📚 Mastering Linux: A Comprehensive Guide with 100 Essential Commands📚

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Linux, a powerful and versatile operating system, is at the heart of many modern computing environments, from servers to embedded systems. For professionals like Krishan Bhatt, a Linux engineer at Pluswealth, mastering Linux commands is crucial for efficient system management, deployment, and troubleshooting. This guide covers 100 essential Linux commands, providing a solid foundation for both beginners and seasoned professionals.

1. System Information Commands

1. `uname -a` - Display kernel information.
2. `hostname` - Show or set the system's hostname.
3. `uptime` - Show how long the system has been running.
4. `uname -r` - Show kernel release information.
5. `uname -m` - Display machine hardware name.
6. `cat /etc/os-release` - Show information about the operating system.
7. `arch` - Display machine architecture.
8. `dmesg` - Print kernel ring buffer messages.
9. `lsb_release -a` - Show Linux Standard Base and distribution information.

2. Hardware Information Commands

10. `lscpu` - Display CPU architecture information.
11. `lsusb` - List USB devices.
12. `lspci` - List PCI devices.
13. `lsblk` - List information about block devices.
14. `df -h` - Display disk space usage.
15. `du -sh` - Show disk usage of a directory.
16. `free -h` - Display memory usage.

17. `dmidecode` - Show DMI (hardware) table contents.
18. `hdparm -I /dev/sda` - Show information about a disk drive.
19. `blkid` - Locate/print block device attributes.

3. User Management Commands

20. `id` - Show user and group IDs.
21. `whoami` - Display the current user.
22. `sudo useradd [username]` - Create a new user.
23. `sudo passwd [username]` - Set a password for a user.
24. `sudo userdel [username]` - Delete a user.
25. `sudo groupadd [groupname]` - Create a new group.
26. `sudo groupdel [groupname]` - Delete a group.
27. `sudo usermod -aG [groupname] [username]` - Add a user to a group.
28. `sudo chage -l [username]` - List password aging information.
29. `sudo su` - Switch to the root user.

4. File and Directory Commands

30. `ls -l` - List files in long format.
31. `cd [directory]` - Change directory.
32. `pwd` - Print working directory.
33. `mkdir [directory]` - Create a new directory.
34. `rmdir [directory]` - Remove an empty directory.
35. `cp [source] [destination]` - Copy files or directories.
36. `mv [source] [destination]` - Move or rename files or directories.
37. `rm [file]` - Remove files.
38. `touch [file]` - Create an empty file or update the timestamp.
39. `find /path -name [filename]` - Search for files by name.
40. `ln -s [target] [linkname]` - Create a symbolic link.

5. File Viewing and Editing Commands

41. `cat [file]` - Concatenate and display file contents.
42. `less [file]` - View file contents one page at a time.
43. `more [file]` - View file contents (similar to less).
44. `head [file]` - Display the first few lines of a file.
45. `tail [file]` - Display the last few lines of a file.
46. `nano [file]` - Edit files with the nano text editor.
47. `vi [file]` - Edit files with the vi text editor.
48. `grep [pattern] [file]` - Search for patterns in files.
49. `diff [file1] [file2]` - Compare files line by line.
50. `wc [file]` - Count words, lines, and characters in a file.

6. Network Commands

51. `ping [host]` - Send ICMP ECHO_REQUEST to network hosts.
52. `ifconfig` - Configure network interfaces.
53. `ip addr show` - Show IP addresses.
54. `traceroute [host]` - Print the route packets take to a network host.
55. `netstat` - Print network connections, routing tables, interface statistics, etc.
56. `ss` - Another utility to investigate sockets.
57. `curl [url]` - Transfer data from or to a server.
58. `wget [url]` - Retrieve files from the web.
59. `scp [source] [destination]` - Securely copy files between hosts.
60. `ssh [user]@[host]` - Open an SSH session to a remote host.

7. Package Management Commands (Debian-based systems)

61. `sudo apt update` - Update package lists.
62. `sudo apt upgrade` - Upgrade all packages.

63. `sudo apt install [package]` - Install a package.
64. `sudo apt remove [package]` - Remove a package.
65. `sudo apt autoremove` - Remove unnecessary packages.
66. `dpkg -l` - List installed packages.
67. `dpkg -i [package.deb]` - Install a Debian package file.
68. `apt-cache search [package]` - Search for packages.
69. `apt-cache show [package]` - Show package details.
70. `sudo apt clean` - Clean up package cache.

8. Process Management Commands

71. `ps aux` - Show all running processes.
72. `top` - Display tasks and system status.
73. `htop` - An improved version of top.
74. `kill [PID]` - Terminate a process by PID.
75. `killall [process]` - Terminate all processes by name.
76. `pkill [name]` - Send a signal to a process by name.
77. `bg` - Resume a suspended job in the background.
78. `fg` - Bring a background job to the foreground.
79. `nice` - Run a program with modified scheduling priority.
80. `renice` - Alter priority of running processes.

9. System Monitoring Commands

81. `vmstat` - Report virtual memory statistics.
82. `iostat` - Report CPU and I/O statistics.
83. `free` - Display amount of free and used memory in the system.
84. `sar` - Collect, report, or save system activity information.
85. `mpstat` - Report CPU statistics.
86. `uptime` - Tell how long the system has been running.

87. `dstat` - Versatile resource statistics.

88. `ss` - Another utility to investigate sockets.

89. `watch [command]` - Execute a program periodically, showing output.

90. `iotop` - Display I/O usage by processes.

10. Security and Permissions Commands

91. `chmod [permissions] [file]` - Change file permissions.

92. `chown [owner]:[group] [file]` - Change file owner and group.

93. `passwd` - Change user password.

94. `sudo` - Execute a command as another user.

95. `ufw enable` - Enable Uncomplicated Firewall.

96. `ufw disable` - Disable Uncomplicated Firewall.

97. `ufw allow [service]` - Allow a service through the firewall.

98. `ufw deny [service]` - Deny a service through the firewall.

99. `gpg` - Encrypt and sign files.

100. `openssl` - Toolkit for SSL/TLS and cryptography.

Conclusion

These 100 commands form the backbone of Linux system administration and daily operations. Whether you're deploying servers, managing users, or troubleshooting issues, mastering these commands will significantly enhance your efficiency and capability as a Linux engineer. For professionals like Krishan Bhatt, whose vision is to make production environments fast, secure, and up-to-date, these commands are indispensable tools in achieving those goals.