Course Description

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.

You will study the functions, features and technologies associated with Internet services, such as cloud computing. You will learn about the advantages and disadvantages of Bring Your Own Device (BYOD), the growing trend of employees bringing their personal mobile devices to work. BYOD policies and enforcement strategies will also be covered.

You will learn about the benefits of implementing a Content Management System (CMS). You will also achieve competency in performing basic hardware and operating system maintenance procedures. In addition, you will study mobile computing devices and mobile operating systems.

You will also learn about the importance of routing, and you will explore IP addressing, IP address classes and subnet masks. Finally, you will explore essential network security concepts, Internet-based challenges facing today's users, and methods you can use to secure networks and network transmissions, including authentication, encryption and firewalls.

This coursebook includes supplemental material located on CIW Online. To practice the skills presented in class or to perform any labs that were not completed, refer to the Classroom Setup section for information about system requirements and using the lab files.

The CIW Web Foundations courses prepare students to take the CIW Web Foundations Associate certification exam.

Series

Network Technology Associate is the third course in the CIW Web Foundations series:

- Internet Business Associate
- Site Development Associate
- *Network Technology Associate*

Prerequisites

No prior experience using the Internet, developing Webpages or configuring networks is necessary. However, students should be familiar with an operating system such as Microsoft Windows 10 before taking this course. The CIW Web Foundations courseware does not provide entry-level computer literacy. Rather, it builds upon computer literacy training and certifications such as Microsoft Office Specialist (*www.microsoft.com*).

Certification

The CIW Web Foundations series of courses prepares students to take the high-stakes CIW Web Foundations Associate certification exam (1D0-610). Those who pass the CIW Web Foundations Associate exam earn the highly respected CIW Web Foundations Associate certification, which is recognized throughout the industry as validating essential Internet skills for the workplace. The CIW Web Foundations Associate certification proves that an individual has evolved from being an Internet consumer to an Internet producer, capable of producing real-world Internet applications. A CIW Web Foundations Associate certificant can use common Internet-ready applications, can create properly formed HTML documents, knows database essentials, understands project management concepts and can troubleshoot networks.

Candidates also have the option to take any or all of the three modular CIW Associate exams, each of which earns the candidate a modular subject certification if passed:

- Internet Business Associate (exam 1D0-61A)
- Site Development Associate (exam 1D0-61B)
- Network Technology Associate (exam 1D0-61C)

Candidates who pass all three modular certification exams also earn the comprehensive CIW Web Foundations Associate certification.

For information about taking any of the CIW Associate exams, visit *www.CIWcertified.com*.

Target audience

All students preparing to enter or continue in the workforce can benefit from the CIW *Network Technology Associate* course and/or certification:

- High school students
- College students
- Technical/trade school students

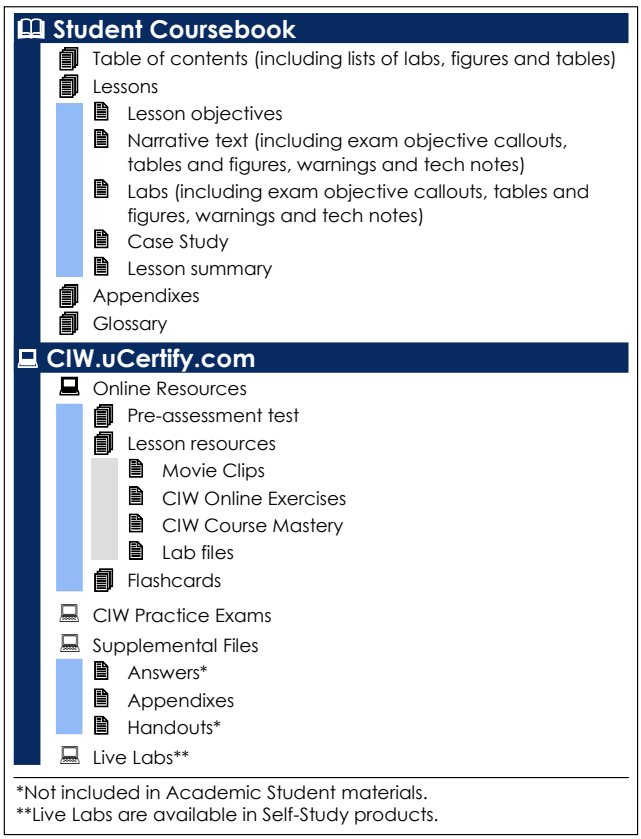
Professionals in all industries can benefit from the CIW *Network Technology Associate* course and/or certification:

- IT professionals
- Healthcare professionals
- Legal professionals
- Marketing professionals
- Graphic artists
- Business professionals

Courseware

This coursebook was developed for instructor-led and/or self-study training. Along with comprehensive instructional text and objectives checklists, this coursebook provides easy-to-follow hands-on labs and a glossary of course-specific terms. It also provides Internet addresses needed to complete some labs, although due to the constantly changing nature of the Internet, some addresses may no longer be valid.

The student coursebook is organized in the following manner:



When you return to your home or office, you will find this coursebook to be a valuable resource for reviewing labs and applying the skills you have learned. Each lesson concludes with questions that review the material. Lesson review questions are provided as a study resource only and in no way guarantee a passing score on the CIW Web Foundations Associate certification exam.

Coursebook versions

The CIW Web Foundations courseware is designed for various classroom environments: academic, learning center/corporate and self-study. Coursebooks are available in both instructor and student versions. Check your book to verify which version you have.

Instructor (Academic, Learning Center/Corporate)

- Example syllabi for 10-week, 16-week and 32-week instruction periods are included in the instructor resource files available in the Resources section of the online course. Learning centers can teach this series at an accelerated pace; consult the implementation tables that can be found in the instructor resource files.
- The instructor version of this book includes Instructor Notes in the margin, which provide additional tips and commentary for the instructor to supplement course narrative. Margin callouts also direct instructors to material that relates directly to specified CIW Web Foundations objectives.
- The instructor book and supplemental files contain answers to Labs, Case Studies, Activities, Optional Labs and Lesson Quizzes.
- The online instructor resources also include handout versions of Labs, Activities, Optional Labs and Lesson Quizzes, which the instructor can print and assign during class or as homework.
- The online instructor resources include an appendix listing the CIW Web Foundations Associate certification exam objectives and locations of corresponding material in the coursebook.

Additional online resources, such as Pre-Assessment, Lesson Quizzes, Practice Exams and Post Assessments, are provided as study and course-grading resources only; success on these materials in no way guarantees a passing score on the CIW Web Foundations Associate certification exam.

Student (Academic, Learning Center/Corporate, Self-Study)

- The student book and supplemental files include Pre-Assessment and Lesson Review questions for each lesson. However, the student book does not provide answers to these questions.
- The student book also does not include any Activities, Optional Labs or Quizzes. Students can obtain these elements and answers from the instructor (for ILT training) or from CIW Online (for learning center/corporate or self-study training).
- The student supplemental materials are available in the online course and include appendixes and files used to perform many of the labs in the coursebook.
- The online course also includes an appendix listing the CIW Web Foundations Associate certification exam objectives and locations of corresponding material in the coursebook.

Lesson Quizzes are provided as study and course-grading resources only; success on these materials in no way guarantees a passing score on the CIW Web Foundations Associate certification exam.

Online resources

You can visit CIW online at *http://ciw.ucertify.com* to access all course materials and to get help in preparing for the CIW Web Foundations Associate certification exam. The online course provides a variety of tools you can use to supplement the Official CIW Courseware.

CIW courseware supplemental files

This coursebook includes online supplemental material that can be accessed from the CIW online course. Online materials are provided for both instructors and students, and include elements required to complete the coursework and other optional elements that are provided for your interest or further study.

Student materials include:

- Lab files used to complete the course labs
- Exercises, glossary flashcards and quizzes.
- Appendixes with related information (including the CIW Web Foundations Objectives And Locations Appendix).

Instructor materials include:

- Course syllabi and implementation tables
- Answers to students exercises and quizzes
- Appendixes with related information (including the CIW Web Foundations Objectives And Locations Appendix).

See the instructor resource files available in the Resources section of the online course for information about accessing these files.

CIW Pre-Assessment

An online Pre-Assessment test is provided to help identify areas for students to concentrate their studies before beginning the CIW Web Foundations courses. The Pre-Assessment test is provided as an initial indicator of base knowledge and course-grading resource; success on the Pre-Assessment in no way guarantees a passing score on the CIW Web Foundations certification exams.

CIW Movies

The CIW Web Foundations courses offer movie clips that provide supplementary instruction in a multimedia format, and enhance the coursebook narrative and labs. However, movie content does not comprehensively address CIW Web Foundations certification exam objectives and is not intended to replace coursebook content.

Instructors in a classroom environment are strongly encouraged to present movies to the entire class using a computer screen projector. Group presentations enable instructors to present and discuss movie content when appropriate. Controlling the presentation of movies also minimizes distractions from course material and essential lecture or lab time.

Students are strongly encouraged to watch the movie clips on their own if they are unable to view them in class. CIW Movies are part of the online course materials for all students.

CIW Online Exercises

These interactive activities are instructional supplements to the official print and online books, designed to offer a blended-learning approach. Mapped directly to the Official CIW Courseware, the CIW Online Exercises enable you to review important concepts from the Web Foundations courses and measure your proficiency on content relevant to the CIW Web Foundations Associate certification exam. CIW Online Exercises challenge you with a wide range of activities that all provide immediate feedback, including:

- Glossary flashcards.
- Matching exercises.
- Fill-in-the-blank exercises.
- True/false questions.

CIW Lesson Quizzes

CIW Lesson Quizzes are designed to assess your knowledge of the concepts, skills and best practices of Web technology taught in the Official CIW Courseware. The CIW Lesson Quizzes assess lesson knowledge, reinforce classroom learning and enhance instruction. This online assessment program contains multiple-choice assessments that cover CIW Web Foundations courseware content lesson by lesson.

CIW Course Mastery

CIW Course Mastery questions are designed to assess your knowledge of the concepts, skills and best practices of Web technology taught in the Official CIW Courseware. The CIW Course Mastery questions assess lesson knowledge, reinforce classroom learning and enhance instruction. This online review program contains multiple-choice questions that cover CIW Web Foundations courseware content lesson by lesson. The Course Mastery program is based on a unique method that maximizes knowledge retention.

CIW Certification Practice Exams

After you have mastered the Web Foundations course material, you are ready to prepare for the high-stakes CIW Web Foundations Associate certification exam. The online CIW Certification Practice Exams program helps you build confidence with your knowledge of the CIW exam objectives. This program provides you with:

- Timed practice exams that simulate the high-stakes testing environment and help predict actual performance on CIW certification exams.
- A feedback review mode that allows you to check answers and gain valuable feedback that relates each question to a CIW exam objective and a lesson in the Official CIW Courseware.
- Exam results that report on your mastery of each CIW exam objective.
- Personalized performance reports and study plans to track individual progress and view overall class trends.

CIW Post-Assessment

The online Post-Assessment test is a multiple-choice post-course assessment that will evaluate your knowledge of the skills and concepts taught in CIW Web Foundations. The Post-Assessment test is provided as study and course-grading resources only; success on these materials in no way guarantees a passing score on the CIW Web Foundations Associate certification exam.

Course Objectives

After completing this course, you will be able to:

- Identify convergence networking, the client/server model, network topologies and major network operating systems.
- Describe the packet creation process and explain the Open Systems Interconnection (OSI) reference model.
- Discuss local area networks (LANs), wide area networks (WANs), Internet Exchange Points (IXPs) and common network components.
- Compare and contrast the functions of network protocols, and describe network transmission media and types, including wireless network technologies.
- Describe IEEE LAN standards.
- Discuss the benefits of virtualization.
- Explain how to run multiple operating systems simultaneously on one computer.
- Describe the Internet architecture model, Internet protocols, the routing process, routing protocols and port numbers.
- Explain IP addressing, IP address classes, default subnet masks and the use of private IP addresses.
- Use diagnostic tools for troubleshooting TCP/IP networks.
- Explain the challenges of the Bring Your Own Device (BYOD) movement, and understand the various methods for properly managing employee personal mobile devices at work.
- Identify and describe the functions and features of various Internet services and their delivery methods, such as cloud service providers and in-house IT departments.
- Describe the functions and benefits of implementing a Content Management System (CMS).
- Identify maintenance issues for common system components.
- Identify the benefits and security risks of mobile computing devices.
- Describe the characteristics of file system types and use file system management tools.
- Identify and suggest corrective measures for operating system boot problems and application failures, and identify methods to remotely manage workstations.
- Identify essential network security concepts and network attack types, and identify various methods of defeating network attacks and securing network transmissions, including authentication, encryption, VPNs and digital certificates.
- Describe firewalls and security zones you can set up to protect your internal trusted network from an outside untrusted network, such as the Internet.

Classroom Setup

Your instructor has probably set up the classroom computers based on the system requirements listed in the following sections. Most software configurations on your computer are identical to those on your instructor's computer. However, your instructor may use additional software to demonstrate network interaction or related technologies.

System Requirements

This section lists the hardware, software and connectivity requirements to implement this course.

Hardware

The following table summarizes the hardware requirements for all courses in the CIW program. Each classroom should be equipped with enough personal computers to accommodate each student and the instructor with their own system.

Note: The CIW hardware requirements are similar to the minimum system requirements for Microsoft Windows 10 implementation.

Hardware Specifications	Minimum Requirements
Processor	1 GHz 32-bit (x86) or 64-bit (x64) processor
Hard disk	16 GB available hard disk space (32-bit) or 20 GB available hard disk space (64-bit) for Windows 10 installation. 16 GB of additional space must be available for course applications and files.
RAM	1 GB RAM (32-bit) or 2 GB RAM (64-bit)
Network interface card (NIC)	Wireless, 10/100 Ethernet, or Gigabit Ethernet
Wireless router (AP)	Wireless-G, Wireless-N or Wireless-AC router with built-in 4-port Ethernet switch to connect wired network PCs and devices. Wireless NICs must support the wireless router (G, N or AC)
Sound card/speakers	Required
Video adapter	Microsoft DirectX 9 graphics device with WDDM driver
Monitor	1024 x 768 screen resolution using a VGA, DVI or HDMI connector
Network connectivity	Enough wireless nodes, hubs or switches to allow classroom computers to communicate and access the Internet.
Web camera (Webcam)	Any type of Web camera. Some monitors include an internal Webcam. USB Webcams are a good choice.

Software

The CIW Web Foundations series is intended to be largely operating system- and browser-independent. Provided you use Hypertext Markup Language version 5 (HTML5)-compliant browsers, the labs should function properly. HTML5-compliant browsers include Google Chrome (any version), Mozilla Firefox (version 10 or higher) and Microsoft Edge.

Each school's network is configured differently. You should test each lab to ensure the ports are open on the firewall before presenting the lab to the class. You may have to talk to your network administrator to open the ports.

If you are teaching all three CIW Web Foundations courses sequentially, there is no need to reformat your computers for each course. The recommended software configurations for computers used to complete the labs in this book series are as follows.

Network Technology Associate

To be installed before class:

- **Microsoft Windows 10** (typical installation)
- **Google Chrome — any version** (typical installation)
- **Firefox 10 or higher** (typical installation)
- **Microsoft Edge** (typical installation)

To be registered by students during class:

- **Google account** (*www.google.com*) — necessary for students to access online cloud services and resources, such as Google Drive, Google Docs, Gmail, Google+ and Blogger. Students are responsible for their own account registration.
- **Microsoft account** (*https://signup.live.com*) — necessary for students to access online cloud services and resources, such as OneDrive, Outlook.com (formerly Hotmail), Windows Essentials and Skype (formerly Windows Live Messenger). Students are responsible for their own account registration.

To be installed by students during course labs:

- **uTorrent** (binary provided in the C:\CIW\Network\Lab Files\Lesson01 folder)
- **FileZilla_v3.0.2.1** (torrent file provided in the C:\CIW\Network\Lab Files\Lesson01 folder)
- **7-Zip** (binary provided in the C:\CIW\Network\Lab Files\Lesson01 folder)
- **TruCrypt 7 or higher** (binary provided in the C:\CIW\Network\Lab Files\Lesson06 folder)
- **VirtualBox** (binary provided in the C:\CIW\Network\Lab Files\Lesson02 folder)
- **Porteus Linux** (binary provided in the C:\CIW\Network\Lab Files\Lesson02 folder)

Connectivity

Internet connectivity is required for this course. You will experience optimal performance with a dedicated Internet connection (e.g., a cable/DSL modem or a T1 line).

CIW supplemental files

Each coursebook includes supplemental materials that are referenced and used throughout the course. These supplemental materials are provided online at *http://ciw.ucertify.com*.

You will need to create a directory for all supplemental materials for the course. The recommended location is *C:\CIW\[Course_Title].* Lab files are available before the lab steps in the online course. You can download them to this directory as you reach each lab. You can then create a shortcut to this directory on your Desktop. As you conduct the course labs, you can use this shortcut to quickly access your lab files.

Conventions and Graphics Used in This Book

The following conventions are used in these coursebooks.

Terms Technology terms defined in the margins are indicated in **bold type** the first time they appear in the text. However, not every word in bold type is a term requiring definition.

Lab Text Text that you enter during a lab appears in ***italic bold type***. Names of components that you access or change in a lab appear in **bold type**.

Notations *Notations or comments regarding screenshots, labs or other text are indicated in italic type.*

Program Code or Commands Text used in program code or operating system commands appears in the `Lucida Sans Typewriter` font.

The following graphics are used in these coursebooks.

Tech Notes point out exceptions or special circumstances that you may find when working with a particular procedure. Tech Notes that occur within a lab are displayed without the graphic.

Tech Tips offer special-interest information about the current subject.

Warnings alert you about cautions to observe or actions to avoid.

This graphic signals the start of a lab or other hands-on activity.

The *CIW Online* graphic signals appropriate points in the course at which to view additional online resources.

Each lesson summary includes an *Application Project.* This project is designed to provoke interest and apply the skills taught in the lesson to your daily activities.

Each lesson concludes with a summary of the skills and objectives taught in that lesson. You can use the *Skills Review* checklist to evaluate what you have learned.

This graphic indicates a line of code that is completed on the following line.

Classroom Setup Guide

The Classroom Setup Guide is divided into three sections:

1. **Before You Begin** — This section includes courseware update links for instructors, a revision history outlining the revisions made to a coursebook since the last version, an explanation of the requirements for preparing a classroom behind a proxy server, and additional notes that you should consider before you set up the classroom.
2. **Classroom Requirements** — This section lists the hardware, software and connectivity requirements to implement this course.
3. **Setup Instructions** — This section includes the configuration requirements for both instructor and student systems and a detailed list of required software installation procedures.

Before You Begin

This section includes courseware update links for instructors, a revision history outlining the revisions made to a coursebook since the last version, an explanation of the requirements for preparing a classroom behind a proxy server, and additional notes that you should consider before you set up the classroom.

Courseware updates

Instructors must download the latest courseware updates from the Instructor Community on the CIW Website (*www.CIWcertified.com*) before teaching the course. CIW courseware is updated continually, and the courseware updates provide the most current changes, revisions and notes for all CIW courseware.

Courseware updates include feedback from Authorized Training Partners (ATPs) and Authorized Academic Partners (AAPs), clients and instructors who implement the CIW program. Feedback is reviewed and updates are posted in dynamic documents for both students and instructors. Each updates document correlates with the identical version of the coursebook (e.g., *v1.0 Update* is designed to be used only with version 1.0 of the coursebook). Updates are available for both the current versions and the immediately previous versions of the coursebooks. CIW does not provide support for coursebooks and instructor materials that are two or more versions removed from the current versions.

Revision history

Released December 2018 (Network Technology Associate version 2.2)

This release is considered a minor update. The main differences between this *Network Technology Associate v2.2* course and the previous version (v2.1 released April 2014) are as follows:

- Upgraded the operating system to Microsoft Windows 10; upgraded browsers to latest versions of Google Chrome, Mozilla Firebox and Microsoft Edge.
- Created new uCorp Website to replace Habitat for Humanity lab examples. uCorp Website will grow as curriculum is implemented. To provide longevity for labs to avoid broken link and other issues created by Website changes.
- Modified labs to use Google Chrome as primary browser profiled.
- Added sample/possible answers to the Case Study questions throughout the course.
- Incorporated minor style guide changes and minor changes to the text and some labs, including corrections of typographical and content errors.
- Replaced outdated links with modern ones.

- Updated network technologies to include modern protocols, speeds and hardware information.
- Updated activities and quizzes to reflect changes in lesson content.

Released April 2014 (Network Technology Associate version 2.1)

This release is considered a minor update. The main differences between this *Network Technology Associate v2.1* course and the previous version (v2.0 released August 2012) are as follows:

- Updated Software Requirements section in coursebook front matter to reflect the migration from Windows Live Messenger to Skype. Revised minor references throughout the course from Windows Live Messenger to Skype.
- Updated Software Requirements section in coursebook front matter to reflect the migration from Hotmail to Outlook.com. Revised minor references throughout the course from Hotmail to Outlook.com.
- In Lesson 2, revised Lab 2-2 by changing a reference to a previous lab from "Lab 2-2" to "Lab 2-1."
- In Lesson 4, revised Lab 4-3 by renaming "Real Story Watch" to "Real Story Group."
- In Lesson 6, revised Lab 6-1 extensively to coincide with changes to the Netcraft Toolbar site. Also removed figures from Lab 6-1, which caused the subsequent figures in Lesson 6 to be renumbered.
- Corrected errata (errors in writing or printing, including but not limited to spelling, style and code errors).

Released August 2012 (Network Technology Associate version 2.0)

This release is considered a major revision. The main differences between this *Network Technology Associate v2.0* course and the previous version (v1.0 released December 2010) are as follows:

- Updated technology, labs and content throughout the course to reflect the growing importance of the cloud and mobile devices, including smartphones and tablets.
- Upgraded the operating system to Microsoft Windows 7; upgraded the browsers to Windows Internet Explorer 9 and the latest versions of Google Chrome and Mozilla Firefox.
- Split Lesson 1 into two lessons. Lesson 1 retained the title Introduction to Networking; the new Lesson 2 is titled "Network Components and Standards." All other lessons moved up by one lesson number.
- Added a lab on virtualization; students will run multiple operating systems simultaneously on one system.
- Changed Lesson 3 title from "TCP/IP Suite and Internet Addressing" to "Connecting to the Internet." The lesson now focuses more on mobile devices and IPv6.
- Changed Lesson 4 title from "Internetworking Servers" to "Internet Services." Expanded content on technologies such as cloud computing and social networking. Removed older technologies and terms, such as news servers and media servers, and various protocols.
- Changed Lesson 5 title from Hardware and Operating System Maintenance to Hardware and Device Connectivity. Expanded the lesson to include mobile devices.
- Changed Lesson 6 title from "Network Security and Personal Privacy" to "Network and Cloud Security Risks." Added content on cloud security risks and Bring Your Own Device (BYOD) security risks. The personal privacy topics were moved to the Internet Business Associate course.

Released December 2010 (Network Technology Associate version 1.0)

This release reflects a name change to the coursebook. The main differences between this *Network Technology Associate v1.0* course and the previous version (Network Technology Foundations v2.0 released May 2009), are as follows:

- Coursebook title was changed from *Network Technology Foundations* to *Network Technology Associate* to mirror the Network Technology Associate exam name.
- Incorporated minor changes to the text and some labs, including corrections of typographical and content errors.
- Discontinued the supplemental CD-ROM and removed the handouts from the coursebook, and made these files available on CIW Online.

Preparing the classroom behind a proxy server

Internet access is required for all the CIW Web Foundations courses. If the classroom is behind a proxy server, you may have problems downloading programs during classroom setup and completing certain labs during class. Most proxy servers already allow HTTP traffic. Difficulties may occur when you require additional services, such as email, FTP, and program downloads.

The following two suggestions are offered.

1. Talk with the network administrator at the location and make sure that:

    a. The classroom has proper access to all Internet-related protocols used in the class. Examples include HTTP (TCP/UDP port 80), SSL (TCP/UDP port 443), FTP (TCP/UDP port 20, 21), Telnet (TCP/UDP port 23), POP3 (TCP/UDP port 110), SMTP (TCP/UDP port 25) and NNTP (TCP/UDP port 119). For certain services, such as FTP, you will need all ports above 1023 (registered ports).

    b. The IP addresses assigned to the computers in your classroom have permission to access the Internet.

2. Download all the required software (with proper licensing) for the course before you arrive at the site, and place the source files on the instructor computer. Students can then access all source files from shares that you create. Consider creating a CD with the required software source files. This will not solve the issues addressed in Suggestion 1, but will solve any download problems.

Troubleshooting tools and the firewall

The CIW *Network Technology Associate* course teaches students to use diagnostic tools such as ping and traceroute. The firewall for your classroom may not allow ICMP packets to access the Internet. As a result, students may not be able to use ping and traceroute.

Classroom Requirements

This section lists the hardware, software and connectivity requirements to implement this course. Before class, the instructor should install and configure the instructor and student systems using the following instructions.

Hardware

Each classroom should be equipped with an individual computer workstation for each student and the instructor. The following table summarizes the hardware requirements for all courses in the CIW program.

Note: The CIW hardware requirements are similar to the minimum system requirements for Microsoft Windows 10 implementation.

Hardware Specifications	Minimum Requirements
Processor	1 GHz 32-bit (x86) or 64-bit (x64) processor
Hard disk	16 GB available hard disk space (32-bit) or 20 GB available hard disk space (64-bit) for Windows 10 installation. 16 GB of additional space must be available for course applications and files.
RAM	1 GB RAM (32-bit) or 2 GB RAM (64-bit)
Wireless router (AP)	Wireless-G, Wireless-N or Wireless-AC router with built-in 4-port Ethernet switch to connect wired network PCs and devices. Wireless NICs must support the wireless router (G, N or AC)
Network interface card (NIC)	Wireless, 10/100 Ethernet, or Gigabit Ethernet
Sound card/speakers	Required
Video adapter	DirectX 9 graphics device with WDDM 1.0 driver
Network connectivity	Enough wireless nodes, hubs or switches to allow classroom computers to communicate and access the Internet.
Monitor	1024 x 768 screen resolution using a VGA, DVI or HDMI connector
Web camera (Webcam)	Any type of Web camera. Some monitors include an internal Webcam. USB Webcams are a good choice.

Software

The CIW Web Foundations series is intended to be largely operating system and browser-independent. Provided you use Hypertext Markup Language version 5 (HTML5)-compliant browsers, the labs should function properly. HTML5-compliant browsers include Google Chrome (any version), Mozilla Firefox (version 10 or higher) and Microsoft Edge.

Each school's network is configured differently. You should test each lab to ensure the ports are open on the firewall before presenting the lab to the class. You may have to talk to your network administrator to open the ports.

If you are teaching all three CIW Web Foundations courses sequentially, there is no need to reformat your computers for each course. The recommended software configurations for computers used to complete the labs in this book series are as follows.

Network Technology Associate

To be installed before class:

- **Microsoft Windows 10 Professional** (typical installation)
- **Microsoft Edge** (typical installation)
- **Firefox 10 or later** (typical installation)
- **Chrome — any version** (typical installation)

To be registered by students during class:

- **Google account** (*www.google.com*) — necessary for students to access online cloud services and resources, such as Google Drive, Google Docs, Gmail, Google+ and Blogger. Students are responsible for their own account registration.
- **Microsoft account** (*https://signup.live.com*) — necessary for students to access online cloud services and resources, such as OneDrive, Outlook.com (formerly Hotmail), Windows Essentials and Skype (formerly Windows Live Messenger). Students are responsible for their own account registration.

Note: In 2013, Microsoft acquired Skype. Windows Live Messenger users were automatically migrated to Skype.

Note: In 2013, Hotmail was replaced with Outlook.com. Hotmail users were automatically migrated to Outlook.com. Throughout the transition and thereafter, users' Hotmail email addresses, passwords, emails and contacts will remain unchanged.

To be installed by students during course labs:

- **uTorrent** (binary provided in the C:\CIW\Network\Lab Files\Lesson01 folder)
- **FileZilla_v3.0.2.1** (torrent file provided in the C:\CIW\Network\Lab Files\Lesson01 folder)
- **7-Zip** (binary provided in the C:\CIW\Network\Lab Files\Lesson01 folder)
- **TruCrypt or higher** (binary provided in the C:\CIW\Network\Lab Files\Lesson06 folder)
- **VirtualBox** (binary provided in the C:\CIW\Network\Lab Files\Lesson02 folder)
- **Porteus Linux** (binary provided in the C:\CIW\Network\Lab Files\Lesson02 folder)

Connectivity

Internet connectivity is required for this course. You will experience optimal performance with a dedicated Internet connection (e.g., a cable/DSL modem or a T1 line). However, you can teach the course using slower connections (e.g., 56-Kbps modem).

Setup Instructions

Use the following procedures to set up the computers for class.

To set up the hardware

Set up the hardware according to the manufacturer's instructions. (Refer to the requirements listed the Hardware section of this Classroom Setup Guide.)

To install and configure Microsoft Windows 10 Professional

The three courses in the CIW Web Foundations series can be taught without reinstalling the operating system for each course. Install Windows 10 Professional with the settings listed in this guide. The basic requirements are:

- All systems must be able to communicate with one another via TCP/IP. You must decide whether to use DHCP or statically configure IP addresses.
- Systems must be able to access the Internet in order for students to perform the hands-on labs in all CIW Web Foundations courses.

The instructions for installing Windows 10 Professional are as follows:

1. Obtain a valid license for all copies of Windows 10 Professional.
2. Begin setup by setting the boot sequence for your computer so that it will boot from the DVD/CD drive, then insert the Windows 10 Professional DVD, CD-ROM or USB and reboot.
3. When prompted, specify your installation language, time and currency format, keyboard type and select Next.
4. Select Install Now.

5. When prompted, enter your product key and Select Next.
6. Accept the license terms.
7. Specify to conduct a Custom (advanced) installation. Use the following parameters to perform a custom installation of Windows 10 Professional.

When This Information Is Required	Use
Phase 1	
Partition Location	Drive 0 Unallocated Space
Partition Size	Entire hard drive
Phase 2 (after Windows formats and installs files to your hard drive)	
Customize Settings	**Use Express settings**
Who owns this PC?	**I Do**
Make it yours	**Skip this step**
Create an account for this PC	***Your Name*** (all lowercase letters)
Enter password	***password***
Re-enter password	***password***
Password hint	***Password hint***
Meet Cortana	**Not now**
Welcome to Windows 10	**Login**

Configure Windows 10 Professional for use in your classroom by specifying the following settings:

Specify valid IP addresses

1. Log on as Administrator.
2. Select the Cortana Search Bar, enter **network**, then click **Network and Sharing Center**.
3. Select **Change Adapter Settings**, then right-click **Ethernet0** or **Wireless Network Connection**, depending on your network media, and select **Properties**.
4. On the Networking tab, click **Internet Protocol Version 4 (TCP/IPv4)**, then click **Properties** to open the Internet Protocol Version 4 (TCP/IPv4) Properties dialog box.
5. Select **Use the following IP address**, then manually enter the IP address information specific to this classroom. You can use DHCP if you prefer; however, prepare the system for networking.

   Note: Do not enter DNS configurations unless you have a DNS server.
6. Click **OK**, then close all open dialog boxes and windows.

Specify the CLASSROOM workgroup

1. Select the Cortana Search Bar, enter **Systems**, then click **Systems Control Panel**.
2. Select **Change settings** from the Computer Name, domain, and workgroup settings.
3. From the Computer Name tab, select **Change**. In the Member Of section, click **Workgroup**, type ***classroom*** in the Workgroup field, click **OK**, enter your name and password when prompted, and then restart your computer.

   Note: If several classrooms are connected, you may encounter name conflicts. If so, add a number to the name. For example, name the workgroup Classroom1.

Disable the Windows firewall on each system in the network

1. Select the Cortana Search Bar, enter firewall, then click **Windows Firewall Control** panel.
2. If Windows Firewall is in use, click **Turn off Windows Firewall (not recommended)** for both Private and Public network settings, then click **OK**.
3. Close all open windows.

Network requirements

Classroom computers should be part of the same local area network (LAN). This class also requires Internet access. Following are two options available to you.

1. Obtain valid IP addresses from a DHCP server.
2. If no DHCP server is available, obtain TCP/IP configurations from the network administrator and manually configure each system.

Installing Oracle VirtualBox

In the *Network Technology Associate* course (Lab 2-4: Running multiple operating systems with virtualization), students will use Oracle VirtualBox to run multiple operating systems on the same physical computer. VirtualBox is free, open-source virtualization software that allows you to install multiple operating systems on one machine. After installing VirtualBox, they will install the Linux Porteus operating system. There are two important notices regarding this installation:

- **The lab requires each system to have at least 256 MB RAM available and 500 MB of free hard drive space** in order to create the virtual Linux machine. If you do not have this amount of RAM and hard drive space available, you may be unable to complete the steps in this lab. Test out a system before class if you are concerned.
- **The lab files should be downloaded before class begins.** The Porteus Linux file is relatively small for an operating system at 212 MB, but can take a long time to download. It should be available over the local area network or a copy placed on each student's computer. Porteus is an ISO image file. You simply point VirtualBox to the ISO file and VirtualBox does the rest.

If you have never used Linux before, do not be alarmed. The version of Linux used in this lab, Porteus, is a simple and easy-to-use operating system. It automatically configures itself and launches from within VirtualBox. It displays a graphical user interface similar to Windows, and includes Firefox and other popular applications. It is comparable to a simplified Netbook operating system, such as Windows RT, that is mainly used for browsing the Internet, checking email and using social networking sites.

CIW supplemental files

Each course includes supplemental materials that are referenced and used throughout the course. These supplemental materials are provided in the online course materials.

You will need to create a directory for all supplemental materials for the course. The default location is *C:\CIW\[Course_Title].* To view or download the materials, go to the CIW Online course, click the link for each file and save to this directory. You can then create a shortcut to this directory on your Desktop. As you conduct the course labs, you can use this shortcut to quickly access your lab files.

