Module 6. Network security, Maintenance and Troubleshooting procedures

Topic: A SOHO Networks

Beginner Question
1. What is SOHO network?
SOHO network means small office/home office. This is a type of LAN network but typically used in small offices or home offices. This usually has a small number of interconnected devices like computer, printer and network equipment.
2. What does SOHO mean networking?
It refers to the setup and configuration of the network typically designed for small office or home office.

Intermediate Question
1. How does a SOHO network work?
2. Issues with Soho Networking?
Some of the issues could be the vulnerability due to lack of proper configuration, scalability and potential performance issue due to multiple device connecting together to the router.

Advance Question
1. How Small is the “S” in SOHO?
Size can vary depending on the need but approximately could be around 10 considering it would have a router, few computers or laptops, mobile, printer, etc
2. SOHO Routers vs. Home Routers?
SOHO routers would have some advanced features for security, would have VPN support, and support multiple users while o the other hand home router would have basic features and designed for residential use.

Topic: NAT & PAT

Beginner Question
1. What is NAT?
It is a technique used in networking used to translate private IP to public IP within local network.
2. What is PAT?
It is a type of NAT that translates multiple private IP addresses to a single public IP address by using different port numbers.
3. Different between NAT & PAT?

NAT translates individual private IP addresses to individual public IP addresses, whereas PAT translates multiple private IP addresses to a single public IP address using different port numbers.

Intermediate Question

1. However, Will Nat work? Explain NAT?

NAT works by mapping private IP addresses to public IP addresses. When a device from the internal network sends a request to the internet, the NAT router replaces the source IP address in the packet header with its own public IP address before forwarding the packet to the internet. When the response comes back, the router uses the mapping table to forward the response to the appropriate internal device.

Advance Question
1. What is different between Static & Dynamic NAT?
Static NAT involves mapping a fixed private IP address to a corresponding public IP address, while Dynamic NAT dynamically assigns public IP addresses from a pool of available addresses to internal devices as needed.
2. NAT stand for?
Network Address Translation
3. PAT stand for?
Port address translation

Topic: Authentication and Access Control

Beginner Question
1. What Is Acl?
Access Control List
2. What Are Different Types of Acl?
Standard and Extended ACL

Intermediate Question
1. Explain Standard Access List?
Standard Access Lists filter traffic based on the source IP address only. They are typically applied closest to the destination in order to conserve router resources.
2. Explain Extended Access List?
Extended Access Lists filter traffic based on source and destination IP addresses, as well as other parameters such as protocols, port numbers, etc. They offer more granular control over traffic compared to standard access lists.

Advance Question
1. What Is Wildcard Mask?

Wildcard mask is used in conjunction with ACL. Wildcard mask can be found by subtracting full subnet mask with the class subnet mask.
2. In Which Directions We Can Apply an Access List?
Inbound traffic

Topic: WAN Technologies

Beginner Question
1. Fiber-optic communication
Fiber-optic communication is a method of transmitting data using light pulses through optical fibers. It offers high bandwidth, low latency, and immunity to electromagnetic interference, making it suitable for long-distance and high-speed communication.

2. What is Leased Line
A leased line is a dedicated telecommunications line that is rented for exclusive use between two points. It provides a constant, reliable connection with guaranteed bandwidth and is typically used for connecting two locations over a private network.
3. Explain Circuit switching

Intermediate Question
1. Explain Packet Switching
Packet switching is a method of data transmission where data is broken down into packets, each of which is transmitted individually across a network. Packets can take different paths to reach their destination and are reassembled into the original data sequence upon arrival.
2. What is difference between leased line and broadband?
Leased lines provide dedicated, symmetric bandwidth with guaranteed performance and reliability, while broadband offers shared, asymmetric bandwidth with variable performance based on network congestion and other factors.
3. How much is a 100mb Leased Line?
Can vary depending on factors such as location, provider, and contract terms. It typically involves a recurring monthly fee based on the bandwidth and service level agreements (SLAs) offered.

Advance Question
1. Difference between a POTS line and a leased line?
POTS is a traditional analog telephone line whereas, leased line is a dedicated digital line for data communication.
2. What is the process of packet switching?
In packet switching, data is broken down into packets, each of which is transmitted individually across the network. Packets may take different paths to reach their destination, and they are reassembled into the original data sequence upon arrival using packet headers containing routing information.
3. Difference between circuit switching and packet switching?
4. Practice on printer sharing - Done in lab

5. Use of IIS [Via "add and remove" feature from control panel. "appwiz.cpl" command] - Done in lab

Topic: Communication technologies Cloud and Virtualization

Beginner Question
1. What is virtualization?
Virtualization is the process of creating the virtual version of hardware platforms, network resource, storage device, etc. This will help maximise the resource, flexibility, and it can run multiple instances on the single physical machine.
2. What are two types of virtualization in cloud?

Intermediate Question
1. What are the two types of virtualization?
2. What is VMware virtualization technology?
VMware is the virtualization technology which allows users to create and manage virtual machines on physical servers. It is a software that provides with a platform to conduct virtualization.

Advance Question
1. What is the difference between cloud and virtualization?
Virtualisation is the technology that enables to create virtual instances of hardware and software while cloud computing is a service which provides on demand access to the shared pool of computing resources over the internet.
2. What are the benefits of implementing virtualization in cloud computing?

- Maximise resource utilization.
- Provides flexibility
- Enhance scalability
- Saves cost
- Increase efficiency
- Easy management

Topic: Monitoring Tools

Beginner Question
1. Why are network monitoring tools used?
Network monitoring tools are used to monitor, analyze and manage network traffic, performance and security. They help identify and troubleshoot issues, optimize performance, ensure compliance, detect and prevent threats.
2. Explain firewalls

Firewalls are network security devices that monitor and control incoming and outgoing network traffic based on predefined security rules. They act as a barrier between a trusted internal network and an untrusted external network to prevent unauthorized access, protect against cybercrime and enforce network security.

Intermediate Question
1. Explain core switches
Core switches are the main high speed network switch that serve as the backbone of the network infrastructure. They connect to the multiple distribution switches and provide high speed connectivity between network segments.
2. Explain client systems
They refer to computers, devices or software applications that request services or resources from a server or server based network.

Advance Question
1. What is network management?
Network management refers to the process of monitoring, administering, and optimizing computer networks to ensure their efficient operation, reliability and security.
2. Explain Event Viewer
Event viewer is a window tool that allows users to view and analyse logs of system, application, and security events on the windows based computer.
3. Practice "parental control" or "family safety" option in control panel - Done in lab

Topic: Network Security, Network vulnerabilities

Beginner Question
1. What are network vulnerabilities?
Network vulnerability are the weaknesses or flaws in a network infrastructure, protocols or configuration that could be exploited by attackers to compromise the confidentiality, integrity and availability of network resources.
2. What are the types of network security attacks?

- Malware
- DOS
- DDos
- Phishing
- Main in the middle
- Trojan Horse

Intermediate Question
1. What is virus in network security?
A virus is a type of malware that is designed to infect and spread across the network by attached itself to the files. Once activated, it can damage files, steal data, or disrupt te normal operations.
2. What is the difference between virus and antivirus?

Virus is a malicious software designed to infect and damage computer systems, while antivirus is the software that is designed to provide security, to detect, prevent and remove virus and other type of malware from the computer.

Advance Question

1. Who is vulnerable in network security?

Everyone connected to the network is vulnerable to network security threats.

2. How do you assess vulnerability?

Vulnerability is assessed by its identifying, quantifying and prioritizing weakness in network infrastructure, system and application.

3. What are the principles of network security?

They are confidentiality, integrity, availability, authentication, authorization

4. What is a firewall to use for?

Firewall is used for network security as a device or a software application that monitors and controls incoming an outgoing network traffic based on the predefined security rules.

5. configure advanced firewall settings? - Done in lab

6. configure "date and time" option - Done in lab