

Appendix A: CIW Network Technology Associate Objectives and Locations

Network Technology Associate teaches essential networking technologies and skills, including TCP/IP, stable network creation, wireless networking, mobile devices and network troubleshooting. You will learn to use various network components and protocols that enable users to share data quickly and easily. You will explore the different types of transmission media, and you will learn how network architecture and topologies provide for efficient and secure communication. In addition, you will learn about the OSI reference model and its relationship to packet creation, and you will compare and contrast the OSI model with the Internet architecture model.

Domain 3: Network Technology Associate Objective	Network Technology Associate Courseware Lesson(s) and Section(s)
Subdomain 3.1: Demonstrate knowledge of basic data communications components, and demonstrate technical knowledge of the Internet.	
3.1.1: Define basic data and telephony network concepts, including convergence, Voice over IP (VoIP), AC/DC requirements for telephony and data equipment.	Lesson 1: Introduction to Networking - Telephony and Convergence Networking Lesson 2: Networking Components and Standards - Common Network Components
3.1.3: Identify basic network topologies (e.g., ring, mesh).	Lesson 1: Introduction to Networking - Network Topologies
3.1.4: Define the Open Systems Interconnection reference model (OSI/RM) in terms of packet creation.	Lesson 1: Introduction to Networking - OSI Reference Model - OSI/RM Protocol Examples
3.1.5: Define the nature, purpose and operation essentials of Transmission Control Protocol/Internet Protocol (TCP/IP).	Lesson 1: Introduction to Networking - Transmission Control Protocol/Internet Protocol (TCP/IP) Lesson 3: Connecting to the Internet - TCP/IP
3.1.6: Define local area network (LAN) and wide area network (WAN).	Lesson 1: Introduction to Networking - Local Area Network (LAN) - Wide Area Network (WAN)
3.1.7: Identify the core components of the current Internet infrastructure and how they relate to each other, including routers, Internet Exchange Points (IXPs), backbone networks.	Lesson 1: Introduction to Networking - Network Operations Center (NOC)

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3.1.8: Identify the components of a Network Operations Center (NOC).	Lesson 1: Introduction to Networking - Network Topologies
3.1.9: Compare and contrast server-based networks and peer-to-peer (P2P) networks, and provide examples of each.	Lesson 1: Introduction to Networking - Networking Categories
3.1.10: Distinguish between distributed architectures and database models, such as Hadoop and SQL.	Lesson 1: Introduction to Networking - Client/Server Model
Subdomain 3.2: Identify the role of networking hardware, and configure common hardware for operation.	
3.2.1: Distinguish among common cable types used in networking (e.g., CAT 5, Class F).	Lesson 2: Networking Components and Standards - Transmission Media
3.2.2: Identify hardware and software connection devices and their uses, including network interface card (NIC), modem, cable/DSL modem, hub, router, switch, firewall.	Lesson 2: Networking Components and Standards - Common Network Components
3.2.4: Explain the routing process, including static routing versus dynamic routing, interior versus exterior routing protocols.	Lesson 3: Connecting to the Internet - Introduction to Routing - Routing Protocols
3.2.5: Identify common TCP/IP network parameters, including IP address (static versus DHCP), subnet mask, subnet prefix length, default gateway, DNS information.	Lesson 3: Connecting to the Internet - Configuring TCP/IP
Subdomain 3.3: Identify the relationship between IP addresses and domain names, including assignment of IP addresses within a subnet.	
3.3.1: Explain IP addressing and the concept of uniqueness, including IP address, subnet mask, subnet prefix length.	Lesson 3: Connecting to the Internet - Internet Protocol Version 4 (IPv4)
3.3.3: Identify the uses of public and private IP addresses.	Lesson 3: Connecting to the Internet - Configuring TCP/IP
3.3.6: Compare and contrast IPv4 and IPv6, including addressing, TCP/IP configurations, troubleshooting tools.	Lesson 3: Connecting to the Internet - Internet Protocol Version 6 (IPv6)
Subdomain 3.4: Identify the functions and components of servers commonly used on the Internet.	
3.4.1: Distinguish between HTTP and other Internet server types.	Lesson 4: Internet Services - Internet Servers
3.4.2: Identify the functions and features of common Internet-based services, and identify protocols used by each, including file, print, HTTP, proxy, mail, mailing list, instant messaging, social networking, DNS, FTP, certificate, directory, fax, transaction.	Lesson 4: Internet Services - Internet Servers

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3.4.3: Choose the correct server to fulfill a specific business/organizational need.	Lesson 4: Internet Services - Choosing Web Server Products
3.4.4: Explain the advantages and disadvantages of using cloud-based Internet services instead of providing them in-house.	Lesson 4: Internet Services - Cloud Services
3.4.5: Discuss the purpose of a Content Management System (CMS) and the benefits it provides an organization.	Lesson 4: Internet Services - Content Management System (CMS)
Subdomain 3.5: Identify common Internet security and availability issues, including user-level and enterprise-level concerns.	
3.5.1: Identify typical attacks on clients and describe procedures to counter each attack type.	Lesson 6: Network and Cloud Security Risks - Malware (Malicious Software) - Overview of Network Attack Types
3.5.2: Recognize and avoid social engineering attacks.	Lesson 6: Network and Cloud Security Risks - Overview of Network Attack Types
3.5.3: Distinguish among symmetric, asymmetric and hash encryption.	Lesson 6: Network and Cloud Security Risks - Encryption
3.5.4: Define authentication principles, including password resetting, password aging.	Lesson 6: Network and Cloud Security Risks - Authentication
3.5.5: Describe Virtual Private Networks (VPNs) and the purposes of remote access protocols, including Point-to-Point Tunneling Protocol (PPTP), Layer 2 Tunneling Protocol (L2TP).	Lesson 6: Network and Cloud Security Risks - Virtual Private Network (VPN)
3.5.6: Distinguish among security zones, including DMZ, VLAN, intranet, extranet.	Lesson 6: Network and Cloud Security Risks - Security Zones
3.5.7: Define fundamental Public Key Infrastructure (PKI) concepts.	Lesson 6: Network and Cloud Security Risks - Authentication
3.5.8: Identify the purpose of an uninterruptible power supply (UPS), and list common concerns and configuration parameters.	Lesson 5: Hardware and Device Connectivity - Preventive Maintenance
3.5.9: Explain the security risks involved with Bring Your Own Device (BYOD) implementations.	Lesson 6: Network and Cloud Security Risks - Bring Your Own Device (BYOD)
3.5.10: Identify the required items for BYOD policies.	Lesson 6: Network and Cloud Security Risks - Bring Your Own Device (BYOD)
3.5.11: Discuss mobile device management (MDM) tools and the mobile device life cycle.	Lesson 6: Network and Cloud Security Risks - Bring Your Own Device (BYOD)
3.5.12: Identify the most common security threats to cloud-based services.	Lesson 6: Network and Cloud Security Risks - Cloud Security Threats

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3.5.13: Explain the key points of an effective disaster recovery plan for cloud-based services.	Lesson 6: Network and Cloud Security Risks - Cloud Disaster Recovery
3.5.14: Determine the most effective continuous data protection (CDP) techniques, depending on network scenarios.	Lesson 6: Network and Cloud Security Risks - Cloud Disaster Recovery
Subdomain 3.6: Identify common performance issues affecting Internet clients, including analysis, diagnosis.	
3.6.1: Identify issues to consider when troubleshooting IP-enabled systems, including DNS/name resolution, correct default gateway and subnet mask, hosts file configuration, DHCP versus static IP configuration.	Lesson 3: Connecting to the Internet - Configuring TCP/IP - Diagnostic Tools for Internet Troubleshooting
3.6.2: Identify when to use various diagnostic tools for troubleshooting and resolving Internet problems, including ping, ipconfig, route, arp, traceroute, netstat, network analyzers (packet sniffers).	Lesson 3: Connecting to the Internet - Diagnostic Tools for Internet Troubleshooting
3.6.3: Distinguish between client-side problems and server-side problems when troubleshooting common services (e.g., e-mail and Web client connectivity issues).	Lesson 3: Connecting to the Internet - Diagnostic Tools for Internet Troubleshooting
3.6.4: Troubleshoot cable and ADSL modem connectivity.	Lesson 3: Connecting to the Internet - Diagnostic Tools for Internet Troubleshooting
Subdomain 3.7: Perform basic hardware and system maintenance for network-aware systems.	
3.7.1: Identify maintenance tasks that can help prevent computer system failures.	Lesson 5: Hardware and Device Connectivity - Motherboard
3.7.2: Connect common peripherals, including USB, FireWire, eSATA, HDMI, CD-ROM/DVD, parallel and serial devices (e.g., printers, hard drives, monitors).	Lesson 5: Hardware and Device Connectivity - Optical Discs - Device Connectivity
3.7.3: Explain the functions of motherboards, storage devices and optical discs (e.g., IRQs, SATA, SCSI, USB, memory card readers, memory cards, NICs, CD/DVD/BD).	Lesson 5: Hardware and Device Connectivity - Motherboard - Storage Devices - Optical Discs
Subdomain 3.8: Manage fundamental elements of modern network-based client operating systems.	
3.8.1: Obtain proper licensing for operating systems and associated applications.	Lesson 5: Hardware and Device Connectivity - System Management
3.8.2: Recover from application failures.	Lesson 5: Hardware and Device Connectivity - Software Troubleshooting
3.8.3: Restart the system and identify common boot problems.	Lesson 5: Hardware and Device Connectivity - Software Troubleshooting

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3.8.4: Explain why a hard drive must be partitioned and formatted.	Lesson 5: Hardware and Device Connectivity - System Management
3.8.5: Identify common file systems (e.g., NTFS, FAT, Ext3, ReiserFS).	Lesson 5: Hardware and Device Connectivity - System Management
3.8.6: Manage basic file and directory permissions.	Lesson 5: Hardware and Device Connectivity - System Management
3.8.7: Use common file system management tools, including Convert, Chkdsk, Disk Cleanup, Disk Defragmenter.	Lesson 5: Hardware and Device Connectivity - System Management - Preventive Maintenance
3.8.8: Delete temporary files manually and by using operating-system-specific methods.	Lesson 5: Hardware and Device Connectivity - Preventive Maintenance
3.8.9: Back up and restore files to prevent data loss.	Lesson 5: Hardware and Device Connectivity - Preventive Maintenance
Subdomain 3.9: Configure and troubleshoot wireless networks.	
3.9.1: Distinguish between ad-hoc and infrastructure mode.	Lesson 2: Networking Components and Standards - Wireless Network Technologies
3.9.2: Identify the function of a wireless access point (AP).	Lesson 2: Networking Components and Standards - Wireless Network Technologies
3.9.3: Connect wireless networks to standard wired LANs.	Lesson 2: Networking Components and Standards - Wireless Network Technologies
3.9.4: Identify benefits and drawbacks of Wired Equivalent Privacy (WEP) and Wi-Fi Protected Access 2 (WPA2).	Lesson 2: Networking Components and Standards - Wireless Network Technologies
3.9.5: Use a Secure Set Identifier (SSID) and describe its purpose.	Lesson 2: Networking Components and Standards - Wireless Network Technologies
3.9.6: Identify the purpose of MAC address filtering.	Lesson 2: Networking Components and Standards - Wireless Network Technologies - IEEE LAN Standards
3.9.7: Identify security issues with wireless networks.	Lesson 2: Networking Components and Standards - Wireless Network Technologies
3.9.8: Evaluate the practicality of a wireless LAN in an organization.	Lesson 2: Networking Components and Standards - Wireless Network Technologies
3.9.9: Troubleshoot wireless connectivity.	Lesson 3: Connecting to the Internet - Configuring a Wireless Network
3.9.10: Implement a wireless network.	Lesson 3: Connecting to the Internet - Configuring a Wireless Network

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3.9.11: Identify mobile devices and various mobile operating systems.	Lesson 3: Connecting to the Internet - Mobile Computing
3.9.12: Explain the relationship between mobile devices and the cloud, including advantages and disadvantages.	Lesson 3: Connecting to the Internet - Mobile Devices and Cloud Computing
3.9.13: List the benefits of 4G networks and 4G mobile hotspot devices.	Lesson 3: Connecting to the Internet - Fourth-Generation (4G) Wireless
Subdomain 3.10: Demonstrate understanding of virtualization.	
3.10.1: List elements of virtualization (e.g., virtual machines, host operating system, virtualization software, RAM, processor speed, and disk space).	Lesson 2: Networking Components and Standards - Virtualization
3.10.2: Identify benefits of virtualization, including reduced consumption of electricity, less heat generation, conservation of space, more efficient use of hardware.	Lesson 2: Networking Components and Standards - Virtualization
Subdomain 3.11: Explain concepts involving personal privacy protection on the Internet.	
3.11.1: Define phishing and pharming, and identify ways to avoid becoming a victim.	Lesson 6: Network and Cloud Security Risks - Overview of Network Attack Types
3.11.2: Identify ways to avoid antisocial activity, including online stalking and cyberbullying.	Lesson 6: Network and Cloud Security Risks - Other Security Threats
3.11.3: Use encryption technology to secure communications (e.g., email encryption, password generators, password managers).	Lesson 6: Network and Cloud Security Risks - Authentication - Encryption