For each topic explore in detail by using the - What, why and how Model

**Linux**

1. Introduction
   1. What is Operating System?
   2. Basics of Computer and OS
   3. History of Linux
   4. Setup Linux environment on Local Machine (WSL, Docker, or VirtualBox etc)
2. Linux Distributions
   1. What are the different Linux distributions?
   2. Why do we have different distributions?
   3. Differences between different distributions
   4. Advantages or Benefits over one another
   5. Use cases for each distribution.
3. Linux Package Management – YUM, RPM, TAR.gz, apt.
   1. What is package management and core concept?
   2. Why do we need package management?
   3. Different package management types and where they are used?
   4. Lab Session to Install RPM, and Debian and Yum package.
   5. Demo on Packaging at an Enterprise
4. FileSystem
   1. What is filesystem?
   2. Why is it important for OS?
   3. Different aspects of filesystem
   4. OS Level Implementation
   5. Filesystem commands -(ls, mkdir, cd, mv, cp)
   6. Linux Filesystem - Hierarchy and Directory structure
   7. File Permissions
   8. Soft Link and Hard Links
   9. Pseudo Filesystem
5. Linux User Management
   1. Permissions, Users, groups
   2. Elevated privileges (sudo permissions)
   3. Commands to create user, group, changing permissions (usermod, groupadd, chown, chmod)
   4. Lab – Create user, group
6. Linux Kernel and Boot Process
   1. Different kernel modes
   2. Boot Sequence and Runlevels
   3. Initd, upstart, system
      1. Commands for init.d, upstart, system
      2. How to check the logs for services running
   4. Know the vocabulary - Daemon, Service, Process, threads, file descriptors
7. Linux Virtualization
   1. Different types of virtualizations
   2. Install VirtualBox/Vargrant and spin up a VM. – If docker or WSL is used in the start.
   3. Enterprise usage in a data center – VMWare, Hyper-V
8. Volume Management Linux
   1. LVM Basics
   2. Mounting a volume in linux
   3. Mounting a volume in linux to a specific directory
9. Linux Networking
   1. aCloud Guru Course – Linux Networking and Troubleshooting
   2. OSI Stack
   3. IP Address
   4. TCP, UDP, ICMP
   5. Protocols – SSH, SMTP, RDP, HTTPS, HTTPS, DNS
   6. CIDR
   7. Public Network vs Private Network
   8. Proxy servers, Load Balancers, VPN
   9. Exercise:
      1. Generate SSH Keys
      2. Create VM using Vagrant/VirtualBox
      3. SSH into the VM without password
         1. Copy the Public key using the ssh
         2. Add ssh key to local windows shell
      4. SSH Config file
      5. Know and Remember file permissions for SSH files
10. Linux Commands
    1. Globing
    2. Pipe
    3. Absolute Path and Relative Path
    4. Whoami, Mkdir, ls, cd, sed, cp, mv, touch, vi, awk, find, locate, mount, systemctl, journalctl, service, ps, top, grep, kill, pwd, chown, chmod, sudo, su, tail, rm, du, df, fsck, cat, echo, unix2dos, gzip, unzip, sleep, export, uptime, uname, tar
    5. Text Editor: vi, vim, nano – Shortcuts: Edit, save, copy single line, view line numbers delete line, delete word, copy the entire file content to clipboard
    6. Network: curl, wget, netstat, ping, traceroute, ifconfig, dig, nslookup, telnet, ssh, scp, sftp, ftp, hostname, host, nc
11. Automation in Linux
    1. Environment Variables in Linux – Setting up variables for a user and system,
       1. What is “PATH” Variable
    2. Bash vs Shell
    3. Shell Scripting Basics
    4. Cron Setup

aCloud Guru: Learn Linux by Doing – All the labs should be finished.

**Networking Concepts Links**

* [What is an IP Address?](https://www.iplocation.net/ip-address)
* [What are the differences between IPv4 and IPv6?](https://www.iplocation.net/ipv4-vs-ipv6)
* [What is the private IP address?](https://www.iplocation.net/private-ip-address)
* [How to find my computer's Private IP address?](https://www.iplocation.net/find-private-ip-address)
* [What is the difference between a static and dynamic IP address?](https://www.iplocation.net/static-vs-dynamic-ip-address)
* [What is the difference between public and private IP address?](https://www.iplocation.net/public-vs-private-ip-address)
* [What is IPv6 Address?](https://www.iplocation.net/ipv6-address)
* [Find IP addresses of a private network](https://www.iplocation.net/find-private-network-ip)
* [What is a MAC Address?](https://www.iplocation.net/mac-address)
* [What is a VPN?](https://www.iplocation.net/vpn)
* [What is the Difference Between Proxies and VPN?](https://www.iplocation.net/what-is-difference-between-proxies-and-vpn)

**Deep Dive Links**

* <https://www.slashroot.in/how-does-udp-work>
* <https://www.slashroot.in/how-does-traceroute-work-and-examples-using-traceroute-command>
* <https://www.slashroot.in/ifconfig-utility-linux-users>
* <https://www.slashroot.in/understanding-tcp-three-way-handshake>
* <https://www.slashroot.in/understanding-and-configuring-dhcp>
* <https://www.slashroot.in/proc-file-system-linux-explained>
* <https://www.slashroot.in/security-checklist-linux-system-administrator>
* <https://www.slashroot.in/inode-and-its-structure-linux>
* <https://www.slashroot.in/df-command-linux>
* <https://www.slashroot.in/yum-repository-and-package-management-complete-tutorial>
* <https://www.slashroot.in/find-command-usage-and-examples-linux>
* <https://www.slashroot.in/how-dns-works>
* <https://www.slashroot.in/curl-command-tutorial-linux-example-usage>
* <https://www.slashroot.in/httphypertext-transfer-protocol-request-and-response>
* <https://www.slashroot.in/packet-capturing-tcpdump-command-linux>
* <https://www.slashroot.in/difference-between-hypervisor-virtualization-and-container-virtualization>
* <https://www.slashroot.in/create-ext2-and-ext3-filesystem>
* <https://www.slashroot.in/san-vs-nas-difference-between-storage-area-network-and-network-attached-storage>
* <https://www.slashroot.in/how-run-multiple-commands-parallel-linux>
* <https://www.slashroot.in/software-raid-1-configuration-linux>