

FBLA HS Network Design*

Network Installation and Configuration (25 test items)

1. Discuss the functions of routers and modems in home and office networks
2. Describe the features of a SOHO router
3. Discuss configuration of software and hardware firewalls (e.g., rules, ACLs)
4. Describe the range, speed, and requirements for fiber optic cable
5. Describe the characteristics of copper cable
6. Explain IEEE 802 wireless standards
7. Describe the purpose of subnetting, subnet masks, and loopback addresses
8. Describe wireless network configuration (e.g., modem, router, network password)
9. Discuss server installation and configuration in rack and blade infrastructures
10. Discuss the impact of power and temperature on physical network infrastructures (e.g., cooling, uninterruptible power supply)
11. Describe configuration options for printing over a network (e.g., printer share, printer connectivity, print servers)
12. Describe the functions of access points and gateways

* Sources: These learning outcomes are based on content from Designing Cisco Enterprise Networks (ENSLD) v1.1, CompTIA Network+ Certification Exam Objectives, and CompTIA A+ Certification Exam Core 1 Objectives.

Network Security and Recovery (20 test items)

1. Describe the purpose of disaster recovery plans
2. Select plans for disaster recovery and prevention
3. Describe network backup solutions (e.g., cloud storage, NAS, external hard drives)
4. Describe defensive measures against DoS, phishing, and internal threats (e.g., least privilege, third-party service, security policy)
5. Describe methods for mitigating network vulnerabilities (e.g., closing ports, updating OS, maintaining antivirus)
6. Discuss best practices for network security (e.g., least privilege, authentication, encryption)
7. Describe the benefits of Zero Trust principles
8. Explain methods of network access control
9. Describe security features of Windows and Linux-based operating systems (e.g., BitLocker, domains, SELinux)
10. Describe the use of Intrusion Detection/Prevention Systems (IDS/IPS)
11. Discuss wireless security standards (e.g., WPA, access control lists)

Network Administration (20 test items)

1. Discuss the need for network maintenance (e.g., audits, updates, backups, restores)
2. Describe user account and permission management
3. Explain the purpose and use of Simple Network Management Protocol (SNMP)
4. Discuss common network issues (e.g. slow performance, connection issues, IP conflicts)
5. Use common network command-line tools (e.g., ping, tracert, ipconfig)
6. Discuss the importance of updates and patch management
7. Discuss the role of documentation in network maintenance and troubleshooting
8. Describe tools for monitoring network traffic and performance
9. Describe the use and benefits of load balancing
10. Describe procedures for managing network assets (e.g., users, groups, and printers)

Network Planning (15 test items)

1. Match business requirements to appropriate network design decisions (e.g., topology, physical size, users)
2. Discuss hardware and performance differences between network types (e.g., LAN, WAN)
3. Describe the physical layouts of network topologies (e.g., star, mesh, bus)
4. Discuss the use cases of network topologies (e.g., star, mesh, bus)
5. Select an appropriate network operating system (Windows Server, Linux-based, etc.)
6. Describe the benefits and risks of a peer-to-peer network
7. Discuss the benefits of cloud services for network infrastructure
8. Describe how business needs can restrict and drive network design decisions (e.g., cost, throughput, availability)
9. Explain how network topology decisions impact performance, cost, and availability

Network Protocols, Services, and Access (20 test items)

1. Describe different types of networks (e.g., LAN, WAN)
2. Describe basic network security practices (e.g., encryption, VPN, packet sniffing, authentication)
3. Describe common network attacks (e.g., phishing, spoofing, poisoning)
4. Describe different connectivity technologies (e.g., Ethernet, Wi-Fi, Bluetooth)
5. Discuss the functions of common network devices (e.g., modems, routers, switches)
6. Discuss types of network environments (e.g., peer-to-peer, client-server, thin client)
7. Explain relationships between major network components (e.g., servers, clients, switches)
8. Describe each layer of the Open System Interconnection (OSI) model
9. Explain basic networking protocols (e.g., TCP/IP, UDP, DHCP, SMP)
10. Discuss the characteristics of network topologies (e.g., star, bus, ring)
11. Describe tools and procedures for troubleshooting networks (e.g., ping, tracert, checking cable connections)

References

- Cisco. *Designing Cisco Enterprise Networks (ENSLD) v1.1*.
<https://learningcontent.cisco.com/documents/marketing/exam-topics/300-420-ENSLD-v1.1.pdf>
- CompTIA. *CompTIA A+ Certification Exam Core 1 Objectives*. [https://partners.comptia.org/docs/default-source/resources/comptia-a-220-1101-exam-objectives-\(3-0\)](https://partners.comptia.org/docs/default-source/resources/comptia-a-220-1101-exam-objectives-(3-0))
- CompTIA. *CompTIA Network+ Certification Exam Objectives*. [https://partners.comptia.org/docs/default-source/resources/comptia-network-n10-009-exam-objectives-\(4-0\)](https://partners.comptia.org/docs/default-source/resources/comptia-network-n10-009-exam-objectives-(4-0))
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