

## Viva Questions and Answers for Networking Experiments

### Chapter 1: Basic Networking Commands in Linux

**Exp. No. 1** - Use basic networking commands in Linux (ping, traceroute, nslookup, netstat, ARP, RARP, ip, ifconfig, dig, route)

1. **What is the purpose of the ping command?**
  - **Answer:** The ping command checks network connectivity between two devices by sending ICMP Echo Requests and receiving Echo Replies.
2. **How does the traceroute command help in diagnosing network issues?**
  - **Answer:** traceroute shows the path that packets take to reach a destination and helps identify where delays or failures occur.
3. **What is the difference between ARP and RARP?**
  - **Answer:** ARP maps IP addresses to MAC addresses, while RARP maps MAC addresses to IP addresses (now mostly replaced by DHCP).
4. **What is the use of the netstat command?**
  - **Answer:** netstat displays network connections, routing tables, and network interface statistics.
5. **How do you configure IP addresses using ifconfig or ip commands?**
  - **Answer:** You can configure an IP address by running ifconfig eth0 [IP address] or using ip addr add [IP address] dev eth0.
6. **Explain the working of the dig command in DNS resolution.**
  - **Answer:** dig queries DNS servers and provides details about DNS records (e.g., A, MX) for a given domain.

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### Chapter 2: Building Network Topologies

**Exp. No. 2** - Build a simple network topology and configure it for static routing protocol using Packet Tracer. Setup a network and configure IP addressing, subnetting, masking.

1. **What is static routing, and how does it differ from dynamic routing?**
  - **Answer:** Static routing is manually configured and doesn't change unless manually updated. Dynamic routing adjusts automatically using protocols like RIP or OSPF.
2. **How do you configure static routes in Packet Tracer?**
  - **Answer:** In Packet Tracer, go to the router, use the CLI, and add static routes using ip route [destination] [subnet mask] [gateway].
3. **Explain subnetting and how it is applied in the network setup.**
  - **Answer:** Subnetting divides a large network into smaller, manageable sub-networks, reducing broadcast traffic and improving security.

4. **What is the purpose of a subnet mask, and how do you calculate it?**
    - **Answer:** A subnet mask separates the network portion from the host portion of an IP address. It's calculated based on how many bits you need for the network.
  5. **Describe the steps involved in assigning IP addresses to devices in Packet Tracer.**
    - **Answer:** Select the device, go to configuration, and assign an IP address and subnet mask in the appropriate fields.
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### **Chapter 3: Remote Access and File Transfers**

**Exp. No. 3** - Perform Remote login using Telnet server.

1. **What is Telnet, and how does it work?**
    - **Answer:** Telnet is a protocol that allows remote login to a server or network device. It works by sending commands over a TCP connection.
  2. **How do you configure a Telnet server in a network?**
    - **Answer:** Enable Telnet on the server by configuring the VTY lines (line vty 0 4), setting a password, and enabling login.
  3. **Explain the security concerns related to Telnet.**
    - **Answer:** Telnet sends data, including passwords, in plain text, making it vulnerable to interception. SSH is more secure as it encrypts data.
  4. **What is the difference between Telnet and SSH?**
    - **Answer:** SSH encrypts the communication, while Telnet does not, making SSH more secure for remote connections.
  5. **How do you establish a remote login session using Telnet?**
    - **Answer:** Use the command telnet [IP address] to initiate a session with the remote device.
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**Exp. No. 4** - Perform File Transfer and access using FTP.

1. **What is FTP, and how does it work?**
  - **Answer:** FTP is a protocol used to transfer files between a client and server over a TCP connection.
2. **How do you set up an FTP server for file transfers?**
  - **Answer:** Install an FTP server (e.g., vsftpd), configure user permissions, and start the service.
3. **Explain the difference between active and passive FTP modes.**

- **Answer:** In active mode, the client opens a port for the server to connect. In passive mode, the server opens a port, and the client connects.
4. **What are the security vulnerabilities of FTP?**
    - **Answer:** FTP sends data, including login credentials, in plain text, which can be intercepted. FTPS or SFTP is recommended for secure transfers.
  5. **How can you transfer files between a client and server using FTP commands?**
    - **Answer:** Use commands like ftp [server], put [filename] to upload, and get [filename] to download.
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## Chapter 4: VPNs and Routing Protocols

**Exp. No. 5** - Design VPN and Configure RIP/OSPF using Packet Tracer.

1. **What is a VPN, and how does it ensure secure communication?**
    - **Answer:** A VPN creates an encrypted tunnel over the internet, ensuring secure communication between remote sites.
  2. **How do you configure a VPN in Packet Tracer?**
    - **Answer:** In Packet Tracer, configure VPN by using security protocols like IPsec to encrypt and authenticate the traffic between routers.
  3. **Explain the difference between RIP and OSPF routing protocols.**
    - **Answer:** RIP uses hop count as the metric and sends periodic updates, while OSPF uses link-state information and updates only when the network changes.
  4. **How do you set up RIP routing in Packet Tracer?**
    - **Answer:** Go to the router, use the CLI, and enable RIP with router rip, then add networks with the network command.
  5. **What are the advantages of OSPF over RIP?**
    - **Answer:** OSPF converges faster, scales better for larger networks, and uses a more efficient metric (cost) compared to RIP's hop count.
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## Chapter 5: Routing Algorithms

**Exp. No. 6** - Implement any one routing algorithm Dijkstra's algorithm / Distance vector routing algorithm.

1. **Explain Dijkstra's algorithm and its application in networking.**
  - **Answer:** Dijkstra's algorithm finds the shortest path between nodes in a network and is used in link-state routing protocols like OSPF.
2. **How does the Distance Vector Routing algorithm work?**

- **Answer:** Each router shares its routing table with its neighbors. Routers update their tables based on the distance to each destination.
  - 3. **Compare Link-State Routing with Distance Vector Routing.**
    - **Answer:** Link-state routing (e.g., OSPF) uses complete network topology information, while distance vector routing (e.g., RIP) uses only information from neighbors.
  - 4. **What are the limitations of Distance Vector Routing?**
    - **Answer:** It can suffer from slow convergence and routing loops due to limited network information.
  - 5. **How would you implement Dijkstra's algorithm in a network simulation tool?**
    - **Answer:** In a tool like Packet Tracer, use OSPF as it implements Dijkstra's algorithm for calculating the shortest paths.
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#### **Predefined Computer Network Questions for Viva:**

1. **What is the difference between a switch and a router?**
  - **Answer:** A switch connects devices within a network, while a router connects different networks and directs data between them.
2. **What is the function of DNS in networking?**
  - **Answer:** DNS translates human-readable domain names into IP addresses, making it easier to access websites.
3. **What are private IP addresses, and why are they used?**
  - **Answer:** Private IP addresses are used within local networks and are not routable on the internet, helping conserve public IP address space.
4. **What is the three-way handshake in TCP?**
  - **Answer:** It's the process of establishing a connection between a client and server, involving SYN, SYN-ACK, and ACK messages.
5. **What are the differences between TCP and UDP?**
  - **Answer:** TCP is connection-oriented and reliable, while UDP is connectionless and faster but doesn't guarantee delivery.