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Guide to Linux+, Fourth Edition
Chapter 2 Solutions

Review Questions

1. What is the default shell in Linux called?
    a. SH
    b. BSH
    c. CSH
    d. BASH

    Answer: d
2. What equivalent to the `man` command generally provides an easier-to-read description of the queried command and also contains links to other related information?
    a. `who`
    b. `man help`
    c. `man -descriptive`
    d. `info`

    Answer: d
3. What command can you use to safely shut down the Linux system immediately?
    a. `shutdown -c`
    b. `shutdown -r`
    c. `down`
    d. `halt`

    Answer: d
4. What command is equivalent to the `man -k` *`keyword`* command?
    a. `find` *`keyword`*
    b. `man` *`keyword`*
    c. `apropos` *`keyword`*
    d. `appaloosa` *`keyword`*

    Answer: c
5. Which of the following is not a piece of information that the Fedora installation program prompts you for?
    a. Time zone
    b. Installation destination
    c. Firewall settings
    d. Keyboard layout

    Answer: c
6. Linux commands entered via the command line are not case sensitive. True or False?
    Answer: False
7. Which command blanks the terminal screen erasing previously displayed output?
    a. `erase`
    b. `clean`
    c. `blank`
    d. `clear`

    Answer: d
8. When sitting at a computer running Linux, what key combination is pressed to open the graphical terminal?
    a. Ctrl+Alt+G
    b. Ctrl+Alt+F4

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c. Ctrl+Alt+F1
d. Ctrl+7

Answer: c

9. To install Linux within a virtual machine, you can specify the path to an ISO image that contains the Linux installation media within virtualization software without having to first write the ISO image to a DVD or USB flash drive. True or False?

Answer: True

10. After you log into a terminal, you receive a user interface called a _____.
    a. GUID
    b. shell
    c. text box
    d. command screen

Answer: b

11. Users enter commands directly to the kernel of the Linux operating system. True or False?

Answer: False

12. How can you protect a metacharacter (such as the $ character) from shell interpretation?
    a. Precede it with a /.
    b. Follow it with a \.
    c. Precede it with a $.
    d. It cannot be done as metacharacters are essential.
    e. Precede it with a \.

Answer: e

13. You know a Linux command will perform a desired function for you, but you cannot remember the full name of the command. You do remember it will flush a variable from your system. Which command typed at a command prompt displays a list of commands that would likely contain the command you desire?
    a. `man -k flush`
    b. `man -k find all`
    c. `man flush`
    d. `man -key flush`

Answer: a

14. Which command displays the users who are currently logged in to the Linux system?
    a. `finger`
    b. `who`
    c. `id`
    d. `date`

Answer: b

15. Which prompt does the root user receive when logged in to the system?
    a. $
    b. @
    c. #
    d. !

Answer: c

16. Which prompt do regular users receive when logged in to the system?
    a. $
    b. @
    c. #
    d. !

Answer: a

17. Which of the following refers to the third primary partition on the second SCSI hard disk within Linux?
    a. hdb2
    b. sda3
    c. hdb3

d. sdb3

Answer: d

18. Which two partitions do you typically create at minimum during a Fedora Linux installation? (Choose two answers.)
    a. /
    b. /boot
    c. swap
    d. /home

    Answer: a, c
19. If you boot your computer from Linux live media, you will be able to use a fully-functional Linux system prior to installing Linux on permanent storage. True or False?

    Answer: False
20. Which of the following is not an example of virtualization software that can be used to install Linux within another operating system?
    a. Oracle VirtualBox
    b. Microsoft Hyper-V
    c. Spiceworks
    d. VMWare

    Answer: c

Hands-on Projects

Project 2-1

Not available.

Project 2-2

Step 1: The # prompt as it is the standard prompt for the root user.
Step 2: The shell is case sensitive; `Date` is not a valid command name. The error message came from the shell.
Step 3: The $ prompt as it is the standard prompt for regular user accounts.
Step 4: The root user is logged in to tty2 and user1 is logged in to tty5.
Step 5: No, the session is kept active even if the user is not interacting with it.
Step 6: The `exit` command ends the shell and returns you to a login prompt.
Step 7: Not available.

Project 2-3

Step 1: The GNOME desktop is the default in Fedora Linux.
Step 2: Not available.
Step 3: The $ prompt as it is the standard prompt for regular user accounts.
Step 4: Not available.
Step 5: Not available.
Step 6: Not available.
Step 7: Not available.
Step 8: Not available.
Step 9: Not available.
Step 10: Not available.
Step 11: The KDE desktop uses navigation similar to the Windows operating system (Start menu-based), whereas the GNOME desktop uses navigation that is more similar to the Macintosh operating system (top-down menus and a Macintosh-like dock at the left).
Step 12: Yes.
Step 13: Not available.

Project 2-4

Step 1: Not available.
Step 2: The ; character acts as a command terminator allowing you to enter more than one command on the command line before execution.
Step 3: Not available.
Step 4: The single quote character needs protection.
Step 5: Don't do this.
Step 6: Don't do this.
Step 7: /bin/bash was displayed first; nothing was displayed second.
Step 8: You have .50—you can protect $ using single quotation marks or a backslash character.
Step 9: You have $4.50.
Step 10: You have .50.
Step 11: You have $4.50.
Step 12: My name is root—the backquotes perform command substitution.
Step 13: Not available.

Project 2-5

Step 1: Not available.
Step 2: There are 2 different manual pages for `crontab` (1 command and 1 file format).
Step 3: Not available.
Step 4: Not available.
Step 5: Not available.
Step 6: Not available.
Step 7: Not available.
Step 8: Not available.
Step 9: Not available.

Project 2-6

Step 1: Not available.
Step 2: The `halt` and `shutdown -h now` commands.

Discovery Exercises

Discovery Exercise 1

Answers will vary. The command used is **man –k copy** or **apropos copy**. Commands that only the root user can execute are indicated with (8) and there are several of them. The remainder of this Discovery Exercise will vary.

Discovery Exercise 2

The correct commands are:
`echo "This command does not work properly"` (echo must be spelled with a lowercase e)
`date` (the date command does not take a -z option)
`apropos man` (the apropos and man –k commands are identicalin function but are separate commands)
`man date` (date is not a shell function – cannot use help)

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`shutdown -h now` or `shutdown -r now` (the –c option to shut down cancels a shutdown; however, the –h and –r options can be used to reboot or halt)
`echo 'I would like lots of $$$'` (the $ character is a shell metacharacter that needs to be protected)
`man 1 date` (date is in section 1 of the manual pages)

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Chapter 2

Linux Installation and Usage

At a Glance

Instructor's Manual Table of Contents

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- Objectives
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- Technical Notes for Hands-On Projects

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Lecture Notes

Overview

This chapter explores the concepts and procedures needed to install a Fedora Linux system. The latter half of the chapter explains the various components you will use when interacting with the operating system as well as how to enter basic shell commands, obtain help, and properly shut down the Linux system.

Chapter Objectives

After completing this chapter, your students will be able to:

- Prepare for and install Fedora Linux using good practices
- Outline the structure of the Linux interface
- Enter basic shell commands and find command documentation
- Properly shut down the Linux operating system

Teaching Tips

Installing Linux

1. Explain to students the importance of careful planning and the configuration of various parts of the Linux operating system as part of the installation process.

   - **Preparing for Installation**

1. Provide students with an overview of the interaction between the operating system and the computer hardware, and of the minimum hardware requirements necessary to successfully install Linux. Be sure that students recognize that these requirements are minimums only, and that a real production machine will usually require significantly higher resource levels in terms of RAM and CPU.

2. Provide students with resources for obtaining the minimum installation requirements, including a manual of a DVD installation kit, a file on an installation DVD, vendor Web sites, and Table 2-1.

3. Outline the purpose of a Hardware Compatibility List (HCL) as it relates to the hardware models that work in conjunction with Linux.
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Teaching Tip	More information regarding Linux hardware compatibility can be found at: • http://linuxhardware.net/linuxhardware/notes/

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Understanding Installation Media

1. Point out that the DVD based installation is the most common method, and provide a brief overview of the installation process for DVD based installations.

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2. **Define an ISO image as a file that contains the content of a DVD. Mention that ISO images of Linux installation media can be downloaded from the Internet and can be written to a USB flash drive, in case your computer does not have a DVD drive.**

3. **Discuss the purpose of a bootable live media DVD image. Point out that if you write a live media DVD image to a blank DVD and boot your computer with it, a fully functional graphical Linux OS that you can use will be loaded into RAM.**

4. **Provide a quick overview of virtualization. State that the popularity of using virtual machines in on the rise. Briefly describe the process of installing Linux as a virtual machine.**

Performing the Installation

1. As part of explaining the process for installing Fedora 20 Linux, walk students through the entire installation process step-by-step as each specific section is encountered. This will help to ensure that students are familiar with the process when completing the hands-on projects.

2. Provide students with an overview of each major section of the installation process, using the bullet points on Page 48 as a guide.

Starting the Installation

1. Start the installation demonstration by using a Fedora Linux DVD. Explain that, in most cases, booting from the DVD drive starts a Linux installation.

2. Explain the purpose of the options encountered on the Fedora Linux startup screen. Discuss the additional four options that will be presented if you select the *Troubleshooting* option. Explain the purpose of each troubleshooting option and give examples of why an installer would choose each option.

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3. **Mention that, in most cases, the troubleshooting options shown in Figure 2-5 are not necessary and they can simply choose Start Fedora Live from Figure 2-4 to start a live Fedora system and install Fedora.**

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Choosing an installation language as well as localization and system options

1. Provide students with an overview of the different language options associated with Fedora Linux, pointing out that different distributions from other vendors may provide a larger or smaller number of installable interface languages.

2. Point out that the keyboard layout is detected automatically, the network interface is set to obtain network configuration automatically using the DHCP protocol, and the date and time are automatically obtained from the Internet (as long as you have Internet connectivity).

3. Outline the basic differences between Parallel Advanced Technology Attachment (PATA) drives, Serial Advanced Technology Attachment (SATA) drives, and Small Computer Systems Interface (SCSI) drives, explaining the relative advantages and disadvantages of each.

4. Introduce students to the hard disk identification names used in Linux. Be sure that students clearly understand these references, as they will need to refer to them again later in the text.

5. Walk students through the process of selecting the type of storage device that will be used to host the Linux OS.

Teaching Tip	• **You can verify PATA disk configuration by accessing the computer's Basic Input/Output System (BIOS) configuration.**

Configuring Storage Devices

1. Explain the concept of a partition, outlining the differences among primary partitions, extended partitions, and logical drives. Be sure that students understand that Linux does not use drive letters as a means to access a partition, but rather as a mount point. Provide examples as necessary.

2. **Explain the purpose of the Master Boot Record (MBR) as it relates to providing an OS with information about existing partitions.**

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3. Provide an overview of the relative advantages and disadvantages of allowing the install program to automatically partition a disk.

4. Explain the concept of virtual memory, specifically with respect to the creation of a swap partition. Provide examples of how virtual memory is used on PC-based OSs like Linux and Windows, and why it is necessary. Be sure that students understand the differences between using RAM and virtual memory in terms of speed.

5. Provide students with an overview of the common Linux filesystems and sizes, as outlined in Table 2-4 in the text. Explain the purpose of allocating the suggested directories to their own partition, and why an administrator might be interested in doing this.

6. Provide students with an overview of the ext2, ext3, ext4, VFAT, and REISER file systems. Outline the advantages and disadvantages of each, including why an administrator might choose one filesystem over another.

7. Explain the concept of a journaling file system and the advantages that this model provides.

8. Provide students with a basic introduction to the concepts of logical volumes and the use of the Logical Volume Manager (LVM).

9. Walk students through the configuration of at least one partition.

Configuring user accounts

1. Explain the concept of authentication, and how it is used by Linux.
   •
2. Provide students with an overview of the purpose of the root user account on a Linux system, and the level of access this account has to a Linux system.

3. Demonstrate the process of configuring the root user account and a regular user account.

4. Discuss the importance of associating a very secure and uncommon password with the root account. Provide students with an overview of the character elements that should be included when developing a secure password such as upper and lowercase and non-alphanumeric characters.

Quick Quiz 1

1. What is the most common method for installing Linux?
   a. From an HTTP server

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b. From a DVD-ROM
c. From packages located on the hard disk
d. From an FTP server
Answer: B

2. Which of the following can be used to boot your computer to a fully functional graphical Linux OS that you can use to ensure all hardware drivers were detected properly?
a. live media DVD
b. virtual machine
c. ISO image
d. virtualization software
Answer: A

3. What type of hard disk can have no more than four units connected to the computer at the same time?
a. Serial Advanced Technology Attachment (SATA)
b. Small Computer Systems Interface (SCSI)
c. Parallel Advanced Technology Attachment (PATA)
d. Basic Input/Output System (BIOS)
Answer: C

4. A partition on a hard disk that can be further subdivided into components called logical drives is known as which of the following?
a. swap partition
b. extended partition
c. primary partition
d. Master Boot Record partition
Answer: B

5. Which of the following is the process whereby each user must log in with a valid user name and password before gaining access to the user interface of a system?
a. root
b. boot loader
c. shell
d. authentication
Answer: D

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Basic Linux Usage

1. Provide students with a basic introduction to both the Linux command line and X Windows interfaces. Outline the reasons why an administrator should be familiar with both environments.

Shells, Terminals, and the Kernel

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1. Outline the concept of a Linux shell, pointing out that the various shells available on Linux are generally associated with different command sets and environment variables of use to programmers, administrators, and so forth.

2. Provide students with an overview of the Bourne Again Shell (BASH) shell, explaining how a default shell can be configured as part of a user's profile.

3. Provide students with an explanation of the concept of a terminal, demonstrating how multiple terminal sessions can be associated with different network or even local users. Provide examples of how the ability to use multiple terminal sessions is useful for system administrators.

4. Walk students through Figure 2-14 in the text, outlining how terminals, shells, and the Linux kernel interact with one another. Be sure that students are able to differentiate between a terminal and a shell.

5. Demonstrate the process of logging on to a Linux server using both the command line and graphical interfaces. Ensure that students understand how to switch between the two environments.

6. Demonstrate how a local user can switch between terminals using the Ctrl, Alt, and function keys.

7. Demonstrate the basic difference between the command prompt associated with the root user and a regular user in the BASH shell.

8. Walk students through the basics of accessing and using the command line from within a GUI environment.

Basic Shell Commands

1. Provide students with an overview of the differences among commands, options, and arguments. Use a common command like `ls` to demonstrate the differences among all three.

2. Ensure that students understand that commands in Linux are case sensitive. Demonstrate this by attempting to use the `ping` command with different upper and lower case key combinations.

3. Demonstrate the output of each of the common Linux commands listed in Table 2-6, explaining why each of these commands would be useful to a Linux system administrator.

4. Demonstrate the process of viewing additional screen information using the Shift and PgUp and PgDn keys from the Linux command line.

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Shell Metacharacters

1. Provide students with an overview of the concept of a metacharacter and how these special keyboard characters are used on a Linux system.

2. Demonstrate the use of various BASH shell metacharacters listed in Table 2-7, such as the home directory variable and the piping command.

3. Explain and demonstrate how to use quotes or double quotes around potential metacharacters that you do not want to be treated as such, and specify the differences between using quotes and using double quotes.
   •
4. **Explain and demonstrate how to use the \ character to protect potential metacharacters that you do not want to be treated as such.**

Getting Command Help

1. Provide students with an overview of the Linux man pages, explaining that these pages form the basis of the Linux user help system.

2. Demonstrate the use of man pages, pointing out the command elements that represent options and arguments. Be sure that students understand that the man pages also provide examples of command syntax that can be useful in cases where a number of different options and/or arguments need to be supplied with a command.

3. Demonstrate the process of accessing the manual pages by section number, using the contents of Table 2-8 as a reference.

4. Demonstrate the process of searching the man pages from the command line.

5. Explain the purpose of GNU info pages, outlining how these are different from the traditional Linux/UNIX man pages.

6. Demonstrate the use of both the `info` and `help` commands, such that students can understand the basic differences between both help systems.

Shutting Down the Linux System

1. Provide students with an overview of each of the commands that can be used to shutdown or restart a Linux server, as outlined in Table 2-9. Provide examples of when each of these commands would most commonly be used.

2. Demonstrate the `shutdown`, `halt`, and `poweroff` commands on the instructor server.

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Quick Quiz 2

1. The OS component which loads all other components and serves to centrally control the activities of the computer is known as which of the following?
   a. MBR
   b. boot loader
   c. terminal
   d. kernel
   Answer: D

2. Which keystroke combination should be used to access the tty3 terminal?
   a. Ctrl+Alt+F7
   b. Ctrl+Alt+F3
   c. Ctrl+Delete+F2
   d. Ctrl+Shift+F3
   Answer: B

3. Which command can be issued to view all users currently logged on to a server and their tasks?
   a. who
   b. w
   c. whoami
   d. id
   Answer: B

4. Which of the following are commands associated with help on a Linux system? *(Choose all that apply.)*
   a. man
   b. help
   c. info
   d. whatis
   Answers: A, B, C

5. Which metacharacter is used for command termination?
   a. ‘
   b. |
   c. ;
   d. &
   Answers: C

Class Discussion Topics

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1. Have students discuss some of the reasons why they either do or do not enjoy working from a traditional computer command line. Have them discuss both the advantages and disadvantages of the command line from the point of view of speed, connection types, ability to remember commands, and so forth.

2. Have students discuss some of the user password policies that have existed at companies they have worked at in the past. What are some of the challenges that a company faces when it attempts to implement a very secure and stringent password policy?

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Additional Projects

1. Have students use the man, info, and help pages to find the purpose of a list of common Linux commands not already covered in the text and supplied by you.

2. Have students research online to find sites that provide lists of essential commands that a new Linux system administrator should be familiar with. Compile this information into a master document to be distributed to all students.

Additional Resources

1. Red Hat Linux Installation Guide: https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/6/html/Installation_Guide/index.html

2. Getting Started with Fedora: https://wiki.duraspace.org/display/FEDORA38/Getting+Started+with+Fedora

3. Linux Command Cheat Sheets : http://www.cyberciti.biz/tips/linux-unix-commands-cheat-sheets.html

4. How to Get Help with a Command from the Linux Terminal: http://www.howtogeek.com/108890/how-to-get-help-with-a-command-from-the-linux-terminal-8-tricks-for-beginners-pros-alike/

Key Terms

- **Advanced Technology Attachment (ATA)** See *Parallel Advanced Technology Attachment*.
- **arguments** The text that appears after a command name, does not start with a dash (- character), and specifies information the command requires to work properly.
- **authentication** The process whereby each user must log in with a valid user name and password before gaining access to the user interface of a system.

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- **B-tree Filesystem (BTRFS)** An experimental Linux filesystem that contains advanced features such as storage pools and filesystem snapshots.
- **BASH shell** Also known as the Bourne Again Shell; this is the default command-line interface in Linux.
- **BIOS (Basic Input/Output System)** The part of a computer system that contains the programs used to initialize hardware components at boot time.
- **boot loader** A small program started by BIOS that executes the Linux kernel in memory.
- **command** A program that exists on the hard disk and is executed when typed on the command line.
- **ext2** A nonjournaling Linux filesystem.
- **ext3** A journaling Linux filesystem.
- **ext4** An improved version of the ext3 filesystem with an extended feature set and better performance.
- **extended partition** A partition on a hard disk or SSD that can be further subdivided into components called logical drives.
- **filesystem** The way in which a hard disk or SSD partition is formatted to allow data to reside on the physical media; common Linux filesystems include ext2, ext3, ext4, REISERFS, and VFAT.
- **GUID Partition Table (GPT)** The area of a large hard disk (> 2TB) outside a partition that stores partition information and boot loaders.
- **Hardware Compatibility List (HCL)** A list of hardware components that have been tested and deemed compatible with a given operating system.
- **Integrated Drive Electronics (IDE)** See *Parallel Advanced Technology Attachment*.
- **info pages** A set of local, easy-to-read command syntax documentation available by typing the `info` command-line utility.
- **ISO image** A file that contains the content of a DVD. ISO images of Linux installation media can be downloaded from the Internet.
- **journaling** A filesystem function that keeps a journal of the information that needs to be written to the hard disk; common Linux journaling filesystems include ext3, ext4, and REISER.
- **live media** Linux installation media that provides a fully functional Linux operating system in RAM prior to installation on permanent storage.
- **logical drives** The smaller partitions contained within an extended partition on a hard disk.
- **Logical Volume Manager (LVM)** A set of services that is used to manage logical volumes stored on one or more hard disks.
- **manual pages** The most common set of local command syntax documentation, available by typing the `man` command-line utility. Also known as man pages.
- **man pages** *See* manual pages.
- **Master Boot Record (MBR)** The area of a typical hard disk (< 2TB) outside a partition that stores partition information and boot loaders.
- **memtest86** A common RAM-checking utility.
- **metacharacters** The key combinations that have special meaning in the Linux operating system.
- **options** The specific letters that start with a dash (the – character) or two and appear after the command name to alter the way the command works.

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- **Parallel Advanced Technology Attachment (PATA)** A legacy hard disk technology that uses ribbon cables to typically attach up to four hard disk devices to a single computer.
- **partitions** A section of a hard disk or SSD. Partitions can be primary or extended.
- **primary partitions** The separate divisions into which a hard disk can be divided (up to four are allowed per hard disk).
- **Redundant Array of Inexpensive Disks (RAID)** A type of storage that can be used to combine hard disks together for performance and/or fault tolerance.
- **REISER** A journaling filesystem used in Linux.
- **Serial Advanced Technology Attachment (SATA)** A technology that allows for fast data transfer along a serial cable for hard disks and SSDs. It is commonly used in newer workstation and server-class computers.
- **shell** A user interface that accepts input from the user and passes the input to the kernel for processing.
- **Small Computer Systems Interface (SCSI)** A high-performance hard disk technology that is commonly used in server-class computers.
- **solid-state drive (SSD)** A type of disk drive that functions within a computer like a hard disk drive but instead uses fast flash memory chips to store data.
- **swap memory** See *virtual memory*.
- **terminal** The channel that allows a certain user to log in and communicate with the kernel via a user interface.
- **VFAT (Virtual File Allocation Table)** A non-journaling filesystem that might be used in Linux.
- **virtual machine** An operating system that is running within virtualization software.
- **virtual machine host** An operating system that runs virtualization software.
- **virtual memory** An area on a hard disk, known as a swap partition, that can be used to store information that normally resides in physical memory (RAM), if the physical memory is being used excessively.
- **virtualization software** A set of programs that can be used to run an operating system within an existing operating system concurrently.

Technical Notes for Hands-On Projects

The Chapter 2 hands-on projects require that students have access to:

- A 64-bit computer with at least 4GB of RAM, 80GB of permanent disk storage, and a DVD drive
- A Windows operating system that contains a virtualization software product, a Web browser, and an Internet connection
- The ISO image for Fedora 20 live media (Fedora-Live-Desktop-x86_64-20-1.iso)

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Chapter 2 Solutions

Lab 2.1

1. The focus of the Linux Mint distribution is which of the following?

   b. Desktop and mobile users

2. You must install Linux Mint to your hard drive before you can use it. True or False?

   False

3. You can use the whoami command to see the currently logged-on user. True or False?

   True

4. The files in the `/proc` directory take up space on your computer's hard disk. True or False?

   False

5. What command do you use to get information about your system's processor?

   `cat /proc/cpuinfo` or `more /proc/cpuinfo`

Lab 2.2

1. Running the memory test requires installing Linux on the computer first. True or False?

   False

2. Memtest86 stops testing after how many passes?

   e. Until you exit

3. Memtest86 tests only main memory, not the processor's cache. True or False?

   False

4. The memory test is the same as memtest86 which can be downloaded and run as standalone software. True or False?

   True

5. The Integrity check option on the Linux Mint boot menu verifies that there is enough memory and disk space to run Linux Mint. True or False?

   False

Lab 2.3

1. FireWire (IEEE 1394) is faster than USB 2.0. True or False?

   True

2. What's the maximum speed of USB 2.0?

   c. 480 Mbps

3. What's the maximum speed of USB 3.0?

   d. 5 Gbps

4. USB 3.0 was supported in the original release of Windows 7. True or False?

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False

5. When did Linux start supporting USB 3.0?

   b. September 2009

Lab 2.4

1. Most Linux distributions place the kernel file in which directory?

   b. `/boot`

2. What command can you use to tell which version of the Linux kernel is currently running?

   uname -r

3. Which are the two most common boot loader programs in Linux?

   c. LILO and GRUB

4. What is the path and name of the GRUB configuration file?

   b. /boot/grub2/grub.cfg

5. Which command tells you whether a file is a kernel file?

   b. `file`

Lab 2.5

1. Which of the following is the correct way to refer to terminals in Linux commands?

   c. `/dev/tty5`

2. If you send a string to a `tty` being used by a program, the program is aware that you wrote to its screen. True or False.

   False

3. Suppose a device called `/dev/dice` produces random numbers between 1 and 6 (simulating the role of a die). What command do you use to display these numbers to `tty6`?

   a. `cat /dev/dice > /dev/tty6`

4. Write the correct command to send the contents of the GRUB boot loader configuration file to `tty5`.

   `cat /boot/grub2/grub.cfg > /dev/tty5`

Lab 2.6

1. When using the `shutdown` command, the only option is to halt the system. True or False?

   False

2. Any user can cancel a shutdown, but only the root user can actually shut the system down. True or False?

   False

3. Which command shuts the system down and reboots immediately?

   b. `shutdown -r now`

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4. Write the command to send this shutdown warning message: “The system is going down for maintenance in 2 minutes! You really need to log off now!” However, the command should not actually shut down the system.

   ```
   shutdown -k 2 The system is going down for maintenance in 2 minutes!
   ```

5. Write the command to cancel a pending shutdown.

   ```
   shutdown -c
   ```

Chapter 2-Lab 1

Show-me1
Here we consider “Fedora” system booting up to the live DVD.

When prompted click “Try Fedora” and close the information window that follows. After a few seconds the known three desktop will load.

At this point this is a fully functional system. Click “Activities” and “Show Applications”.

Then the “Install the hard drive” icon to launch the Fedora installer.

Show-me2
As Fedora installs to the hard disk, check that “English” is the language and click “Continue”.

Now verify the “INSTALLATION DESTINATION” as the 20 gigabyte virtual SDA.

It is checked so you can click “Done”. It takes a moment to partition then you can click “Begin Installation”

Provide the “ROOT PASSWORD” and confirm it.

Things should go smoothly from here. The installation process was accelerated as much as possible for obvious reasons.

When the installation concludes, click “Quit” to return to the desktop.

Show-me3
When you return to the desktop check the “User”. You’ll see it is still the “Live System User”, meaning you’re still running from the DVD. A restart is required in order to completely boot the system to the new install. Click the “Power” button and then “Restart”.

Show-me4
The first thing you’ll see is the grad two boot loader with the new operating system installed and highlighted.

Now it’s time to do your permanent configuration. Make sure that “English” is selected and click “Next”.

Confirm “English (US)” for the keyboard layout.

Leave the “Time Zone” as configured and click “Next”.

Skip the “Online Account” creation, you do that later.

Enter your “Username and Password” exactly as given in your instructions.

Click “Start using Fedora” and you are ready to go.

When the desktop appears check that you are logged in as the user “LabConnection”. Look’s good then Power Off the system.