

# Cybersecurity Software Operations, Advanced

6306 36 weeks

## Table of Contents

Acknowledgments.....	2
Course Description.....	3
Task Elements Table.....	3
Curriculum Framework.....	8
Introducing Basic Server Systems Concepts .....	8
Installing Network Operating System and Services.....	16
Configuring Network Servers .....	20
Performing Network Administrative Functions.....	35
Performing Network Management and Security Function .....	43
Maintaining Servers .....	58
Implementing and Managing Web Servers.....	63
Providing User Training and Support .....	68
Performing Legal and Ethical Functions .....	74
Preparing for Industry Certification.....	78
Developing Employability Skills.....	82
SOL Correlation by Task .....	85
Teacher Resources .....	88
Entrepreneurship Infusion Units .....	90
Curriculum Resources.....	90
Appendix: Credentials, Course Sequences, and Career Cluster Information .....	92

# Acknowledgments

The components of this instructional framework were developed by the following business panelists:

Dr. Chuck Gardner, Director of Curriculum, Cyber Innovation Center, Bossier  
Denise Hobbs, IT Security Engineering Manager, Oracle Academy, Albuquerque  
Giles Ring, IT Security Manager, Virginia Credit Union, Richmond

The following educators served on the curriculum development panel:

George Bennett, Chantilly Academy, Fairfax County Public Schools  
Nancy Brandon, Colonial Forge High School, Stafford County Public Schools  
Dr. Darrell Carpenter, Director, Center for Cyber Security, Longwood University  
Patrick Kuesters, Edison High School Academy, Fairfax County Public School  
Linda Lavender, Advanced Technology Center, Virginia Beach City Public Schools  
Mark Nagurney, Marshall Academy, Fairfax County Public Schools  
Dr. John Savage, Director of Cyber Security, Virginia Community College System  
John Warf, Burton Center for Arts and Technology, Roanoke County Public Schools

Correlations to the Virginia Standards of Learning were reviewed and updated by:

Norma J. Bonney, Kempsville High School, Virginia Beach City Public Schools  
Vickie L. Inge, Mathematics Committee Member, Virginia Mathematics and Science  
Coalition  
Anne F. Markwith, New Teacher Mentor, Gloucester County Public Schools  
Cathy Nichols-Cocke, PhD, Fairfax High School, Fairfax County Public Schools  
Caroline C. Wheeler, MT, Secondary English, Richmond

The framework was edited and produced by the CTE Resource Center:

Leanne Forbes Tipton, Writer/Editor  
Kevin P. Reilly, Administrative Coordinator

Judith P. Sams, Specialist, Business and Information Technology and Related Clusters  
Office of Career, Technical, and Adult Education Services  
Virginia Department of Education

Dr. Tricia S. Jacobs, CTE Coordinator of Curriculum and Instruction  
Office of Career, Technical, and Adult Education Services  
Virginia Department of Education

# Course Description

**Suggested Grade Level:** 12

**Prerequisites:** 6304

Cybersecurity Software Operations, Advanced continues to teach aspects of network administration, focusing on the management and support of network users and systems. The topics covered include understanding the responsibilities of computer professionals, training end users, evaluating new technology, developing system policies, troubleshooting workstations, managing network services and protocols, and effectively using email and business communications. Students learn communication protocols, troubleshooting techniques for systems and client-server networks, website management, and other advanced networking topics. Techniques that are used to install operating systems, set up and manage accounts, load software, and create and implement security plans are taught. This course may provide instruction about software-based network operating systems, such as Windows Server or Linux. Instruction will emphasize preparation for industry certification.

## Task Elements Table

- Tasks/competencies designated by plus icons (⊕) in the left-hand column(s) are essential
- Tasks/competencies designated by empty-circle icons (○) are optional
- Tasks/competencies designated by minus icons (⊖) are omitted
- Tasks marked with an asterisk (\*) are sensitive.

Task Number	6306	Tasks/Competencies
Introducing Basic Server Systems Concepts		
39	⊕	Explain server operating systems.
40	⊕	Explain the hardware found in a server.
41	○	Explain the uses of current and emerging server and storage hardware.
42	○	Explain the various security procedures related to storage devices.
43	⊕	Explain the uses of current and emerging server racking systems.
44	⊕	Describe client-server architecture, including virtual server architecture.
45	⊕	Identify the services commonly found on a network server.

46	<input checked="" type="radio"/>	Identify the various components of a virtual network system.	
47	<input checked="" type="radio"/>	Explain the authentication of users in a network environment.	
Installing Network Operating System and Services			
48	<input checked="" type="radio"/>	Compare essential network operating system components.	
49	<input checked="" type="radio"/>	Determine when to use peer-to-peer and/or directory services.	
50	<input checked="" type="radio"/>	Identify major decisions associated with the installation of a network operating system.	
51	<input checked="" type="radio"/>	Select server services.	
52	<input checked="" type="radio"/>	Install a server operating system.	
Configuring Network Servers			
53	<input type="radio"/>	Implement directory services on a network.	
54	<input type="radio"/>	Manage directory and file replication.	
55	<input checked="" type="radio"/>	Describe the structure and architecture of the DNS.	
56	<input type="radio"/>	Install the DNS.	
57	<input checked="" type="radio"/>	Explain how a DHCP client obtains an IP address from a DHCP server.	
58	<input type="radio"/>	Install a DHCP service.	
59	<input type="radio"/>	Manage fault-tolerant volumes, using RAID.	
60	<input checked="" type="radio"/>	Explain the difference between roaming and local profiles.	
61	<input type="radio"/>	Implement directory replication.	
62	<input type="radio"/>	Troubleshoot directory services replication.	
63	<input checked="" type="radio"/>	Implement Internet Printing Protocol (IPP) services.	
64	<input checked="" type="radio"/>	Explain types of server malware protection.	
65	<input checked="" type="radio"/>	Identify security threats to applications and web services.	
66	<input checked="" type="radio"/>	Implement web-based and server security features.	

67	<input checked="" type="radio"/>	Describe the Secure Sockets Layer (SSL) and Transport Layer Security (TLS).
68	<input checked="" type="radio"/>	Explore a security certificate.
69	<input checked="" type="radio"/>	Describe firewalls.
70	<input type="radio"/>	Install a firewall.
71	<input checked="" type="radio"/>	Configure basic security policies of a firewall.
72	<input checked="" type="radio"/>	Implement user security policies.
Performing Network Administrative Functions		
73	<input checked="" type="radio"/>	Define different types of accounts.
74	<input type="radio"/>	Configure user and group accounts.
75	<input checked="" type="radio"/>	Implement global, domain, and local account policies.
76	<input checked="" type="radio"/>	Describe considerations and procedures for deploying sharing applications on the network.
77	<input checked="" type="radio"/>	Manage shared disk resources.
78	<input checked="" type="radio"/>	Identify the procedures for the administration of a shared printer.
79	<input type="radio"/>	Identify the functions, features, and guidelines of enterprise collaboration and communication software calendaring.
80	<input checked="" type="radio"/>	Implement groups for resource access and management.
81	<input checked="" type="radio"/>	Implement disk quotas.
82	<input checked="" type="radio"/>	Explain concepts related to logon authentication.
83	<input checked="" type="radio"/>	Identify methods of encryption.
Performing Network Management and Security Function		
84	<input checked="" type="radio"/>	Develop a plan to avoid data loss.
85	<input checked="" type="radio"/>	Back up files and directories.
86	<input type="radio"/>	Restore files and directories.
87	<input type="radio"/>	Develop a network performance monitoring plan.

88	<input checked="" type="radio"/>	Troubleshoot user access problems.	
89	<input checked="" type="radio"/>	Develop a preventive maintenance plan.	
90	<input checked="" type="radio"/>	Develop an audit policy.	
91	<input type="radio"/>	Monitor server resources to track usage and disk space.	
92	<input checked="" type="radio"/>	Set up file, directory, and printer auditing.	
93	<input checked="" type="radio"/>	Explain the importance of asset management and documentation.	
94	<input checked="" type="radio"/>	Describe security concepts.	
95	<input checked="" type="radio"/>	Document a network security plan.	
96	<input checked="" type="radio"/>	Implement a network security plan.	
97	<input checked="" type="radio"/>	Describe hardening techniques.	
98	<input checked="" type="radio"/>	Describe various forms of malware protection for clients and servers.	
99	<input checked="" type="radio"/>	Explain the basic network security systems and protocols.	
Maintaining Servers			
100	<input checked="" type="radio"/>	Describe remote administration.	
101	<input checked="" type="radio"/>	Identify the resources available to solve common support issues.	
102	<input type="radio"/>	Describe service packs and patches.	
103	<input checked="" type="radio"/>	Describe performance monitoring.	
104	<input checked="" type="radio"/>	Describe the utilities that monitor a server's performance.	
105	<input checked="" type="radio"/>	Describe the backup/restore process for directory services.	
Implementing and Managing Web Servers			
106	<input checked="" type="radio"/>	Describe the key protocols of web servers.	
107	<input type="radio"/>	Install web-based services (e.g., Apache, Windows IIS).	
108	<input type="radio"/>	Configure web-based services	
109	<input checked="" type="radio"/>	Explain the major architectural components and security vulnerabilities of web-based services.	

110	<input checked="" type="radio"/>	Establish web-based services.	
111	<input type="radio"/>	Add virtual servers and directories.	
112	<input checked="" type="radio"/>	Install a server-side programming language that supports dynamic content.	
Providing User Training and Support			
113	<input checked="" type="radio"/>	Identify user and network administrator training needs.	
114	<input checked="" type="radio"/>	Provide orientation (onboarding) about a network system for new employees.	
115	<input checked="" type="radio"/>	Develop a security awareness training plan.	
116	<input checked="" type="radio"/>	Provide training to users.	
117	<input checked="" type="radio"/>	Create a user manual.	
118	<input checked="" type="radio"/>	Provide ongoing user support.	
119	<input checked="" type="radio"/>	Track hardware and software usage problems.	
Performing Legal and Ethical Functions			
120	<input checked="" type="radio"/>	Identify copyright and licensing laws that apply to computer use and network administration.	
121	<input checked="" type="radio"/>	Describe procedures to ensure the proper licensing of a client-server operating system and applications.	
122	<input checked="" type="radio"/>	Identify ethical behavior.	
Preparing for Industry Certification			
123	<input checked="" type="radio"/>	Describe the process and requirements for obtaining industry certifications related to the Cybersecurity Software Operations, Advanced course.	
124	<input checked="" type="radio"/>	Identify testing skills/strategies for a certification examination.	
125	<input checked="" type="radio"/>	Demonstrate the ability to complete selected practice examinations (i.e., practice questions similar to those on certification exams).	
126	<input type="radio"/>	Complete an industry certification examination representative of skills learned in this course.	

Developing Employability Skills		
127	+	Update résumé.
128	+	Update a professional portfolio that contains representative samples of student work.
129	+	Identify potential employment barriers for nontraditional groups and ways to overcome these barriers.

Legend: + Essential ○ Non-essential - Omitted

## Curriculum Framework

### Introducing Basic Server Systems Concepts

#### Task Number 39

#### Explain server operating systems.

##### Definition

Explanation should include

- identifying the benefits and limitations
- defining the term *operating systems*
- discussing the functions and unique characteristics of specific operating systems (e.g., Microsoft Windows, macOS, Linux distributions, Chrome OS), mobile operating systems, and embedded systems.

#### FBLA Competitive Events and Activities Areas

##### Business Communication

##### Computer Applications

##### Network Design

##### Networking Concepts



## Word Processing

### Microsoft Imagine Academy Resources

[2.009] Microsoft Digital Literacy: Computer Basics—Lesson 4

[Computer Operating Systems](#)

[4.070] Windows 7: Using Disks and Devices—Lesson 4

[Windows 7 Lesson Plan: Using Disks and Devices](#)

[5.118] PowerPoint 2010 Term Project: Lesson 3

[Printing \(project\)](#)

---

## Task Number 40

### Explain the hardware found in a server.

#### Definition

Explanation should include

- roles and relationships among the various components
- central processing unit (CPU)
- memory
- network adapters (wired and wireless)
- graphic and sound cards
- mass storage devices (internal) (Serial Advanced Technology Attachment [SATA], solid state drive [SSD], digital versatile drive read-only memory [DVD ROM], Blu-ray disc, read-only memory [BD ROM])
- ports (e.g., Universal Serial Bus [USB2], USB3, serial, parallel)
- peripherals (e.g., printers, removable media/storage)
- input and output devices
- motherboard
- power supply
- Plug n Play hardware memory
- video graphics processors
- Ethernet and wireless adapters.

## FBLA Competitive Events and Activities Areas

### Business Communication

### Computer Applications

## **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

## **Network Design**

## **Networking Concepts**

## **Word Processing**

## **Microsoft Imagine Academy Resources**

[2.009] Microsoft Digital Literacy: Computer Basics—Lesson 4

[Computer Operating Systems](#)

[4.070] Windows 7: Using Disks and Devices—Lesson 4

[Windows 7 Lesson Plan: Using Disks and Devices](#)

[5.188] Windows 7 Higher Education: Lesson 8—Exercise 1

[Operating System Updates \(project\)](#)

## **NBEA Achievement Standards for Information Technology**

**Describe current and emerging hardware; configure, install, and upgrade hardware; diagnose problems; and repair hardware.**

**Describe interrelationships between hardware components and supportive software.**

**Remove, upgrade, store, and install computer hardware and supportive software.**

**Repair computer hardware and solve supportive software problems.**

**Select operating systems and utilities appropriate for specific hardware, software, and tasks.**

**Troubleshoot advanced hardware and supportive software problems.**

---

## **Task Number 41**

**Explain the uses of current and emerging server and storage hardware.**

### **Definition**

Explanation of server and storage hardware includes

- server types
  - blade
  - symmetric multiprocessing (SMP)
- storage types
  - redundant array of independent disks (RAID)
  - SATA
  - Small Computer System Interface (SCSI)
  - Fibre Channel (FC).

Explanation of storage hardware should also include

- characteristics
  - distributed antennae system (DAS)
    - partitioning and formatting
    - interfaces
    - file systems
    - various RAID configurations
    - mechanical disk specifications
  - network attached storage (NAS), storage area network (SAN), just a bunch of disks (JBOD), tape, optical, flash
  - hot swappable
- role
- cost/benefit analysis
- software design description (SDD) vs. mechanical
- performance considerations.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

## **Microsoft Imagine Academy Resources**

### **[3.019] Configuring Disks and Device Drivers—E-Learning Module 1**

[Configuring Disk Partitions on Client Computers Running Windows 7 Operating Systems](#)

### **[4.070] Windows 7: Using Disks and Devices—Lesson 4**

[Windows 7 Lesson Plan: Using Disks and Devices](#)

**[5.224] Windows Server 2008 Network Infrastructure Higher Education: Lesson 2—  
Project 1**  
[Disk Configuration \(project\)](#)

**NBEA Achievement Standards for Information Technology**

**Describe server functions, including specialized servers (e.g., Web, DHCP, DNS, mail, proxy servers), and identify hardware and software requirements, such as RAID.**

**Explore industry standards for cross-platform interface development (e.g., XML, ASP, PHP).**

**Install and configure network components to implement a functional network.**

**Install specialized servers (e.g., Web, DHCP, DNS, mail, proxy servers).**

**Select operating systems and utilities appropriate for specific hardware, software, and tasks.**

---

**Task Number 42**

**Explain the various security procedures related to storage devices.**

**Definition**

Explanation should include

- data redundant configuration software vs. hardware comparison
- encryption
- access control lists (ACLs) and permissions
- secure disposal
- data deletion procedures.

**FBLA Competitive Events and Activities Areas**

**Business Communication**

**Computer Applications**

**Cyber Security**

## **Task Number 43**

**Explain the uses of current and emerging server racking systems.**

### **Definition**

Explanation should include

- the characteristics of each piece/type of hardware
  - form factors
  - power requirement – power distribution unit (PDU), uninterruptible power supply (UPS)
  - rack-specific hardware and configuration
  - rack-Kernel-based Virtual Machine (KVM)
  - rails
  - cable management systems
- the role of each piece/type of hardware
- a cost/benefit analysis of each piece/type of hardware.

## **FBLA Competitive Events and Activities Areas**

**Business Communication**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

---

## **Task Number 44**

**Describe client-server architecture, including virtual server architecture.**

## **Definition**

Description should include

- characteristics of a client and a server
- the relationship to each other
- the roles in a network environment.

## **FBLA Competitive Events and Activities Areas**

**Business Communication**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

---

## **Task Number 45**

**Identify the services commonly found on a network server.**

### **Definition**

Identification should include a list of the most commonly used services found in the client-server environment, including

- email
- file
- printing
- application
- web
- network
- database
- routing and remote access.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

---

## **Task Number 46**

**Identify the various components of a virtual network system.**

### **Definition**

Identification should include

- hosts and guests
- management interfaces
- hypervisor
- resources allocated between client/server.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

---

## **Task Number 47**

**Explain the authentication of users in a network environment.**

### **Definition**

Explanation should include the

- process for logging a user onto a server and network, based on the client
- services software

- server's security features
- software being used (e.g., Active Directory [AD]).

## **FBLA Competitive Events and Activities Areas**

**Business Communication**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

---

---

# **Installing Network Operating System and Services**

---

---

## **Task Number 48**

**Compare essential network operating system components.**

### **Definition**

Comparison should include components that

- are common among all network operating systems
- vary among individual network operating system platforms.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**



Word Processing

## Microsoft Imagine Academy Resources

[4.092] Windows Server 2008 Network Infrastructure: Installing Windows Server 2008—  
Lesson 2

[Windows Server 2008 NI Lesson Plan: Installing Windows Server 2008](#)

[5.222] Windows Server 2008 Network Infrastructure Higher Education: Lesson 1—  
Project 1

[Domain Function Levels \(project\)](#)

## NBEA Achievement Standards for Information Technology

Install and configure network operating systems.

---

## Task Number 49

**Determine when to use peer-to-peer and/or directory services.**

### Definition

Determination should include

- consideration of the needs of the company
- benefits and limitations of peer-to-peer and directory service models.

## FBLA Competitive Events and Activities Areas

Computer Applications

Network Design

Networking Concepts

Word Processing

## Microsoft Imagine Academy Resources

[4.097] Windows Server 2008 Network Infrastructure: Configuring Print Services—Lesson 7

[Windows Server 2008 NI Lesson Plan: Configuring Print Services](#)

[5.223] Windows Server 2008 Network Infrastructure Higher Education: Lesson 2—Exercise 1

[Sever Roles \(project\)](#)

---

## **Task Number 50**

**Identify major decisions associated with the installation of a network operating system.**

### **Definition**

Identification should include decisions that must be made before installing network operating systems, including licensing and features.

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

### **Microsoft Imagine Academy Resources**

[4.092] Windows Server 2008 Network Infrastructure: Installing Windows Server 2008—Lesson 2

[Windows Server 2008 NI Lesson Plan: Installing Windows Server 2008](#)

[5.223] Windows Server 2008 Network Infrastructure Higher Education: Lesson 2—Exercise 1

[Sever Roles \(project\)](#)

---

## **Task Number 51**

**Select server services.**

## Definition

Selection should include

- choosing and accessing key server services
  - printers
  - Domain Name System (DNS)
  - Dynamic Host Configuration Protocol (DHCP)
  - web (Hypertext Transfer Protocol/Hypertext Transfer Protocol Secure [HTTP/HTTPS]).

## FBLA Competitive Events and Activities Areas

### Computer Applications

### Network Design

### Networking Concepts

### Word Processing

## Microsoft Imagine Academy Resources

[4.094] Windows Server 2008 Network Infrastructure: Configuring and Managing Windows Server 2008—Lesson 4

[Windows Server 2008 NI Lesson Plan: Configuring and Managing the DNS Server Role](#)

[5.218] Windows Server 2008 Active Directory Higher Education: Lesson 12—Project 1 [Domain Name System \(project\)](#)

## NBEA Achievement Standards for Information Technology

Describe server functions, including specialized servers (e.g., Web, DHCP, DNS, mail, proxy servers), and identify hardware and software requirements, such as RAID.

---

## Task Number 52

### Install a server operating system.

#### Definition

Installation should include following the manufacturer's specifications to install a server operating system.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

**[4.092] Windows Server 2008 Network Infrastructure: Installing Windows Server 2008—  
Lesson 2**

[Windows Server 2008 NI Lesson Plan: Installing Windows Server 2008](#)

## **NBEA Achievement Standards for Information Technology**

**Install specialized servers (e.g., Web, DHCP, DNS, mail, proxy servers).**

---

---

# **Configuring Network Servers**

---

---

## **Task Number 53**

### **Implement directory services on a network.**

#### **Definition**

Implementation should include

- Lightweight Directory Access Protocol (LDAP), such as naming conventions and hierarchical structures
- other related standards.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

**[3.025] Configuring File Access and Printers on Windows 7 Client Computers—E-Learning Module 3**

[Describing Authentication and Authorization](#)

**[4.078] Windows Server 2008 Active Directory: An Introduction to Active Directory Domain Services—Lesson 1**

[Windows Server 2008 AD Lesson Plan: An Introduction to Active Directory Domain Services](#)

**[5.198] Windows Server 2008 Active Directory Higher Education: Lesson 2—Exercise 1**  
[Active Directory Installation \(project\)](#)

---

## **Task Number 54**

### **Manage directory and file replication.**

#### **Definition**

Management should include

- describing the uses
- determining the requirements
- establishing the processes.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

## Task Number 55

### Describe the structure and architecture of the DNS.

#### Definition

Description should include

- name servers—resolve computer or domain names to Internet Protocol (IP) addresses
- domain name space—a hierarchical grouping of names in various structures (e.g., root-level domains, top-level domains, second-level domains, and host names)
- domain resource records (e.g., A, AAAA, mail exchanger [MX], PTR)
- time to live (TTL)
- security vulnerabilities associated with DNS
- types of DNS queries and their usage.

#### FBLA Competitive Events and Activities Areas

##### Computer Applications

##### Network Design

##### Networking Concepts

##### Word Processing

#### Microsoft Imagine Academy Resources

[3.033] Configuring Network Connectivity—E-Learning Module 3

[Describing Name Resolution](#)

[4.094] Windows Server 2008 Network Infrastructure: Configuring and Managing Windows Server 2008—Lesson 4

[Windows Server 2008 NI Lesson Plan: Configuring and Managing the DNS Server Role](#)

[5.217] Windows Server 2008 Active Directory Higher Education: Lesson 12—Exercise 1  
[Domain Name System \(project\)](#)

---

## Task Number 56

## **Install the DNS.**

### **Definition**

Installation should include

- configuring zones, replications, TTL values, and forwarders, as needed
- following the manufacturer's instructions for the running operating system (OS).

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

## **Microsoft Imagine Academy Resources**

[3.033] **Configuring Network Connectivity—E-Learning Module 3**

[Describing Name Resolution](#)

[4.094] **Windows Server 2008 Network Infrastructure: Configuring and Managing Windows Server 2008—Lesson 4**

[Windows Server 2008 NI Lesson Plan: Configuring and Managing the DNS Server Role](#)

[5.217] **Windows Server 2008 Active Directory Higher Education: Lesson 12—Exercise 1 Domain Name System (project)**

---

## **Task Number 57**

### **Explain how a DHCP client obtains an IP address from a DHCP server.**

#### **Definition**

Explanation should include

- requesting an IP address
- configuring the length of the IP address' lease
- setting common parameters with a lease (default gateway, DNS servers, etc.)
- identifying the function of an automatic private IP address (APIPA)

- identifying the function of a static IP address
- identifying the alternate configuration of an IP address.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

## **Microsoft Imagine Academy Resources**

[3.034] **Configuring Network Connectivity—E-Learning Module 4**

[Implementing Automatic IP Address Allocation](#)

[4.091] **Windows Server 2008 Network Infrastructure: An Introduction to Networking Concepts—Lesson 1**

[Windows Server 2008 NI Lesson Plan: An Introduction to Networking Concepts](#)

[5.225] **Windows Server 2008 Network Infrastructure Higher Education: Lesson 3—Exercise 1**

[DHCP \(project\)](#)

---

## **Task Number 58**

### **Install a DHCP service.**

#### **Definition**

Installation should include

- adhering to the operating system's specifications
- managing the security of DHCP and network threats to DHCP
- explaining the role of the DHCP relay agent (i.e., configured on a router with the IP address of the computer running DHCP, enabling the agent to forward requests from clients to DHCP servers on remote subnets)
- determining when or why a DHCP relay agent (or helper address) is necessary.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**



**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

[3.034] **Configuring Network Connectivity—E-Learning Module 4**

[Implementing Automatic IP Address Allocation](#)

[4.093] **Windows Server 2008 Network Infrastructure: Configuring and Managing Windows Server 2008—Lesson 3**

[Windows Server 2008 NI Lesson Plan: Configuring and Managing Windows Server 2008](#)

[5.225] **Windows Server 2008 Network Infrastructure Higher Education: Lesson 3—Exercise 1**

[DHCP \(project\)](#)

---

## **Task Number 59**

### **Manage fault-tolerant volumes, using RAID.**

#### **Definition**

Management should include

- explaining the characteristics of software RAID and hardware RAID
- describing RAID 0, RAID 1, RAID 5, and RAID 1+0
- determining the level of fault tolerance vs. the amount of system overhead needed
- deciding whether or not to mirror the drives.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

[3.019] Configuring Disks and Device Drivers—E-Learning Module 1

[Configuring Disk Partitions on Client Computers Running Windows 7 Operating Systems](#)

[4.096] Windows Server 2008 Network Infrastructure: Configuring File Services—Lesson 6

[Windows Server 2008 NI Lesson Plan: Configuring File Services](#)

[5.224] Windows Server 2008 Network Infrastructure Higher Education: Lesson 2—  
Project 1

[Disk Configuration \(project\)](#)

---

## Task Number 60

**Explain the difference between roaming and local profiles.**

### Definition

Explanation should include the

- storage of all user files on server storage devices
- elimination of access to local computer drives.

### Related Standards of Learning

#### English

##### 12.5

The student will read, interpret, analyze, and evaluate a variety of nonfiction texts.

- a. Use critical thinking to generate and respond logically to literal, inferential, and evaluative questions about the text(s).
- b. Identify and synthesize resources to make decisions, complete tasks, and solve specific problems.
- c. Analyze multiple texts addressing the same topic to determine how authors reach similar or different conclusions.
- d. Recognize and analyze use of ambiguity, contradiction, paradox, irony, overstatement, and understatement in text.
- e. Analyze false premises claims, counterclaims, and other evidence in persuasive writing.

### FBLA Competitive Events and Activities Areas

#### Computer Applications

#### Network Design

#### Networking Concepts

## Microsoft Imagine Academy Resources

[5.190] Windows 7 Higher Education: Lesson 9—Exercise 1

[Local Groups & Users \(project\)](#)

---

## Task Number 61

### Implement directory replication.

#### Definition

Implementation should include automating a scheduled replication process between servers for the sake of redundancy.

#### FBLA Competitive Events and Activities Areas

Computer Applications

Network Design

Networking Concepts

Word Processing

## Microsoft Imagine Academy Resources

[4.080] Windows Server 2008 Active Directory: Using Active Directory Sites—Lesson 3

[Windows Server 2008 AD Lesson Plan: Using Active Directory Sites](#)

[5.293] Windows Server 2008 Active Directory Higher Education: Lesson 3—Project 1

[Replication Process \(project\)](#)

---

## Task Number 62

### Troubleshoot directory services replication.

#### Definition

Troubleshooting should include identifying reasons and remedies to replicate services.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

---

## **Task Number 63**

### **Implement Internet Printing Protocol (IPP) services.**

#### **Definition**

Implementation should include

- describing IPP services
- managing printers from a web browser
- sending print jobs to printers using the HTTP protocol
- diagnosing problems using utilities.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

**[3.026] Configuring File Access and Printers on Windows 7 Client Computers—E-Learning Module 4**

[Installing, Configuring, and Administering Printers](#)

**[4.097] Windows Server 2008 Network Infrastructure: Configuring Print Services—Lesson 7**

[Windows Server 2008 NI Lesson Plan: Configuring Print Services](#)

## **Task Number 64**

### **Explain types of server malware protection.**

#### **Definition**

Explanation should include

- antivirus software, spam, adware, spyware filtering, and patch management
- characteristics of each form
- strengths and weaknesses of each form
- determinations about which forms are necessary in various environments
- location where protections are deployed (e.g., email security gateways, web security gateways, endpoints)
- effects of each form on a server
- performance impact.

#### **FBLA Competitive Events and Activities Areas**

##### **Network Design**

##### **Networking Concepts**

##### **Word Processing**

#### **Microsoft Imagine Academy Resources**

**[3.038] Configuring Network Security in Windows 7—E-Learning Module 3**  
[Configuring Windows Defender to Help Protect a Windows 7 Client Computer against Malicious Software](#)

**[4.076] Windows 7: Windows 7 Administration—Lesson 11**  
[Windows 7 Lesson Plan: Windows 7 Administration](#)

**[5.194] Windows 7 Higher Education: Lesson 11—Exercise 1**  
[Troubleshooting \(project\)](#)

---

## **Task Number 65**

## **Identify security threats to applications and web services.**

### **Definition**

Identification should include

- Structured Query Language (SQL) injection
- buffer overflows
- cross-site scripting (XSS) attacks.

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

---

## **Task Number 66**

### **Implement web-based and server security features.**

#### **Definition**

Implementation should include utilizing web-based and server security features to control access to an Internet server by

- employing password authentication schemes
- restricting or permitting access at the IP address level
- managing server access keys
- disabling folder browsing
- patching software and operating systems
- testing systems for vulnerabilities.

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

**Microsoft Imagine Academy Resources**

[3.036] **Configuring Network Security in Windows 7—E-Learning Module 1**  
[Configuring Security-related Settings in Internet Explorer to Help Protect a Windows 7 Client Computer that Is Connected to the Internet](#)

---

## **Task Number 67**

### **Describe the Secure Sockets Layer (SSL) and Transport Layer Security (TLS).**

#### **Definition**

Description should include

- defining the purpose of SSL/TLS
- explaining the benefits of SSL/TLS
- describing the difference between SSL and TLS
- explaining the deprecation of SSL protocol versions in favor of TLS protocols
- summarizing the process of obtaining an SSL digital certificate
- explaining common issues with digital certificates.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

**Microsoft Imagine Academy Resources**

[5.230] **Windows Server 2008 Network Infrastructure Higher Education: Lesson 5—Project 1**  
[Authentication Protocols \(project\)](#)

---

## **Task Number 68**

### **Explore a security certificate.**

#### **Definition**

Exploration should include

- understanding the purpose and benefits of certificates and public key infrastructure (PKI)
- describing how a certificate affects user security
- identifying how a certificate is used to encrypt data and how a certificate/key combination is used to decrypt said data
- viewing certificates in Internet browsers.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Network Design**

**Networking Concepts**

**Word Processing**

#### **Microsoft Imagine Academy Resources**

**[4.090] Windows Server 2008 Active Directory: Configuring Name Resolution and Additional Services—Lesson 13**

[Windows Server 2008 AD Lesson Plan: Configuring Active Directory Certificate Services](#)

**[5.220] Windows Server 2008 Active Directory Higher Education: Lesson 13—Project 1 Certificate Services (project)**

---

## **Task Number 69**

### **Describe firewalls.**

#### **Definition**

Description of firewalls should include



- characteristics, uses, and benefits of each to include performance comparison
- comparison of software and hardware firewalls
- pros and cons of host-based vs. network.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

## **Microsoft Imagine Academy Resources**

**[3.037] Configuring Network Security in Windows 7—E-Learning Module 2**

[Configuring Windows Firewall on a Windows 7 Client Computer](#)

**[4.099] Windows Server 2008 Network Infrastructure: Securing Data Transmission and Authentication —Lesson 9**

[Windows Server 2008 NI Lesson Plan: Securing Data Transmission and Authentication](#)

---

## **Task Number 70**

### **Install a firewall.**

#### **Definition**

Installation should include following the

- manufacturer's instructions
- business and security requirements to securely enable applications across a network.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

## Microsoft Imagine Academy Resources

[3.037] Configuring Network Security in Windows 7—E-Learning Module 2

[Configuring Windows Firewall on a Windows 7 Client Computer](#)

[4.099] Windows Server 2008 Network Infrastructure: Securing Data Transmission and Authentication —Lesson 9

[Windows Server 2008 NI Lesson Plan: Securing Data Transmission and Authentication](#)

---

## Task Number 71

### Configure basic security policies of a firewall.

#### Definition

Configuration should include

- blocking by protocol, port, or data
- Uniform Resource Locator (URL) protection
- malware protection
- protocol inspection
- configuration of overall unified threat protection.

#### FBLA Competitive Events and Activities Areas

Computer Applications

Network Design

Networking Concepts

Word Processing

## Microsoft Imagine Academy Resources

[4.099] Windows Server 2008 Network Infrastructure: Securing Data Transmission and Authentication —Lesson 9

[Windows Server 2008 NI Lesson Plan: Securing Data Transmission and Authentication](#)

---

## Task Number 72

### Implement user security policies.

## **Definition**

Implementation should include following an established security plan to ensure measures are in place to protect the network.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Cyber Security**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

## **Microsoft Imagine Academy Resources**

[3.047] Securing Windows 7 Desktops—E-Learning Module 2

[Configuring Local Security Policy Settings on a Client Computer Running the Windows 7 Operating System](#)

[4.084] Windows Server 2008 Active Directory: An Introduction to Group Policy—Lesson 7

[Windows Server 2008 AD Lesson Plan: An Introduction to Group Policy](#)

[5.193] Windows 7 Higher Education: Lesson 10—Project 1 Policies (project)

---

---

# **Performing Network Administrative Functions**

---

---

## **Task Number 73**

### **Define different types of accounts.**

#### **Definition**

Definition should include

- types of accounts
  - user
  - group
  - system
  - administration
  - service
- characteristics
- application in a network environment.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

#### **Introduction to Business Procedures**

#### **Network Design**

#### **Networking Concepts**

#### **Word Processing**

## **Microsoft Imagine Academy Resources**

[3.046] Securing Windows 7 Desktops—E-Learning Module 1

[Configuring Application Restrictions by Using Windows AppLocker](#)

[4.085] Windows Server 2008 Active Directory: Configuring Users and Groups using Group Policy—Lesson 8

[Windows Server 2008 AD Lesson Plan: Configuring Users and Groups using Group Policy](#)

[5.190] Windows 7 Higher Education: Lesson 9—Exercise 1

[Local Groups & Users \(project\)](#)

---

## **Task Number 74**

### **Configure user and group accounts.**

#### **Definition**

Configuration should include making decisions based on user needs for connectivity, applications, permissions, and/or privileges.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

[3.046] Securing Windows 7 Desktops—E-Learning Module 1

[Configuring Application Restrictions by Using Windows AppLocker](#)

[4.085] Windows Server 2008 Active Directory: Configuring Users and Groups using Group Policy—Lesson 8

[Windows Server 2008 AD Lesson Plan: Configuring Users and Groups using Group Policy](#)

[5.190] Windows 7 Higher Education: Lesson 9—Exercise 1

[Local Groups & Users \(project\)](#)

---

## **Task Number 75**

**Implement global, domain, and local account policies.**

### **Definition**

Implementation should include

- establishing, governing, and observing well-defined policies
- naming conventions
- creating password and access parameters
- setting up user rights and privileges.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

## Word Processing

### Microsoft Imagine Academy Resources

[3.046] Securing Windows 7 Desktops—E-Learning Module 1

[Configuring Application Restrictions by Using Windows AppLocker](#)

[4.084] Windows Server 2008 Active Directory: An Introduction to Group Policy—Lesson 7

[Windows Server 2008 AD Lesson Plan: An Introduction to Group Policy](#)

[5.193] Windows 7 Higher Education: Lesson 10—Project 1

[Policies \(project\)](#)

---

## Task Number 76

**Describe considerations and procedures for deploying sharing applications on the network.**

### Definition

Description should include

- risks and advantages
- procedures for deploying on various platforms
- security considerations.

### FBLA Competitive Events and Activities Areas

#### Computer Applications

#### Introduction to Business Procedures

#### Network Design

#### Networking Concepts

#### Word Processing

### Microsoft Imagine Academy Resources

[4.096] Windows Server 2008 Network Infrastructure: Configuring File Services—Lesson 6

[Windows Server 2008 NI Lesson Plan: Configuring File Services](#)

## Task Number 77

### Manage shared disk resources.

#### Definition

Management should include

- identifying users' access needs
- planning the sharing of resources for the most effective use of disk space
- creating and administering rights (e.g., permissions, quotas)
- supervising shared resources to minimize negative effects on performance and appropriate permissions assigned
- identifying and correcting hardware failures
- checking system health indicators.

#### FBLA Competitive Events and Activities Areas

##### Computer Applications

##### Introduction to Business Procedures

##### Network Design

##### Networking Concepts

##### Word Processing

#### Microsoft Imagine Academy Resources

[3.046] Securing Windows 7 Desktops—E-Learning Module 1  
[Configuring Application Restrictions by Using Windows AppLocker](#)

[4.070] Windows 7: Using Disks and Devices—Lesson 4  
[Windows 7 Lesson Plan: Using Disks and Devices](#)

[5.209] Windows Server 2008 Active Directory Higher Education: Lesson 8—Exercise 1  
[Disk Quotas \(project\)](#)

---

## Task Number 78

# **Identify the procedures for the administration of a shared printer.**

## **Definition**

Identification should include

- following manufacturer's installation specifications
- utilizing printer wizards
- installing printer drivers
- troubleshooting procedures
- employing user printing permissions.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

#### **Introduction to Business Procedures**

#### **Network Design**

#### **Networking Concepts**

#### **Word Processing**

## **Microsoft Imagine Academy Resources**

[3.026] **Configuring File Access and Printers on Windows 7 Client Computers—E-Learning Module 4**

[Installing, Configuring, and Administering Printers](#)

[4.097] **Windows Server 2008 Network Infrastructure: Configuring Print Services—Lesson 7**

[Windows Server 2008 NI Lesson Plan: Configuring Print Services](#)

[5.233] **Windows Server 2008 Network Infrastructure Higher Education: Lesson 7—Exercise 1**

[Printing \(project\)](#)

---

## **Task Number 79**

**Identify the functions, features, and guidelines of enterprise collaboration and communication software calendaring.**



## **Definition**

Identification should include listing

- functions and features common to enterprise communication, storage, collaboration, and management of software, email, and calendaring systems
- appropriate guidelines for email usage
- ethical, legal, and privacy concerns.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

#### **Introduction to Business Procedures**

#### **Network Design**

#### **Networking Concepts**

#### **Word Processing**

---

## **Task Number 80**

### **Implement groups for resource access and management.**

#### **Definition**

Implementation should include

- importance of separation of duties and principle of least privilege
- group types and memberships
- permissions and responsibilities assigned to groups.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

#### **Introduction to Business Procedures**

#### **Network Design**

#### **Networking Concepts**

## Word Processing

---

### **Task Number 81**

#### **Implement disk quotas.**

##### **Definition**

Implementation should include

- identifying the reasons for and benefits of establishing and following disk quotas
- following the manufacturer's instructions.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Introduction to Business Procedures**

##### **Network Design**

##### **Networking Concepts**

##### **Word Processing**

---

### **Task Number 82**

#### **Explain concepts related to logon authentication.**

##### **Definition**

Explanation should include single and multi-factors authentication and

- process by which a user name is located and authenticated
- various types of authentication (e.g., anonymous, basic, form-based, secure, integrated, multi-factor [security tokens, smart cards, biometrics]).

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Word Processing**

---

## **Task Number 83**

**Identify methods of encryption.**

### **Definition**

Identification should include

- asymmetric encryption
- symmetric encryption
- one-way hash
- salting.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Word Processing**

---

---

# **Performing Network Management and Security Function**

---

---

## **Task Number 84**

### **Develop a plan to avoid data loss.**

#### **Definition**

Development should include

- determining what data should be backed up
- choosing the type and frequency of backups
- establishing a policy for restoring data
- selecting a remote storage facility
- documenting the plan
- determining a retention period
- deciding on tape backup vs. disk backup
- selecting file-by-file backups vs. snapshots vs. system images
- determining the appropriate levels of access to data, based on principle of least privilege
- implementing strategies and solutions to prevent data loss, whether accidental or as a result of malicious activity
- creating/documenting a backup policy
- testing the backup plan, to include restoration of data.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Introduction to Business Procedures**

##### **Network Design**

##### **Networking Concepts**

##### **Word Processing**

#### **Microsoft Imagine Academy Resources**

**[4.088] Windows Server 2008 Active Directory: Active Directory Maintenance, Troubleshooting, and Disaster Recovery—Lesson 11**

[Windows Server 2008 AD Lesson Plan: Active Directory Maintenance, Troubleshooting, and Disaster Recovery](#)

**[5.215] Windows Server 2008 Active Directory Higher Education: Lesson 11—Exercise 1**  
[Windows Backup \(project\)](#)

## **NBEA Achievement Standards for Information Technology**

**Develop and implement data retention and destruction schedules.**

**Develop and implement disaster prevention and recovery policies and procedures.**

**Discuss distributed storage technologies (e.g., SAN, NAS).**

---

## **Task Number 85**

### **Back up files and directories.**

#### **Definition**

Backing up should be performed at regular intervals and according to a carefully developed policy and well-tested plan.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Introduction to Business Procedures**

##### **Network Design**

##### **Networking Concepts**

##### **Word Processing**

#### **Microsoft Imagine Academy Resources**

**[3.030] Configuring Mobile Computing and Remote Access in Windows 7—E-Learning Module 3**

[Configuring Mobile Computer and Device Settings](#)

**[3.051] Optimizing and Maintaining Windows 7 Client Computers—E-Learning Module 1**  
[Backing Up and Restoring Data on a Client Computer Running Windows 7 by Using Windows Backup](#)

**[4.088] Windows Server 2008 Active Directory: Active Directory Maintenance, Troubleshooting, and Disaster Recovery—Lesson 11**

[Windows Server 2008 AD Lesson Plan: Active Directory Maintenance, Troubleshooting, and Disaster Recovery](#)

**[5.125] PowerPoint 2010 Higher Education: Lesson 2—Exercise 1**

## **Task Number 86**

### **Restore files and directories.**

#### **Definition**

Restoration should be performed according to a carefully developed policy and well-tested plan.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Introduction to Business Procedures**

##### **Network Design**

##### **Networking Concepts**

##### **Word Processing**

#### **Microsoft Imagine Academy Resources**

[3.051] **Optimizing and Maintaining Windows 7 Client Computers—E-Learning Module 1**  
[Backing Up and Restoring Data on a Client Computer Running Windows 7 by Using Windows Backup](#)

[4.088] **Windows Server 2008 Active Directory: Active Directory Maintenance, Troubleshooting, and Disaster Recovery—Lesson 11**  
[Windows Server 2008 AD Lesson Plan: Active Directory Maintenance, Troubleshooting, and Disaster Recovery](#)

[5.216] **Windows Server 2008 Active Directory Higher Education: Lesson 11—Project 1**  
[Restore \(project\)](#)

#### **NBEA Achievement Standards for Information Technology**

**Implement organizational policies and procedures for security, privacy, and risk management.**

**Implement procedures used to recover information from failures and security breaches (e.g., malware, viral infection).**

---

## **Task Number 87**

### **Develop a network performance monitoring plan.**

#### **Definition**

Development should include

- determining what activity should be monitored
- considering the costs of system resources
- determining baselines and expected performance levels
- choosing the monitoring method
- documenting the plan.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Introduction to Business Procedures**

##### **Network Design**

##### **Networking Concepts**

##### **Word Processing**

#### **Microsoft Imagine Academy Resources**

[3.051] **Optimizing and Maintaining Windows 7 Client Computers—E-Learning Module 1**  
[Backing Up and Restoring Data on a Client Computer Running Windows 7 by Using Windows Backup](#)

[4.074] **Windows 7: Windows 7 Performance—Lesson 8**  
[Windows 7 Lesson Plan: Windows 7 Performance](#)

---

## **Task Number 88**

### **Troubleshoot user access problems.**

#### **Definition**

Troubleshooting should include following established procedures for addressing common problems, such as

- expired password
- expired account
- network connectivity issues
- exceeded disk quota
- offline printer
- printer unable to connect
- shared resources inaccessible.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

#### **Introduction to Business Procedures**

#### **Network Design**

#### **Networking Concepts**

#### **Word Processing**

## **Microsoft Imagine Academy Resources**

**[3.054] Optimizing and Maintaining Windows 7 Client Computers—E-Learning Module 4**  
[Maintaining the Performance of a Client Computer Running Windows 7 by Using Performance Management Tools](#)

**[4.088] Windows Server 2008 Active Directory: Active Directory Maintenance, Troubleshooting, and Disaster Recovery—Lesson 11**  
[Windows Server 2008 AD Lesson Plan: Active Directory Maintenance, Troubleshooting, and Disaster Recovery](#)

**[5.189] Windows 7 Higher Education: Lesson 8—Project 1**  
[Troubleshooting \(project\)](#)

---

## **Task Number 89**

### **Develop a preventive maintenance plan.**

#### **Definition**

Development should include identifying and documenting preventive tasks and procedures that maintain network stability, including

- power issues (uninterrupted power supply [UPS], spikes, surges)
- defragmentation



- disk clean
- virus scan
- hardware and software maintenance (i.e., security patches)
- performance monitoring.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

#### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

#### **Introduction to Business Procedures**

#### **Network Design**

#### **Networking Concepts**

#### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

---

## **Task Number 90**

### **Develop an audit policy.**

#### **Definition**

Development should include

- deciding what types of access need to be monitored and why
- justifying auditing methods
- determining resources needed to audit events
- documenting audit policy.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

#### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

#### **Introduction to Business Procedures**

## **Network Design**

## **Networking Concepts**

## **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

## **Word Processing**

---

# **Task Number 91**

## **Monitor server resources to track usage and disk space.**

### **Definition**

Monitoring should include

- following guidelines outlined in the audit policy
- observing the method for mapping storage usage on a scheduled basis
- tracking the method for observing performance objectives
- determining baselines and expected performance levels
- comparing utilization to baselines.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Introduction to Business Procedures**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

## **Microsoft Imagine Academy Resources**

[3.051] **Optimizing and Maintaining Windows 7 Client Computers—E-Learning Module 1**  
[Backing Up and Restoring Data on a Client Computer Running Windows 7 by Using Windows Backup](#)

[4.070] **Windows 7: Using Disks and Devices—Lesson 4**  
[Windows 7 Lesson Plan: Using Disks and Devices](#)

**[5.224] Windows Server 2008 Network Infrastructure Higher Education: Lesson 2—  
Project 1**  
[Disk Configuration \(project\)](#)

## **NBEA Achievement Standards for Information Technology**

**Use appropriate tools to monitor network performance.**

---

## **Task Number 92**

### **Set up file, directory, and printer auditing.**

#### **Definition**

Setting up should include following guidelines set forth in the audit policy to track the usage of files, directories, and printers.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

##### **Introduction to Business Procedures**

##### **Network Design**

##### **Networking Concepts**

##### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

##### **Word Processing**

#### **Microsoft Imagine Academy Resources**

**[4.097] Windows Server 2008 Network Infrastructure: Configuring Print Services—Lesson 7**  
[Windows Server 2008 NI Lesson Plan: Configuring Print Services](#)

---

## **Task Number 93**

### **Explain the importance of asset management and documentation.**

#### **Definition**

Explanation should include inventory, licensing, labeling, and life cycle management for both hardware and software.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Introduction to Business Procedures**

##### **Network Design**

##### **Networking Concepts**

##### **Word Processing**

---

## **Task Number 94**

### **Describe security concepts.**

#### **Definition**

Description should include

- mantrap
- radio frequency ID (RFID) chip
- biometric
- keypad
- access list.

#### **FBLA Competitive Events and Activities Areas**

##### **Computer Applications**

##### **Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Word Processing**

---

## **Task Number 95**

### **Document a network security plan.**

#### **Definition**

Documentation includes recording, in writing, policies and procedures related to a developed security plan that addresses

- risks
- vulnerabilities
- breaches
- other issues.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

**Word Processing**

#### **Microsoft Imagine Academy Resources**

**[4.083] Windows Server 2008 Active Directory: Administration of Active Directory—  
Lesson 6**

## **NBEA Achievement Standards for Information Technology**

**Design and implement a security plan for an information system, including communications systems.**

**Design and implement security, privacy, and risk management policies and procedures for information technology.**

**Design hardware and software network security solutions (e.g., VPN, SSL, firewall).**

**Develop and implement data retention and destruction schedules.**

---

## **Task Number 96**

### **Implement a network security plan.**

#### **Definition**

Implementation should include explaining and enforcing well-documented usage policies that ensure network security, including

- Internet security software
- antivirus or anti-malware software
- protocol control
- network segmentation
- implementation of the principle of least privilege
- acceptable use policies
- access points
- intrusion detection systems (host and network based)
- intrusion protection systems (host and network based).

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Cyber Security**

### **Network Design**

### **Networking Concepts**

## **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

## **Word Processing**

## **Microsoft Imagine Academy Resources**

**[4.083] Windows Server 2008 Active Directory: Administration of Active Directory—  
Lesson 6**

[Windows Server 2008 AD Lesson Plan: Security Planning and Administrative Delegation of Active Directory](#)

## **NBEA Achievement Standards for Information Technology**

**Design and implement security, privacy, and risk management policies and procedures for information technology.**

**Design hardware and software network security solutions (e.g., VPN, SSL, firewall).**

**Develop and implement data retention and destruction schedules.**

**Develop and implement disaster prevention and recovery policies and procedures.**

**Implement procedures used to recover information from failures and security breaches (e.g., malware, viral infection).**

---

## **Task Number 97**

### **Describe hardening techniques.**

#### **Definition**

Description should include OS, application, and hardware, including

- identifying unneeded items (software, patches, open ports, roles, services)
- vulnerability scans
- endpoint security
- minimal setups.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

---

## **Task Number 98**

**Describe various forms of malware protection for clients and servers.**

### **Definition**

Description should include

- various forms
  - antivirus software
  - spam
  - adware
  - spyware filtering
  - patch management
- characteristics
  - function
  - cost
  - upkeep
  - reliability
  - reporting
- types of systems on which protection it is deployed
  - email security gateways
  - web security gateways
  - endpoints (workstations or servers).

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Introduction to Business Procedures**



## **Network Design**

### **Networking Concepts**

#### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

#### **Word Processing**

## **Microsoft Imagine Academy Resources**

[3.051] **Optimizing and Maintaining Windows 7 Client Computers—E-Learning Module 1**  
[Backing Up and Restoring Data on a Client Computer Running Windows 7 by Using Windows Backup](#)

[4.100] **Windows Server 2008 Network Infrastructure: Maintaining Network Health—Lesson 10**

[Windows Server 2008 NI Lesson Plan: Maintaining Network Health](#)

[5.239] **Windows Server 2008 Network Infrastructure Higher Education: Lesson 10—Exercise 1**

[Network Access Protection \(project\)](#)

---

## **Task Number 99**

### **Explain the basic network security systems and protocols.**

#### **Definition**

Explanation should include

- firewalls
- port security
- router access lists
- network intrusion detection system (NIDS)
- authentication protocols
- public key infrastructure (PKI)
- virtual private network (VPN)
- Internet Protocol Security (IPSec)
- virtual LAN (VLAN)
- security zones.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Word Processing**

---

---

# **Maintaining Servers**

---

---

## **Task Number 100**

### **Describe remote administration.**

#### **Definition**

Description should include the methods of implementing remote administration by utilizing remote access security.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Help Desk**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

**[3.031] Configuring Mobile Computing and Remote Access in Windows 7—E-Learning Module 4**

[Configuring Remote Desktop and Remote Assistance for Remote Access](#)

**[4.095] Windows Server 2008 Network Infrastructure: Configuring Routing and Remote Access (RRAS) and Wireless Networking—Lesson 5**

[Windows Server 2008 NI Lesson Plan: Configuring Routing and Remote Access \(RRAS\) and Wireless Networking](#)

**[5.195] Windows 7 Higher Education: Lesson 11—Project 1**

[Remote Desktop \(project\)](#)

---

## **Task Number 101**

**Identify the resources available to solve common support issues.**

### **Definition**

Identification of support should include resources such as

- built-in (e.g., help menus, tutorials)
- telephone
- web-based
- printed publications.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Help Desk**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

### **[3.030] Configuring Mobile Computing and Remote Access in Windows 7—E-Learning Module 3**

[Configuring Mobile Computer and Device Settings](#)

---

## **Task Number 102**

### **Describe service packs and patches.**

#### **Definition**

Description should include

- identifying characteristics, uses, and benefits of each
- explaining how to locate/obtain service packs and patches
- explaining why service packs and patches are required
- explaining how to install packs and patches
- explaining firmware updates
- defining patch management and change management
- explaining hardware compatibility lists
- identifying the need for testing and validation.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

#### **Cyber Security**

#### **Help Desk**

#### **Introduction to Business Procedures**

#### **Network Design**

#### **Networking Concepts**

#### **Word Processing**

## **Microsoft Imagine Academy Resources**

**[4.098] Windows Server 2008 Network Infrastructure: Maintaining and Updating Windows Server 2008—Lesson 8**

[Windows Server 2008 NI Lesson Plan: Maintaining and Updating Windows Server 2008](#)

**[5.236] Windows Server 2008 Network Infrastructure Higher Education: Lesson 8—Project 1**

[Automatic Updates \(project\)](#)

---

## **Task Number 103**

### **Describe performance monitoring.**

#### **Definition**

Description should include

- activating audit logs
- capturing utilization data
- comparing against a baseline.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Help Desk**

**Introduction to Business Procedures**

**Networking Concepts**

**Word Processing**

#### **Microsoft Imagine Academy Resources**

**[3.051] Optimizing and Maintaining Windows 7 Client Computers—E-Learning Module 1**

[Backing Up and Restoring Data on a Client Computer Running Windows 7 by Using Windows Backup](#)

**[4.074] Windows 7: Windows 7 Performance—Lesson 8**

[Windows 7 Lesson Plan: Windows 7 Performance](#)

---

## **Task Number 104**

**Describe the utilities that monitor a server's performance.**

### **Definition**

Description should include the characteristics of and procedures for using utilities (e.g., Microsoft Task Manager, system monitors).

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Help Desk**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Word Processing**

### **Microsoft Imagine Academy Resources**

[3.054] **Optimizing and Maintaining Windows 7 Client Computers—E-Learning Module 4**  
[Maintaining the Performance of a Client Computer Running Windows 7 by Using Performance Management Tools](#)

[4.088] **Windows Server 2008 Active Directory: Active Directory Maintenance, Troubleshooting, and Disaster Recovery—Lesson 11**  
[Windows Server 2008 AD Lesson Plan: Active Directory Maintenance, Troubleshooting, and Disaster Recovery](#)

[5.189] **Windows 7 Higher Education: Lesson 8—Project 1**  
[Troubleshooting \(project\)](#)

---

## **Task Number 105**

**Describe the backup/restore process for directory services.**

### **Definition**

Description should include

- system state backups
- registry backups
- backup utilities.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Help Desk**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Word Processing**

## **Microsoft Imagine Academy Resources**

[3.051] **Optimizing and Maintaining Windows 7 Client Computers—E-Learning Module 1**  
[Backing Up and Restoring Data on a Client Computer Running Windows 7 by Using Windows Backup](#)

[4.088] **Windows Server 2008 Active Directory: Active Directory Maintenance, Troubleshooting, and Disaster Recovery—Lesson 11**  
[Windows Server 2008 AD Lesson Plan: Active Directory Maintenance, Troubleshooting, and Disaster Recovery](#)

[5.215] **Windows Server 2008 Active Directory Higher Education: Lesson 11—Exercise 1**  
[Windows Backup \(project\)](#)

---

---

# **Implementing and Managing Web Servers**

---

---

**Task Number 106**

## **Describe the key protocols of web servers.**

### **Definition**

Description should include

- HTTP
- Hypertext Transfer Protocol Secure (HTTPS), SSL, and TLS
- FTP
- Simple Mail Transfer Protocol (SMTP)
- Network News Transfer Protocol (NNTP).

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

**Word Processing**

---

## **Task Number 107**

### **Install web-based services (e.g., Apache, Windows IIS).**

#### **Definition**

Installation should include observing documentation and licensing restrictions.

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**



## **Introduction to Business Procedures**

### **Network Design**

### **Networking Concepts**

### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Word Processing**

---

## **Task Number 108**

### **Configure web-based services**

#### **Definition**

Configuration should include using a utility (e.g., Internet Service Manager Snap-in) to configure and monitor Microsoft IIS.

### **FBLA Competitive Events and Activities Areas**

#### **Computer Applications**

#### **Cyber Security**

#### **Introduction to Business Procedures**

#### **Network Design**

#### **Networking Concepts**

#### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

#### **Word Processing**

---

## **Task Number 109**

## **Explain the major architectural components and security vulnerabilities of web-based services.**

### **Definition**

Explanation should include

- FTP publishing service
- web-based administrative service
- database service (e.g., SQL, MySQL)
- mail service
- World Wide Web (WWW) publishing service.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Cyber Security**

### **Introduction to Business Procedures**

### **Network Design**

### **Networking Concepts**

### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Word Processing**

---

## **Task Number 110**

## **Establish web-based services.**

### **Definition**

Establishment should include

- FTP publishing service
- web-based administrative service
- database service (e.g., SQL, MySQL)
- mail service

- WWW publishing service
- SMTP
- NNTP.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

**Word Processing**

---

## **Task Number 111**

### **Add virtual servers and directories.**

#### **Definition**

Addition should include using OS administration tools.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Word Processing**

---

## **Task Number 112**

### **Install a server-side programming language that supports dynamic content.**

#### **Definition**

Installation should include

- explaining the advantages and disadvantages of server-side programming languages (e.g., active server pages [ASP.NET], server-side Java [SSJ], hypertext preprocessor [PHP], Perl, Python)
- demonstrating the ability to install languages on a server.

### **FBLA Competitive Events and Activities Areas**

#### **Computer Applications**

#### **Cyber Security**

#### **Introduction to Business Procedures**

#### **Network Design**

#### **Networking Concepts**

#### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Word Processing**

---

---

## **Providing User Training and Support**

---

---

## **Task Number 113**

### **Identify user and network administrator training needs.**

#### **Definition**

Identification of user training needs should include

- logon steps
- FTP, access and security
- print operations
- data backups
- data storage policies.

Identification of network administrator training needs should include

- web network services
- system and security logs
- system backups
- maintenance of logon scripts.

### **FBLA Competitive Events and Activities Areas**

#### **Computer Applications**

#### **Cyber Security**

#### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

#### **Help Desk**

#### **Introduction to Business Procedures**

#### **Job Interview**

#### **Network Design**

#### **Networking Concepts**

#### **Word Processing**

---

## **Task Number 114**

## **Provide orientation (onboarding) about a network system for new employees.**

### **Definition**

Provision should include using a network guide that articulates

- procedures for logging on to the network
- methods for accessing resources on the network
- procedures for resolving common problems
- policies about system usage
- descriptions of available network resources.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Cyber Security**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Help Desk**

### **Introduction to Business Procedures**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

---

## **Task Number 115**

### **Develop a security awareness training plan.**

#### **Definition**

Development should include

- adhering to security policies
- instructing common security issues

- determining the subject matter and expected results of the training
- determining the format of the training plan (e.g., instructor-led, self-paced)
- selecting the trainees
- providing the method (e.g., one-to-one, hands-on) and mode (e.g., seminar) of training
- assessing the users' prior knowledge of and experience with the subject.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Cyber Security**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Help Desk**

### **Introduction to Business Procedures**

### **Network Design**

### **Networking Concepts**

### **Word Processing**

## **Task Number 116**

### **Provide training to users.**

#### **Definition**

Provision should include following a training plan and allowing users to demonstrate what they will have learned.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Cyber Security**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

**Help Desk**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Word Processing**

---

## **Task Number 117**

### **Create a user manual.**

#### **Definition**

Creation should include

- selecting the topics
- outlining the manual
- writing descriptions and instructions
- incorporating illustrations
- testing the accuracy of the manual
- deciding method of delivery (blog, newsletter, email, etc.)
- selecting topics to be covered and reviewed frequently.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

**Help Desk**

**Introduction to Business Procedures**

**Job Interview**

**Network Design**



**Networking Concepts**

**Word Processing**

---

## **Task Number 118**

### **Provide ongoing user support.**

#### **Definition**

Provision should include assisting users with computer problems by requiring that a support person be available during core business hours and demonstrating

- established troubleshooting procedures
- communication skills
- sensitivity to user needs and frustrations
- patience with users who do not have the same level of computer experience as the support person.

#### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Cyber Security**

**Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

**Help Desk**

**Introduction to Business Procedures**

**Network Design**

**Networking Concepts**

**Word Processing**

---

## **Task Number 119**

## **Track hardware and software usage problems.**

### **Definition**

Tracking should include

- operating a database or similar software tool
- documenting problems commonly experienced by network users
- targeting factors that may contribute to the problems
- detailing steps taken to resolve the problems.

## **FBLA Competitive Events and Activities Areas**

### **Computer Applications**

### **Cyber Security**

### **Help Desk**

### **Introduction to Business Procedures**

### **Network Design**

### **Networking Concepts**

### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Word Processing**

---

---

## **Performing Legal and Ethical Functions**

---

---

### **Task Number 120**

**Identify copyright and licensing laws that apply to computer use and network administration.**

## **Definition**

Identification should include laws that govern the use of software, information (text), and graphics.

## **FBLA Competitive Events and Activities Areas**

### **Business Ethics**

### **Business Law**

### **Computer Applications**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Introduction to Business Procedures**

### **Network Design**

### **Networking Concepts**

### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Word Processing**

## **Microsoft Imagine Academy Resources**

**[2.028] Microsoft Digital Literacy: Computer Security and Privacy—Lesson 5**

[Computer Ethics](#)

## **NBEA Achievement Standards for Information Technology**

**Analyze legal and ethical dilemmas within the framework of current laws and legislation (e.g., virus development, hacking, threats, phishing).**

**Compare and contrast various types of license agreements (e.g., open source, multiple license agreements, single-user installation, site license).**

**Demonstrate legal and ethical behaviors when using information technologies.**

**Discuss copyright rules and regulations (e.g., images, music, video, software).**

**Explain the consequences of illegal and unethical use of information technologies (e.g., piracy; illegal downloading; licensing infringement; inappropriate use of software, hardware, and mobile devices).**

**Read, interpret, and adhere to software license agreements and legal mandates (e.g., ADA, Sarbanne-Oxly).**

**Write organization policy for the legal and ethical use of information (e.g., code of ethics).**

---

## **Task Number 121**

### **Describe procedures to ensure the proper licensing of a client-server operating system and applications.**

#### **Definition**

Description should include steps for developing a method for

- tracking server connections (physical and virtual)
- monitoring software licenses
- searching for unlicensed software.

#### **FBLA Competitive Events and Activities Areas**

##### **Business Ethics**

##### **Business Law**

##### **Computer Applications**

##### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

##### **Introduction to Business Procedures**

##### **Network Design**

##### **Networking Concepts**

##### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

##### **Word Processing**

## **Microsoft Imagine Academy Resources**

**[2.028] Microsoft Digital Literacy: Computer Security and Privacy—Lesson 5**

[Computer Ethics](#)

## **NBEA Achievement Standards for Information Technology**

**Analyze legal and ethical dilemmas within the framework of current laws and legislation (e.g., virus development, hacking, threats, phishing).**

**Compare and contrast various types of license agreements (e.g., open source, multiple license agreements, single-user installation, site license).**

**Read, interpret, and adhere to software license agreements and legal mandates (e.g., ADA, Sarbanne-Oxly).**

**Write organization policy for the legal and ethical use of information (e.g., code of ethics).**

---

## **Task Number 122**

### **Identify ethical behavior.**

#### **Definition**

Identification should include

- ethical concerns that an administrator will encounter
- email privacy issues
- nondisclosure of confidential information
- application of copyrighted material.

## **FBLA Competitive Events and Activities Areas**

**Business Ethics**

**Business Law**

**Computer Applications**

**Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Introduction to Business Procedures**

#### **Network Design**

#### **Networking Concepts**

#### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

#### **Word Processing**

### **NBEA Achievement Standards for Information Technology**

Analyze legal and ethical dilemmas within the framework of current laws and legislation (e.g., virus development, hacking, threats, phishing).

Analyze various codes of ethics for computer usage.

Explain the consequences of illegal and unethical use of information technologies (e.g., piracy; illegal downloading; licensing infringement; inappropriate use of software, hardware, and mobile devices).

---

---

## **Preparing for Industry Certification**

---

---

### **Task Number 123**

**Describe the process and requirements for obtaining industry certifications related to the Cybersecurity Software Operations, Advanced course.**

#### **Definition**

Description should include a list of industry certifications related to the Cybersecurity Software Operations, Advanced course and the process/requirements for obtaining the certifications from

- official websites of the testing organization/vendor
- materials from publishers that have developed practice materials and tests based on information from the testing organization/vendor
- information from certified instructors or industry-certified professionals
- information from the Virginia Department of Education's Administrative Planning Guide
- information in the "Introduction/Course Description" section of this document.

## **FBLA Competitive Events and Activities Areas**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Introduction to Business Procedures**

### **Job Interview**

### **Network Design**

### **Networking Concepts**

### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Word Processing**

## **Microsoft Imagine Academy Resources**

### **[2.052] Microsoft Learning: Test Your Knowledge**

[Test Your Knowledge Web Site](#)

## **NBEA Achievement Standards for Information Technology**

**Obtain industry certification in one or more information technology areas.**

## **Task Number 124**

### **Identify testing skills/strategies for a certification examination.**

#### **Definition**

Identification of testing skills and strategies should be undertaken by

- conducting an Internet research project
- reviewing materials from exam and practice-exam publishers
- interviewing certified instructors and/or industry-certified professionals.

## **FBLA Competitive Events and Activities Areas**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Introduction to Business Procedures**

### **Job Interview**

### **Network Design**

### **Networking Concepts**

### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Word Processing**

## **Microsoft Imagine Academy Resources**

### **[2.053] Get started with Microsoft Certification**

[Get started with Microsoft Certification Web Page](#)

## **NBEA Achievement Standards for Information Technology**

Obtain industry certification in one or more information technology areas.

---

## **Task Number 125**

**Demonstrate the ability to complete selected practice examinations (i.e., practice questions similar to those on certification exams).**

### **Definition**



Demonstration should include completing practice examinations for selected certifications obtained from vendor sites and/or materials from publishers. The level of performance on a practice examination serves as a gauge of the applicant's readiness for formal industry testing.

## **FBLA Competitive Events and Activities Areas**

### **Emerging Business Issues**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Introduction to Business Procedures**

### **Job Interview**

### **Network Design**

### **Networking Concepts**

### **Website Design**

The topic for this event changes from year to year. The annual topic may or may not correlate with this particular course. Please refer to the current Virginia FBLA State Handbook.

### **Word Processing**

## **Microsoft Imagine Academy Resources**

### **[2.052] Microsoft Learning: Test Your Knowledge**

[Test Your Knowledge Web Site](#)

## **NBEA Achievement Standards for Information Technology**

**Obtain industry certification in one or more information technology areas.**

---

## **Task Number 126**

### **Complete an industry certification examination representative of skills learned in this course.**

#### **Definition**

Completion of an industry certification examination is achieved when the student applicant earns an examination score deemed "passing" by the testing organization. Qualifying examinations are those currently approved at the state level as representative of Cybersecurity Software

Operations, Advanced skills. (These may be found in the Virginia Department of Education's Administrative Planning Guide <http://www.cteresource.org/apg/>).

Students should be encouraged to attain industry certification as evidence of their computer network software operations skill level and general employability.

## **FBLA Competitive Events and Activities Areas**

### **Introduction to Business Procedures**

#### **Job Interview**

#### **Word Processing**

### **Microsoft Imagine Academy Resources**

**[2.052] Microsoft Learning: Test Your Knowledge**  
[Test Your Knowledge Web Site](#)

---

---

# **Developing Employability Skills**

---

---

## **Task Number 127**

### **Update résumé.**

#### **Definition**

Updating the résumé should include

- educational background
- work history
- honors and awards
- membership in club and/or community activities
  - leadership positions held
  - community service.

Students should know how to convert a résumé created in a word processing application into

ASCII or plain text format with line breaks, so it can be posted on the Internet, placed into an employer's résumé bank on a company website, or scanned by an optical character recognition (OCR) scanner.

Students should be encouraged to keep a résumé current and updated to reflect their education and experience, even if they are not currently involved in a job search.

## **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Electronic Career Portfolio**

**Future Business Leader**

**Introduction to Business Procedures**

**Job Interview**

**Network Design**

**Networking Concepts**

**Microsoft Imagine Academy Resources**

[2.058] Student Career Portal—Get Started  
[Get Started Web Page](#)

---

## **Task Number 128**

**Update a professional portfolio that contains representative samples of student work.**

### **Definition**

Updating the portfolio should include

- résumé (electronic and non-electronic documents)
- representations of the student's qualifications and work (e.g., program design, source code, technical documentation, output).

**FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Electronic Career Portfolio**

**Future Business Leader**

**Introduction to Business Procedures**

**Job Interview**

**Network Design**

**Networking Concepts**

---

## **Task Number 129**

**Identify potential employment barriers for nontraditional groups and ways to overcome these barriers.**

### **Definition**

Identification of potential employment barriers should include

- gender
- ethnicity
- age
- discrimination in hiring or promoting practices.

Identification of ways to overcome the barriers should include

- scholarships
- job training programs
- mentorships
- minority assistance programs.

### **FBLA Competitive Events and Activities Areas**

**Computer Applications**

**Electronic Career Portfolio**

**Introduction to Business Procedures**

## Job Interview

### Network Design

#### Networking Concepts

---

## SOL Correlation by Task

39	Explain server operating systems.	English: 12.3, 12.5
40	Explain the hardware found in a server.	English: 12.5
41	Explain the uses of current and emerging server and storage hardware.	English: 12.5
42	Explain the various security procedures related to storage devices.	English: 12.5
43	Explain the uses of current and emerging server racking systems.	English: 12.5
44	Describe client-server architecture, including virtual server architecture.	English: 12.5
45	Identify the services commonly found on a network server.	
46	Identify the various components of a virtual network system.	
47	Explain the authentication of users in a network environment.	English: 12.5
48	Compare essential network operating system components.	English: 12.5
49	Determine when to use peer-to-peer and/or directory services.	
50	Identify major decisions associated with the installation of a network operating system.	
51	Select server services.	
52	Install a server operating system.	English: 12.5
53	Implement directory services on a network.	
54	Manage directory and file replication.	English: 12.5
55	Describe the structure and architecture of the DNS.	English: 12.2, 12.5
56	Install the DNS.	English: 12.5
57	Explain how a DHCP client obtains an IP address from a DHCP server.	
58	Install a DHCP service.	English: 12.5
59	Manage fault-tolerant volumes, using RAID.	English: 12.5
60	Explain the difference between roaming and local profiles.	English: 12.5
61	Implement directory replication.	
62	Troubleshoot directory services replication.	
63	Implement Internet Printing Protocol (IPP) services.	
64	Explain types of server malware protection.	English: 12.5
65	Identify security threats to applications and web services.	

66	Implement web-based and server security features.	
67	Describe the Secure Sockets Layer (SSL) and Transport Layer Security (TLS).	English: 12.5
68	Explore a security certificate.	
69	Describe firewalls.	English: 12.5
70	Install a firewall.	English: 12.5
71	Configure basic security policies of a firewall.	
72	Implement user security policies.	English: 12.5
73	Define different types of accounts.	English: 12.3, 12.5
74	Configure user and group accounts.	
75	Implement global, domain, and local account policies.	English: 12.5
76	Describe considerations and procedures for deploying sharing applications on the network.	English: 12.5
77	Manage shared disk resources.	
78	Identify the procedures for the administration of a shared printer.	English: 12.5
79	Identify the functions, features, and guidelines of enterprise collaboration and communication software calendaring.	English: 12.5
80	Implement groups for resource access and management.	
81	Implement disk quotas.	English: 12.5
82	Explain concepts related to logon authentication.	English: 12.5
83	Identify methods of encryption.	
84	Develop a plan to avoid data loss.	English: 12.5
85	Back up files and directories.	English: 12.5
86	Restore files and directories.	
87	Develop a network performance monitoring plan.	English: 12.5, 12.6, 12.7
88	Troubleshoot user access problems.	English: 12.5
89	Develop a preventive maintenance plan.	English: 12.5, 12.6, 12.7
90	Develop an audit policy.	English: 12.5, 12.6, 12.7
91	Monitor server resources to track usage and disk space.	English: 12.5
92	Set up file, directory, and printer auditing.	English: 12.5
93	Explain the importance of asset management and documentation.	English: 12.5
94	Describe security concepts.	English: 12.5
95	Document a network security plan.	English: 12.5
96	Implement a network security plan.	English: 12.5
97	Describe hardening techniques.	English: 12.5
98	Describe various forms of malware protection for clients and servers.	English: 12.2, 12.5
99	Explain the basic network security systems and protocols.	English: 12.2, 12.5
100	Describe remote administration.	English: 12.5

101	Identify the resources available to solve common support issues.	English: 12.2, 12.5, 12.8
102	Describe service packs and patches.	English: 12.5
103	Describe performance monitoring.	English: 12.5
104	Describe the utilities that monitor a server's performance.	English: 12.2, 12.5
105	Describe the backup/restore process for directory services.	
106	Describe the key protocols of web servers.	English: 12.2, 12.5
107	Install web-based services (e.g., Apache, Windows IIS).	English: 12.2, 12.5
108	Configure web-based services	
109	Explain the major architectural components and security vulnerabilities of web-based services.	English: 12.5
110	Establish web-based services.	
111	Add virtual servers and directories.	
112	Install a server-side programming language that supports dynamic content.	
113	Identify user and network administrator training needs.	
114	Provide orientation (onboarding) about a network system for new employees.	English: 12.5
115	Develop a security awareness training plan.	English: 12.5
116	Provide training to users.	
117	Create a user manual.	English: 12.6, 12.7
118	Provide ongoing user support.	
119	Track hardware and software usage problems.	
120	Identify copyright and licensing laws that apply to computer use and network administration.	English: 12.5  History and Social Science: GOVT.1, GOVT.9
121	Describe procedures to ensure the proper licensing of a client-server operating system and applications.	English: 12.5
122	Identify ethical behavior.	History and Social Science: GOVT.1, GOVT.16
123	Describe the process and requirements for obtaining industry certifications related to the Cybersecurity Software Operations, Advanced course.	English: 12.5, 12.8
124	Identify testing skills/strategies for a certification examination.	English: 12.5, 12.8
125	Demonstrate the ability to complete selected practice examinations (i.e., practice questions similar to those on certification exams).	English: 12.5
126	Complete an industry certification examination representative of skills learned in this course.	English: 12.2, 12.5, 12.8
127	Update résumé.	English: 12.2, 12.6, 12.7

128	Update a professional portfolio that contains representative samples of student work.	English: 12.2, 12.6, 12.7  History and Social Science: VUS.14
129	Identify potential employment barriers for nontraditional groups and ways to overcome these barriers.	

## Teacher Resources

### Instructional Scenarios

#### Network for All

##### **Duty/Concept areas addressed:**

*Performing Network Administration Functions*

*Maintaining Servers*

*Configuring Network Security*

*Conducting TCP/IP Activities*

*Implementing and Managing a Web Server*

You have just been hired by a small marketing company to take over as systems administrator. The company is growing rapidly and recently added five new employees (for a total of 25) who will need computers and access to network drives and files. With the addition of new employees, it seems like a good time to get rid of the old AppleTalk network and replace it with updated technology that can accommodate PCs as well as Mac computers. Previously, the company did not have a domain controller or specific user access to its network. As the only systems administrator, you are on call 24/7.

When you were hired, the company's chief executive officer (CEO) talked specifically about hosting the company's website in-house and has made that your first priority after completing the technology upgrade. Because the new network will contain confidential files as well as a web server, strong security measures are needed to protect company records.

**Big Question:** What steps will you take to implement a robust in-house network and convert to internal web hosting?

##### **Focused Questions:**

1. How will you go about setting up a state-of-the-art network? What hardware and software will you choose?
2. As the only systems administrator, what can you do when problems arise after work hours or while you are traveling?
3. What types of security features need to be installed to protect the company's network?



4. Describe a plan for setting up a web server that will host email, file transfer, and new groups.

### **Project-Based Assessment**

1. Design an oral or electronic presentation to explain security procedures that should be taken to protect company records.
2. Design a report describing all steps involved in setting up a secure computer network and providing means for external maintenance.

### **Voice on a Wire**

#### **Duty/Concept areas addressed:**

*Employability Skills*

*Configuring Network Servers*

*Performing Network Administration Functions*

*Providing User Training and Support*

*Using Basic Desktop Systems Concepts*

*Using Basic Server Systems Concepts*

As an employee of a local IT consulting firm, you just met with a new client who described the following problem: the support workers of a charity that houses the homeless in three residences have to consult with each other many times a day while providing support services to their residents. In most cases, the consultations are conducted over the phone. The charity is spending more than \$2,000 per year on local phone service. In addition, many of the support workers move among the three locations each day, making it difficult to locate them and adding to the number of calls.

A local business has donated four fairly new computers and a server, but each will need a new operating system installed and configured. The charity's staff is not very technologically literate and will also need instruction on the operation and use of the computers.

With limited funding, a requirement to keep overhead costs as low as possible, and a need to improve consultations, the charity has to find a better way for support workers to contact each other, without restricting working methods.

During the consultation, you and the client consider the following solutions.

1. Installation of a Secure Intranet

A secure Intranet allows the charity's support workers to use any computer available at the three residences. This would allow a support worker to always be accessible via email.

2. Installation of Voice over IP (VoIP) Enabled Phones and Software  
VoIP, which provides digital telephone service via Internet connection, reduces local calls, thereby decreasing the charity's overhead by approximately 30 percent per year.

The solutions you develop and implement for this client will be reflected on your resume, which will become a part of your professional portfolio, which is maintained by your consulting firm to show prospective clients.

**Big Question:** What steps will you take to implement these two solutions, and how much will it cost?

**Focused Questions:**

1. What hardware and software are needed for this project?
2. How will you determine VoIP providers and compare services?
3. What are the requirements for the charity's Intranet? What data would you need to gather to set up and administer the Intranet?
4. What are the requirements for setting up a VoIP system?

**Project-Based Assessment**

1. Design a VoIP system to demonstrate the necessary program for the solution.
2. Diagram the flow of information within the intranet.

**Resources:**

Tech Republic:

<http://downloads.techrepublic.com.com/whitepaper.aspx?&scname=VoIP+-+IP=Telephony&docid=84013&promo=100511>

Microsoft Tech Net:

<http://technet.microsoft.com/en-us/default.aspx>

## Entrepreneurship Infusion Units

Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked “optional.”

## Curriculum Resources

[The Academic Initiative of the Cyber Innovation Center](#) offers access to its curricula at no cost to K-12 teachers. These lessons could be used to supplement the following tasks:

- Task 40: Describe cybersecurity threats to an organization. (How Businesses Secure Information)
- Task 43: Describe the cyberattack surface of various organizations (How Businesses Secure Information)
- Task 64: Distinguish among types of ethical concerns. (Privacy vs. Security)
- Task 73: Explain the concept of "personally identifiable information." (You are the Data)
- Task 74: Explain how and why personal data is valuable to both an individual and to the organizations. (You are the Data)
- Task 75: Identify ways to control and protect personal data. (You are the Data)
- Task 77: Analyze the social and legal significance of the ongoing collection of personal digital information. (Your Permanent Electronic Record)

The National Institute of Standards and Technology has published the [Glossary of Key Information Security Terms](#), which has been extracted from federal standards, publications, reports, and instructions.

The [SANS Institute](#) offers free professional development curricula focused on the fundamentals of cybersecurity. The course covers operating systems, networking, and systems administration.

[The Virginia Cyber Range](#) is a Commonwealth of Virginia initiative with a mission to enhance cybersecurity education for students in the Commonwealth's public high schools, colleges, and universities. The Virginia Cyber Range seeks to increase the number of fully prepared students entering the cybersecurity workforce in operations, development, and research. The Virginia Cyber Range provides an extensive Courseware Repository for educators and a cloud-hosted Exercise Area environment for hands-on cybersecurity labs and exercises for students.

[AFA CyberPatriot](#) is the National Youth Cyber Education Program created by the Air Force Association to inspire K-12 students toward careers in cybersecurity or other science, technology, engineering, and mathematics (STEM) disciplines critical to our nation's future. At the core of the program is the National Youth Cyber Defense Competition, the nation's largest cyber defense competition that puts high school and middle school students in charge of securing virtual networks.

## Net Etiquette

["What do I need to know about technology?"](#) Northern Virginia Community College

["Netiquette,"](#) Justice Institute of British Columbia

## Coding Standards

["SEI CERT Coding Standards,"](#) Software Engineering Institute, Carnegie-Mellon University

[Open Web Application Security Project \(OWASP\)](#), focused on improving the security of software.

## Job-related Tools and Data

[CyberSeek](#): Provides detailed data about supply and demand in cybersecurity fields, including an interactive state-by-state map which shows the field where demand is highest. For job seekers, educators, school counselors, and students.

[Burning Glass Technologies](#): Job market analytics firm which looks at trends in hiring. Includes research about the cybersecurity job market.

[“Breaking the Code on a Career in Cybersecurity”](#): Virginia Space Grant Consortium’s free video series, which features interviews with cyber professionals about their career pathways.

## Appendix: Credentials, Course Sequences, and Career Cluster Information

### Industry Credentials: Only apply to 36-week courses

- A+ Certification Examination
- Business Information Processing Assessment
- Certified Associate in Python Programming (PCAP) Examination
- Certified Entry-Level Python Programmer (PCEP) Examination
- Certified Internet Web (CIW) Advanced HTML 5 and CSS 3 Specialist Examination
- Certified Internet Web (CIW) Data Analyst Examination
- Certified Internet Web (CIW) Database Design Specialist Examination
- Certified Internet Web (CIW) E-Commerce Services Specialist Examination
- Certified Internet Web (CIW) Internet Business Associate Examination
- Certified Internet Web (CIW) JavaScript Specialist Examination
- Certified Internet Web (CIW) Network Technology Associate Examination
- Certified Internet Web (CIW) Site Development Associate Examination
- Certified Internet Web (CIW) Social Media Strategist Examination
- Certified Internet Web (CIW) User Interface Designer Examination
- Certified Internet Web (CIW) Web Design Specialist Examination
- Certified Internet Web (CIW) Web Security Specialist Examination
- Cloud Essentials Certification Examination
- College and Work Readiness Assessment (CWRA+)
- Computer Maintenance Technology Examination
- Computer Networking Fundamentals Assessment
- Computer Repair Technology Assessment
- Computer Technology Assessment
- Cyber Forensics Associate Examination
- Ethical Hacking Associate Examination
- IC3 Digital Literacy Certification Examination
- Internetworking Examination
- IT Fundamentals+ Certification Examination
- Linux+ Certification Examination
- Microsoft 365 Fundamentals Examination
- Microsoft Certified Azure Fundamentals Examination

- Microsoft Dynamics 365 Fundamentals Examination
- Microsoft Office Specialist (MOS) Examinations
- Microsoft Technology Associate (MTA) Examinations
- National Career Readiness Certificate Assessment
- Network Administration Certification Tests
- Network Pro Certification Examination
- Network+ Certification Examination
- Oracle Certified Associate Examinations
- Oracle Certified Junior Associate Examinations
- PC Pro Certification Examination
- Security Pro Certification Examination
- Security+ Certification Examination
- Technical Support Certification Tests
- Workplace Readiness Skills for the Commonwealth Examination

**Concentration sequences:** *A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.*

- Cybersecurity Fundamentals (6302/36 weeks)
- Cybersecurity Software Operations (6304/36 weeks)

<b>Career Cluster: Information Technology</b>	
<b>Pathway</b>	<b>Occupations</b>
<b>Information Support and Services</b>	<b>Computer Support Specialist Computer Systems Engineer, Architect Multimedia Artist, Animator Network Systems and Data Communication Analyst</b>
<b>Network Systems</b>	<b>Computer and Information Systems Administrator Computer Security Specialist Computer Support Specialist Network and Computer Systems Administrator Network Systems and Data Communication Analyst Telecommunications Specialist</b>
<b>Programming and Software Development</b>	<b>Game Designer, Programmer Multimedia Artist, Animator Network Systems and Data Communication Analyst Software Applications Engineer Web Developer</b>

<b>Career Cluster: Science, Technology, Engineering and Mathematics</b>	
<b>Pathway</b>	<b>Occupations</b>
<b>Engineering and Technology</b>	<b>Computer Hardware Engineer</b> <b>Computer Programmer</b> <b>Computer Software Engineer</b> <b>Network and Computer Systems Administrator</b> <b>Network Systems and Data Communication Analyst</b> <b>Power Systems Engineer</b> <b>Production, Planning, Expediting Clerk</b> <b>Stockroom, Warehouse, or Storage Yard Stock Clerk</b> <b>Technical Writer</b> <b>Telecommunications Specialist</b> <b>Transportation Manager</b>