Chapter 01: Introduction to Linux

True / False
1. Open Source Software (OSS) is freely developed and continuously improved by a large community of software developers.
   a. True
   b. False

   **ANSWER:** True

2. The term hacker refers to someone who illegally uses computers for personal benefit or to cause damage.
   a. True
   b. False

   **ANSWER:** False

3. Each computer on a network requires a unique way to identify itself and to refer to other computers. This is accomplished by using IP addresses.
   a. True
   b. False

   **ANSWER:** True

4. Many programming function libraries and UNIX-like commands appeared in the 1980s as a result of the work on the GNU project.
   a. True
   b. False

   **ANSWER:** True

5. On closed-source operating systems, hot fixes for software bugs are deployed very quickly.
   a. True
   b. False

   **ANSWER:** False

Multiple Choice
6. What piece of software tells the operating system how to use a specific hardware device?
   a. graphical user interface
   b. system service
   c. device driver
   d. user interface

   **ANSWER:** c

7. When viewing the version number for a Linux kernel, what number indicates the stability of the kernel?
   a. major number
   b. revision number
   c. minor number
   d. production kernel number

   **ANSWER:** c
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8. What stipulates that the source code of any software published under its license must be freely available.
   a. GNU Public License   b. Free Software Foundation
   c. Freeware             d. Artistic License

   ANSWER: a

9. What software type is software that is distributed free of charge, but the source code is not available?
   a. Open source software   b. Shareware
   c. Close source software  d. Freeware

   ANSWER: d

10. Which of the following is the greatest expense for companies using Linux?
    a. Additional software
    b. Operating system cost
    c. Hiring people to maintain the Linux system
    d. Software upgrades

    ANSWER: c

11. In what year was the source code for the Linux kernel released?
    a. 1987       b. 1990
    c. 1991       d. 1993

    ANSWER: c

12. In Linux, the core component of the GUI is known as:
    a. GNOME       b. KDE
    c. X Windows   d. Red Hat

    ANSWER: c

13. An archive of files that usually contain scripts that install the software contents to the correct location on the system is referred to as a:
    a. router       b. package manager
    c. DBMS         d. tarball

    ANSWER: d

14. What Linux distribution is the most commonly used distribution within organizations today?
    a. Mandrake     b. SuSE
    c. Debian       d. Red Hat

    ANSWER: d
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15. What service provides a method for the efficient transfer of files over the Internet?
   a. FTP  b. HTML  
   c. SMTP  d. Telnet

   ANSWER: a

16. What computer system was the first to run the UNIX operating system?
   a. Apple II  
   b. DEC PDP-7  
   c. Sun SPARC  
   d. IBM 5150

   ANSWER: b

17. Which type of open source license ensures that the source code of a program is freely available while also allowing
   the original author of the source code some control over the changes made to it?
   a. Freeware  
   b. Shareware  
   c. GPL  
   d. Artistic

   ANSWER: d

18. The GNU General Public License (GPL) was developed by which organization?
   a. Free Software Foundation (FSF)  
   b. Electronic Frontier Foundation (EFF)  
   c. Microsoft  
   d. Sun Microsystems

   ANSWER: a

19. The iptables software on Linux is an example of what kind of software?
   a. Routing  
   b. Anti-virus  
   c. Firewall  
   d. Proxy

   ANSWER: c

20. The Linux kernel was developed and released in 1991 by:
   a. Richard Stallman  
   b. Linus Torvalds  
   c. Andrew Tannenbaum  
   d. Dennis Ritchie

   ANSWER: b
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21. The QT toolkit is utilized by which GUI environment?
   a. GNOME
   b. Enlightenment
   c. KDE
   d. Xfce

   ANSWER: c

22. The overall cost of using a particular operating system is known as?
   a. Total cost of ownership (TCO)
   b. Owner Related Expense (ORE)
   c. Cost to Own (CTO)
   d. Return on Investment (ROI)

   ANSWER: a

23. Dennis Ritchie invented what programming language, which was then used to rewrite the UNIX operating system?
   a. PERL
   b. Python
   c. Pascal
   d. C

   ANSWER: d

24. The mutt software is an example of what type of mail service software on Linux?
   a. Mail Transfer Agent
   b. Mail Delivery Agent
   c. Mail User Agent
   d. Mail Transport Agent

   ANSWER: c

25. Proxy servers keep track of the information passed to each client by maintaining what type of table?
   a. firewall
   b. routing
   c. Network Address Translation (NAT)
   d. caching

   ANSWER: c

Completion

26. The _________________________ is the core component of the Linux operating system.

   ANSWER: Linux kernel
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27. A(n) _________________________ is a computer or special hardware device that provides interconnection between company networks, home networks, and institutional networks.
   
   **ANSWER:** router

28. The ability for a computer to increase workload as the number of processors increases is known as _________________________.
   
   **ANSWER:** scalability

29. _______________ are a collection of programs and tools designed to allow for the creation, modification, manipulation, maintenance, and access of information from databases.
   
   **ANSWER:** Database Management Systems (DBMSs)

30. The __________ implementation of X Windows is the latest implementation, and is based on the original MIT X Windows project that was released as OSS in 2004.
   
   **ANSWER:** X.org

Subjective Short Answer

31. List and describe the different types of programs that are executed on a computer.

   **ANSWER:** There are two types of programs. The first type, **applications**, includes those programs designed for a specific use and with which you commonly interact, such as word processors, computer games, graphical manipulation programs, and computer system utilities. The second type, **operating system (OS)** software, consists of a series of software components used to control the hardware of your computer. Without an operating system, you would not be able to use your computer. Turning on a computer loads the operating system into computer hardware, which then loads and centrally controls all other application software in the background. At this point, the user (the person using the computer) is free to interact with the applications, perhaps by typing on the keyboard or clicking a mouse. Applications then take the information supplied by the user and relay it to the operating system. The operating system then uses the computer hardware to carry out the requests.

32. What is scalability? How does it relate to clustering?

   **ANSWER:** The ability for a computer to increase workload as the number of processors increases is known as **scalability**, and most computers, regardless of the operating system used, do not scale well when there are more than 32 processors. As a result of this limitation, many people in the supercomputing community **cluster** several smaller computers together to work as one large computer. This approach results in much better scalability; 64 computers with one processor each working toward a common goal can handle close to 64 times as much as a single processor.
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33. Describe what a fully qualified domain name (FQDN) is, and how it is used, then detail how IP addresses are related to FQDNs.

   **ANSWER:** Servers on the Internet are identified by names, which are known as fully qualified domain names (FQDNs). When using a web browser such as Internet Explorer or Netscape to request information from a Web server, the FQDN is typically used. These FQDNs exist only for the convenience of the human beings who use computer networks. Computers themselves rely on IP addresses. A browser gets the IP address associated with a FQDN by contacting a Domain Name System (DNS) server, which maintains a list of the proper FQDN to IP mappings.

34. Describe the differences between Mail Transfer Agents (MTAs), Mail Delivery Agents (MDAs), and Mail User Agents (MUAs). Provide examples of each.

   **ANSWER:** E-mail is distributed via a network of e-mail servers, also known as Mail Transfer Agents (MTAs). Many MTAs are freely available for Linux, including sendmail, postfix, smail, and exim. Before the user can access his e-mail, it must be downloaded from a MTA; the service that provides this is known as a Mail Delivery Agent (MDA). Linux also provides several of these services; procmail and fetchmail are two of the most common. Finally, the user views her e-mail using a program known as a Mail User Agent (MUA). Common MUAs available for Linux include mutt, pine, printmail, elm, mail, Netscape, and Eudora.

35. Discuss the difference between developmental kernels and production kernels, and explain how the minor number is used to distinguish between the two.

   **ANSWER:** Developmental kernels are not fully tested and imply instability; they are tested for vulnerabilities by people who develop Linux software. Production kernels are developmental kernels that have been thoroughly tested by several Linux developers and are declared to be stable. The minor number of a kernel version indicates the stability of the kernel. An odd minor number indicates a developmental kernel, whereas an even minor number indicates a production kernel.
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Matching

*Match each correct item with the statement below.*

- a. Beowulf clustering
- b. Closed source software
- c. cracker
- d. distribution
- e. flavor
- f. GNU General Public License (GPL)
- g. hacker
- h. kernel
- i. newsgroup
- j. process

36. A term that refers to the specific type of UNIX operating system.

   *ANSWER:* e

37. A complete set of operating system software, including the Linux Kernel, supporting function libraries, and a variety of OSS packages that can be downloaded from the Internet free of charge.

   *ANSWER:* d

38. The central, core program of the operating system.

   *ANSWER:* h

39. A program loaded into memory and running on the processor performing a specific task.

   *ANSWER:* j

40. A person who explores computer science to gain knowledge.

   *ANSWER:* g

41. The software whose source code is not freely available from the original author; Windows 98 is an example.

   *ANSWER:* b

42. An Internet protocol service accessed via an application program called a newsreader.

   *ANSWER:* i

43. A software license, ensuring that the source code for any OSS will remain freely available to anyone who wants to examine, build on, or improve upon it.

   *ANSWER:* f

44. A popular and widespread method of clustering computers together to perform useful tasks using Linux.

   *ANSWER:* a

45. A person who uses computer software maliciously for personal profit.

   *ANSWER:* c
Multiple Response

46. Because Linux has the ability to manage thousands of tasks at the same time, including allowing multiple users to access the system simultaneously, it is referred to as an operating system that is:
   a. multiaccess  
   b. multilevel  
   c. multiuser  
   d. multitasking

   **ANSWER:** c, d

47. What two options below are examples of common UNIX flavors?
   a. Macintosh OS X  
   b. Red Hat Linux  
   c. OpenSuSE  
   d. HP-UX

   **ANSWER:** a, d

48. The two different implementations of X Windows are called:
   a. KDE  
   b. XFree86  
   c. Gnome  
   d. X.org

   **ANSWER:** b, d

49. The two main competing GUI environments available in Linux are:
   a. XFree86  
   b. X.org  
   c. GNU Network Object Model Environment (GNOME)  
   d. K Desktop Environment (KDE)

   **ANSWER:** c, d

50. What two Linux distributions below utilize the Debian package manager by default?
   a. Red Hat Linux  
   b. SUSE Linux  
   c. Linux Mint  
   d. Ubuntu Linux

   **ANSWER:** c, d