

Course code
SCRIPTING

ECAP448

Course Title

LINUX AND SHELL

Unit- 1

Getting started with Linux: The History of UNIX and GNU–Linux, What Is So Good About Linux?, Overview of Linux, Additional Features of Linux

1.

An operating system is

Schedules tasks

Allocates storage

Interfaces the peripheral devices

Performs all: schedules tasks, allocates storage and interfaces the peripheral devices.

2.

The _____ allocates machine resources to all other programs that run on that computer.

Kernel

System programs

Disk

None of the above

3.

Free software is a matter of _____, not _____.

Liberty, Price

Price, Liberty

Management, distribution

None of the above

4.

Which of these is not a distribution of Linux?

CentOS

Red Hat

DOS

Fedora

5.

What is available to users in Linux OS?

Source code

Prebuilt binaries

Both source code and prebuilt binaries

None of the above

6.

Linux is a _____ operating system.

Generic

Proprietary

Closed

None of the above

7.

Which of these shells belongs to Linux?

Bourne Again Shell

TC Shell

Z shell

All: Bourne Again Shell, TC Shell and Z Shell

8.

The shell of Linux System can work as

Command Interpreter

High level language

Both command interpreter and high level language

None of the above

9.

An operating system has

Kernel

System Programs

Both kernel and system programs

None of the above

10.

Which of these represents system programs?

Libraries

Device drivers

Servers

All of the above

11.

Which of these are included in Linux?

Peripheral interfacing

Software Compatibility

Both peripheral interfacing and software compatibility

None of the above

12.

Which of these are included in Linux?

Peripheral interfacing

Software Compatibility

Both peripheral interfacing and software compatibility

None of the above

13.

Which of these programs run code intended for other operating systems?

Emulators

Xen

Standards

Standards

14.

The core of Linux OS is

Kernel

Shell

Terminal

Command

15.

Which one provide command interpreter environment?

Kernel

Shell

CPU

Hardware

16.

Linux OS supports

Multi User

Multi Process

Multi-tasking

All of the above

17.

Which of these are the general utilities in Linux?

ls

cat

rm

All of the above

18.

Which of these are the general utilities in Linux?

ls

cat

rm

All of the above

19.

Which of these utilities is used to show which files and folders are available in the system?

ls

cat

rm

All of the above

Self Assessment

1. An operating system is responsible for
A. Scheduling the tasks. B. Allocation the storage C. Handling the interfaces for peripherals
D. All of the above
2. An operating system has
A. Kernel B. System programs C. Both of the above D. None of the above
3. Which of these are distributions of Linux?
A. Fedora B. RedHat C. CentOS D. All of the above
4. A Linux distribution comprises of
A. Application programs B. Utilities C. Kernel D. All of the above
5. Which of these shells are available in Linux?
A. TC Shell B. Z Shell C. Debian Almquist Shell D. All of the above
6. Which is the core of the operating system?
A. Kernel B. Commands C. Shell D. Script
7. Which of these utilities is used to show which files and folders are available in the system?
A. ls B. cat C. rm D. All of the above
8. Linux OS supports
A. Multi User B. Multi Process C. Multi-tasking D. All of the above
9. Which of these utilities is used for concatenation of files?
A. ls B. cat C. rm D. echo
10. Which of these utilities is used for displaying the contents of a file?
A. ls B. cat C. rm D. echo
11. Linux is an example of
A. Web browser B. Word processing software C. Operating system D. Photo editor
12. Who founded the Linux Kernel?
A. Richard Stallman B. Ben Thomas C. Linus Torvalds D. None of the above
13. Which of the following OS is not based upon Linux?
A. BSD B. Redhat C. Ubuntu D. CentOS

14. What is available to users in Linux OS?

- A. Source code B. Prebuilt binaries C. Both source code and prebuilt binaries
D. None of the above

15. Which of these represents system programs?

- A. Libraries B. Device drivers C. Servers D. All of the above

Answers for Self Assessment

1.D 2. C 3. D 4. D 5. D 6. A 7. A 8. D 9. B 10. B 11.C 12. C 13. A 14. C 15. D

Review Questions:

1. What is an operating system? Explain its main parts.

An operating system (OS) is system software that manages computer hardware and software resources, and provides common services for computer programs. The operating system is a vital part of the computer system, without which no other programs can run.

The main parts of an operating system are:

- **Kernel:** The kernel is the core of the operating system. It is responsible for managing the computer's hardware resources, such as the CPU, memory, and storage.
- **Device drivers:** Device drivers are software that allows the operating system to communicate with hardware devices, such as printers, keyboards, and mice.
- **File system:** The file system is a way of organizing files on a storage device, such as a hard drive or SSD.
- **User interface:** The user interface (UI) is a way for users to interact with the operating system. There are two main types of UIs: command-line interfaces (CLIs) and graphical user interfaces (GUIs).
- **Utilities:** Utilities are small programs that perform specific tasks, such as formatting a hard drive or copying files.

The operating system provides a number of services to computer programs, including:

- **Process management:** The operating system manages the execution of programs by allocating CPU time and memory to each program.
- **Memory management:** The operating system manages the computer's memory by allocating memory to each program and by preventing programs from accessing each other's memory.
- **File management:** The operating system manages the computer's files by storing them on a storage device and by providing a way for programs to access them.
- **Input/output (I/O) management:** The operating system manages the computer's I/O devices, such as printers, keyboards, and mice.

- **Security:** The operating system provides a way to protect programs and data from unauthorized access.

The operating system is a complex piece of software that is essential for the smooth operation of a computer system. It provides a number of services that allow programs to run efficiently and securely.

2. What are the features of Linux? Explain.

Answer 1

Linux is a Unix-like operating system that is based on the Linux kernel and GNU utilities. It is a free and open-source operating system that is available for a wide range of hardware platforms. Linux is known for its stability, security, and performance.

Some of the key features of Linux include:

- **Free and open-source:** Linux is a free and open-source operating system, which means that the source code is freely available for anyone to use, modify, and redistribute. This makes Linux a very cost-effective option for businesses and individuals.
- **Portable:** Linux is a portable operating system, which means that it can be installed on a wide range of hardware platforms, from servers to personal computers to smartphones. This makes Linux a very versatile operating system that can be used in a variety of settings.
- **Secure:** Linux is a very secure operating system. It has a number of security features built in, such as a firewall and encryption, which help to protect users from malware and other security threats.
- **Stable:** Linux is a very stable operating system. It is known for its reliability and uptime, which makes it a good choice for businesses and organizations that need a reliable operating system.
- **Performance:** Linux is a very performant operating system. It can be used to run a wide range of applications, from web servers to gaming applications. Linux is also known for its scalability, which means that it can be used to run large and complex applications.

In addition to these key features, Linux also has a number of other features that make it a popular choice for businesses and individuals. These features include:

- **Customizability:** Linux is a very customizable operating system. Users can change the look and feel of Linux to suit their own needs. They can also install additional software and features to make Linux even more powerful.

- **Community support:** Linux has a large and active community of users and developers. This community provides support and resources to help users learn about and use Linux.
- **Documentation:** Linux has extensive documentation that is available online. This documentation helps users learn about Linux and how to use it.

Overall, Linux is a powerful and versatile operating system that is available for free. It is a good choice for businesses and individuals who are looking for a secure, stable, and performant operating system.

Answer 2

Linux is an open-source operating system kernel that serves as the foundation for numerous Linux-based operating systems, also known as distributions or distros. Linux itself provides several fundamental features that have contributed to its popularity and widespread adoption. Here are some of the key features of Linux:

1. **Open Source:** Linux is released under an open-source license, which means its source code is freely available to the public. This allows developers to study, modify, and distribute the code, promoting collaboration and innovation. The open-source nature of Linux fosters a large and active community of developers and contributors.
2. **Multitasking and Multithreading:** Linux supports multitasking, allowing multiple processes to run concurrently. It efficiently manages system resources, such as CPU time, memory, and input/output, ensuring that different processes can run simultaneously. Additionally, Linux supports multithreading, enabling applications to execute multiple threads within a single process for improved performance.
3. **Stability and Reliability:** Linux is known for its stability and reliability. It has a robust design and is engineered to handle heavy workloads and operate continuously for extended periods without requiring frequent reboots. The separation of user processes and the kernel ensures that a crash or error in one process does not affect the entire system.
4. **Security:** Linux provides several security features, making it a popular choice for servers, embedded systems, and other security-sensitive environments. It offers robust access controls, file permissions, and user management mechanisms. Additionally, the open-source nature allows security vulnerabilities to be identified and addressed rapidly by the community.
5. **Portability:** Linux is highly portable and can run on a wide range of hardware architectures, including x86, ARM, PowerPC, and more. This flexibility enables

Linux to power various devices, from personal computers and servers to smartphones, embedded systems, and supercomputers.

6. **Networking Capabilities:** Linux has extensive networking capabilities built into its kernel, making it an excellent choice for network servers and infrastructure. It supports various networking protocols, such as TCP/IP, and includes features like firewalling, routing, and network device drivers.
7. **Scalability:** Linux scales well, allowing it to adapt to different system sizes and configurations. It can efficiently handle both small embedded devices with limited resources and large-scale enterprise environments with thousands of interconnected systems.
8. **Wide Range of Software:** Linux benefits from a vast ecosystem of open-source software. Numerous applications, tools, and utilities are available for Linux, covering diverse domains such as web servers, databases, programming languages, desktop environments, and more. This wealth of software options provides users with flexibility and choice.
9. **Command-Line Interface (CLI) and Shell Scripting:** Linux offers a powerful command-line interface, allowing users to interact with the system using text commands. This provides advanced users and administrators with fine-grained control over the system. Moreover, Linux supports shell scripting, allowing users to automate tasks, create custom scripts, and streamline workflows.

These features collectively contribute to Linux's popularity, versatility, and widespread adoption across various domains, including servers, desktops, embedded systems, and scientific computing.

3. What are proprietary and generic operating systems? Explain why Linux is popular with hardware companies and developers?

Answer

A proprietary operating system is an operating system that is owned by a company and is not available for free. Proprietary operating systems are typically closed-source, which means that the source code is not available for public viewing or modification. Examples of proprietary operating systems include Microsoft Windows and macOS.

- Pros:
 - Typically more polished and user-friendly than generic operating systems
 - Often have more features and applications available
 - Receive more support from the operating system vendor

- Cons:
 - Can be expensive
 - Not as customizable as generic operating systems
 - May not be as secure as generic operating systems

A generic operating system is an operating system that is not owned by any company and is available for free. Generic operating systems are typically open-source, which means that the source code is available for public viewing and modification. Examples of generic operating systems include Linux and FreeBSD.

- Pros:
 - Free to use
 - Very customizable
 - Often more secure than proprietary operating systems
- Cons:
 - May not be as polished or user-friendly as proprietary operating systems
 - May not have as many features or applications available
 - May not receive as much support from the operating system community

Ultimately, the best type of operating system for you will depend on your individual needs and preferences. If you are looking for a polished and user-friendly operating system with a wide range of features and applications, then a proprietary operating system may be a good choice for you. If you are looking for a free and open-source operating system that is very customizable and secure, then a generic operating system may be a better option.

Linux's Popularity with Hardware Companies and Developers:

Linux enjoys popularity among hardware companies and developers for several reasons:

1. **Flexibility:** Linux's open-source nature and modular design allow hardware companies to customize and tailor the operating system to suit their specific needs. They can modify the kernel, drivers, and other components to optimize performance and compatibility with their hardware platforms. This flexibility enables hardware companies to create specialized products and differentiate themselves in the market.

2. **Cost:** Linux is free to use and distribute, which significantly reduces costs for hardware companies. They do not have to pay licensing fees or royalties associated with proprietary operating systems. This financial advantage allows hardware companies to allocate their resources to other areas, such as hardware development or customer support.
3. **Customizability:** Linux provides a high degree of customization and control. Hardware companies can customize the user interface, add or remove features, and create their own software stacks tailored to their hardware offerings. This level of customization enables hardware companies to create unique user experiences and differentiate their products in the market.
4. **Wide Hardware Support:** Linux has extensive hardware support, thanks to its large community of developers and contributors. It runs on a wide range of hardware architectures, making it an attractive choice for hardware companies that want their products to be compatible with various devices. Linux also benefits from a vast ecosystem of device drivers, enabling support for a wide array of peripherals and hardware components.
5. **Developer-Friendly Environment:** Linux offers a rich and developer-friendly environment. It provides a robust set of development tools, libraries, and frameworks that enable developers to create software and applications with ease. The availability of open-source software and development resources fosters innovation and collaboration among developers.
6. **Community and Support:** Linux has a vibrant and active community of developers, users, and enthusiasts. This community provides valuable support, knowledge sharing, and troubleshooting resources. Hardware companies can leverage this community to get assistance, collaborate on projects, and access a wealth of knowledge and expertise.

Overall, Linux's flexibility, cost-effectiveness, customizability, wide hardware support, developer-friendly environment, and strong community make it a popular choice for hardware companies and developers. It allows them to create innovative products, reduce costs, and benefit from the collective efforts of a vast community of contributors.

4. What is so good about Linux? Explain about its applications, peripherals, platforms and Standards.

Answer 1

Linux offers numerous advantages that contribute to its widespread popularity and success. Let's explore some of the key aspects that make Linux a favorable choice:

1. **Applications:** Linux provides a vast ecosystem of applications, including office productivity tools, web browsers, media players, graphic design software, programming environments, and much more. Popular applications like LibreOffice, Firefox, GIMP, and VLC are available on Linux, offering comparable functionality to their proprietary counterparts.
2. **Peripherals and Hardware Support:** Linux has extensive hardware support and compatibility. It works well with a wide range of peripherals such as printers, scanners, cameras, and input devices. Many hardware manufacturers provide Linux drivers, and the open-source community actively develops and maintains drivers for various hardware components, ensuring broad compatibility.
3. **Platforms:** Linux is highly versatile and powers a wide array of platforms. It is commonly used on desktops and laptops as a complete operating system alternative to Windows or macOS. Linux is also a popular choice for servers, both for small-scale applications and large-scale data centers, due to its stability, security, and scalability. Furthermore, Linux is widely adopted in embedded systems, powering devices such as routers, smart TVs, IoT devices, and automotive systems.
4. **Standards and Compatibility:** Linux adheres to various industry standards, ensuring compatibility and interoperability. It supports standard networking protocols (TCP/IP), file systems (ext4, Btrfs), and communication protocols (USB, Bluetooth, Wi-Fi). Additionally, Linux supports numerous software standards and programming languages, allowing developers to build applications using widely accepted technologies.
5. **Customizability and Flexibility:** Linux is highly customizable and adaptable. Its modular design allows users and developers to choose the components and features they need, tailoring the operating system to their specific requirements. Linux distributions (distros) offer different desktop environments, package managers, and software configurations, providing users with a range of choices to match their preferences.
6. **Security:** Linux is renowned for its security features. Its open-source nature allows vulnerabilities to be discovered and patched quickly by the community. The strong focus on security and privacy has made Linux a popular choice for servers and systems that handle sensitive data. Moreover, Linux provides robust access controls, encryption options, and tools for auditing and monitoring system activity.

7. **Community and Support:** Linux has a thriving and passionate community of users, developers, and enthusiasts. This community offers extensive support through online forums, mailing lists, IRC channels, and dedicated websites. Users can seek assistance, share knowledge, and contribute to the development and improvement of Linux and its associated software.
8. **Cost:** Linux is typically free to use and distribute. This cost advantage appeals to individuals, businesses, and organizations looking to reduce expenses associated with operating system licenses. Additionally, the low resource requirements of Linux make it suitable for running on older hardware, extending the lifespan of such systems.

Overall, Linux's strength lies in its versatility, customizability, robust hardware support, adherence to standards, security features, strong community support, and cost-effectiveness. These factors have made Linux a preferred choice in various domains, from desktop computing to server infrastructure and embedded systems.

5. What is kernel programming interface? Explain.

Answer

The kernel programming interface (KPI) is a set of functions and data structures that allow user-space programs to interact with the Linux kernel. The KPI is used to access system resources such as memory, files, and devices. It also provides access to kernel services such as scheduling, networking, and I/O.

The KPI is divided into two parts:

The system call interface :- The system call interface is used by user-space programs to request services from the kernel. The system call interface is a set of functions that are provided by the kernel. These functions allow user-space programs to access system resources and services. Some of the most common system calls include:

- `open()`: Opens a file.
- `read()`: Reads data from a file.
- `write()`: Writes data to a file.
- `close()`: Closes a file.
- `fork()`: Creates a new process.
- `exec()`: Executes a program.
- `wait()`: Waits for a child process to finish.

The device driver interface:- The device driver interface is used by user-space programs to interact with hardware devices. The device driver interface is a set of functions that are provided by the kernel to allow user-space programs to interact with hardware devices. These functions allow user-space programs to read and write data to devices, as well as control the devices. Some of the most common device driver functions include:

- `ioctl()`: Controls a device.
- `read()`: Reads data from a device.
- `write()`: Writes data to a device.
- `open()`: Opens a device.
- `close()`: Closes a device.

The KPI is a powerful tool that allows user-space programs to interact with the Linux kernel and hardware devices. It is used by a wide range of applications, including web servers, databases, and games.

Here are some of the benefits of using a KPI:

- **Efficiency:** The KPI provides a way for user-space programs to access system resources directly, without having to go through an intermediary layer. This can improve efficiency, as it reduces the amount of time that is spent transferring data between user-space and kernel space.
- **Security:** The KPI provides a way for user-space programs to interact with the kernel in a controlled manner. This can help to improve security, as it makes it more difficult for user-space programs to access system resources that they are not authorized to access.
- **Portability:** The KPI is typically implemented in a way that is portable across different operating systems. This makes it easier to write code that can be used on a variety of different platforms.

Here are some of the challenges of using a KPI:

- **Complexity:** The KPI can be complex to learn and use. This is because the KPI is designed to provide a low-level interface to the kernel.
- **Inefficiency:** The KPI can be inefficient in some cases. This is because the KPI can add overhead to the execution of user-space programs.

- **Security:** The KPI can be a security risk. This is because the KPI provides a way for user-space programs to interact with the kernel, which can be used to exploit security vulnerabilities.

Overall, the KPI is an important part of the operating system, and it provides a way for user-space programs to access system resources and to interact with the kernel. The KPI has a number of benefits, such as efficiency, security, and portability. However, the KPI also has some challenges, such as complexity, inefficiency, and security risks.

6. What are the basic utilities in Linux? Explain.

Answer 👍

Linux provides a wide range of basic utilities, also known as command-line utilities or core utilities, that are essential for performing common tasks and managing the system. These utilities are typically accessed through the command line or terminal and play a crucial role in Linux administration and everyday usage. Here are some of the basic utilities in Linux:

1. **ls:** The "ls" utility lists directory contents, displaying files and directories within a specified directory.
2. **cd:** The "cd" utility is used to change the current working directory in the command line.
3. **pwd:** The "pwd" utility prints the current working directory, showing the path of the current directory.
4. **cp:** The "cp" utility copies files and directories from one location to another.
5. **mv:** The "mv" utility is used to move or rename files and directories.
6. **rm:** The "rm" utility removes or deletes files and directories.
7. **mkdir:** The "mkdir" utility creates new directories (folders).
8. **rmdir:** The "rmdir" utility removes empty directories.
9. **cat:** The "cat" utility displays the content of one or more files.
10. **grep:** The "grep" utility searches files for lines that match a given pattern or regular expression.
11. **find:** The "find" utility searches for files and directories in a specified location based on various criteria, such as name, size, or permissions.
12. **chmod:** The "chmod" utility changes the permissions (read, write, execute) of files and directories.
13. **chown:** The "chown" utility changes the ownership of files and directories.
14. **ps:** The "ps" utility displays information about currently running processes.

- 15.top:** The "top" utility provides a dynamic real-time view of system processes, resource usage, and system statistics.
- 16.df:** The "df" utility displays information about disk space usage on file systems.
- 17.du:** The "du" utility estimates the disk usage of files and directories.
- 18.tar:** The "tar" utility is used for creating, extracting, and managing compressed archives.
- 19.ssh:** The "ssh" utility enables secure remote login and command execution on remote systems.
- 20.ping:** The "ping" utility sends network packets to a specified IP address or hostname to check connectivity and measure response times.

These utilities represent just a fraction of the numerous core utilities available in Linux. They provide powerful and flexible functionality for managing files, directories, processes, networks, and system resources. Additionally, Linux offers a rich set of specialized utilities and command-line tools for specific tasks, such as package management, text editing, networking, system administration, and mor

Unit- 2

Installation Guide: Booting Linux Installation Program, Partitioning Hard Drives, Setting up Swap Space, Choosing Partitions to Format Booting with LILO, Multi-boot with Other Operating Systems, Logging In from a Terminal or Terminal Emulator, More About Logging In, Run levels.

Keywords:

- **Bootting:** It is a bootstrapping process that starts operating systems when the user turns on a computer system.
- **BIOS:** It refers to the software code run by a computer when first powered on.
- **Partitioning:** It is a means to divide a single hard drive into many logical drives.A partition is a contiguous set of blocks on a drive that are treated as an independent disk.
- **Swap:** Swap partitions are used to support virtual memory. In other words, data is written to a swap partition when there is not enough RAM to store the data your system is processing.
- **GNOME:** The default desktop interface of Red Hat Linux is GNOME.
- **Run-level:** A run-level is a software configuration of the system which allows only a selected group of processes to exist

1.

What does BIOS mean?

Basic Input/ Output Service
Basic Input/ Output System

Buffer Input/ Output System

Buffer Input/ Output Service

2.

MBR is executed by _____ .

BIOS

GRUB

Kernel

Init

3.

Which of these is a Linux boot loader?

GRUB

LILO

Both GRUB and LILO

None of the above

4.

In which mode, it is possible to install and upgrade Red Hat Linux?

Graphical

Text

Both graphical and text

None of the above

5.

Which of these is a Red Hat Linux installer?

Anaconda

GRUB

LILO

Emulator

6.

Which of these programs allows us to partition the disk?

Anaconda

GRUB

Disk Druid

Disk Help

7.

In partition field, i.e., SIZE, the measurement unit is ____

TB

MB

GB

KB

8.

Which of these partitions is used to support virtual memory?

/

/var

/boot
swap
9.

Which of these defines the runlevels?

0-6
1-7
2-8
3-9
10.

Which of these is the default desktop interface of Red Hat Linux?

KDE
GNOME
GRUB
LILO
11.

Which of these executes kernel?

MBR
BIOS
GRUB
Init
12.

Which of these tasks are handled by Kernel?

System Call
Process Management
Device Management
All: System call, process and device management
13.

The first thing a Kernel does is _____.

Execute GRUB
Execute LILO
Execute init program
None of the above
14.

While installation of Red Hat Linux in the system, it asks for _____.

Language Selection
Keyboard Configuration
Mouse Configuration
All: Language selection, keyboard and mouse configuration
15.

What type can be installed in Red Hat Linux?

Personal Desktop
Server

Self Assessment

1. Which of these executes the kernel?
A. MBR B. BIOS C. GRUB D. Init
2. The first thing a Kernel does is _____.
A. Execute GRUB B. Execute LILO C. Execute init program D. None of the above
3. Which of these tasks are handled by Kernel?
A. System Call B. Process Management C. Device Management
D. All: System call, process and device management
4. While installing Red Hat Linux in the system, it asks for _____.
A. Language Selection B. Keyboard Configuration C. Mouse Configuration
D. All: Language selection, keyboard and mouse configuration
5. In partition field, i.e., SIZE, the measurement unit is _____.
A. TB B. MB C. GB D. KB
6. Which of these defines the runlevels?
A. 0-6 B. 1-7 C. 2-8 D. 3-9
7. Which of these partitions is used to support virtual memory?
A. / B. /var C. /boot D. swap
8. Which of these is a Red Hat Linux installer?
A. Anaconda B. GRUB C. LILO D. Emulator
9. Which of these programs allows us to partition the disk?
A. Anaconda B. GRUB C. Disk Druid D. Disk Help
10. MBR is executed by _____.
A. BIOS B. GRUB C. Kernel D. Init
11. In which mode, it is possible to install and upgrade Red Hat Linux?
A. Graphical B. Text C. Both graphical and text D. None of the above

12. What does BIOS mean?

- A. Basic Input/ Output Service
- B. Basic Input/ Output System
- C. Buffer Input/ Output System
- D. Buffer Input/ Output Service

13. MBR is executed by _____ .

- A. BIOS
- B. GRUB
- C. Kernel
- D. Init

14. In which mode, it is possible to install and upgrade Red Hat Linux?

- A. Graphical
- B. Text
- C. Both graphical and text
- D. None of the above

15. What type can be installed in Red Hat Linux?

- A. Personal Desktop
- B. Server
- C. Workstation
- D. All: personal desktop, server and workstation

Answers for Self Assessment

1. C 2. C 3. D 4. D 5. B 6. A 7. D 8. A 9. C 10. A 11. C 12. B 13. A 14. C 15. D

Review Questions:

1. What is booting? Explain the booting sequence in detail.

Answer

Booting refers to the process of starting up a computer system and loading the operating system into memory, making the system ready for use. When a computer is powered on or restarted, the booting sequence is initiated, and several steps are followed to bring the system to an operational state. Here is a detailed explanation of the typical booting sequence:

BIOS	Basic Input/Output System executes MBR
MBR	Master Boot Record executes GRUB
GRUB	Grand Unified Bootloader executes Kernel
Kernel	Kernel executes /sbin/init
Init	Init executes runlevel programs
Runlevel	Runlevel programs are executed from /etc/rc.d/rc*.d/

BIOS (Basic Input/ Output System)

BIOS refers to the software code run by a computer when first powered on. It identifies your computer's hardware, configures it, tests it, and connects it to the operating system for further instruction. This is called the boot process. The primary function of BIOS is code program embedded on a chip that recognizes and controls various devices that make up the computer.

MBR(Master Boot Record)

OS is booted from a hard disk, where the Master Boot Record (MBR) contains the primary boot loader. The MBR is a 512-byte sector, located in the first sector on the disk (sector 1 of cylinder 0, head 0). After the MBR is loaded into RAM, the BIOS yields control to it.

Boot loader

Boot loader could be more adeptly called the kernel loader. The task at this stage is to load the

Linux kernel. GRUB and LILO are the most popular Linux boot loader. Examples of boot loaders are: GRUB, LILO, GRUB2WIN, BOOTCAMP, BOOTKEY, NTLDR and Syslinux

GRUB: GRUB stands for GRand Unified Bootloader. It is an operating system independent boot loader. It is a multiboot software packet from GNU. It has a flexible command line interface. It has file system access. It supports multiple executable formats. It supports diskless system.

LILO: LIinux Loader This boot loader does not depend on a specific file system. It can boot from hard-disk and

Task of kernel

The kernel helps in process management, memory management. The device management is also one of the tasks of kernel. The system calls are also handled by kernel.

Init process

The first thing the kernel does is to execute init program. Init is the root/parent of all processes executing on Linux. The first processes that init starts is a script /etc/rc.d/rc.sysinit. Based on the appropriate run-level, scripts are executed to start various processes to run the system and make it functional. The init process is identified by process id "1". Init is responsible for starting system processes as defined in the /etc/inittab file. Upon shutdown, init controls the sequence and processes for shutdown.

Runlevels

A run-level is a software configuration of the system which allows only a selected group of processes to exist. Init can be in one of seven run-levels: 0-6.

Runlevel	ScriptsDirectory (RedHat/Fedora Core)	State
0	/etc/rc.d/rc0.d/	shutdown/halt system
1	/etc/rc.d/rc1.d/	Single user mode
2	/etc/rc.d/rc2.d/	Multiuser with no network services exported
3	/etc/rc.d/rc3.d/	Default text/console only start. Full multiuser
4	/etc/rc.d/rc4.d/	Reserved for local use. Also X-windows (Slackware/BSD)
5	/etc/rc.d/rc5.d/	XDM X-windows GUI mode (Redhat/System V)
6	/etc/rc.d/rc6.d/	Reboot
s or S		Single user/Maintenance mode (Slackware)
M		Multiuser mode (Slackware)

It's worth noting that the booting sequence can vary depending on the specific hardware, firmware, and operating system being used. For example, some systems may use different boot loaders or boot managers, and the init system may differ based on the Linux distribution or Unix-like operating system in use. However, the general concept and steps involved in the booting process remain consistent across most computer systems.

2. What is a kernel? Explain the tasks of a kernel in detail.

Answer

A kernel is the core component of an operating system that acts as a bridge between the hardware and software layers. It is responsible for managing system resources, providing essential services, and facilitating communication between applications and the underlying hardware.

The kernel is typically divided into two parts:

The kernel space : The kernel space is the part of the kernel that is responsible for managing the hardware and providing services to user programs. The kernel space is typically implemented in a privileged mode, which means that it has access to all of the computer's hardware resources. **The user space** : It is the part of the kernel that is responsible for running user programs. The user space is typically implemented in a non-privileged mode, which means that it does not have direct access to the hardware resources.

The kernel is a critical part of the operating system and is responsible for ensuring that the computer runs smoothly and efficiently. Here are some additional details about the tasks performed by the kernel:

Memory management: The kernel manages the computer's memory by dividing it into two main parts: kernel space and user space. Kernel space is used by the kernel and device drivers, while user space is used by applications. The kernel ensures that no application can access kernel space, which would allow it to damage the operating system.

Process management: The kernel manages the computer's processes by assigning each process a unique identifier and a set of resources, such as memory and CPU time. The kernel also ensures that no process can monopolize the CPU or other resources, and that processes are scheduled to run fairly.

Device management: The kernel manages the computer's devices by loading device drivers, which are software programs that allow the operating system to communicate with the device. The kernel also ensures that no device can access the computer's memory or other resources without permission.

Inter-process communication (IPC): The kernel provides mechanisms for applications to communicate with each other. These mechanisms include shared memory, pipes, and sockets. Shared memory is a region of memory that is shared by two or more

processes. Pipes are unidirectional communication channels that allow two processes to send and receive data. Sockets are bidirectional communication channels that allow two processes to send and receive data in both directions.

Security: The kernel provides security features, such as access control and encryption. Access control is used to prevent unauthorized users from accessing the computer's resources. Encryption is used to protect data from unauthorized access.

The kernel is a complex piece of software that is essential for the operation of the computer. It is responsible for managing the computer's hardware resources, providing basic services to applications, and ensuring the security of the system.

3. What is a partition? Write the partition fields. What is the recommended partition scheme?

In computer systems, a partition refers to a logical division or subdivision of a storage device, such as a hard disk drive or solid-state drive. Partitions are created to separate the storage space into distinct sections, each with its own file system and data. By dividing the storage device into partitions, users can allocate space for different purposes, improve data organization, and enable the use of multiple operating systems on a single device.

The partition fields describe the characteristics and properties of a partition. The specific fields may vary depending on the partitioning scheme or file system used, but here are some commonly encountered fields:

1. **Partition Type:** This field indicates the type or format of the partition. It is typically represented by a code or identifier that signifies the file system used, such as FAT32, NTFS, ext4, or HFS+.
2. **Partition Size:** This field specifies the total size or capacity of the partition, typically measured in bytes, kilobytes (KB), megabytes (MB), gigabytes (GB), or terabytes (TB).
3. **Partition Label:** Also known as the partition name, this field provides a descriptive name or label assigned to the partition for easy identification and reference.
4. **Partition Start/End:** These fields denote the starting and ending positions of the partition on the storage device. They indicate the location of the partition's first and last sectors.
5. **Partition Status:** This field indicates whether the partition is active or inactive. An active partition is the one from which the system boots.

As for the recommended partition scheme, it depends on the specific use case and the operating system being used. Here are a few common partition schemes:

1. **Master Boot Record (MBR):** MBR is an older partitioning scheme commonly used on BIOS-based systems. It supports up to four primary partitions or three primary partitions and an extended partition containing logical partitions. However, MBR has limitations, such as a maximum disk size of 2 terabytes and a maximum of four primary partitions.
2. **GUID Partition Table (GPT):** GPT is a newer partitioning scheme designed for modern systems, including UEFI-based computers. GPT supports larger disk sizes (up to 9.4 zettabytes) and allows for more than four primary partitions. It also includes redundancy and backup features for improved data integrity.

For most modern systems, using the GPT partition scheme is recommended, especially if you have a UEFI-based computer and need support for large disk sizes or more than four partitions. However, it's important to consider the compatibility requirements of the operating system and any specific software you intend to use, as some older operating systems or utilities may have limitations with GPT.

4. What is a file system? Explain its types in detail.

A file system is a method or structure used by an operating system to organize and manage files on a storage device. It provides a way to store, retrieve, and organize data, as well as manage access and permissions for files and directories. File systems define how data is stored, named, accessed, and organized on a storage medium, such as a hard disk drive or solid-state drive.

There are several types of file systems, each with its own characteristics, features, and compatibility. Here are some commonly used file systems:

1. **File Allocation Table (FAT):**

- FAT12: Introduced with early versions of MS-DOS, it supports file and partition sizes up to 32 MB.
- FAT16: Supports larger partition sizes and file sizes compared to FAT12, with a maximum partition size of 2 GB.
- FAT32: Supports larger partition and file sizes, with a maximum file size of 4 GB and a maximum partition size of 2 TB.

- exFAT: Developed by Microsoft, it is an extension of FAT32 designed for use with flash drives and external storage devices. It supports larger file sizes and partition sizes than FAT32.

2. NTFS (New Technology File System):

- Developed by Microsoft, NTFS is the default file system for Windows NT and its successors (Windows 2000, XP, Vista, 7, 8, 10).
- Offers advanced features such as file and folder permissions, encryption, compression, journaling, and support for large file sizes and partition sizes.
- Provides better performance and reliability compared to FAT-based file systems.

3. HFS+ (Hierarchical File System Plus):

- Developed by Apple for Mac OS 8.1 and later versions, including macOS.
- Supports features like journaling, file and folder permissions, symbolic links, and metadata.
- HFS+ has been replaced by the newer APFS (Apple File System) in recent versions of macOS.

4. ext2, ext3, ext4 (Extended File System):

- The ext family of file systems is commonly used in Linux distributions.
- ext2: The second extended file system, providing basic file and directory features.
- ext3: An extension of ext2 with the addition of journaling for improved reliability and recovery after system crashes.
- ext4: Further extends ext3 with improvements in performance, scalability, and support for larger file systems.

5. APFS (Apple File System):

- Introduced by Apple as the default file system for macOS High Sierra and later, as well as iOS devices.
- Offers features like strong encryption, snapshot support, fast directory sizing, and improved performance on solid-state drives (SSDs).

6. NTFS+ (NTFS Plus):

- An updated version of NTFS introduced with Windows 10 October 2018 Update (version 1809).
- Includes additional features like support for larger sector sizes, better performance on large disks, and improved handling of power loss or hardware failures.

These are just a few examples of file systems, and there are many more in use today. The choice of file system depends on the operating system being used, compatibility

requirements, desired features, and specific use cases, such as the size and type of storage media or the need for cross-platform compatibility.

5. What is a run-level? Explain about the run-level of it.

In Unix-like operating systems, including Linux, a run-level refers to a specific operating state or mode in which the system operates. Each run-level represents a different configuration of services, daemons, and processes that are started or stopped, depending on the run-level in use.

Traditionally, Unix systems had seven run-levels, numbered from 0 to 6, each with a specific purpose. However, the usage and interpretation of run-levels may vary slightly between different Unix-like systems. Here is a common representation of the run-levels:

Runlevel	ScriptsDirectory (RedHat/Fedora Core)	State
0	/etc/rc.d/rc0.d/	shutdown/halt system
1	/etc/rc.d/rc1.d/	Single user mode
2	/etc/rc.d/rc2.d/	Multiuser with no network services exported
3	/etc/rc.d/rc3.d/	Default text/console only start. Full multiuser
4	/etc/rc.d/rc4.d/	Reserved for local use. Also X-windows (Slackware/BSD)
5	/etc/rc.d/rc5.d/	XDM X-windows GUI mode (Redhat/System V)
6	/etc/rc.d/rc6.d/	Reboot
s or S		Single user/Maintenance mode (Slackware)
M		Multiuser mode (Slackware)

Modern Linux distributions, such as Ubuntu and Fedora, often use a simplified version of run-levels, where run-level 0 is for halt/shutdown, run-level 1 is for single-user mode, and run-levels 2 to 5 are generally used for different multi-user states, including various levels of GUI and networking support. Run-level 6 remains reserved for system reboot.

Unit- 3

Connecting to Internet: Network interfacing tool, Connecting to LAN, DNS (Static and Dynamic connection).

1.

What is an internet?

- A tool to write the text data
- A network that connects the computer all over the world
- A tool to convert the word doc to pdf
- None of the above

2.

What is another name of Network Interfacing Tool?

- Network Administration Tool
- Network Configuration Tool
- Both network administration and configuration tool
- None of the above

3.

If we want to make a connection to the LAN, then what kind of device will be chosen?

- CIPC Connection
- Ethernet Connection
- ISDN Connection
- None of the above

4.

The IP address can be assigned

- Statically
- Dynamically
- Both statically and dynamically
- None of the above

5.

What provides the interfacing between human-readable address and IP address of the machine?

- DNS
 - ABC
 - Wrox
 - None of the above
- 6.

What is the path to enter the Network Administration Wizard?

- Main Menu | System Tools | Internet Configuration Wizard
 - Main Menu | Systems | Settings
 - Main Menu | System Tools | Web Browsers
 - None of the above
- 7.

What is required to access the internet?

- Pdf converter
 - Photoshop
 - Web browser
 - None of the above
- 8.

What is the format of the IP address?

- X.X
 - X.X.X
 - X.X.X.X
 - None of the above
- 9.

For a machine connected to a LAN or ISP using a static IP address, we need to obtain the network details like

IP address
Subnet mask
Default gateway address
All IP address, subnet mask and default gateway address
10.

In the case of a machine connected to a LAN using a dynamic IP address, the address is allocated either using _____

DHCP
BOOTP
Either DHCP or BOOTP
None of the above
11.

Which of these tabs are available in the Network Interfacing Tool?

Device tab
Hardware tab
DNS tab
All device, hardware and DNS tabs
12.

In the process of activating the internet, how many files were modified?

One
Two
Three
Four
13.

How to open the network configuration manager through the command line?

redhat-config-network
redhat-config-internet
redhat-config-mozillabrowser
None of the above
14.

Which of these is not a web browser?

- Windows
 - Google Chrome
 - Mozilla Firefox
 - Microsoft Edge
- 15.

What is used by browsers to retrieve any published resource on the web?

- URL
- VRL
- LRU
- None of the above

Self Assessment

1. If we want to make a connection to the LAN, then what kind of device will be chosen?
A. CIPC Connection B. Ethernet Connection C. ISDN Connection D. None of the above
2. What is an internet?
A. A tool to write the text data B. A network that connects the computer all over the world
C. A tool to convert the word doc to pdf D. None of the above
3. The IP address can be assigned
A. Statically B. Dynamically C. Both statically and dynamically D. None of the above
4. What is another name of Network Interfacing Tool?
A. Network Administration Tool B. Network Configuration Tool
C. Both network administration and configuration tool D. None of the above
5. For a machine connected to a LAN or ISP using a static IP address, we need to obtain the network details like
A. IP address B. Subnet mask C. Default gateway address
D. All IP address, subnet mask and default gateway address
6. Which of these tabs are available in Network Interfacing Tool?
A. Device tab B. Hardware tab C. DNS tab
D. All device, hardware, and DNS tabs
7. In the case of a machine connected to a LAN using a dynamic IP address, the address is

allocated either using _____

- A. DHCP B. BOOTP C. Either DHCP or BOOTP D. None of the above

8. In the process of activating the internet, how many files were modified?

- A. One B. Two C. Three D. Four

9. Which of these is not a web browser?

- A. Windows B. Google Chrome C. Mozilla Firefox D. Microsoft Edge

10. How to open the network configuration manager through command line?

- A. redhat-config-network B. redhat-config-internet
C. redhat-config-mozillabrowser D. None of the above

11. What is used by browsers to retrieve any published resource on the web?

- A. URL B. VRL C. LRU D. None of the above

12. What is the path to enter the Network Administration Wizard?

- A. Main Menu | System Tools | Internet Configuration Wizard B. Main Menu | Systems | Settings
C. Main Menu | System Tools | Web Browsers D. None of the above

13. What is the format of IP address?

- A. x.x B. x.x.x C. x.x.x.x D. None of the above

14. What is required to access internet?

- A. Pdf converter B. Photoshop C. Web browser D. None of the above

15. What provides the interfacing between human-readable address and IP address of the machine?

- A. DNS B. ABC C. Wrox D. None of the above

Answers for Self Assessment

1. C 2. B 3. C 4. C 5. D 6. D 7. C 8. C 9. A 10. A 11. A 12. A 13. C 14. C 15. A

Review Questions:

1. Is it necessary to configure the system before the internet connection take place? If yes, how can we configure it?

Answer:-

Yes, it is often necessary to configure a system before establishing an internet connection. The configuration process ensures that the system is properly set up to

connect to the internet and make the most efficient use of available resources. Here are the general steps to configure a system for an internet connection:

1. **Set up hardware:** Ensure that all necessary hardware components, such as network interface cards (NICs) or Wi-Fi adapters, are properly installed and connected to the system.
2. **Install drivers:** If required, install the drivers for your network hardware. Most modern operating systems automatically detect and install the necessary drivers, but in some cases, you may need to manually install them.
3. **Network settings:** Access the network settings of your operating system to configure the network connection. This can usually be done through the control panel or system preferences. Here are some key settings to configure:
 - **IP Address:** Choose whether to use a static IP address or obtain one automatically using DHCP (Dynamic Host Configuration Protocol). DHCP is the most common choice for home networks, as it simplifies the setup process.
 - **DNS Settings:** Specify the DNS (Domain Name System) servers that your system will use to resolve domain names to IP addresses. You can use your ISP's DNS servers or use public DNS servers like Google DNS (8.8.8.8 and 8.8.4.4) or Cloudflare DNS (1.1.1.1 and 1.0.0.1).
 - **Gateway:** Set the default gateway or router IP address. This is the device that connects your system to the internet and forwards network traffic between your local network and the internet.
 - **Proxy Settings** (if applicable): If you need to use a proxy server to connect to the internet, configure the proxy settings accordingly.
4. **Wireless network setup** (if applicable): If you are connecting to the internet via Wi-Fi, you need to configure the wireless network settings. You will need to enter the SSID (network name) and password for the Wi-Fi network you want to connect to.
5. **Firewall and security settings:** Configure any firewall or security settings to allow internet access. Make sure the necessary ports are open, and any security software or antivirus programs are properly configured.
6. **Test the connection:** Once the configuration is complete, test the internet connection to ensure that everything is working as expected. Open a web browser and try to access a website to verify the connectivity.

These steps provide a general overview of the configuration process. The exact steps may vary depending on the operating system and network setup you are using. It's

recommended to refer to the documentation or help resources provided by your operating system or network equipment manufacturer for specific instructions.

2. What is an IP address? Explain the difference between static and dynamic IP address.

Answer:-

An IP address is a unique address that identifies a device on the internet or a local network. IP stands for "Internet Protocol," which is the set of rules governing the format of data sent via the internet or local network. In essence, IP addresses are the identifier that allows information to be sent between devices on a network: they contain location information and make devices accessible for communication. The internet needs a way to differentiate between different computers, routers, and websites. IP addresses provide a way of doing so and form an essential part of how the internet works.

In brief it can be stated that an IP address (Internet Protocol address) is a unique numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication. It serves two primary functions: identifying the host or network interface and providing the location/address for data routing on the internet

These are of two types: static IP address and dynamic IP address:

Static IP address: A static IP address is simply an address that doesn't change. Once your device is assigned a static IP address, that number typically stays the same until the device is decommissioned or your network architecture changes. Static IP addresses generally are used by servers or other important equipment. Static IP addresses are assigned by Internet Service Providers (ISPs). Your ISP may or may not allocate you a static IP address depending on the nature of your service agreement. We describe your options a little later, but for now assume that a static IP address adds to the cost of your ISP contract. A static IP address may be IPv4 or IPv6; in this case the important quality is static. Some day, every bit of networked gear we have might have a unique static IPv6 address. We're not there yet. For now, we usually use static IPv4 addresses for permanent addresses. So it can be stated that A static IP address is a permanent address that is assigned to a device by the ISP. The address does not change, even if the device is rebooted or moved to a different network. Static IP addresses are often used for servers and other devices that need to be accessible from the internet.

Dynamic IP address:As the name suggests, dynamic IP addresses are subject to change,

sometimes at a moment's notice. Dynamic addresses are assigned, as needed, by Dynamic Host Configuration Protocol (DHCP) servers. We use dynamic addresses because IPv4 doesn't provide enough static IP addresses to go around. So, for example, a hotel probably has a static IP address, but each individual device within its rooms would have a dynamic IP address. On the internet, your home or office may be assigned a dynamic IP address by your ISP's DHCP server. Within your home or business network, the dynamic IP address for your devices -- whether they are personal computers, Smartphone, streaming media devices, tablet, what have you -- are probably assigned by your network router. Dynamic IP is the standard used by and for consumer Equipment.

Overall , A dynamic IP address is an address that is assigned to a device by the ISP for a limited period of time. The address may change each time the device connects to the network. Dynamic IP addresses are the most common type of IP address and are used for most home and office networks.

3. What is a network interfacing tool? Explain its tabs.

Answer:-

Network Interfacing Tool is also known as the Network Administration Tool or Network Configuration Tool. The purpose of the Network Interfaces Tool is to provide details about each network interface and to show whether the computer you are using is connected to the access point.

It has four tabs:

- **Devices Tab:** Lists the device connections that we have available on our machine.
- **Hardware Tab:** Allows us to manage the various network devices on the system, such as Ethernet cards, internal modems, and wireless cards.
- **DNS Tab:** Allows us to specify DNS server information.
- **Hosts Tab:** Allows us to modify the hostname of the machine and add aliases to the same host.

Ans:==>

A network interfacing tool is a software application that allows users to configure and manage network interfaces. Network interfaces are the physical or logical connections that allow computers to communicate with each other over a network.

There are many different network interfacing tools available, each with its own strengths and weaknesses. Some of the most popular network interfacing tools include:

Network Manager: Network Manager is a graphical network configuration tool that is included in most Linux distributions. It is easy to use and provides a wide range of features, including the ability to configure wired and wireless connections, VPNs, and DNS servers.

iproute2: iproute2 is a command-line network configuration tool that is available for Linux and Unix-like operating systems. It is a powerful tool that provides a wide range of features, but it can be difficult to use for beginners.

Netsh: Netsh is a command-line network configuration tool that is available for Windows operating systems. It is a powerful tool that provides a wide range of features, but it can be difficult to use for beginners.

The tabs in a network interfacing tool typically allow users to configure the following:

General: The general tab typically allows users to configure the name of the network interface, the IP address, the subnet mask, and the default gateway.

Advanced: The advanced tab typically allows users to configure more advanced settings, such as the DNS servers, the MTU, and the MAC address.

Security: The security tab typically allows users to configure security settings, such as the encryption type and the authentication method.

Status: The status tab typically displays the current status of the network interface, including the IP address, the subnet mask, the default gateway, and the link speed.

Network interfacing tools are a valuable tool for managing network interfaces. They allow users to quickly and easily configure and manage their network connections.

4. What is DNS? Explain.

Answer -

DNS stands for Domain Name System. It is a hierarchical and distributed naming system that translates domain names (such as www.example.com) into the corresponding IP addresses (such as 192.0.2.1) used by computers to identify and communicate with each other over the internet.

The main purpose of DNS is to provide a user-friendly and human-readable way to access resources on the internet. Rather than remembering and using the numeric IP

addresses, which can be complex and difficult to remember, users can simply enter domain names in their web browsers or other applications to access websites, send emails, or perform other network activities.

Here's how DNS works:

1. **Domain Hierarchy:** The DNS system is organized in a hierarchical structure. At the top of the hierarchy is the root domain, represented by a dot (.) and managed by the Internet Corporation for Assigned Names and Numbers (ICANN). Below the root domain, there are top-level domains (TLDs) like .com, .org, .net, country-specific TLDs like .us, .uk, and second-level domains (SLDs) like example.com, google.com, etc.
2. **DNS Servers:** The DNS system relies on a network of DNS servers that store and distribute the domain name and IP address information. These servers are categorized into different types:
 - Recursive DNS Resolvers: These are typically provided by internet service providers (ISPs) or network administrators. When a user requests a domain name lookup, the resolver performs the necessary steps to find the IP address associated with the domain. If it doesn't have the information in its cache, it communicates with other DNS servers to retrieve the required information.
 - Root DNS Servers: These are the highest-level DNS servers in the hierarchy. They have information about the authoritative servers for the top-level domains.
 - TLD DNS Servers: These servers store information about the authoritative name servers for each specific TLD. For example, the .com TLD servers know the authoritative name servers for all domains ending in .com.
 - Authoritative DNS Servers: These servers hold the DNS records for specific domain names. They are responsible for providing the IP address or other information associated with a domain name.
3. **DNS Resolution Process:** When a user enters a domain name in a web browser, the DNS resolution process takes place:
 - The user's device sends a DNS query to the recursive DNS resolver, typically provided by the ISP.
 - The resolver checks its cache to see if it has the IP address for the requested domain name. If it does, it returns the IP address to the user's device. If not, it proceeds to the next step.
 - The resolver sends a query to the root DNS servers, asking for the IP address of the TLD DNS servers associated with the requested domain.

- The root DNS servers respond with the IP address of the TLD DNS servers.
- The resolver then sends a query to the TLD DNS servers, asking for the IP address of the authoritative DNS servers for the requested domain.
- The TLD DNS servers respond with the IP address of the authoritative DNS servers.
- Finally, the resolver sends a query to the authoritative DNS servers, requesting the IP address of the requested domain. The authoritative DNS servers provide the IP address, and the resolver caches it for future use.
- The resolver returns the IP address to the user's device, allowing it to establish a connection with the desired resource on the internet.

This entire process, from the initial DNS query to obtaining the IP address, typically happens within a few milliseconds.

In summary, DNS is a critical component of the internet that translates domain names into IP addresses, enabling users to access resources on the internet using human-readable names.

5. Explain the process of configuring the system for internet connection.

Configuring a system for an internet connection involves several steps to ensure that the system is properly set up to connect to the internet. Here is a general overview of the process:

1. **Hardware setup:** Ensure that the necessary hardware components are in place. This includes connecting the network interface card (NIC) or Wi-Fi adapter to the system if it's not built-in.
2. **Check drivers:** Verify that the drivers for the network hardware are installed and up to date. Most modern operating systems automatically detect and install the necessary drivers. However, if required, download and install the drivers from the manufacturer's website.
3. **Network settings configuration:** Access the network settings of your operating system. The steps to access these settings may vary depending on the operating system you're using. Some common paths include the control panel, network settings, or system preferences.
 - **IP Address:** Choose whether to use a static IP address or obtain one automatically using DHCP (Dynamic Host Configuration Protocol). DHCP is the most common choice for home networks, as it simplifies the setup process by automatically assigning IP addresses. If you opt for a static IP

address, you need to manually enter the IP address, subnet mask, default gateway, and DNS server addresses.

- **DNS Settings:** Specify the DNS (Domain Name System) servers that your system will use to resolve domain names to IP addresses. You can use your ISP's DNS servers or public DNS servers like Google DNS (8.8.8.8 and 8.8.4.4) or Cloudflare DNS (1.1.1.1 and 1.0.0.1). These settings can usually be configured within the network settings of your operating system.
 - **Proxy Settings** (if applicable): If you need to use a proxy server to connect to the internet, configure the proxy settings accordingly. This includes entering the proxy server address and port.
4. **Wireless network setup** (if applicable): If you're connecting to the internet via Wi-Fi, you need to configure the wireless network settings. Access the Wi-Fi settings on your operating system, select the desired network (SSID), and enter the corresponding password if required.
 5. **Firewall and security settings:** Check your firewall and security settings to ensure that they allow internet access. Configure the necessary exceptions or rules to enable network traffic for internet connectivity. If you have security software or antivirus programs, ensure that they are properly configured to allow internet access.
 6. **Test the connection:** Once the configuration is complete, test the internet connection to ensure that everything is working correctly. Open a web browser and try to access a website or perform other network activities to verify the connectivity.

It's important to note that the specific steps and terminology may vary depending on the operating system you're using. It's recommended to refer to the documentation or help resources provided by your operating system or network equipment manufacturer for detailed instructions and troubleshooting guidance.

Unit- 4

Installing software: RPM management tool, Querying RPM packages, Package installation in TAR format, Adding & removing packages.

1.

With RPM, it is easy to _____ softwares on the computer system.

Install

Uninstall

Upgrade

All: install, uninstall and upgrade

2.

What is the extension of the RPM file

- .txt
 - .doc
 - .rpm
 - .pdf
- 3.

Which of these packages are always available when a package group is installed?

- Standard packages
 - Extra packages
 - Grouped packages
 - None of the above
- 4.

The RPM package management tool is a _____.

- Graphical interface
 - Textual interface
 - Not an interface
 - None of the above
- 5.

From _____, it is possible to install packages network, FTP or HTTP connections.

- Command line
 - Graphical interface
 - Both command line and graphical interface
 - None of the above
- 6.

TAR stands for

- Toor Archive
 - Tape Archive
 - Tape Assistance
 - Toor Assistance
- 7.

How can we start RPM package management tool?

- \$redhat-config-services
 - \$redhat-config-packages
 - \$redhat-config-management
 - None of the above
- 8.

Which of the buttons are available on the tool interface?

- Update button
 - Quit button
 - Both update and quit buttons
 - None of the above
- 9.

Using RPM package management tool, we can install

Web server
Mail server
DNS name server
All of the above

10.

Under development tools, what can be installed using RPM package management tool?

KDE Software development
GNOME Software development
X Software development
All of the above

11.

What are the benefits of using RPM?

Package queries
System verification
Security
All of the above

12.

The slash (/) in the interface of RPM package management tool represents:

Total number of packages/ Number of packages installed
Number of packages installed/ total number of packages
Package category/ package group
Package group/ package category

13.

We can which packages are installed/ not installed by clicking on

Update button
Quit button
Details link
None of the above

14.

While graphical interface of RPM package management tool can install/remove/update the packages, but it still lacks which functionality.

It cannot install packages using network, FTP, or HTTP connections.
It does not show the location the files in a package are installed to.
Both of the above
None of the above

Self Assessment

1. TAR stands for

A. Tour Archive B. Tape Archive C. Tape Assistance D. Tour Assistance

2. Under development tools, what can be installed using RPM package management tool?

A. KDE Software development B. GNOME Software development

C. X Software development D. All of the above

3. While graphical interface of RPM package management tool can install/remove/update the packages, but it still lacks which functionality.

A. It cannot install packages using network, FTP, or HTTP connections.

B. It does not show the location the files in a package are installed to.

C. Both above D. None of the above

4. The RPM package management tool is a _____

A. Graphical interface

B. Textual interface

C. Not an interface

D. None of the above

5. Using RPM package management tool, we can install

A. Web server

B. Mail server

C. DNS name server

D. All of the above

6. We can which packages are installed/ not installed by clicking on

A. Update button

B. Quit button

C. Details link

D. None of the above

7. Which of these packages are always available when a package group is installed?

A. Standard packages

B. Extra packages

C. Grouped packages

D. None of the above

8. Which of the buttons are available on the tool interface?

A. Update button

B. Quit button

C. Both update and quit buttons

D. None of the above

9. The slash (/) in the interface of RPM package management tool represents:

A. Total number of packages/ Number of packages installed

B. Number of packages installed/ total number of packages

C. Package category/ package group

D. Package group/ package category

10. What is the extension of the RPM file

A. .txt

B. .doc

C. .rpm

D. .pdf

11. How can we start RPM package management tool?

A. \$redhat-config-services

B. \$redhat-config-packages

C. \$redhat-config-management

D. None of the above

12. What are the benefits of using RPM?

A. Package queries

B. System verification

C. Security

D. All of the above

13. With RPM, it is easy to _____ softwares on the computer system.

- A. Install B. Uninstall C. Upgrade D. All: install, uninstall and upgrade

14. From _____, it is possible to install packages network, FTP or HTTP connections.

- A. Command line B. Graphical interface C. Both command line and graphical interface
D. None of the above

15. Which of these commands is used for querying the information about a package after Installation?

- A. rpm -qi<filename> B. rpm -qu<filename> C. rpm -qr<filename> D. None of the above

Answers for Self Assessment

1. B 2. D 3. C 4. A 5. D 6. C 7. A 8. C 9. B 10. C 11. B 12. D 13. D 14. A 15. A

Review Questions:

1. What is RPM? Write the ways and benefits of using RPM.

Answer:-

RPM stands for Redhat Package Manager. The RPM package manager is an open-source packaging system distributed under the GNU GPL. It runs on most Linux distributions and makes it easy for you to install, uninstall, and upgrade the software on your machine. RPM files can be easily recognized by their .rpm file extension and the 'package' icon that appears in your navigation window

Benefits of using RPM: There are few reasons to use RPM.

- **Simplicity:** RPM is quite simple to use. The interface of RPM is very clear. The packages and the groups in RPM are very easy to locate. So, this is the remarkable feature of RPM.
- **Upgradability:** RPM interface is easy to upgrade. If a new package comes, it can be easily upgraded.
- **Manageability:** RPM interface is easily manageable. If we want to add or delete some packages using RPM, then it can be easily done. So, the manageability is one of the greatest feature of RPM interface.
- **Package Queries:** The packages are easily queried in RPM. By querying the packages, we can see which all packages are installed in the computer system.
- **Uninstalling:** It is very easy to uninstall a package or a group. If we don't need any package or its related extra group at some time, then it can be deleted at that time.
- **System Verification:** System verification can be easily done using RPM.
- **Security:** The RPM way of installing and installing packages is secure.

Ways to use RPM: RPM can be used in two different, yet complementary ways –

- From the desktop, using the GUI interface,

- From the command line.

The RPM package management (GUI) tool

This tool is a graphical user interface (GUI) designed for the management of package installation

and removal. The GUI allows us to add and remove packages at the click of a mouse.

Starting the RPM Package Management Tool: There are two ways to start RPM.

- Main Menu, select Main Menu | System Settings | Add/Remove Applications.
- `$ redhat-config-packages`

Answer 1:-

RPM (Red Hat Package Manager) is a package management system commonly used in Linux distributions, especially those based on Red Hat Enterprise Linux (RHEL) and Fedora. It is also known as RPM Package Manager. RPM provides a way to package, distribute, install, upgrade, and manage software packages in a consistent and efficient manner. Here's an overview of the ways and benefits of using RPM:

1. **Package Management:** RPM simplifies software package management by bundling all the necessary files, libraries, and metadata into a single package file with the .rpm extension. This package contains everything needed to install and run the software on compatible systems.
2. **Installation:** RPM provides a standardized method for installing software packages on a Linux system. The installation process involves executing the rpm command with the package file as the input. RPM handles the extraction and installation of files, as well as the configuration of the software.
3. **Dependency Resolution:** RPM manages software dependencies, ensuring that all required dependencies are installed before installing a package. It automatically resolves and fetches the necessary dependencies from repositories or local sources. This helps in preventing conflicts and ensures that the software runs smoothly with all its required components.
4. **Upgrades and Updates:** RPM allows for easy upgrades and updates of software packages. It can compare the versions of installed packages with the newer versions available in repositories and intelligently perform upgrades while preserving configuration files and user data. This simplifies the process of keeping software up to date and ensures that security patches and bug fixes are applied promptly.
5. **Verification and Validation:** RPM includes features for verifying the integrity and authenticity of software packages. It uses checksums and digital signatures to validate package integrity and ensure that the package has not been tampered with. This helps maintain the security and reliability of the software installation process.

6. Uninstallation: RPM facilitates the clean removal of software packages from the system. It keeps track of installed files and configuration files, allowing for easy removal without leaving behind any remnants or unused files.

Benefits of using RPM:

- Standardization: RPM provides a standardized format for software packages, making it easier for developers, system administrators, and users to create, distribute, and manage software across different Linux distributions.
- Dependency Management: RPM handles dependency resolution, ensuring that all required software components are installed. This simplifies software installation and reduces the risk of conflicts or missing dependencies.
- Security and Integrity: RPM includes mechanisms for verifying the integrity and authenticity of packages, protecting against tampering and ensuring that software packages are trustworthy.
- Upgrades and Updates: RPM simplifies the process of upgrading and updating software packages, making it easy to keep software up to date with the latest features, bug fixes, and security patches.
- Uninstallation and Cleanup: RPM enables clean removal of software packages, minimizing clutter and unused files on the system.
- Repository Ecosystem: RPM packages are often distributed and managed through repositories, which provide centralized and curated collections of software packages. This facilitates easy access to a wide range of software and simplifies package installation and management.

Overall, RPM provides a robust and efficient system for packaging, distributing, and managing software packages on Linux systems, contributing to the stability, security, and ease of use of the operating system.

2. What is RPM package management tool? How can we start it? Explain some details about its interface.

Answer:-

3. How can we add and remove the packages? Explain.

4. What is RPM command line tool? Write its benefits.

5. How can we query a package? Write syntax.

6. Explain the package installation in TAR format. How can we create, view and extract a tar ball?

Unit- 5

Utilities: Basic Utilities, Working with Files, Pipe, Four More Utilities, Compressing and Archiving Files, Locating Commands

1.

Which of these represents the basic utilities in Linux?

- ls
- cat
- rm
- All of the above mentioned

2.

When you log in a Linux system, you work in _____ directory

- root
- home
- var
- None of the above

3.

Which of these utility displays the contents of a text file?

- ls
- cat
- rm
- All of the above mentioned

4.

Which of these utilities are used when you want to view a file that is longer than one page?

- more
- less
- Both more and less
- None of the above

5.

Which of these utilities removes duplicate lines from a file?

- grep
- uniq
- sort
- None of the above

6.

Which of these utilities compares two files and display the difference between them?

- grep
- uniq
- diff
- differ

7.

Which of these utilities displays the names of files that are available?

ls
cat
rm
All of the above mentioned

8.

Which option with rm provides the interactive deletion?

-i
-a
-b
-r
9.

In less/more, which of these keys should be pressed to display the next screen?

SPACE
ENTER
CTRL
ALT
10.

Which of these utilities records a shell session?

echo
date
script
cat
11.

Which of these utilities copies the characters that you type on command line after it?

echo
date
script
cat
12.

Which of these utilities is used to convert a Linux text file so that it can be read on a Windows system?

todos
dos2unix
echo
script
13.

Which of these utilities is used to compress a file?

bzip2
bunzip2
gunzip
zcat
14.

Which of these is not used in Linux System?

zip

bzip2
bunzip2
zcat

Unit- 6

File Systems: Obtaining User and System Information, Communicating with Other Users, Directory Files and Ordinary Files, Pathnames, Working with Directories, Access Permissions, Access Control Lists, Links.

1.

Which of these utilities is used to obtain the system and user information?

who

finger

w

All of the above

2.

On those systems, where security is concern, the system administrator can disable _____

echo

finger

ls

None of the above

3.

Which of these is used for establishing and ending the conversation?

o

oo

Both of the above

None of the above

4.

Which key combination is used to stop the communication with other user?

CTRL-A

CTRL-B

CTRL-C

CTRL-D

5.

Which of these utilities is used for communication when the recipient is not logged in?

echo

email

email

None of the above

6.

The utility *who* produces the

List of users who are logged in on the local system

Device each person is using

The time each person is logged in

All of the above mentioned

7.

Which of these files appear at the ends of paths that cannot support other paths?

Directory files

Ordinary files

Ordinary files

None of the above

8.

Which of these files are the points that other paths can branch off from?

Directory files

Ordinary files

Base files

None of the above

9.

When you refer to the tree, _____ is towards the root and _____ is away from the root.

up, down

down, up

left, right

right, left

10.

Which of these builtin is used to display the pathname of the working directory?

pwd

pwd

path

None of the above

11.

With a slash (/), we represent

Home directory

Root directory

Path directory

None of the above

12.

Any pathname that does not begin with _ is a relative pathname.

/

~

Either / or ~

None of the above

13.

Which of these utilities is used to create a directory?

mkdir

cd

mv

None of the above

14.

Which of these utilities is used to change to another working directory?

mkdir

cd

mv

None of the above

15.

Which character is used for indicating the execute permission?

r

x

e

w

16.

Which utility is used to change the access permissions?

chmod

chaccess

chperm

None of the above

17.

What kind of arguments can be specified to chmod?

Symbolic

Numerical

Either symbolic or numeric

None of the above

18.

Which methods are used in Linux for controlling who can access a file and how they can access it?

Traditional linux access permission

Access Control Lists

Both access permission and access control lists

None of the above

19.

What kind of rules exists in ACLs?

Access rules

Default rules

Both access and default rules

None of the above

20.

Which of these utilities preserve ACLs?

cp

mv

Both cp and mv

None of the above

21.

Which of these links exists in Linux?

Hard links

Soft links

Water links

Any of these

22.

Following program is an example of _____ conversion.

```
#include <iostream>

using namespace std;

int main()
{
    int x = 100;

    char y = 'a';

    x = x + y;

    float z = x + 1.0;

    cout << "x = " << x << endl
         << "y = " << y << endl
         << "z = " << z << endl;

    return 0;
}
```

Implicit

Explicit

Both

None of Above

23.

What is type casting?

Converting one function into another

Converting one data type into another

Converting operator type to another type

None of them

24.

Choose the correct syntax for explicit conversion.

- Explicit (type)**
- (type) expression;**
- Expression (explicit)**
- None of Above**

25.

Who carries out implicit type casting?

- The Micro Controller**
- The Compiler**
- The Programmer**
- The User**

26.

Who initiates explicit type casting?

- The Micro Controller**
- The Compiler**
- The Programmer**
- The User**

27.

5. hat will be the data type of the result of the following operation?

$(\text{float})a * (\text{int})b / (\text{long})c * (\text{double})d$

- int**
- long**
- float**
- double**

28.

When double is converted to float, the value is?

- Truncated**
- Rounded**
- Depends on the compiler**
- Depends on the standard**

29.

Which of the following type conversion is not possible in C++?

- Basic to Class type**
- Class to Basic type**
- One Class to another class type**
- Inheritance to inheritance**

30.

Which of the following is correct statement for class to basic type conversion?

Class type to basic type conversion never performed

In this conversion source type is class type and the destination type is basic type.

Class type to basic type conversion acts like data type

None of above

31.

Conversion function _____.

must be a class member

must not have any argument

All of above

None of above

32.

Conversion function must not specify the return value even though it returns the value.

True

False

33.

To convert from a user defined class to a basic type, you would most likely use.

Built-in conversion function

A one-argument constructor

A conversion function that's a member of the class

An overloaded '='operator

34.

How many ways to perform conversion from one class to another class can perform?

4

2

3

1

35.

_____ refers to the process of changing the data type of the value stored in a variable.

Type char

Type int

Type float

Type cast

36.

Which of the following type-casting have chances for wrap around?

From int to float

From int to char

From char to short

From char to int

Unit- 7

The Shell and popular editors: The Command Line, Standard Input and Standard Output, Running a Command in the Background, Filename Generation/Pathname Expansion, Builtins, Using VIM to Create and Edit a File, Introduction to vim Features, Command Mode, Input Mode, Emacs versus Vim, Getting Started with Emacs, Basic Editing Commands

1.

Which of these components of operating system is the innermost part?

Kernel

Shell

CPU

None of the above

2.

Which of these components of operating system is the outermost part?

Kernel

Shell

CPU

None of the above

3.

Which of these are available for processing the command line?

CTRL-H

CTRL-U

CTRL-W

All of the above mentioned

4.

Which kind of programs can be supported by shell?

Shell scripts

Application programs

User defined programs

All of the above

5.

How many arguments are atleast required in cp utility?

0

1

2

3

6.

Which of these is used for erasing a word?

CTRL-H

CTRL-W

CTRL-U

None of the above

7.

The redirection output symbol is

>

<

!

None of the above

8.

The redirection input symbol is

>

<

!

None of the above

9.

Which of these utilities avoids the overwriting of files?

noclobber

echo

set

None of the above

10.

Which symbol is used for appending the standard output to a file?

>>

<<

!!

<>

11.

Which of these utilities sends the output in two directions?

tee

noclobber

echo

cat

12.

Standard _____ is a place that a program gets information from.

Output

Input

Error

None of the above

13.

Which of these is considered as a data sink and also known as a bit bucket?

/dev/null

/dev/bit

/dev/sink

None of the above

14.

How many jobs we can run in foreground?

0

1

2

3

15.

When we run any job in the background, the shell assigns _____ to the job.

Job number

Process identification number

Both of the mentioned above

None of the above

16.

Which of these is a suspend key which can suspend a foreground job?

CTRL-Z

CTRL-D

CTRL-C

CTRL-A

17.

What is another name of pathname expansion?

Local-ling

Globing

Met-forcing

None of the above

18.

The special character '?' matches _____ character in the name of the existing file.

Zero

Single

Double

None of the above

19.

The special character '*' matches _____ number of character in the name of the existing file.

Five

Ten

Any

None of the above

20.

A _____ within a bracket defines a range.

Hyphen

Underscore

Asterisk

None of the above

21.

Which of these modes are available in vim?

Command mode
Input mode
Last line mode
All of the above mentioned

22.

In vim, which of these modes is also known as normal mode?

Command mode
Input mode
Last line mode
All of the above mentioned

23.

Which of these symbols puts the vim in last line mode?

:
;
"
?

24.

Which key should be pressed to return vim to command mode?

ESCAPE
ALT
CTRL
RETURN

25.

If we want to enter the text, then the vim should be in

Command mode
Input mode
Last line mode
None of the above mentioned

26.

Which keys can be used to correct the text in vim?

CTRL-H
CTRL-U
CTRL-W
All of the above mentioned

27.

What is the shortcut key combination for REDO?

CTRL-R
CTRL-E
CTRL-D
CTRL-O

28.

Which of these keys can be used to change to insert mode?

i

a

Either i or a

None of the above mentioned

29.

While you are done with editing of text, which key can be used to exit?

ZZ

!q

Either ZZ or !q

None of the above mentioned

30.

While vim is in command mode, forward means towards the ____

Right

Bottom

Both right and bottom

None of the above mentioned

31.

Which of these keys can be used to move the cursor backward by one character?

h

i

j

k

32.

To move the cursor to the end of next word, which key should be pressed?

h

e

k

s

33.

Which of these keys is used to scroll the screen down?

CTRL-D

CTRL-O

CTRL-W

CTRL-N

34.

Which of these characters delete a character?

x

y

z

None of the above

35.

Which character causes to change the case of the characters?

Tidle
Asterick
Underscore
None of the above

36.

The shortcut for exiting from emacs is

CTRL-X CTRL-C
CTRL-X CTRL-X
CTRL-C CTRL-C
CTRL-C CTRL-X

37.

What moves the cursor to the beginning of the paragraph the cursor is on?

META-(
META-)
META-{
META-}

38.

For copy the text, press

E-w
C-w
O-w
P-w

39.

For backward search, press

C-s
C-b
C-r
C-c

40.

Which class is used to design the base class?

abstract class
derived class
base class
derived & base class

41.

Which is also called as abstract class?

virtual function
pure virtual function
derived class
base class

Unit- 8

The Bourne Again Shell and TC Shell: Shell Basics, Parameters and Variables, Special Characters, Processes, Re-executing and Editing Commands, Aliases, Functions, Controlling bash, Entering and Leaving the TC Shell, Features Common to the Bourne Again and TC Shells

1.

What is shorthand for the home directory?

 $\sim/$ $\sim/$ $\sim/$ $\sim/$ $\sim/$ $\sim/$ $\sim/$ \sim \sim \sim $\frac{2}{}$ $\frac{2}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{2}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{2}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

2.

 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

2.

 $\frac{1}{2}$

2.

 $\frac{1}{2}$

2.

2.

2.

2.

2. —

2. 3

!~

!~

!~

!~

!~

!~

!~

!~

2.

The symbol `$()` is used for

Subshell

Subshell

Subshell

Command substitution

Command substitution

Command substitution

Arithmetic evaluation

Arithmetic evaluation

Arithmetic evaluation

Arithmetic expression

Arithmetic expression

Arithmetic expression

3.

Linux opens which file descriptor for the program?

0<

0<

1>

1>

2>

2>

All of the above mentioned

All of the above mentioned

4.

The directory stack implements _____ rule.

FIFO

FIFO

LIFO

LIFO

RIRO

RIRO

None of the above

None of the above

5.

To remove a directory from the stack, use the _____ builtin.

popd

pushd
remd
None of the above

6.

A variable name must start with a _____

Letter
Underscore
Either letter or underscore
None of the above

7.

What is the naming convention for global variables?

Only lowercase letters
Only uppercase letters
Mixed case letters
Only numbers

8.

What is the correct syntax for assigning a value to a variable in Bourne Again Shell?

VARIABLE=value
VARIABLE = value
VARIABLE= value
VARIABLE =value

9.

Which builtin sets the attributes and values for shell variables?

declare
typeset
Both declare and typeset
None of the above mentioned

10.

Which attribute makes the variable readonly?

-a
-f
-l
-r

11.

PS4 is _____

Primary prompt
Secondary prompt
Prompt issued by select
Bash debugging symbol

12.

What is the use of | character?

Separates commands

Executes a command in the background

Pipe

Here document

13.

&& represents

Boolean AND

Boolean AND

Boolean OR

Boolean OR

Boolean NOT

Boolean NOT

Boolean XOR

Boolean XOR

14.

Which builtin is used to make the value of a variable available to the child processes?

echo

echo

export

export

cat

cat

avail

avail

15.

What is used to see the parent-child relationship?

pstree

pstree

treeps

treeps

trpsee

trpsee

eesptr

eesptr

16.

What begins a comment?

!

@

\$

17.

The history builtin is available in _____ .

bash

bash

tcsh

tcsh

Both bash and tcsh
Both bash and tcsh
None of the above
None of the above

18.

Which of these variables gives the location of history file?

HISTSIZE
HISTSIZE
HISTFILE
HISTFILE
HISTFILESIZE
HISTFILESIZE
None of the above
None of the above

19.

Which of these variables gives the maximum number of events saved during a session?

HISTSIZE
HISTFILE
HISTFILESIZE
None of the above

20.

The default number of events the variables of history can save is ____

100
100
500
500
1000
1000
5000
5000

21.

Using _____, we can recall, modify and re-execute previously executed events.

Fc builtin
Exclamation point commands
Readline libraries
All of the above mentioned

22.

This command `$ fc -l 1021 1021`

List a single command 1021 from the history list
List 1+0+2+1 commands from the history list
List only 10 and 21 commands from the history list
None of the above

23.

Event designators start with

&

!

@

#

24.

!# specifies

Previous command

Current command

Next command

Last command

25.

!! specifies

Previous command

Current command

Next command

Last command

26.

Which key is used for pathname and command completion?

CTRL

TAB

RETURN

SHIFT

27.

In aliases, which of these is a correct syntax?

\$ alias ls='ls -F'

\$ alias ls = 'ls -F'

\$ alias ls= 'ls -F'

\$ alias ls ='ls -F'

28.

Which builtin is used to remove the alias?

remalias

unalias

dralias

dlalias

29.

Which keyword holds the pathname of the working directory?

pwd
work
dir
key
30.

How can we avoid the alias substitution?

Forward slash
Forward slash
Exclamation point
Exclamation point
Backslash
Backslash
Dollar
Dollar
31.

You can specify arguments when you call a function. Within the function these arguments are available as _____

Special parameters
Special parameters
Positional parameters
Positional parameters
Uni parameters
Uni parameters
None of the above
None of the above
32.

The short command line options consists of

Hyphen
Hyphen
A letter
A letter
Hyphen followed by a letter
Hyphen followed by a letter
None of the above
None of the above
33.

Which command will turn off the feature noclobber?

\$ set +o noclobber

\$ set -o noclobber

\$ set !o noclobber

None of the above

34.

The shopt builtin _____ the features that control the bash.

Enables

Disables

Lists

All of the above mentioned

35.

Which of these utilities are used for checking the shell?

ps

finger

Both of the above mentioned

None of the above

36.

Which of these features are common in bash and tcsh?

Aliases

Job control

Command substitution

All of the above mentioned

37.

The term substitution is used by _____ shell.

bash

tcsh

Both of the above

None of the above

38.

Which variable gives the maximum number of events saved between the session?

history

histfile

savehist

None of the above

Unit- 9

Programming the Bourne Again Shell: Control Structures, File Descriptors, Parameters and Variables, Built-in Commands, Expressions

1.

Which of these control structures are available in Linux?

If.....then

For.....in

While

All of the above mentioned

2.

The while control structure is available in _____ shell.

tcsh

bash

Both of the above

None of the above mentioned

3.

Instead of using if.....else multiple times, we can use one _____.

case....esac

if....fi

else.....else

None of the above

4.

The loops can be interrupted by using

break

continue

Both break and continue

None of the above

5.

Before a file can read/write to a file, it must _____ the file.

Open

Close

Check

None of the above

6.

The file descriptor is associated with _____

Opening of file

Reading from file

Writing from file

None of the above mentioned

7.

A typical Linux process has

File descriptor 0

File descriptor 1

File descriptor 2

All of the above mentioned

8.

The file descriptor 1 is associated with

Standard input

Standard output

Standard error

None of the above

9.

We can reference a shell special parameter by preceding a special character with a _____

!
@
\$
10.

Which of these operators has the higher precedence?

Pipe
AND
OR
NOT
11.

The conditional evaluation is done using

?:
:?
::
??
12.

Which of these is assignment operator?

=
*=
/=
All of the above
13.

^ represents

Bitwise AND
Bitwise OR
Bitwise XOR
None of the above
14.

<< represents

Left bitwise shift
Right bitwise shift
Centre bitwise shift
None of the above
15.

Which of these builtin removes a variable or function?

set
unset
mask
umask

Unit- 10

Linux System Administration: System Administrator and Superuser, Rescue Mode, SELinux, System Operation, System Administration Utilities, Setting Up a Server, Important Files and Directories, File Types, Filesystems, Configuring User and Group Accounts, Backing Up Files, Scheduling Task, System Reports, Parted.

1.

Who is a superuser in Linux environment?

- Root
- Normal user
- Machine
- None of the above

2.

A root user can execute these commands?

- Adding of new users
- Partition of hard drives
- Change system configuration
- All of the above mentioned

3.

The default prompt for root is ____.

- Pound
- Dollar
- Asterisk
- Exclamation point

4.

When you bring the system up in a single user mode, then you are the _____

- Normal user
- Superuser
- Machine
- None of the above mentioned

5.

su stands for

- substitute user
- switch user
- substandard user
- None of the above

6.

Which of these tools gives you another user's privileges?

- kill
- su
- consolehelper
- None of the above

7.

What is an exit command for terminating the shell?

CTRL-D
CTRL-A
CTRL-T
CTRL-E

8.

Which of these tools runs programs as a root?

kill
su
consolehelper
None of the above

9.

SELinux stands for

Security Enhanced Linux
Server Enhanced Linux
Sudo Enhanced Linux
None of the above

10.

What are the modes of SELinux?

Enforcing
Permissive
Disabled
All of the above

11.

Which of these is the diagnostic state of SELinux?

Enforcing
Permissive
Disabled
All of the above

12.

Which of these is the default state of SELinux?

Enforcing
Permissive
Disabled
All of the above

13.

The policies of SELinux are

Targeted
MLS
Strict
All of the above

14.

By default the run level is

2

3

4

5

15.

Which of these key combinations reboots the system?

CTRL-ALT-HOME

CTRL-DEL-END

CTRL-ALT-DEL

CTRL-TAB-DEL

16.

Which of these are Fedora/RHEL configuration tools?

system-config-authentication

system-config-bind

system-config-boot

All of the above mentioned

17.

Which of these utility changes the login shell for a user?

chsh

su

clear

None of the above

18.

Which of these utility displays the kernel ring buffer?

chsh

clear

dmesg

None of the above

19.

Which of these utility creates a new filesystem on device?

mkfs

chsh

dmesg

clear

20.

Which superserver listens for network connection?

xinted

Machine

Fedora

None of the above

21.

How can we secure a server?

By using TCP wrappers
By setting up a chroot jail
By using both of the above
None of the above

22.

DHCP stands for

Dynamic Host Configuration Protocol
Dynamic Hope Configuration Protocol
Different Host Configuration Protocol
DifferentHope Configuration Protocol

23.

The user's login shell initialization script is located in _____ file.

~/.bash_profile
~/.bashrc
/dev
None of the above

24.

The user's interactive non-login shell initialization script is located in _____ file.

~/.bash_profile
~/.bashrc
/dev
None of the above

25.

Which of these is known as a bit bucket?

/dev/empty
/dev/bucket
/dev/null
None of the above

26.

Which of these holds the system log files?

Only /log/var
Only /var/log
Both of the above
None of the above

27.

Which utility manages device naming dynamically?

echo
su
udev
device

28.

The _____ special file is known as a pipe.

FIFO
LIFO
FIFO and LIFO
None of the above

29.

Which of the data structure follows the rule of FIFO?

Stack
Queue
Graph
Tree

30.

A raw device is characterized by

Direct I/O (no buffering through the Linux kernel).
A one-to-one correspondence between system calls and hardware requests.
Device-dependent restrictions on I/O.
All of the above

31.

The _____ option causes Linux not to mount the filesystem automatically.

noauto
nosuid
nomount
None of the above

32.

Which utility unmount a filesystem?

umount
umount
unfile
None of the above

33.

Which utility displays the user manager window?

system-config-manager
system-config-users
system-config-services
None of the above

34.

Which tabs are available in User Properties Window?

User Data tab
Account Info tab
Password info and groups tab
All of the above mentioned

35.

Which utilities are used for management of user account?

useradd
userdel
Both of the above
None of the above

36.

The _____ backup makes copies of all the files.

Full
Incremental
Decremental
Half

37.

Which of these are the backup utilities?

tar
cpio
dump/restore
All of the above

Unit- 11

Web Server Configuration: Apache Web Server, Installing Apache, Configuring Web server, Starting Apache, Setting up first web page.

1.

What is the task of a web server?

Listens for a page request.
Examines and responds with the page requested
Both of the above
None of the above

2.

Which one is the standard protocol of internet?

HTTP
PTTH
PTHT
None of the above

3.

HTTP stands for

Host text transfer protocol
Hypertext transfer protocol
High text transfer protocol
None of the above

4.

The commercial web servers are

Zeus
Microsoft
SunOne
All of the mentioned

5.

Which of these features belongs to Apache web server?

Portability
Scalability
Security
All of the above mentioned

6.

The important packages for Apache web server are

httpd-manual
mod_ssl
mod_ssl
All of the above mentioned

7.

Which command is used to check the ip address of the Linux machine?

ip addr show
internet address show
ip address show
None of the above mentioned

8.

Why do we require web server on a Linux machine?

To test the site that is under development
To test a private website only available in private network
Both of the above
None of the above

9.

With which way we can open RPM's graphical interface?

Main Menu | System Settings | Add/Remove Applications
\$ redhat-config-packages
Either of these mentioned
None of the above

10.

When we are talking about the web servers, how many packages are available?

15
16
17
18

11.

Which package contains the documentation of httpd web server?

httpd-manual
hwcrypto
php
php-image

12.

We can install the web server package if we have logged in as

Root
Normal user
Either root or normal user
None of the above

13.

When we are installing web server, which service should be started from service configuration dialog?

echo
httpd
cups
None of the above

14.

The configuration file is modified by searching

ServerAdmin
ServerName
Both of the above
None of the above

15.

Where do we provide the ip address of machine when the modification of configuration file is done?

ServerAdmin
ServerName
Both of the above
None of the above

Unit- 12

File Server Configuration: FTP protocol, Starting FTP server, Using FTP server, Using FTP client to test anonymous read access, Testing FTP server.

1.

FTP stands for

File transfer protocol
First transfer protocol
First temperature protocol
None of the above

2.

Why FTP client program is used?

To upload the files to FTP server
To download the files from FTP server
Both upload and download
None of the above

3.

Why FTP is not considered secure?

Communications are fake
Communications are unencrypted
Communications are available to everyone
None of the above

4.

SFTP stands for

Second file transfer protocol
Secure file transfer protocol
Steamed file transfer protocol
None of the above

5.

Which of these are FTP servers?

vsftpd
TUX
Both of the above
None of the above

6.

How can we open the RPM's GUI tool?

Main Menu | System Settings | Add/ Remove Applications
\$ redhat-config-packages
By using either of these ways
None of the above

7.

Who can install FTP in the system?

Only root
Normal user
Any of the above
None of the above

8.

Which key combination is used to terminate the FTP session?

CTRL-A
CTRL-B
CTRL-C
CTRL-D

9.

FTP is a

TCP protocol
HTTP protocol
SMTP protocol
None of the above

10.

What indicates the relevance of FTP today?

Availability of different FTP client programs
Many OS come with FTP preinstalled
Both of the above mentioned
None of the above

11.

FTP is

Easy to use
Free
Internet standard protocol for file transfer
All of the above mentioned

12.

Who is the owner of /var/ftp?

All normal users
Only root
Owner can be anyone
None of the above

13.

Which utility is used to change the directories?

cd
changedir
chdirectory
None of the above

14.

FTP server can be considered as

Area of disk space used for storing files
Softwares to allow access
Configuration files to allow access
All of the above mentioned

15.

In FTP server, the software and configuration files are required for

Giving the user access for download
Giving the user access for upload
Both of the mentioned above
None of the above

Unit- 13

Samba Servers: Overview of SAMBA server, Installing SAMBA server, SAMBA configuration with SWAT and starting SWAT service, Starting and stopping the SAMBA server, Adding SAMBA user, Creating and configuring SAMBA share.

1.

SAMBA server on UNIX is an implementation of

- Windows SMB
- CIFS protocol
- Both of the above
- None of the above

2.

How can we start the RPM GUI tool?

- Main Menu | System Settings | Add/Remove Applications
- \$ redhat-config-packages
- By using either of the way mentioned above
- Something other than this

3.

Which server group will be chosen for installing SAMBA server?

- DNS name server
- FTP server
- Mail server
- Windows File server

4.

In package group "Windows File Server", which standard packages are available?

- samba
- samba-client
- Both of the above
- None of the above

5.

By using which way, we can start the SAMBA service?

- Main Menu | System Settings | Server Settings | Services
- \$ redhat-config-services
- By using either of the way mentioned above
- None of the above

6.

Which service needs to be started for SAMBA server through service configuration?

- smbd
- nmbd
- Both of the above mentioned
- None of the above

7.

Which of these is the main configuration file of SAMBA?

- secrets.tdb

smb.conf
samba.conf
imhosts
8.

Which of these is unmount an SMB file system?

smbunmount
smbumount
smbmount
None of the above
9.

For configuration of SAMBA, which service is required?

SWAT
FTP
TCP
None of the above
10.

SWAT stands for

System Web Administration Tool
SAMBA Web Administration Tool
Source Web Administration Tool
Science Web Administration Tool
11.

Starting of SWAT service is _____ step process.

One
Two
Three
Four
12.

SWAT service will run as _____ service.

FTP
TCP
xinted
None of the above
13.

Which of these utility is used to create a directory?

crtdir
mkdir
dircreate
None of the above
14.

Because of the SAMBA server, it is possible to

Share files between computers

Share printers between computers
Both of the above
None of the above

Unit- 14

Network File System: NFS overview, Planning an NFS installation, Configuring an NFS server, Configuring an NFS client, Using automount services, Examining NFS security.

1.

NFS stands for

Network FileSystem
Not a FileSystem
New Filesystem
None of the above

2.

NFS

Reduces the storage requirement
Boosts efficiency
Reduces administration workload
All of the above

3.

Which utility displays a list of directory hierarchies available on the system?

df
dir
dirhier
None of the above

4.

The problem in NFS security is

NFS is encrypted
NFS is not encrypted
NFS does not respond
None of the above

5.

In FEDORA, which utility is used for setting up an NFS client?

portmap
rpcbind
setupnfs
None of the above

6.

In RHEL, which utility is used for setting up an NFS client?

portmap
rpcbind
setupnfs

None of the above

7.

If a user has the ability to run a setuid program, that user

Is a normal user

Has the power of a superuser

Hides the identity

None of the above

8.

Which of these options disables the attribute caching?

ac

noac

unac

None of the above

9.

Which of these options disables a signal to interrupt a file operation on hardmounted directory hierarchy?

intr

nointr

unintr

None of the above

10.

By default block size in wsize and rsize is _____

128

256

1468

4096

11.

The NFS performance can be improved by _____

Increasing the block size

Decreasing the block size

Block size should remain constant

None of the above

12.

Kernel's export table consists of

Active exported directory hierarchies

Inactive exported directory hierarchies

Both active and inactive

None of the above

13.

Which of these options permits only read access on an NFS directory hierarchy?

r

ro

rw

or

14.

Which of these options displays a list of exported directories?

-a

-e

-list

None of the above

15.

Which of these options are used to mount a remote directory hierarchy?

mount

automount

Both of the above

None of the above

READINGS:

1. DATA COMMUNICATION AND NETWORKING by B.A. FOROUZAN, MCGRAW HILL EDUCATION

2. DATA AND COMPUTER COMMUNICATIONS by WILLIAM STALLINGS, PEARSON