

**Hardware Networking**

**SUBMITTED TO**

**KAMLESH SHUKLA SIR**

**SUBMITTED BY**

**MANAV BANDHANIA**

# Module 3 [Network Configuration]

**Topic: Local Area Networking**

**Assignment Level Basic**

1. **What is Network?**
   * A network is a group of interconnected devices that can communicate with each other.
   * It allows sharing of resources like files, printers, and internet connections.
2. **What is Internet & Intranet?**
   * **Internet:** A global network connecting millions of private, public, academic, business, and government networks.
   * **Intranet:** A private network accessible only to an organization’s staff, often used to share information and resources within the organization.

**Assignment Level Intermediate**

1. **How Many Types of Network Do We Use?**
   * **Local Area Network (LAN)**
   * **Personal Area Network (PAN)**
   * **Metropolitan Area Network (MAN)**
   * **Wide Area Network (WAN)**
   * **Virtual Private Network (VPN)**
2. **Difference Between LAN & PAN?**
   * **LAN (Local Area Network):**
     + Covers a small geographic area like a home, office, or building.
     + Used for connecting computers and devices within a limited area.
   * **PAN (Personal Area Network):**
     + Covers a very small area, typically within a range of a few meters.
     + Used for connecting personal devices like smartphones, tablets, and laptops.

**Assignment Level Advanced**

1. **Explain LAN:**
   * LAN is a network that connects computers and devices within a limited area such as a home, school, or office building.
   * It allows devices to share resources like files, printers, and internet connections.
   * LANs can be wired (using Ethernet cables) or wireless (using Wi-Fi).
2. **What Are Different Types of LAN Devices?**
   * **Router:** Connects multiple networks and directs data between them.
   * **Switch:** Connects devices within a LAN and forwards data to the correct device.
   * **Hub:** Connects multiple Ethernet devices, making them act as a single network segment.
   * **Access Point:** Allows wireless devices to connect to a wired network.
   * **Network Interface Card (NIC):** Hardware that connects a computer to a network.

**Topic: Configured Network**

**Assignment Level Basic**

1. **What is Configured Network?**
   * A configured network is a network that has been set up with specific settings and parameters to ensure proper communication between devices.
2. **How Do We Configure Network?**
   * Connect all devices to the network.
   * Assign IP addresses to each device.
   * Set up network settings like DNS, gateway, and subnet mask.
   * Configure security settings like firewalls and encryption.

**Assignment Level Intermediate**

1. **How to Check the IP Address?**
   * Open “Settings” > “Network & Internet” > “Status”.
   * Click on “Properties” under your network connection.
   * Look for the “IPv4 address”.
2. **How to Check the IP Address Through CMD?**
   * Open Command Prompt.
   * Type ipconfig and press Enter.
   * Look for the “IPv4 Address” under your network adapter.
3. **How Can We Enter Static Address in Network Adapter?**
   * Open “Settings” > “Network & Internet” > “Status”.
   * Click on “Properties” under your network connection.
   * Scroll down to “IP settings” and click “Edit”.
   * Select “Manual” and turn on “IPv4”.
   * Enter the static IP address, subnet mask, gateway, and DNS servers.
   * Click “Save”.

**Assignment Level Advanced**

1. **Practical to Release the Packets from the Adapter:**
   * Open Command Prompt.
   * Type ipconfig /release and press Enter.
   * This will release the current IP address assigned to the adapter.
2. **Practical to Renew the Lease of the IP Address:**
   * Open Command Prompt.
   * Type ipconfig /renew and press Enter.
   * This will request a new IP address from the DHCP server.
3. **Practical to Check the Connectivity to Google:**
   * Open Command Prompt.
   * Type ping www.google.com and press Enter.
   * This will send packets to Google’s server and check if you can reach it.

**Topic: Wireless Networking**

**Assignment Level Basic**

1. **What is the Difference Between WEP and WPA?**
   * **WEP (Wired Equivalent Privacy):**
     + Older and less secure encryption method for wireless networks.
     + Easier to crack and not recommended for modern networks.
   * **WPA (Wi-Fi Protected Access):**
     + Newer and more secure encryption method.
     + Provides better protection against unauthorized access.
2. **What is Wireless Network?**
   * A wireless network uses radio waves to connect devices without physical cables.
   * Commonly used for Wi-Fi connections in homes, offices, and public places.

**Assignment Level Intermediate**

1. **What is a Wireless Network Connection?**
   * A wireless network connection allows devices to connect to a network using Wi-Fi.
   * It enables internet access and communication between devices without cables.
2. **What Are the Basic Concepts of Networking?**
   * **IP Address:** A unique identifier for a device on a network.
   * **Subnet Mask:** Defines the network and host portions of an IP address.
   * **Gateway:** A device that routes traffic from a local network to other networks.
   * **DNS (Domain Name System):** Translates domain names to IP addresses.
   * **DHCP (Dynamic Host Configuration Protocol):** Automatically assigns IP addresses to devices on a network.

**Assignment Level Advanced**

1. **What Do You Need to Know About Networking?**
   * Understanding of network types (LAN, WAN, etc.).
   * Knowledge of network devices (routers, switches, etc.).
   * Familiarity with IP addressing and subnetting.
   * Awareness of network security practices.
2. **How Do You Explain Computer Networking?**
   * Computer networking is the practice of connecting computers and other devices to share resources and information.
   * It involves hardware (routers, switches) and software (protocols, services) to enable communication between devices.

**Topic: Wireless Networking**

**Assignment Level Basic**

1. **What is the Difference Between WEP and WPA?**
   * **WEP (Wired Equivalent Privacy):**
     + Older encryption method for wireless networks.
     + Less secure and easier to crack.
   * **WPA (Wi-Fi Protected Access):**
     + Newer and more secure encryption method.
     + Provides better protection against unauthorized access.
2. **What is Wireless Network?**
   * A wireless network uses radio waves to connect devices without physical cables.
   * Commonly used for Wi-Fi connections in homes, offices, and public places.

**Assignment Level Intermediate**

1. **What is a Wireless Network Connection?**
   * A wireless network connection allows devices to connect to a network using Wi-Fi.
   * It enables internet access and communication between devices without cables.
2. **What Are the Basic Concepts of Networking?**
   * **IP Address:** A unique identifier for a device on a network.
   * **Subnet Mask:** Defines the network and host portions of an IP address.
   * **Gateway:** A device that routes traffic from a local network to other networks.
   * **DNS (Domain Name System):** Translates domain names to IP addresses.
   * **DHCP (Dynamic Host Configuration Protocol):** Automatically assigns IP addresses to devices on a network.

**Assignment Level Advanced**

1. **What Do You Need to Know About Networking?**
   * Understanding of network types (LAN, WAN, etc.).
   * Knowledge of network devices (routers, switches).
   * Familiarity with IP addressing and subnetting.
   * Awareness of network security practices.
2. **How Do You Explain Computer Networking?**
   * Computer networking is the practice of connecting computers and other devices to share resources and information.
   * It involves hardware (routers, switches) and software (protocols, services) to enable communication between devices.

**Topic: The Internet**

**Assignment Level Basic**

1. **What Do You Mean by the Term URL?**
   * URL (Uniform Resource Locator) is the address used to access web pages on the internet.
   * Example: https://www.example.com
2. **Term Which is Used to See Web Pages is Called What?**
   * The term is **Web Browser**.
   * Examples include Google Chrome, Mozilla Firefox, and Microsoft Edge.

**Assignment Level Intermediate**

1. **In the Ethernet Which Topology is Used?**
   * Ethernet typically uses **Bus Topology** or **Star Topology**.
2. **Set of Rules and Regulations While Working on Internet, Which Term is Used?**
   * The term is **Protocol**.
   * Examples include HTTP, HTTPS, FTP.

**Assignment Level Advanced**

1. **What Do You Mean by RAS?**
   * RAS (Remote Access Service) allows users to connect to a network remotely.
   * It provides access to network resources from a remote location.
2. **What Are the Main Search Engines to Get More Website URLs on Internet?**
   * Google
   * Bing
   * Yahoo
   * DuckDuckGo
3. **What Does the Protocol Consist of?**
   * A protocol consists of rules and conventions for communication between network devices.
   * It includes syntax, semantics, and timing rules.

**Topic: Virtualization**

**Assignment Level Basic**

1. **What is Virtualization?**
   * Virtualization is the creation of virtual versions of physical resources like servers, storage, and networks.
   * It allows multiple virtual machines to run on a single physical machine.
2. **What is the Difference Between Full Virtualization and Para Virtualization?**
   * **Full Virtualization:**
     + The virtual machine simulates the complete hardware.
     + The guest OS is unaware it is running in a virtualized environment.
   * **Para Virtualization:**
     + The guest OS is aware of the virtualization.
     + It communicates directly with the hypervisor for better performance.

**Assignment Level Intermediate**

1. **What is Hypervisor?**
   * A hypervisor is software that creates and manages virtual machines.
   * It allows multiple operating systems to run on a single physical machine.
2. **What Are Different Hypervisors Available in Linux?**
   * KVM (Kernel-based Virtual Machine)
   * Xen
   * VMware ESXi
   * VirtualBox
3. **What is Virtualization and What Are Its Types?**
   * Virtualization is the creation of virtual versions of physical resources.
   * Types include:
     + Server Virtualization
     + Storage Virtualization
     + Network Virtualization
     + Desktop Virtualization

**Assignment Level Advanced**

1. **Name the Components That Are Used in VMware Infrastructure:**
   * **ESXi:** The hypervisor that runs virtual machines.
   * **vCenter Server:** Manages multiple ESXi hosts and virtual machines.
   * **vSphere Client:** Interface for managing VMware infrastructure.
   * **VMFS (Virtual Machine File System):** File system for storing virtual machine files.
2. **What Are the Benefits of Virtualization?**
   * **Cost Savings:** Reduces hardware costs by running multiple virtual machines on a single physical machine.
   * **Efficiency:** Improves resource utilization and reduces energy consumption.
   * **Scalability:** Easily scale resources up or down as needed.
   * **Flexibility:** Quickly deploy and manage virtual machines.
   * **Disaster Recovery:** Simplifies backup and recovery processes.