

Syllabus

Course Overview

This course provides the opportunity to acquire the foundational skills and knowledge required of a systems administrator to employ tools and procedures to install, configure, administer, troubleshoot, and maintain modern computer systems. You gain hands on experience in a live lab environment to prepare you for basic skills required to work with hardware and software in an organization, install applications, monitor and update systems, and maintain user access and accounts.

Technology Resources

This Capella course offers real-world, hands-on labs provided by Practice-Labs.com. These labs offer guided practice in performing tasks related to achieving course competencies and completing assessments. If you require the use of assistive technology or alternative communication methods to participate in these activities, please contact DisabilityServices@Capella.edu to request accommodations.

Course Competencies

(Read Only)

To successfully complete this course, you will be expected to:

- 1 Explain system administration duties, concepts, and standards.
- 2 Explain system administration procedures and tools used to install, configure, maintain, and repair IT systems.
- 3 Conduct networking operations typically performed by system administrators.
- 4 Communicate effectively.

Course Prerequisites

Integrated Materials

Many of your required books are available via the VitalSource Bookshelf link in the courseroom, located in your Course Tools. Registered learners in a Resource Kit program can access these materials using the courseroom link on the Friday before the course start date. Some materials are available only in hard-copy format or by using an access code. For these materials, you will receive an email with further instructions for access. Visit the [Course Materials](#) page on Campus for more information.

Book

Andrews, J., Dark, J., West, J. (2017). *A+ Guide to IT Technical Support*. Boston, MA: Cengage. ISBN: 9781305266438

Library

The following required readings are provided in the Capella University Library or linked directly in this course. To find specific readings by journal or book title, use [Journal and Book Locator](#). Refer to the [Journal and Book Locator library guide](#) to learn how to use this tool.

- Lobban, C. & Long, R. (n.d.). [CompTIA A+ 220-902: Monitoring the Windows OS and an Introduction to Other OSs \[Tutorial\]](#). Skillsoft, Ireland.
- Lobban, C. & Long, R. (n.d.). [CompTIA A+ 220-902: Networking with the Windows Operating System \[Tutorial\]](#). Skillsoft, Ireland.
- Lobban, C. (n.d.). [CompTIA A+ 220-901: Desktop Security \[Tutorial\]](#). Skillsoft, Ireland.
- Lobban, C. (n.d.). [CompTIA A+ 220-902: Common Troubleshooting and Security Practices \[Tutorial\]](#). Skillsoft, Ireland.
- Lobban, C. (n.d.). [CompTIA A+ 220-902: Mobile Troubleshooting \[Tutorial\]](#). Skillsoft, Ireland.
- Lobban, C. (n.d.). [CompTIA A+ 220-902: Non-desktop Technologies \[Tutorial\]](#). Skillsoft, Ireland.
- Lobban, C. (n.d.). [CompTIA A+ Exam 220-902: Non-Windows Operating Systems \[Tutorial\]](#). Skillsoft, Ireland.
- Lobban, C. (n.d.). [CompTIA A+ Exam 220-902: Troubleshooting Software \[Tutorial\]](#). Skillsoft, Ireland.
- Lobban, C., Long, R., & Plumb, M. (n.d.). [CompTIA A+ 220-902: Introduction to Mobile Operating Systems](#). Skillsoft, Ireland.
- Lobban, C., Long, R., & Plumb, M. (n.d.). [CompTIA A+ 220-902: Windows Utilities and Management \[Tutorial\]](#). Skillsoft, Ireland.
- Plumb, M. (n.d.). [CompTIA A+ 220-901: Networking \[Tutorial\]](#). Skillsoft, Ireland.
- Plumb, M. (n.d.). [CompTIA A+ 220-901: Troubleshooting Networking Devices \[Tutorial\]](#). Skillsoft, Ireland.
- Young, D. (n.d.). [CompTIA A+ Exam 220-901: Mobile Computing \[Tutorial\]](#). Skillsoft, Ireland.

External Resource

Please note that URLs change frequently. While the URLs were current when this course was designed, some may no longer be valid. If you cannot access a specific link, contact your instructor for an alternative URL.

Permissions for the following links have been either granted or deemed appropriate for educational use at the time of course publication.

- Bernsen, E. (n.d.). [What you need out of Windows server monitoring](https://www.opsview.com/resources/windows-monitoring/blog/what-you-need-out-windows-server-monitoring). Retrieved from <https://www.opsview.com/resources/windows-monitoring/blog/what-you-need-out-windows-server-monitoring>
- CBT Nuggets. (2016). [Windows through the years: A retrospective](https://www.cbtnuggets.com/blog/2016/09/windows-through-the-years-a-retrospective/). Retrieved from <https://www.cbtnuggets.com/blog/2016/09/windows-through-the-years-a-retrospective/>
- Chen, B. (2017). [Why your next Wi-Fi setup should be a mesh network](https://www.nytimes.com/2017/04/26/technology/personaltech/mesh-network-vs-router.html). Retrieved from <https://www.nytimes.com/2017/04/26/technology/personaltech/mesh-network-vs-router.html>
- Computer Hope. (n.d.). [Basic network troubleshooting](https://www.computerhope.com/issues/ch000445.htm). Retrieved from <https://www.computerhope.com/issues/ch000445.htm>
- ComputerNetworkingNotes. (n.d.). [Network cable types and specifications](https://www.computernetworkingnotes.com/networking-tutorials/network-cable-types-and-specifications.html). Retrieved from <https://www.computernetworkingnotes.com/networking-tutorials/network-cable-types-and-specifications.html>
- Fisher, T. (2018). [How to fix freezing & other issues during Windows startup](https://www.lifewire.com/how-to-fix-stopping-freezing-and-reboot-issues-during-windows-startup-2624448). Retrieved from <https://www.lifewire.com/how-to-fix-stopping-freezing-and-reboot-issues-during-windows-startup-2624448>
- Frank, B. H. (2018). [Windows Server 2019 will feature Linux and Kubernetes support](https://venturebeat.com/2018/03/20/windows-server-2019-will-feature-linux-and-kubernetes-support/). Retrieved from <https://venturebeat.com/2018/03/20/windows-server-2019-will-feature-linux-and-kubernetes-support/>
- Froehlich, A. (2017). [5 advanced network troubleshooting tools](https://www.networkcomputing.com/networking/5-advanced-network-troubleshooting-tools/678163981). Retrieved from <https://www.networkcomputing.com/networking/5-advanced-network-troubleshooting-tools/678163981>
- GeeksforGeeks. (n.d.). [Computer Network | Layers of OSI Model](https://www.geeksforgeeks.org/layers-osi-model/). Retrieved from <https://www.geeksforgeeks.org/layers-osi-model/>
- GeeksforGeeks. (n.d.). [Operating System | Types of Operating Systems](https://www.geeksforgeeks.org/operating-system-types-operating-systems-awaiting-author/). Retrieved from <https://www.geeksforgeeks.org/operating-system-types-operating-systems-awaiting-author/>
- Glenn, W. (2016). [How to apply local group policy tweaks to specific users](https://www.howtogeek.com/248206/how-to-apply-local-group-policy-tweaks-to-specific-users/). Retrieved from <https://www.howtogeek.com/248206/how-to-apply-local-group-policy-tweaks-to-specific-users/>
- Help Net Security. (2017). [Maintaining Windows 10 security tops list of enterprise challenges](https://www.helpnetsecurity.com/2017/09/21/maintaining-windows-10-security/). Retrieved from <https://www.helpnetsecurity.com/2017/09/21/maintaining-windows-10-security/>
- Hoffmann, R. (2017). [The paranoid Windows traveler's data-protection checklist](https://www.computerworld.com/article/3218165/microsoft-windows/the-paranoid-windows-travelers-data-protection-checklist.html). Retrieved from <https://www.computerworld.com/article/3218165/microsoft-windows/the-paranoid-windows-travelers-data-protection-checklist.html>
- Inspired Techs. (2017). [The main benefits of computer networking in 2017](http://www.inspiredtechs.com.au/computer-networking/). Retrieved from <http://www.inspiredtechs.com.au/computer-networking/>
- IT Pro. (2018). [17 Windows 10 problems - and how to fix them](http://www.itpro.co.uk/operating-systems/25802/17-windows-10-problems-and-how-to-fix-them). Retrieved from <http://www.itpro.co.uk/operating-systems/25802/17-windows-10-problems-and-how-to-fix-them>
- Javier. (2017). [Server monitoring: a small guide with the best practices you need to know](https://blog.pandorafms.org/server-monitoring-best-practices/). Retrieved from <https://blog.pandorafms.org/server-monitoring-best-practices/>
- Khanse, A. (2016). [Tips to maintain Windows in good running condition](https://www.thewindowsclub.com/maintain-windows-good-running-condition). Retrieved from <https://www.thewindowsclub.com/maintain-windows-good-running-condition>
- Kumar, C. (2018). [Run Linux from web browser with these six websites](https://geekflare.com/run-linux-from-a-web-browser/). Retrieved from <https://geekflare.com/run-linux-from-a-web-browser/>
- Kuziv, I. (2016). [15 fixes to common Windows PC problems that anyone can do](https://macpaw.com/how-to/15-fixes-to-common-windows-pc-problems). Retrieved from <https://macpaw.com/how-to/15-fixes-to-common-windows-pc-problems>
- Lantronix. (n.d.). [Ethernet tutorial – Part I: Networking basics](https://www.lantronix.com/resources/networking-tutorials/ethernet-tutorial-networking-basics/). Retrieved from <https://www.lantronix.com/resources/networking-tutorials/ethernet-tutorial-networking-basics/>

- Lou Frenzel. (2013). [What's the difference between the OSI seven-layer network model and TCP/IP?](http://www.electronicdesign.com/what-s-difference-between/what-s-difference-between-osi-seven-layer-network-model-and-tcpip) Retrieved from <http://www.electronicdesign.com/what-s-difference-between/what-s-difference-between-osi-seven-layer-network-model-and-tcpip>
- Mathias, C. (n.d.). [Wi-Fi troubleshooting checklist for mobile devices](https://searchmobilecomputing.techtarget.com/tip/Wi-Fi-troubleshooting-checklist-for-mobile-devices). Retrieved from <https://searchmobilecomputing.techtarget.com/tip/Wi-Fi-troubleshooting-checklist-for-mobile-devices>
- Mitchell, B. (2018). [SOHO routers and networks explained](https://www.lifewire.com/soho-routers-and-networks-explained-3971344). Retrieved from <https://www.lifewire.com/soho-routers-and-networks-explained-3971344>
- Neagu, C. (2016). [Simple questions: What is the Local Group Policy Editor & how to use it?](https://www.digitalcitizen.life/simple-questions-what-local-group-policy-editor-how-use-it) Retrieved from <https://www.digitalcitizen.life/simple-questions-what-local-group-policy-editor-how-use-it>
- Neagu, C. (2017). [Fix problems that keep Windows from loading, with Startup Repair](https://www.digitalcitizen.life/fix-problems-keep-windows-81-loading-start-repair). Retrieved from <https://www.digitalcitizen.life/fix-problems-keep-windows-81-loading-start-repair>
- Plummer, Q. (2015). [Tips, tricks for troubleshooting Android mobile devices](https://www.techtimes.com/articles/23749/20150101/troubleshooting-android-devices.htm). Retrieved from <https://www.techtimes.com/articles/23749/20150101/troubleshooting-android-devices.htm>
- Polish Linux. (2018). [The top problems with major operating systems](http://polishlinux.org/polishlinux-org/top-problems-major-operating-systems/). Retrieved from <http://polishlinux.org/polishlinux-org/top-problems-major-operating-systems/>
- Ravenscraft, E. (2015). [How to configure Windows 10 to protect your privacy](https://lifelife.com/how-to-configure-windows-10-to-protect-your-privacy-1716204024). Retrieved from <https://lifelife.com/how-to-configure-windows-10-to-protect-your-privacy-1716204024>
- Robish, E. (2017). [Home network design – Part 1](https://www.blackhillsinfosec.com/home-network-design-part-1/). Retrieved from <https://www.blackhillsinfosec.com/home-network-design-part-1/>
- Security in a Box. (2016). [Basic security for Windows](https://securityinabox.org/en/guide/basic-security/windows/). Retrieved from <https://securityinabox.org/en/guide/basic-security/windows/>
- Server Density. (2016). [60+ Windows monitoring tools](https://blog.serverdensity.com/windows-monitoring-tools/). Retrieved from <https://blog.serverdensity.com/windows-monitoring-tools/>
- Server Density. (2016). [80 Linux monitoring tools](https://blog.serverdensity.com/80-linux-monitoring-tools-know/). Retrieved from <https://blog.serverdensity.com/80-linux-monitoring-tools-know/>
- Shekhar, A. (2016). [Different networking devices and hardware types — hub, switch, router, modem, bridge, repeater](https://fossbytes.com/networking-devices-and-hardware-types/). Retrieved from <https://fossbytes.com/networking-devices-and-hardware-types/>
- Sophos. (n.d.). [When malware goes mobile](https://www.sophos.com/en-us/security-news-trends/security-trends/malware-goes-mobile.aspx). Retrieved from <https://www.sophos.com/en-us/security-news-trends/security-trends/malware-goes-mobile.aspx>
- The Connectivity Center. (n.d.). [Computer tips - Network hubs and switches](http://www.connectworld.net/cis/network-equipment.html). Retrieved from <http://www.connectworld.net/cis/network-equipment.html>
- Tutorials Point. (n.d.). [Operating system - Overview](https://www.tutorialspoint.com/operating_system/os_overview.htm). Retrieved from https://www.tutorialspoint.com/operating_system/os_overview.htm
- University of Oxford IT Services. (n.d.). [Fixing Windows system 7 and startup problems](https://help.it.ox.ac.uk/helpcentre/troubleshooting/winos7/index). Retrieved from <https://help.it.ox.ac.uk/helpcentre/troubleshooting/winos7/index>
- uSwitch. (2016). [What are the different mobile operating systems?](https://www.uswitch.com/mobiles/guides/mobile-operating-systems/) Retrieved from <https://www.uswitch.com/mobiles/guides/mobile-operating-systems/>
- Woodford, C. (2018). [Computer networks](https://www.explainthatstuff.com/howcomputernetworkswork.html). Retrieved from <https://www.explainthatstuff.com/howcomputernetworkswork.html>

Suggested

The following materials are recommended to provide you with a better understanding of the topics in this course. These materials are not required to complete the course, but they are aligned to course activities and assessments and are highly recommended for your use.

Optional

The following optional materials are offered to provide you with a better understanding of the topics in this course. These materials are not required to complete the course.

Unit 1 >> Desktop, Mobile, and Network Operating Systems

Introduction

Operating Systems and the User Interface

Operating Systems (OS) are software programs that manage computer resources and provide an interface for users to communicate with a computer's hardware. Operating systems have some form of a user interface (GUI or command line). The user interface (UI) is the name for everything you see on your computer screen at any time. It ranges from icons, buttons, commands, links, bars, windows, graphics, colors, mouse pointer, and anything else that you interact with while you are using your computer for any reason. The UI is significant because it includes the navigation system that the user must use to accomplish a task.

Several operating systems have emerged over the years (most perform similar functions). Consumers typically purchase computers that are fully installed with an OS. The type of OS installed on the computer depends on the hardware and the vendor. For example, Apple computers are delivered to consumers with preinstalled MacOS. Most computer users commonly use a GUI (graphical user interface) to communicate with a computer. System administrators and other IT professionals often use a command line interface to effectively configure or troubleshoot their systems. Popular types of operating systems include Windows, MacOS, and Linux systems (desktop, network, and mobile operating systems).

Desktop Operating System

Desktop operating systems such as personal computers, laptops, and workstations are sometimes referred to as stand-alone computers. Desktop operating systems have full functional operating systems. An example is a laptop or personal computer that is not connected to a network.

Network Operating System

A network operating system (NOS) is a computer with a server type of operating system. A NOS supports users and devices on the network (such as LANs). The NOS contains a directory service with information for all

resources on the network, and making it possible for users to share files, print services, and other resources on the network. Windows server versions such as Windows Server 2016 is an example of a NOS.

Mobile Devices

There is an upward trend in the use of mobile devices. Numerous hardware vendors build mobile devices and have responded to this trend by developing proprietary operating systems for use with their specialized hardware. The most popular mobile operating systems are Android and iOS.

Labs

In this unit you will complete the following labs:

- Configuring a Mobile Device.
- Configuring E-mail on a Mobile Device.

Learning Activities

u01s1 - Studies

Readings

Read the following in your *A+ Guide to IT Technical Support (Hardware and Software)* text:

- Chapter 7, "Survey of Windows Features and Supporting Tools," pp. 277–288.
- Chapter 16, "Supporting Mobile Operating Systems," pp. 747–799.
- Chapter 20, "Virtualization, Linux, and Mac OS X."
 - "Linux Operating System," pp. 972–985.
 - "Mac OS X Operating System," pp. 990–1014.

Read the following on the Internet:

- CBT Nuggets. (2016). [Windows through the years: A retrospective](https://www.cbtnuggets.com/blog/2016/09/windows-through-the-years-a-retrospective/). Retrieved from <https://www.cbtnuggets.com/blog/2016/09/windows-through-the-years-a-retrospective/>
 - Explains the Windows operating system from its earlier years.
- Frank, B. H. (2018). [Windows Server 2019 will feature Linux and Kubernetes support](https://venturebeat.com/2018/03/20/windows-server-2019-will-feature-linux-and-kubernetes-support/). Retrieved from <https://venturebeat.com/2018/03/20/windows-server-2019-will-feature-linux-and-kubernetes-support/>
 - Explains the features of an upcoming Windows server operating system.
- GeeksforGeeks. (n.d.). [Operating System | Types of Operating Systems](https://www.geeksforgeeks.org/operating-system-types-operating-systems-awaiting-author/). Retrieved from <https://www.geeksforgeeks.org/operating-system-types-operating-systems-awaiting-author/>
 - Describes the tasks of an operating system.
- Kumar, C. (2018). [Run Linux from web browser with these six websites](https://geekflare.com/run-linux-from-a-web-browser/). Retrieved from <https://geekflare.com/run-linux-from-a-web-browser/>

- Provides a list of web-based portals for the Linux operating system to assist in practicing Linux commands.
- Tutorials Point. (n.d.). [Operating system - Overview](https://www.tutorialspoint.com/operating_system/os_overview.htm). Retrieved from https://www.tutorialspoint.com/operating_system/os_overview.htm
 - Covers the functions of an operating system.
- uSwitch. (2016). [What are the different mobile operating systems?](https://www.uswitch.com/mobiles/guides/mobile-operating-systems/) Retrieved from <https://www.uswitch.com/mobiles/guides/mobile-operating-systems/>
 - Covers different types of mobile operating systems and their functions.

Skillssoft Resources

View the listed sections of the following Skillssoft Tutorials:

- Young, D. (n.d.) [CompTIA A+ Exam 220-901: Mobile Computing \[Tutorial\]](#). Skillssoft, Ireland. (19 Minutes).
 - Understanding Mobile Computers.
 - Mobile Computing.
 - Mobile Computing Advantages.
 - Mobile Computing Disadvantages.
 - Common Flavors of Mobile Devices.
 - Wearable Technology.
 - Portable Devices.
 - Tethering.
- Lobban, C. (n.d.) [CompTIA A+ 220-902: Non-desktop Technologies \[Tutorial\]](#). Skillssoft, Ireland. (19 Minutes).
 - Mobile Computing.
 - Mobile Operating Systems.
 - Wireless Data.
 - Mobile Synchronization.
- Lobban, C., Long, R., & Plumb, M. (n.d.). [CompTIA A+ 220-902: Introduction to Mobile Operating Systems \[Tutorial\]](#). Skillssoft, Ireland. (41 Minutes).
 - Mobile Devices and Operating Systems.
 - Comparing Mobile OS.
 - Common Mobile Elements (Part 1).
 - Common Mobile Elements (Part 2).
 - Emergency Notifications.
 - Install and Configure Wireless Data Network.
 - Wireless Data Demo.
 - Install and Configure Bluetooth.
 - Bluetooth Demo.
 - Mobile E-mails.
 - E-mail Demo.
 - Mobile Synchronization.

- Mobile Synchronization Methods
- Lobban, C. (n.d.). [CompTIA A+ Exam 220-902: Non-Windows Operating Systems \[Tutorial\]](#). Skillsoft, Ireland. (54 Minutes).
 - Other Operating System Technologies.
 - Introduction to Other Operating Systems.
 - History of OS X.
 - OS X Features and Utilities.
 - Advanced OS X Utilites.
 - Introduction to Linux.
 - Interacting with Linux .
 - Navigating in a Linux Environment.
 - Manipulating a Linux File System.
 - Advanced Linux Commands.
 - More Advanced Linux commands.
 - Advantages of a Non-Windows OS.

Course Resources

A+ Guide to IT Technical Support

u01s1 - Learning Components

- Explain the interface metric and blind methods.
- Explain how POP3 and IMAP4 work.
- Explain ActiveSync.

u01s2 - Software Preparation and Technology Access

In this course, you will be using software and technology that is needed to complete designated activities and assignments. There is no additional cost for this software and technology. Some software packages will be made available to you at no additional cost through Capella's subscription with Microsoft, while other software packages are available for free download through open-source licensing.

Capella University requires learners to meet certain minimum [computer requirements](#). Please note that some software required for a course may exceed these minimum requirements. Check the requirements for the software you may need to download and install to make sure it will work on your device. Most software will require a Windows PC. If you use a Mac, refer to [Installing a Virtual Windows Environment](#).

The software and technologies below are strongly recommended to support you in completing the course objectives. If you have access to other tools that you believe may still meet course requirements or if you have

any difficulties accessing this resource or completing the related assignments, please contact your course faculty member to discuss potential alternatives.

If you use assistive technology or any alternative communication methods to access course content, please contact DisabilityServices@Capella.edu with any access-related questions or to request accommodations.

For this course, follow the instructions provided through the links below to download and install software or register for an account, as required.

Practice Labs

This Capella course offers real-world, hands-on labs provided by Practice Labs in many of the units of this course. Click the Practice Labs Orientation link in this unit to access an introductory lab.

Note: As a Capella learner, you have access to IT online resources through Capella's [Skillsoft](#) subscription, where you can find helpful materials.

u01v1 - Practice Labs Orientation: Module Zero – Basics

This lab is designed to familiarize you with the Practice Labs platform. This is a great time to ensure that you can access the labs without any technical difficulty.

Click the linked title heading above to access the hands-on lab.

u01v2 - Hands-On Lab: Configuring a Mobile Device

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u01v3 - Hands-On Lab: Configuring E-mail on a Mobile Device

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u01a1 - Configuring Mobile Devices

Preparation

By now you should have completed the labs in the Hands-On Labs for this unit and saved the lab report PDF for submission with this assignment.

Instructions

Complete the following in a Word document titled "Unit 1 Assignment."

Labs-Related Assignment

1. In one of the labs, you used the bind method to configure the order of network interfaces. This method is deprecated in newer versions of Windows (Windows 10, and Windows Server 2016). A new method (interface metric) is now the preferred method. Explain how the interface metric method is configured to achieve the same benefit as the bind method.
2. In one of the labs, you configured POP3 and IMAP4 settings. Explain both types of setup and the benefits and disadvantages of using one over the other. Include an explanation of the connections and ports involved.

Non-Lab Assignment

Mobile devices, especially smartphones, use Exchange ActiveSync (EAS) protocol to synchronize data with Microsoft Exchange network server (such as emails, calendar, and contact information).

1. Explain two common ActiveSync features used by system administrators. What are they used for?
2. Explain how to configure ActiveSync on your mobile Android, Apple, Windows or other smart device to connect to an email account.

Submission Requirements

Submit the following documents:

- Lab Report.
- Unit 1 Assignment.

u01d1 - OS System Upgrade.

All operating systems age and there comes a time when they need to be upgraded or replaced.

Discuss your responsibilities as a system administrator when planning for an upgrade to a network operating system. What are some of the things you should consider during your planning?

As with all discussions in this course, it is recommended that you make your initial post by 12 a.m. Central Standard Time on Wednesday evening to allow time for your peers to respond.

Response Guidelines

The expectation within the course discussions is to respond to at least two posts by each Sunday evening, but it is highly recommended that you extend the dialog further. Responding over multiple days will help in stimulating a lively discussion. Start by submitting your initial post on (or before) Wednesday. If you provide responses to your peers on Thursday, Saturday, and Sunday, and your peers reciprocate with their responses, you will have more opportunity for in-depth interaction with your classmates and the instructor.

Prior to Sunday evening, read your peers' posts, and provide feedback to at least two of them.

Course Resources

Undergraduate Discussion Participation Scoring Guide

u01d1 - Learning Components

- Explain basic duties of a system administrator regarding system upgrades.
- Explain basic duties of a system administrator regarding system upgrades.

Windows Domains and The Role of a Directory Service

All modern networks need good management. A network directory service enables systems administrators to effectively manage resources such as user accounts, shared folders, and shared printers. It is an administrative tool that allows users to make use of directory services to find resources on the network. A directory service provides a centralized management tool that requires careful planning prior to setup.

On a computer network, a domain involves user and computer accounts that can be managed from a central security database. A domain is nothing more than a container of all network components over which you have control and responsibility. One way to look at a domain is to think of it as a parent folder with subfolders and files underneath, all of which can be maintained and organized through the domain controller. A Windows domain enables systems administrators to manage huge numbers of workstations (client computers) and control them from a central location. A directory service is used to manage resources on a Windows network (Active Directory). The server on which Active Directory is running is known as the domain controller.

Active Directory

Active Directory is Microsoft's version of a directory service. It was first implemented in Windows 2000 Server. The features in Active Directory include: hierarchical organization, centralized and distributed databases, scalability, security, flexibility, and policy-based administration. The Physical structure of Active Directory consists of sites and servers, which are configured as domain controllers. The logical structure consists of organizational units (OU) that can be customized to suit an organization.

An OU is a logical container used to organize objects within a single domain. Objects such as groups, users, computers, and other OUs, can be stored in an OU container. OUs are the primary container object for organizing and managing resources in a domain. OUs can organize multiple objects into one administrative group, that can be configured with specific policies relevant to that group. The authority of an OU can also be delegated. Nesting OUs can build a hierarchical Active Directory structure, that mimics a corporate structure for easier object management. For example, an OU can be created for the HR, Sales, Accounting, Marketing, and Engineering departments of an organization, and users will be placed in specific departments. In this way it is easier to apply policies on the container instead of individual users.

Windows Networking Concepts

Network protocols allow us to communicate over the network. There are several protocols used in modern networks, but Transmission Control Protocol/Internet Protocol (TCP/IP) is the most widely used protocol. TCP/IP is the default network protocol installed on Windows client and server computers. Windows Networking Components include some key components such as the network adapter/network interface cards (NICs), switches, routers, network protocol, and Network Client and Server Software.

Readings

Read the following in your *A+ Guide to IT Technical Support (Hardware and Software)* text:

- Chapter 7, "Survey of Windows Features and Support Tools," pp. 306–320.
- Chapter 14, "Connecting To and Setting Up a Network," pp. 633–687.
- Chapter 15, "Supporting Network Hardware," pp. 696–742.

Read the following on the Internet:

- Chen, B. (2017). [Why your next Wi-Fi setup should be a mesh network](https://www.nytimes.com/2017/04/26/technology/personaltech/mesh-network-vs-router.html). Retrieved from <https://www.nytimes.com/2017/04/26/technology/personaltech/mesh-network-vs-router.html>
 - Discusses trends in Wi-Fi networking.
- ComputerNetworkingNotes. (n.d.). [Network cable types and specifications](https://www.computernetworkingnotes.com/networking-tutorials/network-cable-types-and-specifications.html). Retrieved from <https://www.computernetworkingnotes.com/networking-tutorials/network-cable-types-and-specifications.html>
 - Covers networking cable standards.
- GeeksforGeeks. (n.d.). [Computer Network | Layers of OSI Model](https://www.geeksforgeeks.org/layers-osi-model/). Retrieved from <https://www.geeksforgeeks.org/layers-osi-model/>
 - A detailed explanation the OSI reference model with illustrations.
- Inspired Techs. (n.d.). [The main benefits of computer networking in 2017](http://www.inspiredtechs.com.au/computer-networking/). Retrieved from <http://www.inspiredtechs.com.au/computer-networking/>
 - Explains the benefit of networked computers in businesses.
- Lantronix. (n.d.). [Ethernet tutorial – Part I: Networking basics](https://www.lantronix.com/resources/networking-tutorials/ethernet-tutorial-networking-basics/). Retrieved from <https://www.lantronix.com/resources/networking-tutorials/ethernet-tutorial-networking-basics/>
 - A detailed tutorial on Ethernet-based networks.
- Lou Frenzel. (2013). [What's the difference between the OSI seven-layer network model and TCP/IP?](http://www.electronicdesign.com/what-s-difference-between/what-s-difference-between-osi-seven-layer-network-model-and-tcpip) Retrieved from <http://www.electronicdesign.com/what-s-difference-between/what-s-difference-between-osi-seven-layer-network-model-and-tcpip>
 - A comparison of the OSI and TCP/IP networking models.
- Shekhar, A. (2016). [Different networking devices and hardware types — hub, switch, router, modem, bridge, repeater](https://fossbytes.com/networking-devices-and-hardware-types/hub-switch-router-modem-bridge-repeater). Retrieved from <https://fossbytes.com/networking-devices-and-hardware-types/hub-switch-router-modem-bridge-repeater>
 - Describes the role of various networking devices.
- The Connectivity Center. (n.d.). [Computer tips - Network hubs and switches](http://www.connectworld.net/cis/network-equipment.html). Retrieved from <http://www.connectworld.net/cis/network-equipment.html>
 - A pictorial explanation of network hubs and switches.
- Woodford, C. (2018) [Computer networks](https://www.explainthatstuff.com/howcomputernetworkswork.html). Retrieved from <https://www.explainthatstuff.com/howcomputernetworkswork.html>
 - A detailed explanation about computer networks.

Skillsoft Resources

View the listed sections of the following Skillsoft Tutorials:

- Plumb, M. (n.d.) [CompTIA A+ 220-901: Networking.\[Tutorial\]](#). Skillsoft, Ireland. (32 Minutes).
 - Networking Basics.
 - Fiber Cable.
 - Cable Characteristics Twisted Pair.
 - Coaxial Cable.
 - TCP/IP Protocol.
 - TCP and UDP Ports.
 - TCP/IP Protocol Support.
 - TCP vs. UDP.
 - Networking Tools.
- Lobban, C. & Long, R. (n.d.). [CompTIA A+ 220-902: Networking with the Windows Operating System \[Tutorial\]](#). Skillsoft, Ireland. (76 Minutes).
 - Windows Networking.
 - Windows as a Networking OS.
 - Windows Device Membership.
 - Home vs. Work vs. Public Network Settings.
 - WorkGroup vs. Domain Setup.
 - Windows Network Components.
 - Network Access Technologies.
 - Configure Adapters.
 - Configure Wireless Networking.
 - Virtual Private Networking in Windows.
 - Setting up VPN Connection in Windows.
 - TCP/IP Stack in Windows.
 - Configure IPv4 or IPv6 Addresses.
 - Anatomy of an IP Address.
 - How Subnet Mask Works.
 - How are IP Addresses Assigned?
 - DHCP vs. APPA vs. Static
 - Types of IPv4 Addresses.
 - Network Installation.
 - Types of IPv6 Addresses.
 - How DNS Works.
 - Sharing in Windows.
 - What is OneDrive?

- Describe group policies concepts.
- Explain IP principles.
- Describe how to use RSATs.

u02v1 - Hands-On Lab: Understand Domains, Workgroups, and Homegroups

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u02v2 - Hands-On Lab: Configure IPv4 and IPv6 Addressing

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u02a1 - Active Directory Concepts

Preparation

By now you should have completed the labs in the Hands-On Labs for this unit and saved the lab report PDF for submission with this assignment.

Instructions

Complete the following in a Word document titled "Unit 2 Assignment."

Labs-Related Assignment:

1. One of the most powerful features of Active Directory (AD) is the Group Policy setting tool. The AD Group Policy setting tool is an essential tool for system administrators to have when managing Windows systems. This tool provides centralized management and configuration of AD objects. There are countless policies that systems administrators can configure with this tool. For example, a system administrator can disable the USB ports of certain workstations from accepting thumb drives to prevent virus introduction into the system.
 - Explain the steps to configure a group policy that enable users to click a button (such as a printer icon) to receive instructions on how to install a network printer on their workstation.
2. Systems Administrators often work in a client-server environment. One of the many tasks that you would have to perform is the configuration of IP settings for servers and workstations that you manage.
 - Identify what type of network device you would assign a dynamic IP address and another that you would assign a static IP address and explain why it is appropriate.
 - Pick a device and explain how to configure its IP address.

Non-Lab Assignment

The Remote Server Administration Tools (RSAT) can be a very useful set of tools for sysadmins. Windows domain controllers are often in remote locations so system administrators often use RSAT to access and manage domains.

- Explain how to access RSAT.
- Assume you need to recover an encrypted password on a remote laptop. Explain which RSAT tool(s) you would enable. Why?
- Explain why RSAT features are not enabled by default.

Submission Requirements

Submit the following Word documents:

- Lab Report.
- Unit 2 Assignment.

u02d1 - Active Directory and Managing Users

The main directory in Windows servers is Active Directory (AD). Discuss the following:

- What the Active Directory is used for.
- An instance where you would use AD to manage a user and how you would do it.

As with all discussions in this course, it is recommended that you make your initial post by 12 a.m. Central Standard Time on Wednesday evening to allow time for your peers to respond.

Response Guidelines

The expectation within the course discussions is to respond to at least two posts by each Sunday evening, but it is highly recommended that you extend the dialog further. Responding over multiple days will help in stimulating a lively discussion. Start by submitting your initial post on (or before) Wednesday. If you provide responses to your peers on Thursday, Saturday, and Sunday, and your peers reciprocate with their responses, you will have more opportunity for in-depth interaction with your classmates and the instructor.

Prior to Sunday evening, read your peers' posts, and provide feedback to at least two of them.

Course Resources

[Undergraduate Discussion Participation Scoring Guide](#)

u02d1 - Learning Components

- Describe Active Directory principles.

Unit 3 >> Security Management

Introduction

Securing the Network

Securing the network is a huge and ongoing challenge for systems administrators. If a company's network is not secure, then its data is susceptible to theft and destruction by malicious viruses and hackers. Windows systems have tools that administrators can use to analyze and apply different security settings and templates to configure required security settings for the networks they manage. Administrators can analyze, create, and apply security measures at both local and domain levels.

Firewalls

Windows systems have a built-in firewall tool that defends computers and servers from hackers attempting to break in. In some cases, hackers may be interested in sending malware via the Internet to a system. Firewalls are designed to thwart such incursions by filtering incoming and outgoing traffic. The current Windows client and Server systems provide the user with a friendly interface to manage the firewall policies. Windows firewall is turned on by default, however, it also allows the user to turn the firewall on and off as necessary.

Proactive Steps

The work of a systems administrator demands good reasoning skills. Can you imagine the entire organizational network experiencing downtime due to insufficient measures? Systems administrators can take proactive steps to ensure that their networks are secure. Simple methods such as a strong password policy can initially deter potential intruders. Other steps to improve security include physical means, such as securing the server areas. System administrators must implement appropriate access control policies as protective mechanisms from public access requests that are directed towards corporate networks. Several issues with security in organizations are related to human or employee error. Applications such as web applications could open the back door for intruders. Certainly, we need to take proactive measures to protect our networks.

Learning Activities

u03s1 - Studies

Readings

Read the following in your *A+ Guide to IT Technical Support (Hardware and Software)* text:

- Chapter 18, "Security Strategies," pp. 855–904.

Read the following Internet resources:

- Glenn, W. (2016). [How to apply local group policy tweaks to specific users](https://www.howtogeek.com/248206/how-to-apply-local-group-policy-tweaks-to-specific-users/). Retrieved from <https://www.howtogeek.com/248206/how-to-apply-local-group-policy-tweaks-to-specific-users/>
 - Explains how to use local group policy for specific users.
- Hoffmann, R. (2017). [The paranoid Windows traveler's data-protection checklist](https://www.computerworld.com/article/3218165/microsoft-windows/the-paranoid-windows-travelers-data-protection-checklist.html). Retrieved from <https://www.computerworld.com/article/3218165/microsoft-windows/the-paranoid-windows-travelers-data-protection-checklist.html>
 - A data protection checklist for Windows travelers.
- Mitchell, B. (2018). [SOHO routers and networks explained](https://www.lifewire.com/soho-routers-and-networks-explained-3971344). Retrieved from <https://www.lifewire.com/soho-routers-and-networks-explained-3971344>
 - A comparison of SOHO vs. home routers.
- Neagu, C. (2016). [Simple questions: What is the Local Group Policy Editor & how to use it?](https://www.digitalcitizen.life/simple-questions-what-local-group-policy-editor-how-use-it) Retrieved from <https://www.digitalcitizen.life/simple-questions-what-local-group-policy-editor-how-use-it>
 - A tutorial on how to use the Local Group Policy console.
- Ravenscraft, E. (2015). [How to configure Windows 10 to protect your privacy](https://lifehacker.com/how-to-configure-windows-10-to-protect-your-privacy-1716204024). Retrieved from <https://lifehacker.com/how-to-configure-windows-10-to-protect-your-privacy-1716204024>
 - Explains how to configure privacy protection in Windows 10.
- Robish, E. (2017). [Home network design – Part 1](https://www.blackhillsinfosec.com/home-network-design-part-1/). Retrieved from <https://www.blackhillsinfosec.com/home-network-design-part-1/>
 - Provides insights on setting-up a home network.

- Security in a Box. (2016). [Basic security for Windows](https://securityinabox.org/en/guide/basic-security/windows/). Retrieved from <https://securityinabox.org/en/guide/basic-security/windows/>
 - Covers security measures for Windows systems.
- Sophos. (n.d.). [When malware goes mobile](https://www.sophos.com/en-us/security-news-trends/security-trends/malware-goes-mobile.aspx). Retrieved from <https://www.sophos.com/en-us/security-news-trends/security-trends/malware-goes-mobile.aspx>
 - Explains how to use preventative measures to avoid malware in mobile devices.

Skillssoft Resources

View the listed sections of the following Skillssoft Tutorial:

- Lobban, C. (n.d.). [CompTIA A+ 220-901: Desktop Security \[Tutorial\]](#). Skillssoft, Ireland. (77 Minutes).
 - Security Overview.
 - Introduction to Security Threats.
 - Introduction to Security Threats (Part 2).
 - Introduction to Types of Security.
 - Windows Security.
 - Account Security.
 - NTFS Security.
 - NTFS Security Interactions.
 - Network Shares.
 - Encrypted File System (EFS).
 - BitLocker.
 - Workstation Security.
 - Mobile Device Security.
 - Discarding Drives.
 - SOHO Wireless Security.

u03s1 - Learning Components

- Describe group policies concepts.
- Explain principles of basic malware attacks.
- Describe how a firewall works.

u03v1 - Hands-On Lab: Configure Security Policies

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u03v2 - Hands-On Lab: Configuring Windows Firewall

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u03a1 - Configuring Security Policies and Windows Firewall

Preparation

By now you should have completed the labs in the Hands-On Labs for this unit and saved the lab report PDF for submission with this assignment.

Instructions

Complete the following in a Word document titled "Unit 3 Assignment."

Labs-Related Assignment:

1. The Microsoft Management Console (MMC) contains several snap-in consoles to assist systems administrators to enforce IT policies on a network. Systems administrators can configure settings such as enforcing secure password policy. Often the configurations are carried-out via Group Policy at the domain level, and the policy flows down to users and nodes on the network. There are times when local group policy and local security policy can be used on workstations.
 - o Explain how to enable a local group policy not to display the most recent logon credentials on a workstation. Why might this be desirable?
2. As a systems administrator, you are already aware that you must protect your network resources from intruders. The Windows Firewall is a security tool in most Windows systems that defends our computers and servers from unauthorized users.
 - o Describe the process Windows firewall uses to filter incoming and outgoing traffic.

- Describe how to deny access to a specific website through the Windows Firewall settings.

Non-Lab Assignment:

- Describe two group policies that a sysadmin should deploy to client computers on the network to address malware issues.
- Recommend a hardware or software solution to combat malware attacks. Explain its effectiveness.

Submission Requirements

Submit the following Word documents:

- Lab Report.
- Unit 3 Assignment.

u03d1 - Security Management

Managing permissions in Windows systems is an important security skill for a systems administrator.

Discuss:

- Some of the tools that Windows uses to control access to network objects (i.e. printers, users, folders).
- Appropriate applications of local security policy, group policy or local group policy.

As with all discussions in this course, it is recommended that you make your initial post by 12 a.m. Central Standard Time on Wednesday evening to allow time for your peers to respond.

Response Guidelines

The expectation within the course discussions is to respond to at least two posts by each Sunday evening, but it is highly recommended that you extend the dialog further. Responding over multiple days will help in stimulating a lively discussion. Start by submitting your initial post on (or before) Wednesday. If you provide responses to your peers on Thursday, Saturday, and Sunday, and your peers reciprocate with their responses, you will have more opportunity for in-depth interaction with your classmates and the instructor.

Prior to Sunday evening, read your peers' posts, and provide feedback to at least two of them.

Course Resources

Undergraduate Discussion Participation Scoring Guide

- Describe group policies concepts.

Unit 4 >> Maintaining the System

Introduction

Systems Maintenance

Systems administrators need to update systems to correct security holes, improve existing functions, and fix bugs. Windows update is responsible for managing the download and installation process of updates from Microsoft. It requires access to the Internet, because it communicates with Microsoft's Windows update servers on a regular basis. Unless domain group policy prohibits updates on your workstation, most users can run Windows update from within their client computers (using the control panel).

One of the most important ongoing tasks faced by server administrators is keeping the network servers and workstations updated with the latest hot fixes and service packs. Although both Windows clients and servers have automatic updates feature that can be downloaded and installed without user intervention, it is not always the best solution for enterprise network systems.

Systems Monitoring

There are numerous tools that systems administrators can use to monitor their systems regardless of whether the system is in a workgroup, or part of a bigger network such as a domain. The Task Manager is a built-in tool in Windows that administrators can use to fine tune their networks. Using this tool provides a quick way to access what is happening inside the computer. The Task Manager consists of various tabs that allows you to monitor applications, processes, performance and connectivity. You can see running processes assigned to applications, and you can start and stop applications as necessary.

Learning Activities

u04s1 - Studies

Readings

Read the following in your *A+ Guide to IT Technical Support (Hardware and Software)* text:

- Chapter 10, "Maintaining Windows." Pages 444–489.
- Chapter 19, "Supporting Printers and Customizing a System." Pages 911–950.

Read the following Internet resources:

- Bernsen, E. (n.d.). [What you need out of Windows server monitoring](https://www.opsview.com/resources/windows-monitoring/blog/what-you-need-out-windows-server-monitoring). Retrieved from <https://www.opsview.com/resources/windows-monitoring/blog/what-you-need-out-windows-server-monitoring>
 - Tips on server monitoring tools.
- Help Net Security. (2017). [Maintaining Windows 10 security tops list of enterprise challenges](https://www.helpnetsecurity.com/2017/09/21/maintaining-windows-10-security/). Retrieved from <https://www.helpnetsecurity.com/2017/09/21/maintaining-windows-10-security/>
 - A checklist for maintaining a Windows PC.
- Javier. (2017). [Server monitoring: A small guide with the best practices you need to know](https://blog.pandorafms.org/server-monitoring-best-practices/). Retrieved from <https://blog.pandorafms.org/server-monitoring-best-practices/>
 - Provides tips for monitoring servers.
- Khanse, A. (2016). [Tips to maintain Windows in good running condition](https://www.thewindowsclub.com/maintain-windows-good-running-condition). Retrieved from <https://www.thewindowsclub.com/maintain-windows-good-running-condition>
 - Suggests ways to maintain a Windows 10 PC.
- Server Density. (2016). [80 Linux monitoring tools](https://blog.serverdensity.com/80-linux-monitoring-tools-know/). Retrieved from <https://blog.serverdensity.com/80-linux-monitoring-tools-know/>
 - Provides a list of tools for monitoring Linux systems.
- Server Density. (2016). [60+ Windows monitoring tools](https://blog.serverdensity.com/windows-monitoring-tools/). Retrieved from <https://blog.serverdensity.com/windows-monitoring-tools/>
 - Provides a list of built-in and vendor tools for monitoring Windows systems.

Skillsoft Resources

View the listed sections of the following Skillsoft Tutorials:

- Lobban, C., Long, R., & Plumb, M. (n.d.). Skillsoft. (n.d.). [CompTIA A+ 220-902: Windows Utilities and Management \[Tutorial\]](#). Skillsoft, Ireland. (70 Minutes).
 - Security Overview.
 - What are CMD and PowerShell?
 - Other Command Line Tools.
 - Command Line Privileges.
 - Command Line Tools.
 - Command Tools.
 - SFC.
 - Access Windows Remotely.
 - Remote Management Firewall Rules.
 - What is Remote Assistance?
 - Windows Components.
 - What is the Registry?
 - What is Control Panel?
 - Exploring the Control Panel of Windows 7 and 8.

- What is the MMC?
 - MMC in Windows 7.
 - What is the Local Security Policy?
 - Configure Power Options.
 - Power Options in Windows 7.
 - System Features and Tools.
 - Features and Tools (Part 1).
 - Features and Tools (Part 2).
 - DXDiag.
- Lobban, C. & Long, R. (n.d.). [CompTIA A+ 220-902: Monitoring the Windows OS and an Introduction to Other OSs \[Tutorial\]](#). Skillssoft, Ireland. (69 Minutes).
 - Security Overview.
 - Why Monitor Windows?
 - Event Logs.
 - Optimize Performance.
 - System Properties.
 - ReadyBoost.
 - Storage Optimization.
 - What is Automatic Maintenance?
 - How do I Back Up?
 - What is File History?
 - Three Important Questions.
 - Windows Boot Environment.
 - Windows Recovery Tools.
 - How to Use Windows Recovery Tools.
 - Other Operating Systems and Technologies.
 - Other Operating Systems.
 - MAC OSX.
 - OSX Intel California Landmarks.
 - Apple Products.
 - Finder.
 - How to Use the Finder.
 - Force Quit.
 - How to Force Quit.
 - Gestures.
 - Mission Control.

u04s1 - Learning Components

- Explain principles of disk defragmenter.
- Explain how automatic updates work.
- Explain principles of the Windows Performance Monitor.

u04v1 - Hands-On Lab: Performing System Maintenance

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u04v2 - Hands-On Lab: Identify Security Threats and Vulnerabilities

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u04a1 - Threats, Vulnerabilities and Maintenance

Preparation

By now you should have completed the labs in the Hands-On Labs for this unit and saved the lab report PDF for submission with this assignment.

Instructions

Complete the following in a Word document titled "Unit 4 Assignment."

Labs-Related Assignment

1. The Windows disk defragmenter is an important tool for keeping hard drives running efficiently.
 - o Explain in detail how this tool helps optimize hard drives.
 - o Is the optimizing tool recommended for use with solid state (SSD) drives? Why or why not?

2. Windows update is a method used by Windows systems to deploy security reinforcements, software updates, and hotfixes. Often this process is performed automatically.

- Explain the pros and cons of automatic updates.
- Explain how to prevent automatic updates on your network. Why might you do this?

Non-Lab Assignment:

Systems administrators aim to keep their computer systems up-to-date. Windows systems have built-in tools that systems administrators can use to fine-tune the system. A popular tool in Windows systems is the performance monitor.

- Explain what the performance monitor does and how the information it provides helps the sysadmin maintain the network.

Submission Requirements

Submit the following Word documents:

- Lab Report.
- Unit 4 Assignment.

u04d1 - Operating System Maintenance

Systems administrators need to maintain the systems they operate for a variety of reasons.

- Discuss proactive measures you would take for the maintenance of your infrastructure's health to prevent unplanned downtime.
- Discuss your favorite maintenance tool.

As with all discussions in this course, it is recommended that you make your initial post by 12 a.m. Central Standard Time on Wednesday evening to allow time for your peers to respond.

Response Guidelines

The expectation within the course discussions is to respond to at least two posts by each Sunday evening, but it is highly recommended that you extend the dialog further. Responding over multiple days will help in stimulating a lively discussion. Start by submitting your initial post on (or before) Wednesday. If you provide responses to your peers on Thursday, Saturday, and Sunday, and your peers reciprocate with their responses, you will have more opportunity for in-depth interaction with your classmates and the instructor.

Prior to Sunday evening, read your peers' posts, and provide feedback to at least two of them.

Course Resources

Undergraduate Discussion Participation Scoring Guide

u04d1 - Learning Components

- Describe various system maintenance tools.

Unit 5 >> Systems Troubleshooting

Introduction

Using Customized Tools to Troubleshoot

The administrative tools console provides many of the troubleshooting tools and monitoring options needed to administer a workstation. Although administrative tools provide a link to the more common troubleshooting and performance monitoring tools, you may find the need to develop your own custom windows. Windows client and server computers provide a way for you to do this by building a customized MMC console. MMCs provide a standardized common interface for application modules, and snap-ins that you use to configure operating system settings, applications, and services. MMC snap-ins are nothing more than shortcuts which are individualized to specific tasks. You can combine the shortcuts in any order or any group within the MMC window to your individual preferences. If you develop an MMC console with one or more snap-ins installed, it is referred to as a console. For example, under administrator tools there's a computer management console. The computer management console is nothing more than an MMC which was customized with some of the more common tools that administrators use to manage their computers.

Troubleshooting with Device Manager

Troubleshooting devices in workstations and servers is a common task for Windows administrators. The device manager is a popular built-in tool used to troubleshoot devices (hardware and driver issues). It allows you to manage all your devices and their associated drivers. Device manager can also provide information about the devices that are installed on a computer, and the resources that are used. Device manager is most commonly used for the installation, update, rollback, or troubleshooting of device drivers.

The administrator can launch a troubleshooter from inside the property sheet of the erring device and can also delete the device from device manager and restart it to allow it to be detected again. As a last resort, the administrator can also boot the computer in safe mode, which loads the generic drivers to allow you into the system for additional troubleshooting. One way to determine if a device is having problems is by looking at the icon of the device itself. If you see an exclamation mark/point (!) on top of an icon or a question mark (?) in place of an icon, you need to click on it to get more information to assist you in resolving the issue.

Learning Activities

u05s1 - Studies

Readings

Read the following in your *A+ Guide to IT Technical Support (Hardware and Software)* text:

- Chapter 12, "Supporting Customers and Troubleshooting Windows," pp. 545–582.
- Chapter 13, "Troubleshooting Windows Startup," pp. 588–627.

Read the following Internet resources:

- Computer Hope. (n.d.). [Basic network troubleshooting](https://www.computerhope.com/issues/ch000445.htm). Retrieved from <https://www.computerhope.com/issues/ch000445.htm>
 - A guide to troubleshooting various basic network issues.
- Fisher, T. (2018). [How to fix freezing & other issues during Windows startup](https://www.lifewire.com/how-to-fix-stopping-freezing-and-reboot-issues-during-windows-startup-2624448). Retrieved from <https://www.lifewire.com/how-to-fix-stopping-freezing-and-reboot-issues-during-windows-startup-2624448>
 - Provides some suggestions on what to do when Windows freezes.
- Froehlich, A. (2017). [5 advanced network troubleshooting tools](https://www.networkcomputing.com/networking/5-advanced-network-troubleshooting-tools/678163981). <https://www.networkcomputing.com/networking/5-advanced-network-troubleshooting-tools/678163981>
 - An advanced approach to troubleshooting network issues.
- IT Pro. (2018) [17 Windows 10 problems - and how to fix them](http://www.itpro.co.uk/operating-systems/25802/17-windows-10-problems-and-how-to-fix-them). Retrieved from <http://www.itpro.co.uk/operating-systems/25802/17-windows-10-problems-and-how-to-fix-them>
 - A pictorial step by step guide on fixing Windows 10 problems.
- Kuziv, I. (2016). [15 fixes to common Windows PC problems that anyone can do](https://macpaw.com/how-to/15-fixes-to-common-windows-pc-problems). Retrieved from <https://macpaw.com/how-to/15-fixes-to-common-windows-pc-problems>
 - Provides tips on fixing common Windows issues.
- Mathias, C. (n.d.). [Wi-Fi troubleshooting checklist for mobile devices](https://searchmobilecomputing.techtarget.com/tip/Wi-Fi-troubleshooting-checklist-for-mobile-devices). Retrieved from <https://searchmobilecomputing.techtarget.com/tip/Wi-Fi-troubleshooting-checklist-for-mobile-devices>
 - Suggestions for troubleshooting Android mobile devices.
- Neagu, C. (2017). [Fix problems that keep Windows from loading, with Startup Repair](https://www.digitalcitizen.life/fix-problems-keep-windows-81-loading-start-repair). Retrieved from <https://www.digitalcitizen.life/fix-problems-keep-windows-81-loading-start-repair>
 - Explains how to fix start-up issues with Windows 10.
- Plummer, Q. (2015). [Tips, tricks for troubleshooting Android mobile devices](https://www.techtimes.com/articles/23749/20150101/troubleshooting-android-devices.htm). Retrieved from <https://www.techtimes.com/articles/23749/20150101/troubleshooting-android-devices.htm>
 - Suggestions for troubleshooting Android mobile devices.
- Polish Linux. (2018). [The top problems with major operating systems](http://polishlinux.org/polishlinux-org/top-problems-major-operating-systems/). Retrieved from <http://polishlinux.org/polishlinux-org/top-problems-major-operating-systems/>

- Covers Windows, Linux, and MacOS operating system issues.
- University of Oxford IT Services. (n.d.). [Fixing Windows system 7 and startup problems](https://help.it.ox.ac.uk/helpcentre/troubleshooting/winos7/index). Retrieved from <https://help.it.ox.ac.uk/helpcentre/troubleshooting/winos7/index>
 - Covers how to fix start-up issues with Windows 7.

Skillssoft Resources

View the listed sections of the following Skillssoft Tutorials:

- Plumb, M. (n.d.). [CompTIA A+ 220-901: Troubleshooting Networking Devices \[Tutorial\]](#). Skillssoft, Ireland. (36 Minutes).
 - Troubleshooting Devices.
 - Troubleshooting Wireless Networks.
 - Troubleshooting Wired Networks.
 - Network Troubleshooting Tools.
 - Command Line Ping, TRACERT, and IPCONFIG.
 - Command Line Network Troubleshooting Tools.
 - Troubleshooting Mobile Device Issues.
 - Troubleshooting Mobile Device Software Issues.
 - Proper Repair Procedures.
 - BIOS Troubleshooting.
- Lobban, C. (n.d.). [CompTIA A+ Exam 220-902: Troubleshooting Software \[Tutorial\]](#). Skillssoft, Ireland. (46 Minutes).
 - Troubleshooting Software.
 - Troubleshooting Methodology.
 - Resolving a Problem.
 - Disk Troubleshooting Tools.
 - Software Troubleshooting Tools.
 - OS Troubleshooting Tools.
 - OS Errors.
 - Troubleshooting Startup Errors.
 - Troubleshooting Security.
 - Physical Security Precautions.
 - Dealing with Malware.
 - Security Soft Skills.
- Lobban, C. (n.d.). [CompTIA A+ 220-902: Common Troubleshooting and Security Practices \[Tutorial\]](#). Skillssoft, Ireland. (45 Minutes).
 - Troubleshooting Methodology.
 - System Checklist.
 - Check for Common Issues.
 - Troubleshooting Scenario.
 - Physically Secure Computers.

- Physically Secure Computers.
- Install Service Packs.
- Use Malware Prevention.
- Quarantine Infected Systems.
- Lobban, C. (n.d.). [CompTIA A+ 220-902: Mobile Troubleshooting \[Tutorial\]](#). Skillsoft, Ireland. (46 Minutes).
 - Troubleshooting Mobile Devices.
 - Wireless Connectivity Issues.
 - Mobile Display Issues.
 - Application Issues.
 - Hardware Issues.
 - Operating System Issues.
 - Troubleshooting Mobile Security.
 - Signal Security Issues.
 - Data Security Issues.
 - Application Security Issues.
 - Operating System Security Issues.

Course Resources

A+ Guide to IT Technical Support

u05s1 - Learning Components

- Explain principles of system rollbacks.
- Understand basic functions of network devices.
- Interpret and Event Viewer log.

u05v1 - Hands-On Lab: Troubleshoot Windows Operating System Errors

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u05v2 - Hands-On Lab: Troubleshoot Common System Problems

Read the requirements for all related course activities in this unit before completing this lab. Follow the lab instructions carefully, as you may be required to take screen captures or produce lab related documents as part of graded activities. Take notes as needed as you complete the lab to help you meet all requirements.

Click the linked title heading above to access the hands-on lab.

u05a1 - Troubleshooting

Preparation

By now you should have completed the labs in the Hands-On Labs for this unit and pasted the screenshots into a word document called "Unit 5 Screenshots" for submission with this assignment.

Instructions

Complete the following in a Word document titled "Unit 5 Assignment."

Lab-Related Assignment

1. You can troubleshoot a failed Windows startup/boot-up by pressing the F8 key to take you to the Advanced Boots Option Screen for more options as the system reboots. After exhausting most of the options there without success in resolving the boot issue, you decide to revert to a previously good working system configuration by choosing the Last Known Good Configuration (Advanced) option. Describe the implications of doing so.
2. Explain why it is sometimes necessary to open the command prompt with administrative privileges.

Non-Lab Assignment

The event viewer is a built-in tool in Windows systems for diagnosing system issues. Identify one of the errors shown on the Event Viewer Log (view the example file in the Resources) and suggest a possible reason for it.

Assume the source of the error that you identified is correct, suggest a series of steps that you would undertake to further investigate and address the problem. State any assumptions you need to make as you step through your troubleshooting process.

Submission Requirements

Submit the following Word documents:

- Lab Report.
- Unit 5 Assignment.

Course Resources

Event Viewer Log

u05d1 - Troubleshooting

Windows systems might fail to successfully install a device, or there might be occasions when you need to manage the devices installed on your server or workstations. It becomes the responsibility of the systems administrator to manually troubleshoot device issues. A tool often used for this in Windows desktops and servers is the device manager.

- Discuss how the device manager works and how this tool to assist systems administrator with installations, updates, rollbacks, and network troubleshooting issues.
- Pick out a specific troubleshooting problem and discuss how the device manager might assist troubleshooting it.

As with all discussions in this course, it is recommended that you make your initial post by 12 a.m. Central Standard Time on Wednesday evening to allow time for your peers to respond.

Response Guidelines

The expectation within the course discussions is to respond to at least two posts by each Sunday evening, but it is highly recommended that you extend the dialog further. Responding over multiple days will help in stimulating a lively discussion. Start by submitting your initial post on (or before) Wednesday. If you provide responses to your peers on Thursday, Saturday, and Sunday, and your peers reciprocate with their responses, you will have more opportunity for in-depth interaction with your classmates and the instructor.

Prior to Sunday evening, read your peers' posts, and provide feedback to at least two of them.

Course Resources

Undergraduate Discussion Participation Scoring Guide