

COMPUTER NETWORKS

Duration: 10 days (70 hours)

Mode : Instructor Led Class room Training and Labs..

In this course, you will learn how to install, operate, configure, and verify a basic IPv4 and IPv6 network. You will focus on configuring a LAN switch, configuring an IP router, understanding redundant topologies, troubleshooting common network issues, connecting to a wide-area network (WAN), configuring EIGRP and OSPF in both IPv4 and IPv6, understanding WAN technologies.

What will you learn?

- Capture and Analysis of Protocols
- Network fundamentals and how to build simple LANs
- Establish Internet connectivity
- OSI and TCP/IP Model
- Manage network device security
- Subnetting and IP routing
- IPv6 basics
- Troubleshoot VLAN issues
- Spanning Tree Protocol (STP)
- Layer 3 redundancy
- Troubleshoot IP connectivity
- Characteristics, functions, and components of a WAN
- Configure and troubleshoot EIGRP
- Configure and troubleshoot OSPF
- Configure and troubleshoot Access Lists and NAT

Who should attend?

- Anyone who is interested to have a career in Computer Networks

Prerequisites

- No pre-requisites.

Introduction to Computer Networks

Devices – Hubs, Repeaters, Switches, Bridges, Routers

Internetworking Models – OSI Model Vs TCP/IP Model -Protocols.

Application Layer

- Application Layer protocols
- HTTP – FTP – FTP Control Connections
- FTP Data connection – SMTP.

Transport Layer

- Introduction to Transport Layer
- Transport Layer Protocols
- Transmission Control Protocol
- User Datagram Protocol – TCP flags
- TCP Three way handshake
- Synchronisation – Acknowledgement
- Sequence numbers – Port numbers
- Sliding windows – Packet capture and analysis.

Network Layer

- IP Addressing Scheme – Class A – Class B – Class C Networks
- Local Area Networks (LAN)
- LAN Communication – Default Gateway
- Communication between Different Networks
- Static Routing
- Dynamic Routing
- Routing Protocols – Routed Protocols – RIP – EIGRP – OSPF
- Introduction to IPV6
- Network Address Translation – Private IP Addresses – Public IP Addresses
- Reserved IP Addresses
- Port Address Translation (PAT) – Packet capture and analysis.

Data Link Layer

- MAC Address – OUI – Address Resolution Protocol (ARP) – RARP
- Encapsulation – Error Detection – Cyclic Redundancy Check (CRC)
- Layer 2 broadcast – Ethernet Frames – Point to Point Protocol (PPP)
- High Level Data Link control (HDLC)- Collision domain
- Broadcast domain – CSMA/CD – Back off Algorithm.
- LAN Switching – packet capture and analysis

Physical Layer

- Connectivity – Cabling structure
- Straight through cable – Cross cable
- Roll over cable – RJ 45 socket.

Subnetting – CIDR – VLSM

- Subnetting IP addresses – Subnet Mask
- Subnetting Class A, Class B and Class C Addresses –
- Classless Inter-domain Routing (CIDR)
- Variable Length Subnet Mask (VLSM).

Networking Services

- Domain Name Service (DNS) – Introduction to DNS
- Installation of DNS Server, DNS Zones
- Forward look up zone, Reverse look up zone
- DNS Resource records, Name resolution by DNS clients
- Primary DNS, Secondary DNS, Zone Transfers
- DNS Root, DNS Messages
- Positive, Negative and Authoritative responses
- DNS Resolver Cache memory.

Dynamic Host Configuration Protocol (DHCP)

- DHCP service, DHCP Scope and Ranges
- Leasing IP addresses, Lease period
- T1 and T2 value, DORA process
- Alternate configuration of TCP/IP under DHCP
- Reservation, Binding MAC address to specific clients
- Using a Cisco Network Device as DHCP – DHCP Relay

IPV4 and IPV6 – Dynamic Routing Protocols

- Routing Information Protocol V1 and V2 (RIP v1 & RIP v2)
- Enhanced Interior Gateway Routing Protocol (EIGRP)
- Open Shortest Path First (OSPF -V3).

Configuring Access lists

- Standard Access Lists – Extended Access Lists
- Network Address Translation (NAT)
- Port Address Translation (PAT)

Introduction to Switching

- CSMA/CD, Creating Virtual Lans (VLAN),
- Inter-Vlan Communication – Spanning Tree Protocol (STP)
- Configuring VLAN Trunking Protocol (VTP)
- Configuring VTP Modes
- Server, Client and Transparent mode configuration

Wide Area Network

- Introduction to WAN Technology
- Frame Relay Technology – Frame Relay Cloud
- Data Link Connection Identifier (DLCI)
- Frame Relay encapsulation.

Introduction to IPV6

- Configuring IPV6 – IP Unicast routing
- IPV6 packet structure – Modifying the MAC address
- Link Local Address – Global prefix address
- IPV6 Addressing Scheme