

# FBLA HS Networking Infrastructures\*

## Networking Basics (20 test items)

1. Discuss characteristics and types of LANs (e.g., SOHO, enterprise, datacenter)
2. Discuss the functions of the physical and data link layers of the OSI model
3. Discuss the functions of the network and transport layers of the OSI model
4. Discuss the functions of the session, presentation, and application layers of the OSI model
5. Explain how data travels across networks (e.g., packets, routers, switches)
6. Describe how devices receive an internet connection (e.g., ISP, equipment, cabling)
7. Describe the purpose of IP addresses, MAC addresses, and subnetting
8. Discuss differences between IPv4 and IPv6
9. Identify IPv4 address classes

## Network Topologies and Architecture (20 test items)

1. Give examples of peer-to-peer and client-server networks
2. Discuss the characteristics of different types of networks (e.g., LAN, MAN, WAN)
3. Recommend network topologies according to business requirements (e.g., bus, mesh, star)
4. Explain characteristics of network topologies (e.g., star, bus, ring, mesh)
5. Discuss wireless connectivity options for small and large-scale networks
6. Explain use cases for Infrastructure, Platform, and Software as a Service (IaaS, PaaS, and SaaS)
7. Discuss benefits, costs, and risks associated with cloud architectures
8. Explain factors that affect range, speed, and reliability of wireless connections
9. Describe characteristics of 5G networks

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\* Sources: These learning outcomes are based on content from Information Technology Curricula 2017, CompTIA A+ Certification Exam Core 1 and 2 Objectives, and CompTIA Network+ Certification Exam Objectives.

## Network Security (25 test items)

1. Explain the differences between risks, vulnerabilities, exploits, and threats
2. Identify internal and external sources of risk and vulnerabilities (e.g., zero day, employees, outdated software)
3. Describe basic forms of network security (e.g., user management, permissions, encryption, authentication)
4. Discuss malware protection measures (e.g., antivirus, filtering, patch management)
5. Describe characteristics of DoS attacks and forms they can take (e.g., botnets, overload, DDoS)
6. Describe common network attacks (e.g., phishing, spoofing, poisoning)
7. Describe confidentiality, integrity, and availability
8. Describe vulnerability mitigations (e.g., closing ports, updating software, antivirus)
9. Explain the importance of hashing, digital signatures, and certificates in network security
10. Describe characteristics of authentication methods (e.g., MFA, SSO, remote authentication)

## Network Protocols and Standards (20 test items)

1. Explain common transfer protocols (e.g., FTP, SFTP, SMTP)
2. Explain the relationship between DNS, DHCP, and IP addresses
3. Describe 802.11 wireless standards (e.g., range, speed, frequency)
4. Describe characteristics of 802.3 wired standards (e.g., range, speed, frequency)
5. Characterize TCP and UDP
6. Describe dynamic routing protocols (e.g., BGP, EIGRP, OSPF)
7. Identify well-known ports reserved for specific protocols (e.g., port 22 reserved for SFTP and SSH)
8. Describe the use of network address translation (NAT) by networked devices
9. Describe wireless encryption standards (e.g., WPA2, WPA3)

## Network Hardware and Connectivity (15 test items)

1. Discuss the functions of common network devices (e.g., modems, routers, switches)
2. Discuss the function and characteristics of network adapters (e.g., NIC, virtual adapters, PCIe adapters)
3. Describe Ethernet cable types (e.g., STP, UTP, coaxial)
4. Describe fiber optic cable types and connectors
5. Analyze the benefits of rack and blade server infrastructures
6. Describe the equipment needed to connect to the internet
7. Discuss the use of NAS and RAID hard drive configurations

## References

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