2024-25 Competitive Events Guidelines
## Networking Infrastructures

Networking Infrastructures provides members with the opportunity to demonstrate knowledge around competencies in network administration. This competitive event consists of an objective test. It aims to inspire members to learn about networks in today's connected workplace.

Event Overview

Division: High School
Event Type: Individual
Event Category: Objective Test, 100-multiple choice questions (breakdown of question by competencies below)
Objective Test Time: *50 minutes*
NACE Connections: Career & Self-Development

Objective Test Competencies

- General Network Terminology and Concepts
- Network Operating System Concepts
- Network Security
- Equipment for Network Access (Wi-Fi, wireless)
- OSI Model Functionality
- Network Topologies & Connectivity

Test Composition
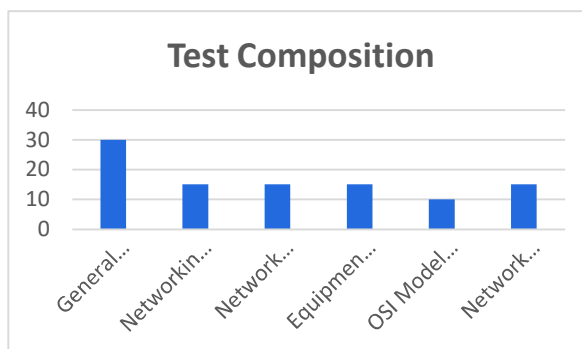
Region

Each chapter may enter two students in this event. Testing is school-site and proctored with careful monitoring to ensure the integrity of the test.

State

Top three (3) qualifiers of each region are eligible to compete at the State Leadership Conference.

National

Required Competition Items

Items Competitor Must Provide	Items FBLA Provides
- Sharpened pencil - Fully powered device for online testing - Conference-provided nametag - Photo identification - Attire that meets the FBLA Dress Code	- One piece of scratch paper per competitor - Internet access - Test login information (link & password)

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Important FBLA Documents

- Competitors should be familiar with the Competitive Events Policy & Procedures Manual, Honor Code, Code of Conduct, and Dress Code.

Eligibility

- FBLA membership dues are paid by 11:59 pm Eastern Time on March 1 of the current school year or prior to regional competition, whichever comes first.
- Members may compete in an event at the National Leadership Conference (NLC) more than once if they have not previously placed in the top 10 of that event at the NLC. If a member places in the top 10 of an event at the NLC, they are no longer eligible to compete in that event.
- Members must be registered for the RLC/SLC/NLC and pay the conference registration fee to participate in competitive events.
- Members must stay in an official FBLA hotel block to compete.
- Each chapter may submit two entries; each region may submit three entries; each state may submit four entries.
- Each competitor can only compete in one individual/team event and one chapter event (American Enterprise Project, Community Service Project, Local Chapter Annual Business Report, Partnership with Business Project) at the national level. RLC/SLC competitors may compete in one objective test/one performance event/ and one chapter event.
- Picture identification (physical or digital: driver's license, passport, state-issued identification, or school-issued identification) matching the conference nametag is required when checking in for competitive events.
- If competitors are late for their assigned objective test time, they will be allowed to compete with a five-point penalty until such time that results are finalized, or the accommodation would impact the fairness and integrity of the event.
- Some competitive events start before the Opening Session of SLC/NLC. The schedules for competitive events are displayed in the local time of the NLC location. Competitive event schedules cannot be changed.

Recognition

- The number of competitors will determine the number of winners. The maximum number of winners for each competitive event is 10/NLC; 5/SLC; 3/RLC.

Event Administration

- This event is an objective test administered online at the RLC/SLC/NLC.
- No reference or study materials may be brought to the testing site.
- No calculators may be brought into the testing site; online calculators will be provided through the testing software.

Tie Breaker

- Ties are broken by comparing the correct number of answers to 10 pre-determined questions on the test. If a tie remains, answers to 20 pre-determined questions on the test will be

reviewed to determine the winner. If a tie remains, the competitor who completed the test in a shorter amount of time will place higher.

Americans with Disabilities Act (ADA)

- FBLA meets the criteria specified in the Americans with Disabilities Act for all competitors with accommodations submitted through the conference registration system by the registration deadline.

Penalty Points

- Competitors may be disqualified if they violate the Code of Conduct or the Honor Code.
- Five points are deducted if competitors do not follow the Dress Code or are late to the testing site.

Electronic Devices

- Unless a pre-approved accommodation is in place, all cell phones, smart watches, and headphones must be turned off and put away before competition begins. Any visibility of these devices will be considered a violation of the Honor Code.

Study Guide: Competencies and Tasks

A. General Network Terminology and Concepts

1. Demonstrate knowledge of the purposes, benefits, and risks for installing a network.
2. Identify types of networks (e.g., LAN, WAN, MAN) and their features and applications.
3. Interpret basic networking terminology and concepts.
4. Identify various network operating systems (i.e., Novell, Linux, Apple, and Mac).
5. Identify the relationship between computer networks and other communications networks (i.e., telephone system).
6. Understand the differences between various network environments (e.g., peer-to-peer, client-server, thin client, n-tier, Internetworks, intranets, and extranets).
7. Analyze the advantages and disadvantages of peer-to-peer and client/server networks.
8. Identify services delivered by a server, such as application server, communication server, domain/directory server, fax server, file and print server, mail server, and Web server.
9. Identify applications and server services, including printer, DNS, DHCP and Internet services.
10. Know the functions of common help-desk tools and resources such as incident tracking, knowledge database, and staffing.
11. Describe the role of the ISP.
12. Define and explain the function of DNS, DHCP, WINS and host files.
13. Differentiate between various current protocols (e.g., AppleTalk, TCP/IP, IPX/SPX, NETBEUI, and DHCP).
14. Explain current network standards and pseudo-standards (e.g., IEEE, RFCs, and ISO).
15. Describe the role of the NIC (Network Interface Card) including explanation of the MAC (Media Access Control) address and its uses.
16. Define terms related to network media (e.g., shielding, crosstalk, and attenuation).
17. Identify standard high-speed networks (e.g., broadband, ISDN, SMDS, ATM, FDDI).

18. Identify names, purposes, and characteristics of network connectors (e.g., RJ45 and RJ11, ST/SC/LC, MT-RJ, USB).
19. Identify tools, diagnostic procedures, and troubleshooting techniques for networks.

B. Network Operating System Concepts
1. Identify the general characteristics and functions of network operating systems (i.e., window NT, LINUX, UNIX, etc.).
2. List and describe the function of the system files for major operating systems.
3. Navigate the desktop operating system environment by using system utilities, system administrative tools, file-structure tools, and hardware-management tools.
4. Identify tools, diagnostic procedures, and troubleshooting techniques for operating systems.
5. Properly setup protocols, clients, and adapters on a network operating system.
6. Identify major considerations faced when installing a network operating system.

C. Network Security
1. Identify security requirements and the need for data protection.
2. Develop, document, and implement a network security plan (install, configure, upgrade and optimize security).
3. Perform preventative maintenance for computer and network security.
4. Demonstrate understanding of physical and logical security issues and solutions.
5. Understand the security procedures and policies necessary to maintain, monitor, and support a network.
6. Know common potential risks and entrance points, including internal and external risks and the tools used to neutralize them (e.g., firewalls, monitoring, antivirus, spyware, and spam protection).
7. Know common techniques for disaster prevention and recovery (backup and restore).
8. Explain principles of basic network security (e.g., IP spoofing, packet sniffing, password compromise, encryption).
9. Describe the importance and demonstrate forms of network security (e.g., password strategies, user accounts).
10. Explore the characteristics, uses, and benefits of software firewalls and hardware firewalls.
11. Illustrate what fundamental legal issues involved with security management.
12. Identify various security, video, building utility monitoring systems and how they link to the network.
13. Describe and implement various forms of malware protection for servers, including antivirus software; spam, adware, and spyware filtering; and patch management.

D. Equipment for Network Access (Wi-Fi, wireless)
1. Explain different functions of network communications equipment (e.g., modems, DSL/CSU, NIC, bridges, switches, routers, and hubs.)
2. Discuss various types of network adapters.
3. Install and configure necessary hardware and software for a basic network installation, including the creation of a shared resource.
4. Explain the uses of current and emerging specialized server hardware, including RAID, blades, SMP, storage devices ultra-SCSI, and hot-swappable technologies.
5. Identify the types of wireless network media (e.g., Wi-Fi, WiMAX, and GSM).
6. Differentiate between broadband and baseband.
7. Describe types of modems (e.g., analog, cable, DSL) and standards.
8. Identify uses of virtual machines.

E. OSI Model Functionality

1. Demonstrate knowledge and identify the properties of the open system interconnection (OSI) standard.
2. Describe the evolution of OSI from its inception to the present and into the future.
3. Describe the primary function of each layer of the OSI model and the way each relates to networking activities.
4. Describe devices in a network environment and their place in the OSI model.
5. Describe the network processes that use protocols and map these to the appropriate OSI levels.
6. Identify the OSI layers at which the following network components operate: Hubs, Switches, bridges, routers, NICs and WAPs.

F. Network Topologies & Connectivity

1. Explain network topologies (e.g., star, bus, ring, broadband, baseband).
2. List advantages and disadvantages and distinguish between the topologies and protocols of local area networks and those of wide area networks.
3. Compare and contrast wireless networking to wired networking.
4. Explain advantages and disadvantages of wireless technologies.
5. Explore the concept of broadband and various incarnations, including DSL, cable, and high-speed wireless (e.g., satellite, Wi-Fi, WiMAX, GSM).
6. Identify components and features of the IEEE (Institute of Electrical and Electronics Engineers) 802 Networking Specifications.
7. Demonstrate knowledge of the principles and operation of fiber optics, analog and digital circuits.
8. Identify the principles and operation of wire (coaxial, fiber optics, etc.) and wireless systems and install.
9. Identify different types of network cabling such as CAT5, Coax, fiber, and select the appropriate type of connectors for each.
10. Install and configure network cards (physical address).
11. Identify names, purposes, and characteristics (e.g., definition, speed and connections) of technologies for establishing connectivity.
12. Demonstrate the use of connectivity methods (cable modem, DSL, T1, dial-up, Wi-Fi) and peripheral equipment (e.g., portable storage devices, printers, and cable modem and wireless technologies).
13. Specify the general characteristics (e.g., carrier speed, frequency, transmission type and topology) of the following wireless technologies: 802.ll, 802.11x, infrared, and Bluetooth.
14. Identify factors which affect the range and speed of wireless service (e.g., interference, antenna type and environmental factors).
15. Test, validate, and troubleshoot IP connectivity using TCP/IP utilities.
16. Demonstrate use of remote access (VPN, teleconferencing, etc.)