2023-24 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)
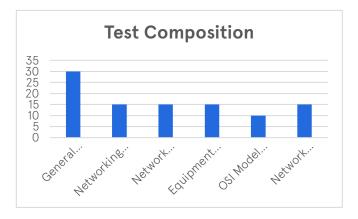***Objective Test Time:*** *50 minutes*
[NACE Connections](): Career & Self-Development

Equipment Competitor Must Provide: Pencil
Equipment FBLA Provides: One piece of scratch paper per competitor

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

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California FBLA Guidelines (State)

- 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.
- All electronic devices such as cell phones and smart watches must be turned off before competition begins.
- Bring a pencil to the testing site.

State

- Each local chapter may have three (3) competitors in this event.
- In addition, each member who does not advance to the final round in a prejudged state events listed below
  - American Enterprise Project, Business Plan, Coding & Programming, Community Service Project, Computer Game & Simulation Programming, Data Analysis, Digital Animation, Digital Video Production, Electronic Career Portfolio, Financial Statement Analysis, Future Business Educator, Graphic Design, Introduction to Business Presentation, Introduction to Social Media Strategy, Local Chapter Annual Business Report, Mobile Application Development, Partnership with Business Project, Public Service Announcement, Social Media Strategies, Visual Design, Website Coding & Development and Website Design

  can switch to <u>one</u> objective test only event listed below.
  - Accounting II
  - Cyber Security
  - Introduction to Marketing Concepts
  - Introduction to Parliamentary Procedure
  - Journalism
  - Networking Infrastructures
  - Organizational Leadership
  - Public Policy & Advocacy
  - UX Design
  - Any of the 12 middle school objective test only events
- **The top four (4) places in state competition** in this event will represent California at the National Leadership Conference.
- Middle school members who place in the top four **cannot** compete at the National Leadership Conference, per national guidelines.

National

Policy and Procedures Manual
- Competitors should be familiar with the Competitive Events Policy & Procedures Manual, found on the Competitive Events page on www.fbla.org.

Eligibility
- FBLA membership dues are paid by 11:59 pm Eastern Time on March 1 of the current program year.
- 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 NLC and pay the national conference registration fee in order to participate in competitive events.
- Members must stay in an official FBLA hotel to be eligible to compete.
- Each state may submit four entries per event.
- Each member 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).
- Picture identification (physical or digital driver's license, passport, state-issued identification, or school-issued identification) is required when checking in for competitive events.
- If competitors are late for an objective test, they will be allowed to compete until such time that results are finalized, or the accommodation would impact the fairness and integrity of the event. Competitive event schedules cannot be changed. Competitive events start in the morning before the Opening Session of the NLC.

Recognition
- The number of competitors will determine the number of winners. The maximum number of winners for each competitive event is 10.

Event Administration
- This event is an objective test administered online at the 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 Competitive Event Guidelines 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
- All electronic devices such as cell phones and smart watches must be turned off before competition begins.

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.)