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## NETWORK DESIGN

### Overview

The ability to evaluate the needs of an organization and then design and implement network solutions is a valuable skill in today's connected workplace. This event provides recognition for FBLA members who demonstrate an understanding of and ability to apply these skills.

This event consists of two parts: an objective test and a role play. If competing as a team, the objective test is taken collaboratively by the team. The top fifteen individuals/teams scoring the highest on the objective test will advance to the final round and participate in the role play component. The role play case will be an analysis of a computing environment situation and recommendation for a network solution that addresses the issues provided.

This event is for an individual or a team of two or three members.

### Competencies and Task Lists

<http://www.fbla-pbl.org/competitive-event/network-design-fbla/>

### Website Resources

- Network Design for Homes and Businesses  
[http://compnetworking.about.com/od/networkdesign/Network\\_Design.htm](http://compnetworking.about.com/od/networkdesign/Network_Design.htm)
- Network Management Definitions  
<http://whatis.techtarget.com/glossary/network-management-category-.html>

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## NETWORK DESIGN SAMPLE QUESTIONS

- 1) The most common type of communication media used in local area network (LAN) technology is known as:
  - A) Token Ring
  - B) POE
  - C) SONET
  - D) Ethernet

**Competency:** Network Installation--Planning and Configuration

- 2) The simple file transfer protocol generally used for automated transfer of configuration or boot files between machines in a local environment is known as:
  - A) TFTP
  - B) SFTP
  - C) FTP
  - D) SMTP

**Competency:** Network Installation--Planning and Configuration

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- 3) The loss in signal power as light travels down the fiber is called:
- A) Attenuation
  - B) Scattering
  - C) Propagation
  - D) Interruption

**Competency:** Network Installation--Planning and Configuration

- 4) The most important component when designing a server is
- A) Sound card
  - B) RAM
  - C) Video card
  - D) Optical mouse

**Competency:** Network Installation--Planning and Configuration

- 5) When using a particular combination of motherboard chipset, CPU, and wireless network adapter laptops received the \_\_\_\_\_ branding.
- A) Celeron
  - B) Pentium
  - C) Centrino
  - D) Cupertino

**Competency:** Network Installation--Planning and Configuration

- 6) A user calls the help desk stating that they can't get on the Internet. You have them try to connect to a website via the URL and the IP address. The IP address works, but the URL doesn't. What network service is likely the problem?
- A) SAP
  - B) ARP
  - C) WINS
  - D) DNS

**Competency:** Network Installation--Planning and Configuration

- 7) \_\_\_\_\_ is the average rate of successful message delivery over a communication channel.
- A) Throughput
  - B) Capacity
  - C) Bandwidth
  - D) Voltage

**Competency:** Network Installation--Planning and Configuration

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- 8) You have a networked PC that has File and Printer Sharing enabled, and your computer can be seen in the Network by other computers. However, other computers **cannot** connect to resources on your computer. Why?
- A) Shared directories are password-protected.
  - B) Other computers do not have File and Printer Sharing enabled.
  - C) You have not shared any directories.
  - D) Other computers are using the ROM protocol.

**Competency:** Network Installation--Planning and Configuration

- 9) \_\_\_\_\_ is a protocol specification for exchanging structured information in the implementation of Web Services in computer networks.
- A) Java
  - B) Flash
  - C) SOAP
  - D) JavaScript

**Competency:** Network Installation--Planning and Configuration

- 10) The best way to push network configuration settings across the network to a large number of computers at boot time is by using the \_\_\_\_\_ protocol.
- A) DNS
  - B) DHCP
  - C) SNMP
  - D) NTP

**Competency:** Problem Solving/Troubleshooting

- 11) Where is a hub specified in the OSI model?
- A) Application layer
  - B) Physical layer
  - C) Data link layer
  - D) Session layer

**Competency:** Problem Solving/Troubleshooting

- 12) What is the main reason the OSI model was created?
- A) So Cisco could use the model
  - B) To create a layered model larger than the DoD mode
  - C) So application developers can change only one layer's protocols at a time
  - D) So different networks could communicate

**Competency:** Problem Solving/Troubleshooting

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- 13) What layer in the TCP/IP stack is equivalent to the Transport layer of the OSI model?
- A) Host-to-Host
  - B) Intranet
  - C) Network Access
  - D) Application

**Competency:** Problem Solving/Troubleshooting

- 14) To display the current state of the routing table, use the \_\_\_\_\_ command in EXEC mode on a Cisco router.
- A) show table
  - B) show BGP route
  - C) route
  - D) show ip route

**Competency:** Problem Solving/Troubleshooting

- 15) You have a Cisco mesh network. What protocol allows multiple APs to connect with many redundant connections between nodes?
- A) STP
  - B) IEEE
  - C) AWPP
  - D) LWAPP

**Competency:** Problem Solving/Troubleshooting

- 16) When setting up Frame Relay for point-to-point subinterfaces, which of the following must not be configured?
- A) The subinterface type as point-to-point
  - B) The local DLCI on each subinterface
  - C) An IP address on the physical interface
  - D) The Frame Relay encapsulation on the physical interface

**Competency:** Network Administrator Functions

- 17) Which of the following describes the creation of private networks across the Internet, enabling privacy and tunneling of non-TCP/IP protocols?
- A) VPN
  - B) HDLC
  - C) IPSec
  - D) xDSL

**Competency:** Network Administrator Functions

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- 18) Acknowledgments, sequencing, and flow control are characteristics of which OSI layer?
- A) Layer 3
  - B) Layer 7
  - C) Layer 4
  - D) Layer 2

**Competency:** Network Administrator Functions

- 19) How to implement a network medium that is not susceptible to EMI. Which type of cabling should you use?
- A) Thinnet coax
  - B) Category 5 UTP cable
  - C) Fiber-optic cable
  - D) Thicknet coax

**Competency:** Network Administrator Functions

- 20) What type of RJ45 UTP cable is used between switches?
- A) Crossover with a CSU/DSU
  - B) Crossover cable
  - C) Crossover with a router in between the two switches
  - D) Straight-through

**Competency:** Network Administrator Functions

- 21) You have an interface on a router with the IP address of 192.168.192.10/29. Including the router interface, how many hosts can have IP addresses on the LAN attached to the router interface?
- A) 30
  - B) 6
  - C) 32
  - D) 8

**Competency:** Configuration of Internet Resources--Web Service, DMZ, FTP, etc.

- 22) You telnet to a router and make your necessary changes; now you want to end the Telnet session. What command do you type in?
- A) Close
  - B) Exit
  - C) Disconnect
  - D) Disable

**Competency:** Configuration of Internet Resources--Web Service, DMZ, FTP, etc.

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23) What command can be used to install the an FTP server on the CentOS Linux operating system?

- A) sudo apt-cache search proftpd
- B) sudo yum install proftpd
- C) get proftpd
- D) sudo apt-get install proftpd

**Competency:** Configuration of Internet Resources--Web Service, DMZ, FTP, etc.

24) What function would a DHCP server perform?

- A) Lease IP addresses to clients
- B) Translate NetBIOS names to TCP/IP addresses
- C) Block network intruders
- D) Locate a DNS server

**Competency:** Backup and Disaster Recovery

25) Your company is so large that by the end of the week you can't fit all the files created or modified during the week on a single backup tape. Which solution would be the best?

- A) Use incremental backups
- B) Use a higher capacity backup tape
- C) Use multiple backup tapes
- D) Compress the data on the backup tape

**Competency:** Backup and Disaster Recovery

26) In relation to encryption, a "key" is a:

- A) pointer to a random number
- B) index in an lookup table
- C) string of random characters
- D) metal object with notches and groves

**Competency:** Backup and Disaster Recovery

27) T1 and PRI ISDN service generally have a rated speed of what?

- A) 256Kbit/sec
- B) 512Kbit/sec
- C) 1.544Mbit/sec
- D) 3 Mbit/sec

**Competency:** Backup and Disaster Recovery

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28) Where does Linux get its name?

- A) Linus Torvalds
- B) Bill Gates
- C) Franklin Huxby
- D) John Linux

**Competency:** Configuration Network Resources and Services

29) On some Linux machines, the first Ethernet network interface is referred to as:

- A) If1
- B) If0
- C) Eth0
- D) Eth1

**Competency:** Configuration Network Resources and Services

30) Administrators often configure a VLAN to map directly to an IP network, or subnet, which gives the appearance of involving Layer:

- A) 3
- B) 2
- C) 1
- D) 4

**Competency:** Configuration Network Resources and Services

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## NETWORK DESIGN SAMPLE CASE STUDY

### PARTICIPANT INSTRUCTIONS

1. You have 20 minutes to review the case.
2. Presentation time is seven minutes. At six minutes the timekeeper will stand and hold up a colored card indicating you have one minute left and at seven minutes the timekeeper will stand and hold up a card indicating time is up.
3. The presentation is interactive with the judges who will ask questions throughout the presentations. One judge will play the role of Stephen who is a small business owner. You will play the role of technicians for King's Ransom Inc.
4. You will be given two note cards to use.
5. Cover all the points described in the case and be prepared to answer questions.
6. The presentation is interactive with the judges who will ask questions throughout the presentation.

### PERFORMANCE INDICATORS

- Communications skills—the ability to exchange information and ideas with others through writing, speaking, reading, or listening
- Analytical skills—the ability to derive facts from data, findings from facts, conclusions from findings, and recommendations from conclusions