



2.0 Networking

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

- Ports and protocols
 - 20-21 – File Transfer Protocol (FTP)
 - 22 – Secure Shell (SSH)
 - 23 – Telnet
 - 25 – Simple Mail Transfer Protocol (SMTP)
 - 53 – Domain Name System (DNS)
 - 67/68 – Dynamic Host Configuration Protocol (DHCP)
 - 80 – Hypertext Transfer Protocol (HTTP)
 - 110 – Post Office Protocol 3 (POP3)
 - 143 – Internet Mail Access Protocol (IMAP)
 - 137-139 Network Basic Input/Output System (NetBIOS)/NetBIOS over TCP/IP (NetBT)
 - 389 – Lightweight Directory Access Protocol (LDAP)
 - 443 – Hypertext Transfer Protocol Secure (HTTPS)
 - 445 – Server Message Block (SMB)/Common Internet File System (CIFS)
 - 3389 – Remote Desktop Protocol (RDP)
- TCP vs. UDP

2.2 Explain wireless networking technologies.

- Frequencies
 - 2.4GHz
 - 5GHz
 - 6GHz
- Channels
 - Regulations
 - Channel selection
 - Widths
 - Frequencies
 - Bands
- Bluetooth
- 802.11 standards
- NFC
- Radio-frequency identification (RFID)

2.3 Summarize services provided by networked hosts.

- Server roles
 - DNS
 - DHCP
 - Fileshare
 - Print servers
 - Mail servers
 - Syslog
 - Web servers
 - Authentication, Authorization, and Accounting (AAA)
 - Database servers
 - Network Time Protocol (NTP)
- Internet appliances
 - Spam gateways
 - Unified threat management (UTM)
 - Load balancers
 - Proxy servers
- Legacy/embedded systems
 - Supervisory control and data acquisition (SCADA)
- Internet of Things (IoT) devices



2.4 Explain common network configuration concepts.

- DNS
 - A
 - AAAA
 - Canonical Name (CNAME)
 - Mail exchanger (MX)
 - Text (TXT)
 - Spam management
 - DomainKeys Identified Mail (DKIM)
 - Sender Policy Framework (SPF)
- Domain-based Message Authentication, Reporting, and Conformance (DMARC)
- DHCP
 - Leases
 - Reservations
 - Scope
 - Exclusions
- Virtual LAN [local area network] (VLAN)
- Virtual private network (VPN)

2.5 Compare and contrast common networking hardware devices.

- Routers
- Switches
 - Managed
 - Unmanaged
- Access points
- Patch panel
- Firewall
- Power over Ethernet (PoE)
 - Injectors
 - Switch
 - PoE standards
- Cable modem
- Digital subscriber line (DSL)
- Optical network terminal (ONT)
- Network interface card (NIC)
 - Physical media access control (MAC) address

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

- Internet Protocol (IP) addressing
 - IPv4
 - Private addresses
 - Public addresses
 - IPv6
 - Automatic Private IP Addressing (APIPA)
 - Static
 - Dynamic
 - Subnet mask
 - Gateway



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

- Internet connection types
 - Satellite
 - Fiber
 - Cable
 - DSL
 - Cellular
 - Wireless internet service provider (WISP)
- Network types
 - LAN
 - Wide area network (WAN)
 - Personal area network (PAN)
 - Metropolitan area network (MAN)
 - Storage area network (SAN)
 - Wireless local area network (WLAN)

2.8 Explain networking tools and their purposes.

- Crimper
- Cable stripper
- Wi-Fi analyzer
- Toner probe
- Punchdown tool
- Cable tester
- Loopback plug
- Network tap