DevOps Shack

100 important Linux Interview Questions and Answers

1. **What is Linux?**
    - Linux is an open-source operating system kernel originally developed by Linus Torvalds in 1991.
2. **Explain the significance of the GNU Project in relation to Linux.**
    - The GNU Project provides essential utilities and tools that, when combined with the Linux kernel, form a complete operating system.
3. **Define a Linux distribution.**
    - A Linux distribution is a collection of software packages based on the Linux kernel, often including utilities, libraries, and a package management system.
4. **Name a few popular Linux distributions.**
    - Examples include Ubuntu, Debian, CentOS, Fedora, Arch Linux, and Red Hat Enterprise Linux (RHEL).
5. **Differentiate between Unix and Linux.**
    - Unix refers to a family of operating systems developed in the late 1960s, while Linux is an independent Unix-like operating system developed by Linus Torvalds.

File System and Navigation

6. **Explain the file system hierarchy in Linux.**
    - The Filesystem Hierarchy Standard (FHS) defines the structure of directories in Linux, such as /bin for binaries, /etc for configuration files, and /home for user data.
7. **What is the root directory in Linux?**
    - The root directory, denoted by /, is the top-level directory from which all other directories and files stem.
8. **How do you navigate directories in Linux?**
    - You can navigate directories using commands like cd, ls, pwd, mkdir, and rmdir.
9. **How do you create a file in Linux?**
    - You can create a file using the touch command, e.g., touch filename.
10. **How do you view the contents of a file in Linux?**
    - You can view the contents of a file using commands like cat, less, more, or tail.

Shell and Command Line

11. **Define a shell in Linux.**
    - A shell is a command-line interpreter that provides a user interface to interact with the operating system.
12. **Name a few popular shells in Linux.**
    - Popular shells include Bash, Zsh, Ksh, and Tcsh.
13. **Explain the difference between . and .. in Linux.**
    - . refers to the current directory, while .. refers to the parent directory.
14. **What is grep in Linux?**
    - grep is a command-line utility for searching plain-text data sets for lines that match a regular expression.

15. **How do you change file permissions in Linux?**
    - Use the chmod command, e.g., chmod u+x filename to give the owner execute permission.

Processes and Services

16. **How do you list all processes running on a system in Linux?**
    - Use the ps command to list processes, and ps aux to display all processes.
17. **What is a daemon in Linux?**
    - A daemon is a background process that runs continuously, often providing services like web servers or database servers.
18. **How do you start, stop, and restart services in Linux?**
    - Use commands like systemctl start, systemctl stop, and systemctl restart for systems using systemd.
19. **What is SSH, and how is it used?**
    - SSH (Secure Shell) is a cryptographic network protocol used for secure remote login and command execution between two networked computers.
20. **What is sudo in Linux?**
    - sudo allows users to execute commands with the security privileges of another user, typically the superuser (root).

System Administration

21. **How do you search for files in Linux?**
    - Use the find command to search for files based on criteria like name, type, or size.
22. **How do you compress and decompress files in Linux?**
    - Use commands like tar and gzip or bzip2 to compress and decompress files.
23. **How do you kill a process in Linux?**
    - Use the kill command with the process ID (PID) to terminate a process, or killall to terminate processes by name.
24. **What is a symbolic link in Linux?**
    - A symbolic link (symlink) is a special file that points to another file or directory.
25. **How do you check system information in Linux?**
    - Use commands like uname, hostname, cat /etc/os-release, and lsb_release -a to check system information.

Advanced Topics

26. **What is SELinux, and how does it enhance security in Linux?**
    - SELinux (Security-Enhanced Linux) is a Linux kernel security module that provides mandatory access control (MAC) policies, restricting the actions that processes and users can perform based on defined security policies.
27. **How do you schedule recurring tasks in Linux?**
    - Use the cron daemon and crontab command to schedule recurring tasks by specifying the desired execution time and frequency.
28. **Explain the purpose of the /dev directory in Linux.**
    - The /dev directory contains device files that represent physical and virtual devices connected to the system, allowing user programs to interact with hardware components.
29. **What is a swap space in Linux, and why is it used?**
    - Swap space is a dedicated area of disk storage used as virtual memory by the operating system when physical RAM is insufficient to hold all running processes and data.
30. **How do you gracefully shut down or reboot a Linux system?**
    - Use commands like shutdown or reboot with appropriate options to initiate a system shutdown or reboot process, allowing running processes to cleanly terminate and system services to shut down in an orderly manner.
31. **What is the purpose of the /etc/passwd file?**
    - The /etc/passwd file stores essential user information, such as usernames, user IDs, home directories, and shell types.
32. **Explain the significance of the /etc/shadow file.**
    - The /etc/shadow file stores encrypted password information for user accounts, enhancing security by keeping password hashes inaccessible to regular users.

33. **What is an inode in Linux?**
    - An inode is a data structure that represents a file or directory on a file system. It stores metadata such as permissions, ownership, and file type.
34. **How do you determine the IP address of a Linux system?**
    - Use the ifconfig or ip addr command to display network interface information, including IP addresses.
35. **What is the purpose of the /proc filesystem in Linux?**
    - The /proc filesystem provides an interface to kernel data structures and system information, allowing processes to access and manipulate system parameters.
36. **How do you install software packages in Linux?**
    - Use package management tools like apt (Advanced Package Tool), yum (Yellowdog Updater, Modified), or dnf (Dandified Yum) to install software packages from repositories.
37. **Explain the role of the /etc/fstab file in Linux.**
    - The /etc/fstab file maintains a list of filesystems and their corresponding mount points, facilitating automatic mounting of filesystems during system boot.
38. **What is a kernel panic in Linux?**
    - A kernel panic occurs when the Linux kernel encounters a critical error from which it cannot recover, resulting in a system halt or crash.
39. **How do you check available disk space in Linux?**
    - Use commands like df -h to display disk usage in a human-readable format, showing available disk space on mounted filesystems.
40. **What is the purpose of the /var directory in Linux?**
    - The /var directory contains variable data files that are expected to grow during normal system operation, such as log files, spool directories, and temporary files.

41. **How do you change the hostname of a Linux system?**
    - Modify the /etc/hostname file and update the hostname using the hostnamectl command.
42. **What is a runlevel in Linux?**
    - A runlevel is a predefined operating state of a Unix-like system, representing a specific configuration of services and system processes.
43. **Explain the significance of the /etc/inittab file.**
    - The /etc/inittab file is used by the init process to determine the system's default runlevel and initiate system startup and shutdown procedures.
44. **What is SELinux, and how does it enhance security in Linux?**
    - SELinux (Security-Enhanced Linux) is a Linux kernel security module that provides mandatory access control (MAC) policies, restricting the actions that processes and users can perform based on defined security policies.
45. **How do you monitor system performance in Linux?**
    - Use tools like top, htop, vmstat, and sar to monitor system performance metrics such as CPU usage, memory utilization, and disk activity.
46. **Explain the purpose of the /tmp directory in Linux.**
    - The /tmp directory is used for temporary file storage by programs and users, typically cleared upon system reboot to free up disk space.
47. **What is a swap space in Linux, and why is it used?**
    - Swap space is a dedicated area of disk storage used as virtual memory by the operating system when physical RAM is insufficient to hold all running processes and data.
48. **How do you schedule recurring tasks in Linux?**
    - Use the cron daemon and crontab command to schedule recurring tasks by specifying the desired execution time and frequency.

49. **Explain the purpose of the /etc/hosts file in Linux.**
    - The /etc/hosts file is used to map IP addresses to hostnames and vice versa, allowing the system to resolve domain names without DNS.

50. **What is the purpose of the /proc filesystem in Linux?**
    - The /proc filesystem provides an interface to kernel data structures and system information, allowing processes to access and manipulate system parameters.

51. **What is the difference between soft link and hard link?**

- Soft Link (Symbolic Link):
    - It's a pointer to another file or directory.
    - Can link files across filesystems.
    - If the original file is removed, the link becomes 'dangling'.
    - Usage: `ln -s source_file link_name`
- Hard Link:
    - It's a directory entry pointing to the same inode as another directory entry.
    - Cannot link directories or files across filesystems.
    - If the original file is removed, the link remains valid.
    - Usage: `ln source_file link_name`

52. **Explain the concept of inodes in Linux.**

- Inodes are data structures in Unix-based filesystems containing metadata about files, such as ownership, permissions, size, and file type. Every file and directory on a Unix filesystem is represented by an inode. Inodes do not store the actual file content but rather act as a reference to where the data is stored on the disk.

53. **How can you find out which processes are consuming the most memory on a Linux system?**

- You can use the `top` command to display running processes and their resource usage, including memory. Press `Shift + M` to sort processes by memory usage.

54. **What is the purpose of the `chmod` command in Linux?**

- `chmod` is used to change the permissions of files or directories. It stands for "change mode." It can be used to grant or revoke read, write, and execute permissions for the owner, group, and others.

55. **How can you recursively delete a directory in Linux?**

- Use the `rm` command with the `-r` (recursive) option. For example:
- `rm -r directory_name`

56. **Explain the difference between `grep`, `egrep`, and `fgrep`.**

- `grep`: It's the basic pattern searching command. It uses basic regular expressions.
- `egrep`: It's an enhanced version of `grep` that supports extended regular expressions.
- `fgrep`: It's a fast version of `grep` that searches for fixed strings and doesn't interpret regular expressions.

57. **How can you find all files modified in the last 7 days?**

- You can use the `find` command with the `-mtime` option. For example:
- `find /path/to/search -type f -mtime -7`

58. **Explain the `cron` and `at` commands in Linux.**

- `cron`: It's a time-based job scheduler in Unix-like operating systems. It allows users to schedule jobs (commands or shell scripts) to run periodically at fixed times, dates, or intervals.
- `at`: It's used to schedule a one-time task to be executed at a specified time in the future. Unlike `cron`, which is for recurring tasks, `at` is for one-time tasks.

59. **How can you list all open ports on a Linux system?**

- You can use the `netstat` or `ss` command to list open ports. For example:
- `netstat -tuln`

  Or

  `ss -tuln`

60. **Explain the purpose of the `awk` command in Linux.**
    - `awk` is a powerful text processing tool in Unix-like operating systems. It's used for searching, filtering, and processing text or data files, particularly when data is presented in columnar format. It operates on a per-line basis and allows users to specify patterns and actions to be performed on those lines.

61. **How can you change the default shell for a user in Linux?**
    - You can use the `chsh` command to change the default shell for a user. For example:
    - `chsh -s /bin/bash username`
62. **What is a systemd service in Linux?**
    - `systemd` is a system and service manager for Linux operating systems. A systemd service is a unit configuration file that defines how a service should behave, including its dependencies, startup and shutdown behavior, and execution environment.
63. **How can you check the disk space usage of a Linux system?**
    - You can use the `df` command to display disk space usage. For more detailed information, you can use `du` to check disk usage of specific directories.
64. **Explain the difference between `tar` and `zip` commands.**
    - `tar`: It's used to create and manipulate tar archives, which are collections of files wrapped up in one file. It's commonly used in Unix-like systems.
    - `zip`: It's used to compress files and create Zip archives. It's more common on Windows systems but can be used on Unix-like systems with appropriate software installed.
65. **How can you find out which shell you are currently using?**
    - You can use the `echo` command with the `SHELL` environment variable. For example:
    - `echo $SHELL`
66. **Explain the purpose of the `sudo` command in Linux.**
    - `sudo` (superuser do) is a command used in Unix-like operating systems to allow users to execute commands with the security privileges of another user, typically the superuser (root). It's commonly used to perform administrative tasks that require elevated privileges.
67. **How can you change the hostname of a Linux system?**
    - You can change the hostname temporarily using the `hostname` command. For example:
    - `hostname new_hostname`

      To change it permanently, you would typically edit the `/etc/hostname` file and also update the `/etc/hosts` file if necessary.

68. **Explain the purpose of the `find` command in Linux.**
    - `find` is a command-line utility in Unix-like operating systems used to search for files and directories based on various criteria such as name, type, size, and permissions. It's a versatile tool for locating files and performing actions on them.

69. **How can you check the version of the Linux kernel?**

    - You can use the `uname` command with the `-r` option to display the kernel release. For example:
    - `uname -r`

70. **What is a shell script and how do you execute it?**

    - A shell script is a text file containing a sequence of shell commands that are executed one after another. It allows users to automate tasks and perform complex operations. To execute a shell script, you need to make it executable (`chmod +x script.sh`) and then run it using `./script.sh`.
71. **Explain the purpose of the `/etc/passwd` file in Linux.**
    - `/etc/passwd` is a system file in Unix-like operating systems that stores essential information about user accounts, including usernames, user IDs (UIDs), group IDs (GIDs), home directories, and default shells.

72. **How can you monitor system performance in real-time on a Linux system?**

    - You can use tools like `top`, `htop`, or `glances` to monitor system performance in real-time. These tools display information about CPU, memory, disk, and network usage, as well as a list of running processes.
73. **Explain the purpose of the `iptables` command in Linux.**
    - `iptables` is a command-line utility for configuring the Linux kernel firewall (netfilter) in Unix-like operating systems. It allows users to set up rules and policies for packet filtering, network address translation (NAT), and other networking tasks.

74. **How can you determine the IP address of a Linux system?**

    - You can use the `ifconfig` or `ip addr` command to display network interface information, including IP addresses assigned to the system.

75. **What is a symbolic link and how do you create one?**

    - A symbolic link (or symlink) is a special type of file that serves as a pointer to another file or directory. To create a symbolic link, you can use the `ln` command with the `-s` option. For example:

    - `ln -s target_file link_name`
76. **Explain the purpose of the `ps` command in Linux.**
    - `ps` is a command-line utility for displaying information about processes running on a Linux system. It can show a snapshot of the current processes, including their process IDs (PIDs), parent process IDs (PPIDs), CPU and memory usage, and other attributes.

77. **How can you find out the amount of free memory on a Linux system?**

    - You can use the `free` command to display information about available memory and swap space on the system.

78. **What is a package manager in Linux and why is it useful?**

    - A package manager is a software tool used to install, update, and manage software packages on a Linux system. It automates the process of software installation and dependency resolution, making it easier for users to manage their software environment.

79. **How can you list all users currently logged into a Linux system?**

    - You can use the `who` or `w` command to list all users currently logged in. For more detailed information, you can use the `last` command.
80. **Explain the purpose of the `rsync` command in Linux.**
    - `rsync` is a powerful file synchronization and transfer tool in Unix-like operating systems. It's used to efficiently copy and synchronize files and directories between two locations, either locally or over a network.

81. **How can you create a new user account in Linux?**

    - You can use the `useradd` command to create a new user account. For example:
    - `useradd username`

82. **What is a kernel panic in Linux and how can you troubleshoot it?**

    - A kernel panic is a critical error in the Linux kernel that results in the system becoming unresponsive and requiring a reboot. It's often caused by hardware failures, driver issues, or kernel bugs. To troubleshoot a kernel panic, you can analyze the kernel panic message, review system logs, and perform hardware diagnostics.

83. **How can you determine the size of a directory in Linux?**

    - You can use the `du` command to display the disk usage of a directory. For example:
    - `du -sh directory_name`

84. **Explain the purpose of the `grep` command in Linux.**
    - `grep` is a command-line utility for searching text patterns in files or output streams. It's commonly used for pattern matching, text filtering, and data extraction tasks.

85. **How can you find out which Linux distribution and version you are using?**
    - You can use the `lsb_release` command to display Linux Standard Base (LSB) information, including the distribution and version. For example:
    - `lsb_release -a`

86. **What is a runlevel in Linux and how does it work?**
    - A runlevel is a predefined operating state on a Unix-like system that determines which services and processes are started or stopped. Linux systems typically have multiple runlevels, each representing a different system configuration, such as single-user mode or multi-user mode with networking.

87. **How can you kill a process in Linux?**
    - You can use the `kill` command to terminate a process by its process ID (PID). For example:
    - `kill PID`

88. **Explain the purpose of the `cron.daily`, `cron.weekly`, and `cron.monthly` directories in Linux.**
    - These directories contain scripts or commands that are executed by the `cron` daemon at predefined intervals (daily, weekly, or monthly). System administrators can place scripts in these directories to automate routine tasks.

89. **How can you check if a Linux system is running in 32-bit or 64-bit mode?**
    - You can use the `uname` command with the `-m` option to display the machine hardware name, which indicates whether the system is running in 32-bit or 64-bit mode.

90. **Explain the purpose of the `sed` command in Linux.**
    - `sed` (stream editor) is a powerful text processing tool in Unix-like operating systems. It's used to perform text transformations, such as search and replace, editing, and filtering, on input streams or files.

91. **How can you set up a static IP address on a Linux system?**
    - You can manually configure network interfaces and set up static IP addresses in the `/etc/network/interfaces` file or use tools like `ip` or `ifconfig` to configure network settings.

92. **What is a symbolic link and how do you create one?**
    - A symbolic link (or symlink) is a special type of file that serves as a pointer to another file or directory. To create a symbolic link, you can use the `ln` command with the `-s` option. For example:
    - `ln -s target_file link_name`

93. **Explain the purpose of the `journalctl` command in Linux.**
    - `journalctl` is a command-line utility for querying and displaying logs from the systemd journal, a centralized logging system in Linux. It allows users to view and filter log messages based on various criteria, such as time, severity, and originating unit.

94. **How can you list all environment variables in a Linux system?**
    - You can use the `env` command to display all environment variables currently set in the system.

95. **What is the purpose of the `crontab` command in Linux?**
    - `crontab` is a command-line utility used to manage user-specific cron jobs. It allows users to create, edit, list, and remove cron jobs that are scheduled to run at specified times or intervals.

96. **How can you check the status of a systemd service in Linux?**
    - You can use the `systemctl` command to check the status of systemd services. For example:
    - `systemctl status service_name`

97. **Explain the purpose of the `awk` command in Linux.**
    - `awk` is a powerful text processing tool in Unix-like operating systems. It's used for searching, filtering, and processing text or data files, particularly when data is presented in columnar format. It operates on a per-line basis and allows users to specify patterns and actions to be performed on those lines.

98. **How can you mount and unmount filesystems in Linux?**
    - You can use the `mount` command to mount filesystems and the `umount` command to unmount them. For example:
    - `mount /dev/sdb1 /mnt`
    - `umount /mnt`

99. **What is the purpose of the `traceroute` command in Linux?**
    - `traceroute` is a command-line utility used to trace the route that packets take from the local system to a destination host or IP address. It displays the IP addresses of routers along the path and measures the round-trip time (RTT) for each hop.

100. **How can you find files containing a specific text string in Linux?**
    - You can use the `grep` command to search for files containing a specific text string. For example:

      ```
      grep -r "search_string" /path/to/search
      ```