Networking

CompTIA A+ certification, Core 1 (220-1201) and Core 2 (220-1202)

23% of the exam · 8 exam objectives · 220-1201

Domain 2 covers how networks carry traffic and how a technician builds them: the TCP and UDP ports of common services, wireless frequencies, channels and standards, the services networked hosts provide, DNS and DHCP configuration, VLANs and VPNs, the hardware that joins devices and networks, IP addressing in a SOHO network, internet connection and network types, and the tools used to build and test cabling.

You should be able to: A SOHO desktop shows the address 169.254.8.12 and cannot reach the internet. What does the address tell you, and which service should you check first?

Every exam objective: the key point and the trap

2.1 Compare and contrast Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) ports, protocols, and their purposes.

TCP is connection-oriented: a three-way handshake, acknowledgments, sequencing and retransmission give reliable, ordered delivery. UDP is connectionless and best effort: less overhead, no guarantee, suited to short queries and real-time traffic.

Trap: Mixing up the mail ports: SMTP 25 sends, POP3 110 and IMAP 143 retrieve. Another common slip is choosing 23 (Telnet) where the question asks for secure remote access, which is SSH on 22.

2.2 Explain wireless networking technologies.

Frequencies: 2.4 GHz reaches farther and passes walls better but is crowded and shares space with microwave ovens and Bluetooth; 5 GHz has many more channels and higher speeds over shorter range; 6 GHz (Wi-Fi 6E and later) adds wide, clean spectrum for newer devices.

Trap: Assuming 6 GHz works for any recent device: only Wi-Fi 6E or later hardware can use it, and an 802.11ac device is limited to 5 GHz. Also, wider channels add speed, not range.

2.3 Summarize services provided by networked hosts.

Core server roles: DNS resolves names to addresses; DHCP assigns IP settings; file share servers hold shared folders; print servers manage printers and queues; mail servers send, receive and store email; web servers host sites and applications; database servers store data for applications.

Trap: Confusing a proxy with a load balancer: a proxy acts for clients going out, while a load balancer spreads traffic coming in to a group of servers.

2.4 Explain common network configuration concepts.

DNS records: A maps a name to an IPv4 address, AAAA to an IPv6 address, CNAME makes one name an alias of another, MX names the servers that receive mail for the domain, and TXT holds text.

Trap: Choosing an exclusion when a device should keep a fixed address from DHCP: an exclusion only stops DHCP from handing out the address, while a reservation actually gives it to that device.

2.5 Compare and contrast common networking hardware devices.

A router forwards packets between IP networks, such as the LAN and the provider's network. A switch connects devices on one LAN and forwards frames by MAC address.

Trap: Confusing a router with a switch. A switch connects devices within one network by MAC address; only a router moves traffic between networks by IP address.

2.6 Given a scenario, configure basic wired/wireless small office/home office (SOHO) networks.

Private IPv4 ranges are 10.0.0.0/8, 172.16.0.0/12 (172.16.0.0 to 172.31.255.255) and 192.168.0.0/16. They are used inside networks and are not routed on the internet; the SOHO router translates them to its public address.

Trap: Treating 169.254.x.x as a private address that just needs a gateway. It is a self-assigned fallback; fix DHCP or the link rather than adding settings.

2.7 Compare and contrast internet connection types, network types, and their characteristics.

Fiber carries light through glass: the highest bandwidth, low latency and no electromagnetic interference, but only where it has been run.

Trap: Calling a SAN a network defined by size. It is defined by its purpose, storage, and can sit within one data centre.

2.8 Explain networking tools and their purposes.

A cable stripper removes the outer jacket; a crimper attaches RJ45 or other modular plugs to the wires.

Trap: Using a crimper where a punchdown tool belongs. Crimpers fit plugs on cable ends; punchdown tools terminate wires on jacks and panels.

Key terms

TCP: Transmission Control Protocol

UDP: User Datagram Protocol

DNS: Domain Name System

DHCP: Dynamic Host Configuration Protocol

VLAN: Virtual LAN [Local Area Network]

PoE: Power over Ethernet

ONT: Optical Network Terminal

APIPA: Automatic Private Internet Protocol Addressing

SOHO: Small Office/Home Office

WLAN: Wireless LAN [Local Area Network]

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