localtime
 - /usr/share/zoneinfo
 - Environment variables:
 - LC_*
 - LC_ALL
 - LANG

- **107 Administrative Tasks**
 - **107.3 Localisation and internationalisation**
 - **The following is a partial list of the used files, terms and utilities (2):**
 - /usr/bin/locale
 - tzselect
 - tzconfig
 - date
 - iconv
 - UTF-8
 - ISO-8859
 - ASCII
 - Unicode



**Linux
Professional
Institute**

108

Essential System Services

- **108 Essential System Services**
 - **108.1 Maintain system time**
 - **Weight: 3**
 - **Description: Candidates should be able to properly maintain the system time and synchronize the clock via NTP.**



- **108 Essential System Services**

- **108.1 Maintain system time**

- **Key Knowledge Areas:**

- Set the system date and time.
 - Set the hardware clock to the correct time in UTC.
 - Configure the correct timezone.
 - Basic NTP configuration.
 - Knowledge of using the `pool.ntp.org` service

- **108 Essential System Services**
 - **108.1 Maintain system time**
 - **The following is a partial list of the used files, terms and utilities (1):**
 - /usr/share/zoneinfo
 - /etc/timezone
 - /etc/localtime
 - /etc/ntp.conf
 - date

- **108 Essential System Services**
 - **108.1 Maintain system time**
 - **The following is a partial list of the used files, terms and utilities (2):**
 - hwclock
 - ntpd
 - ntpdate
 - pool.ntp.org

- **108 Essential System Services**
 - **108.2 System logging**
 - **Weight: 2**
 - **Description: Candidates should be able to configure the syslog daemon. This objective also includes configuring the logging daemon to send log output to a central log server or accept log output as a central log server.**

- **108 Essential System Services**
 - **108.2 System logging**
 - **Key Knowledge Areas:**
 - syslog configuration files
 - syslog
 - standard facilities, priorities and actions

- **108 Essential System Services**
 - **108.2 System logging**
 - **The following is a partial list of the used files, terms and utilities:**
 - syslog.conf
 - syslogd
 - klogd
 - logger

- **108 Essential System Services**
 - **108.3 Mail Transfer Agent (MTA) basics**
 - **Weight: 3**
 - **Description: Candidates should be aware of the commonly available MTA programs and be able to perform basic forward and alias configuration on a client host. Other configuration files are not covered.**

- **108 Essential System Services**
 - **108.3 Mail Transfer Agent (MTA) basics**
 - **Key Knowledge Areas:**
 - Create e-mail aliases.
 - Configure e-mail forwarding.
 - Knowledge of commonly available MTA programs (postfix, sendmail, qmail, exim) (no configuration)

- **108 Essential System Services**
 - **108.3 Mail Transfer Agent (MTA) basics**
 - **The following is a partial list of the used files, terms and utilities (1):**
 - ~/.forward
 - sendmail emulation layer commands
 - newaliases
 - mail

- **108 Essential System Services**
 - **108.3 Mail Transfer Agent (MTA) basics**
 - **The following is a partial list of the used files, terms and utilities (2):**
 - mailq
 - postfix
 - sendmail
 - exim
 - qmail



- **108 Essential System Services**
 - **108.4 Manage printers and printing**
 - **Weight: 2**
 - **Description: Candidates should be able to manage print queues and user print jobs using CUPS and the LPD compatibility interface.**

- **108 Essential System Services**
 - **108.4 Manage printers and printing**
 - **Key Knowledge Areas:**
 - Basic CUPS configuration (for local and remote printers).
 - Manage user print queues.
 - Troubleshoot general printing problems.
 - Add and remove jobs from configured printer queues.



- **108 Essential System Services**
 - **108.4 Manage printers and printing**
 - **The following is a partial list of the used files, terms and utilities:**
 - CUPS configuration files, tools and utilities
 - /etc/cups
 - lpd legacy interface (lpr, lprm, lpq)



**Linux
Professional
Institute**

109

Networking Fundamentals

- **109 Networking Fundamentals**
 - **109.1 Fundamentals of internet protocols**
 - **Weight: 4**
 - **Description: Candidates should demonstrate a proper understanding of TCP/IP network fundamentals.**

- **109 Networking Fundamentals**
 - **109.1 Fundamentals of internet protocols**
 - **Key Knowledge Areas (1):**
 - Demonstrate an understanding network masks.
 - Knowledge of the differences between private and public "dotted quad" IP-Addresses.
 - Setting a default route.

- **109 Networking Fundamentals**
 - **109.1 Fundamentals of internet protocols**
 - **Key Knowledge Areas (2):**
 - Knowledge about common TCP and UDP ports (20, 21, 22, 23, 25, 53, 80, 110, 119, 139, 143, 161, 443, 465, 993, 995).
 - Knowledge about the differences and major features of UDP, TCP and ICMP.
 - Knowledge of the major differences between IPv4 and IPV6.

- **109 Networking Fundamentals**
 - **109.1 Fundamentals of internet protocols**
 - **The following is a partial list of the used files, terms and utilities:**
 - /etc/services
 - ftp
 - telnet
 - host
 - ping
 - dig
 - traceroute
 - tracepath



- **109 Networking Fundamentals**
 - **109.2 Basic network configuration**
 - **Weight: 4**
 - **Description: Candidates should be able to view, change and verify configuration settings on client hosts.**

- **109 Networking Fundamentals**
 - **109.2 Basic network configuration**
 - **Key Knowledge Areas:**
 - Manually and automatically configure network interfaces
 - Basic TCP/IP host configuration.

- **109 Networking Fundamentals**
 - **109.2 Basic network configuration**
 - **The following is a partial list of the used files, terms and utilities:**
 - /etc/hostname
 - /etc/hosts
 - /etc/resolv.conf
 - /etc/nsswitch.conf
 - ifconfig
 - ifup
 - ifdown
 - route
 - ping

- **109 Networking Fundamentals**
 - **109.3 Basic network troubleshooting**
 - **Weight: 4**
 - **Description: Candidates should be able to troubleshoot networking issues on client hosts.**

- **109 Networking Fundamentals**
 - **109.3 Basic network troubleshooting**
 - **Key Knowledge Areas:**
 - Manually and automatically configure network interfaces and routing tables to include adding, starting, stopping, restarting, deleting or reconfiguring network interfaces.
 - Change, view, or configure the routing table and correct an improperly set default route manually.
 - Debug problems associated with the network configuration.

- **109 Networking Fundamentals**
 - **109.3 Basic network troubleshooting**
 - **The following is a partial list of the used files, terms and utilities (1):**
 - ifconfig
 - ifup
 - ifdown
 - route
 - host

- **109 Networking Fundamentals**
 - **109.3 Basic network troubleshooting**
 - **The following is a partial list of the used files, terms and utilities (2):**
 - hostname
 - dig
 - netstat
 - ping
 - traceroute

- **109 Networking Fundamentals**
 - **109.4 Configure client side DNS**
 - **Weight: 2**
 - **Description: Candidates should be able to configure DNS on a client host.**

- **109 Networking Fundamentals**
 - **109.4 Configure client side DNS**
 - **Key Knowledge Areas:**
 - Demonstrate the use of DNS on the local system.
 - Modify the order in which name resolution is done.

- **109 Networking Fundamentals**
 - **109.4 Configure client side DNS**
 - **The following is a partial list of the used files, terms and utilities:**
 - /etc/hosts
 - /etc/resolv.conf
 - /etc/nsswitch.conf



**Linux
Professional
Institute**

110

Security



- **110 Security**

- **110.1 Perform security administration tasks**
 - **Weight: 3**
 - **Description: Candidates should know how to review system configuration to ensure host security in accordance with local security policies.**

- **110 Security**

- **110.1 Perform security administration tasks**

- **Key Knowledge Areas:**

- Audit a system to find files with the suid/sgid bit set.
 - Set or change user passwords and password aging information.
 - Being able to use nmap and netstat to discover open ports on a system.
 - Set up limits on user logins, processes and memory usage.
 - Basic sudo configuration and usage.

- **110 Security**

- **110.1 Perform security administration tasks**

- **The following is a partial list of the used files, terms and utilities (1):**

- find
 - passwd
 - lsof
 - nmap
 - chage
 - netstat

- **110 Security**

- **110.1 Perform security administration tasks**

- **The following is a partial list of the used files, terms and utilities (2):**

- sudo
 - /etc/sudoers
 - su
 - usermod
 - ulimit



- **110 Security**
 - **110.2 Setup host security**
 - **Weight: 3**
 - **Description: Candidates should know how to set up a basic level of host security.**

- **110 Security**

- **110.2 Setup host security**

- **Key Knowledge Areas:**

- Awareness of shadow passwords and how they work.
 - Turn off network services not in use.
 - Understand the role of TCP wrappers.

- **110 Security**

- **110.2 Setup host security**

- **The following is a partial list of the used files, terms and utilities (1):**

- /etc/nologin
 - /etc/passwd
 - /etc/shadow
 - /etc/xinetd.d/*
 - /etc/xinetd.conf

- **110 Security**

- **110.2 Setup host security**

- **The following is a partial list of the used files, terms and utilities (2):**

- /etc/inet.d/*
 - /etc/inetd.conf
 - /etc/inittab
 - /etc/init.d/*
 - /etc/hosts.allow
 - /etc/hosts.deny

- **110 Security**
 - **110.3 Securing data with encryption**
 - **Weight: 3**
 - **Description: The candidate should be able to use public key techniques to secure data and communication.**

- **110 Security**

- **110.3 Securing data with encryption**

- **Key Knowledge Areas:**

- Perform basic OpenSSH 2 client configuration and usage.
 - Understand the role of OpenSSH? 2 server host keys
 - Perform basic GnuPG configuration and usage.
 - Understand SSH port tunnels (including X11 tunnels).

- **110 Security**

- **110.3 Securing data with encryption**

- **The following is a partial list of the used files, terms and utilities (1):**

- ssh
 - ssh-keygen
 - ssh-agent
 - ssh-add
 - ~/.ssh/id_rsa und id_rsa.pub
 - ~/.ssh/id_dsa und id_dsa.pub

- **110 Security**

- **110.3 Securing data with encryption**

- **The following is a partial list of the used files, terms and utilities (2):**

- /etc/ssh/ssh_host_rsa_key und ssh_host_rsa_key.pub
 - /etc/ssh/ssh_host_dsa_key und ssh_host_dsa_key.pub
 - ~/.ssh/authorized_keys
 - /etc/ssh_known_hosts
 - gpg
 - ~/.gnupg/*