

ARIZONA CTE CAREER PREPARATION STANDARDS & MEASUREMENT CRITERIA

NETWORK TECHNOLOGIES, 15.1200.3	
STANDARD 1.0 – APPLY PROBLEM-SOLVING AND CRITICAL THINKING SKILLS APPLICABLE TO INFORMATION TECHNOLOGY	
1.1	Describe methods of establishing priorities
1.2	Prepare a plan of work and schedule information technology tasks
1.3	Apply problem-solving processes
1.4	Explain the purpose, types, and content of documentation
STANDARD 2.0 – MAINTAIN A SAFE GREEN INFORMATION TECHNOLOGY WORK ENVIRONMENT	
2.1	Demonstrate personal responsibility for developing and maintaining a safe and healthy information technology work environment
2.2	Use tools, materials, and equipment commonly utilized in the field of information technology safely
2.3	Identify ergonomics and repetitive strain injuries common to information technology occupations
2.4	Determine safe working practices to avoid or eliminate physical and electrical hazards
2.5	Describe techniques used to reduce power consumption in the computer environment
2.6	Identify methods for making the computer environment more environmentally friendly
2.7	Explain environmental considerations when disposing of computer/networking components
STANDARD 3.0 – RECOGNIZE SECURITY ISSUES RELATED TO INFORMATION TECHNOLOGY	
3.1	Explain procedures to maintain data integrity and security
3.2	Identify security issues related to the network, computer hardware, software, and data
3.3	Describe computer threats and methods to protect a computer, i.e., viruses, phishing, e-mail, social engineering, spoofing, identify theft, and spamming
3.4	Explain concepts such as denial of service, hacking/cracking, intrusion, detection, and prevention
STANDARD 4.0 – EXPLORE LEGAL AND ETHICAL ISSUES RELATED TO INFORMATION TECHNOLOGY	
4.1	Explore issues regarding intellectual property rights including software licensing and software duplication
4.2	Understand the difference between open source and proprietary systems in relation to legal and ethical issues
4.3	Identify issues and trends affecting computers and information privacy
4.4	Differentiate between ethical and legal uses of information technology, i.e., data pricing, use of public and private networks, social networking, industry-related data, and data piracy

ARIZONA CTE CAREER PREPARATION STANDARDS & MEASUREMENT CRITERIA

STANDARD 5.0 – DEMONSTRATE BASIC COMPUTER MATHEMATICS REQUIRED FOR INFORMATION TECHNOLOGY	
5.1	Explain the function of general mathematics as it relates to computer hardware
5.2	Perform binary to decimal, decimal to hexadecimal, hexadecimal to decimal, binary to hexadecimal, and binary to hexadecimal conversions as needed to solve problems with hardware and software
STANDARD 6.0 – DESCRIBE THE DEVELOPMENT/EVOLUTION OF COMPUTERS AND INFORMATION TECHNOLOGY	
6.1	Describe a computer, its components and functions
6.2	Explain the historical evolution of the computer and computer networks
6.3	Explain how the development of computers has impacted modern life
6.4	Identify the structure and components of an information system, such as servers, network devices, system software, and applications
6.5	Discuss future trends in information technology
STANDARD 7.0 – DEMONSTRATE KNOWLEDGE OF NETWORK MEDIA AND TOPOLOGIES	
7.1	Document proper logical and physical network topology
7.2	Specify the main features of various networking types, such as ring, star, bus, and mesh
7.3	Specify the characteristics of speed, length, topology, and cable type of typical network types
7.4	Identify appropriate media connectors for various networks
7.5	Identify appropriate media types and uses
7.6	Understand the purpose, features, and functions of various network components
7.7	Specify the general characteristics of speed, frequency, topology, and transmission type of various wireless technologies (metropolitan, local, and short distance)
7.8	Identify factors that affect the speed and range of various wireless technologies
STANDARD 8.0 – DEFINE NETWORK PROTOCOLS AND STANDARDS	
8.1	Describe the parts and functions of a Media Access Control (MAC) address
8.2	Describe the name, function, and characteristics of the seven layers of the Open Systems Interconnect (OSI) model
8.3	Describe the name, function, and characteristics of the four layers of the TCP/IP model
8.4	Differentiate between network protocols in terms of routing, addressing schemes, interoperability, and naming conventions, such as RIP, OSPF, and EIGRP
8.5	Define the purpose of well-known protocols, such as HTTP, FTP, SMTP, DNS, DHCP, and POP
8.6	Describe the difference between well-known dynamic and ephemeral ports

These technical knowledge and skill standards were validated by a Skill Standards Validation Committee on April 30, 2009, and used in the adaptation, adoption, and development of test items for first time testing in Spring 2010.

ARIZONA CTE CAREER PREPARATION STANDARDS & MEASUREMENT CRITERIA

8.7	Describe the characteristics of TCP and UDP
8.8	Categorize IP addresses and default subnet masks
8.9	Identify well-known ports associated with the most commonly used networking services and protocols
8.10	Describe the purpose of network services
8.11	Summarize the basic characteristics of WAN technologies
8.12	Describe the usage of frame relay, ATM, and MPLS WAN technologies
8.13	Identify and describe the most commonly used internet access
8.14	Define the functions of remote access protocols and services, such as telnet, SSH, and remote desktop
8.15	Describe the purpose and function of security protocols, such as VPN, HTTPS, and tunneling
STANDARD 9.0 – INSTALL A BASIC NETWORK SYSTEM	
9.1	Describe the essential capabilities of Server Operating Systems (SOS)
9.2	Define client support, interoperability, authentication, file and print services, application support, and security
9.3	Configure network cards and network settings
9.4	Identify the appropriate tool to use for network repair or diagnostic tasks
9.5	Configure a client-to-server network connection for NetWare, Unix/Linux, and Windows
9.6	Describe the purpose and benefits of using a firewall
9.7	Describe the purpose and benefits of using a proxy service
9.8	Differentiate the various network security implementation strategies, i.e., blocking port numbers and encryption
9.9	Describe the main characteristics of Virtual Local Area Networks (VLAN)
9.10	Describe the purpose and characteristics of extranets and intranets
9.11	Describe the purpose and installation considerations in using antivirus solution
9.12	Describe the purpose of the components needed to build fault tolerance into a network
9.13	Describe the purpose of a disaster recovery plan for a network
STANDARD 10.0 – PERFORM NETWORK MAINTENANCE	
10.1	Use the appropriate network utility to troubleshoot various connectivity issues

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ARIZONA CTE CAREER PREPARATION STANDARDS & MEASUREMENT CRITERIA

10.2	Demonstrate the use of visual indicators and diagnostic utilities to interpret problems
10.3	Use visual indicators to help determine the nature of a network connectivity issue
10.4	Troubleshoot and resolve small office/home network failures
10.5	Configure TCP/IP utility with host communicating in a LAN and on the internet
10.6	Troubleshoot and resolve a client connectivity problem
10.7	Identify connectivity issues in various server environments, such as NetWare, Unix/Linux, and Windows
10.8	Identify and resolve a network configuration with incorrect protocols, client software misconfiguration, authentication misconfiguration, and insufficient rights/permissions
10.9	Locate, identify, and resolve a physical network topology problem
10.10	Identify and describe the sequential steps in troubleshooting a network problem
10.11	Describe the sequential steps needed to identify and resolve a wiring or infrastructure problem
10.12	Describe and resolve the most common electrostatic discharge (ESD) hazards in a network environment