Introduction to Operating Systems, Skill Labs

Course Specifications

Course Number: ACI76-053SL_rev1.0
Lab Length: Approximately 11 hours

Introduction to Operating Systems

Introduction
Objective

CompTIA A + (220-1102) Domain:
Domain 1.0: Operating Systems
Domain 2.0: Security

CompTIA A+ (220-1102) Objective:
Objective 1.2: Given a scenario, use the appropriate Microsoft command line tool
Objective 1.3: Given a scenario, use the features and tools of the Microsoft Windows 10 operating system (OS)
Objective 1.4: Given a scenario, use the appropriate Microsoft Windows 10 Control Panel utility
Objective 1.11: Identify common features and tools of the Linux client/desktop OS.
Objective 2.6: Given a scenario, configure a workstation to meet best practices for security.

Overview
This lab is an introduction to Operating Systems. An operating system is the interface between the user and a computer. It provides the necessary services to allow you to run applications. Services include user interface (graphical and text-based), job/task management, file management, device management, memory management, and security management. Each section of this lab will go into the different services at an awareness level.

In this lab, students will learn how to use Windows and Linux from a user perspective. The lab will review how to interact with a PC (both graphical and text-based), with both a mouse and a keyboard.

Outcomes
In this lab, you will learn to:

1. Interact with the computer via the graphical user interface and the command-line interface.
2. Use task manager to manage applications and tasks.
3. Use file manager and the command line to create files and folders.
4. Use the control panel/system monitor to manage memory and devices.
5. Use the security features of both Windows and Linux.

	Key Term	Description
1	GUI	GUI stands for graphical user interface which is the default way users interact with a computer today. It provides a desktop that allows you to do your work.
2	CLI	Command line interface is a textual way to interact with the computer. A computer technician uses the command line to accomplish common system administration tasks.
3	URL	URL stands for Uniform Resource Locator which is an address that allows you to visit websites on your computer.

Computer Security Basics

Introduction
Objective

CompTIA A + (220-1102) Domain:
Domain 2.0: Security

CompTIA A+ (220-1102) Objective:
Objective 2.1: Summarize various security measures and their purposes.
Objective 2.6: Configure a workstation to meet basic practices for security.
Objective 2.10: Given a scenario, install and configure browsers and relevant security settings

Overview
This lab is an introduction to computer security in Windows. Cybersecurity is defined as the processes, technologies, and practices to protect networks, computing devices, and data. Cybersecurity is about the CIA triad – Confidentiality, Integrity, and Availability. Confidentiality is defined as protecting sensitive information from people who are not giving permission for that information. Integrity is about making sure information is trustworthy and accurate. Availability is about reliable access to information by authorized people.

In this lab, students will learn how to use the different host security features in Windows from a user perspective and about cybersecurity awareness for users of networks.

Outcomes
In this lab, you will learn to:

1. Understand security policies and their application.
2. Configure peripheral security.
3. Configure Web browser security.
4. Use miscellaneous security features of an operating system.
5. Use authentication and authorization in an operating system.
6. Protect data in an operating system

	Key Term	Description
1	Security Policy	A security policy is an organization's way of communicating proper and expected user behavior.
2	Encryption	Encryption is a process of turning plain text into something called ciphertext. Ciphertext uses a key to jumble the data going through encryption to something that is not readable by a third party.
3	Patch	an update that fixes issues with the operating system. Updates can happen several times a week or more depending on how critical the update is. Windows update is the application that is responsible for updating the user's computer to fix any issues including security.

Desktop Virtualization

Introduction
Objective

CompTIA A + (220-1101) Domain:
Domain 4.0: Virtualization and Cloud Computing

CompTIA A+ (220-1001) Objective:
Objective 4.1: Summarize cloud-computing concepts
Objective 4.2: Summarize aspects of client-side virtualization

Overview
This lab is an introduction to desktop virtualization. We live in a virtualized world. Everything is virtualized from virtual worlds to virtual computers. Desktop virtualization is the ability to run multiple OSs on your computer. You need to have decent RAM and hard disk space to do virtualization appropriately. It is suggested to have a computer with 16 GB of RAM with a 1 TB hard drive if you are going to do a lot of virtualization.

In this lab, students will learn how to use desktop virtualization in Windows.

Outcomes
In this lab, you will learn to:

1. Install and configure desktop virtualization
2. Create and configure a virtual machine
3. Download, install and configure Windows XP mode

	Key Term	Description
1	ISO Image	ISO image is a special file that contains a bootable CD image that allows you to mount to a virtual machine to install operating systems.

	Key Term	Description
2	Virtual Machine	A virtual machine is a virtual representation of a computer. It allows a host machine to host multiple virtual machines. A virtual machine emulates hardware such as RAM, hard disks, CD ROM drives, etc.

Introduction to Windows 7

Introduction
Objective

CompTIA A + (220-1002) Domain:
Domain 1.0: Operating Systems

CompTIA A+ (220-1002) Objective:
Objective 1.3: Summarize general OS installation considerations and upgrade methods.
Objective 1.5: Given a scenario, use Microsoft operating system features and tools.

Overview
This lab is an introduction to installing, configuring, and managing a Windows 7 machine. You will explore the different features of Windows so you can customize parts of the Operating System to meet your needs. You will also configure Windows 7 security features such as local security, the Windows Firewall, and Windows Defender.

In this lab, students will learn how to use Windows 7 Professional.

Outcomes
This lab includes the following tasks:

1. Install and configure Windows 7.
2. Use the features of Windows 7.
3. Manage a Windows 7 system.
4. Configure local security in Windows 7.

	Key Term	Description
1	Windows Start Menu	Windows Start Menu allows you to launch different applications in Windows 7.
2	Recycle Bin	The recycle bin is a feature in Windows that enables you to restore files you have deleted.
3	Computer Management	Computer Management is a component of Windows 7 that allows the user to control and manage their system.
4	Windows	Windows Explorer is a default Windows program. It's the most well-known file

	Key Term	Description
	Explorer	management tool on Windows.
5	Windows Firewall	The Windows firewall is a built-in feature that prevents unauthorized access to your computer and networks.
6	Windows Defender	Windows Defender is built-in antimalware protection for the Microsoft Windows operating system.
7	Windows Update	Windows Update is a built-in service of the Microsoft Windows operating system that keeps the computer up to date with the latest OS patches and security fixes.

Introduction to Windows 8.1

Introduction
Objective

CompTIA A + (220-1002) Domain:
Domain 1.0: Operating Systems

CompTIA A+ (220-1002) Objective:
Objective 1.3: Summarize general OS installation considerations and upgrade methods.
Objective 1.5: Given a scenario, use Microsoft operating system features and tools.

Overview
This lab is an introduction to installing, configuring, and managing a Windows 8.1. You will also configure Windows 8.1 security features.

In this lab, students will learn how to use Windows 8.1.

Outcomes
In this lab, you will learn to:

1. Install and configure Windows 8.1
2. Use the features of Windows 8.1
3. Manage a Windows 8.1 system
4. Configure local security in Windows 8.1

Introduction to Windows 10

Introduction
Objective

CompTIA A + (220-1102) Domain:
Domain 1.0: Operating Systems

CompTIA A+ (220-1102) Objective:

Objective 1.3: Given a scenario, use features and tools of the Microsoft Windows 10 Operating System (OS)
Objective 1.7: Given a scenario, apply application installation and configuration

Overview

This lab is an introduction to installing, configuring, and managing a Windows 10 machine. You will explore the different features of Windows so you can customize parts of the Operating System to meet your needs. You will also configure Windows 10 security features such as local security, and the Windows Defender Security Center.

Outcomes

In this lab, you will learn to:

1. Install and configure Windows 10.
2. Use the features of Windows 10.
3. Manage a Windows 10 system.
4. Configure local security in Windows 10.

	Key Term	Description
1	Start Menu	In Windows 10, the Start Menu is where you will launch applications and administrative features.
2	Action Center	The Windows 10 Action Center is a central location for all of your system and app notifications. When you miss a notification, they show up in the Action Center just like with any other app. You can also turn off notifications from apps that are bothering you.
3	Virtual Desktop	You can work on one set of apps in one desktop and another set of apps in a second desktop.
4	Windows Defender Security Center	Windows Defender Security Center is a built-in antimalware and firewall protection for the Microsoft Windows operating system.

Supporting and Troubleshooting Windows

Introduction
Objective

CompTIA A + (220-1102) Domain:

Domain 1.0: Operating Systems
Domain 3.0: Software Troubleshooting

CompTIA A+ (220-1002) Objective:

Objective 1.2: Given a scenario, use the appropriate Microsoft command-line tool
Objective 1.3: Given a scenario, use features and tools of the Microsoft Windows 10 operating system (OS)
Objective 3.1: Given a scenario, troubleshoot common Windows OS problems

Overview

This lab is an introduction to supporting and troubleshooting Windows 10. You will also learn to install a printer in this lab.

outcomes

In this lab, you will learn to:

1. Understand the registry
2. Understand Windows user options and power options
3. Install and manage device drivers
4. Troubleshoot common Windows problems

	Key Term	Description
1	Safe Mode	Safe mode is a feature of Windows that allows you to boot your computer with a minimal configuration to fix any issues with your computer.
2	Windows Registry	The Windows Registry is a database of Windows configuration information.
3	Device Driver	A device driver is a software application between the hardware and the operating system. It manipulates the hardware.

Linux on the Desktop

Introduction
Objective

CompTIA A + (220-1102) Domain:

Domain 1.0: Operating Systems
Doman 2.0: Security

CompTIA A+ (220-1102) Objective:

Objective 1.9: Given a scenario, perform OS installations and upgrades in a diverse OS environment
Objective 1.11: Identify common features and tools of the Linux client/desktop OS
Objective 2.6: Given a scenario, configure a workstation to meet basic practices for security

Overview

This lab is an introduction to installing, configuring and managing a Linux machine using the Graphical User Interface and the Command-Line. You will also configure the local Linux security features such as user accounts and file and folder permissions.

In this lab, students will learn how to use Linux Desktop and Comand Line.

In this lab, you will learn to:

1. Install and configure Linux
2. Use the features of Linux
3. Manage a Linux system
4. Configure local security in Linux

	Key Term	Description
1	GUI	GUI stands for graphical user interface which is the default way users interact with a computer today. It provides a desktop that allows you to do your work.
2	CLI	Command line interface is a textual way to interact with the computer. A computer technician uses the command line to accomplish common system administration tasks.

Connecting Desktops and Laptops to Networks

Introduction
Objective

CompTIA A + (220-1102) Domain:
Domain 1.0: Operating Systems

CompTIA A+ (220-1102) Objective:
Objective 1.2: Given a scenario, use the appropriate Microsoft command-line tool.
Objective 1.4: Given a scenario, use the appropriate Microsoft Windows 10 Control Panel utility.
Objective 1.6: Given a scenario, configure Microsoft Windows networking features on a client/desktop

Overview
This lab is an introduction to configuring, troubleshooting, and managing a network connection in Windows 10. In today's modern world, a computer does not act in isolation. It is connected to a network. Computing devices on a network can have different specialized roles on the network. A client's job is to access resources and services on the network. A server's job is to provide resources and services on a network. A peer can act as both a client and server. A gateway/router is a specialized device that allows computers to communicate over a local and/or wide area. Its job is to route pieces of information called a packet from a source to a destination. There are several specialized services that you will review in this lab. A Web server serves up Web pages. A Web client, called an Internet browser, requests Web pages from Web servers. An e-mail server serves up e-mails. An e-mail client requests e-mails.

Outcomes
In this lab, you will learn to:

1. Examine, set, and configure an IP address.
2. Work with Internet browsers.

3. Troubleshoot common network client problems.

	Key Term	Description
1	Network	A network is one or more computers connected to each other to allow for communication between them.
2	Client	A network client is a computer that requests resources (i.e., files/folders, printers, etc.) from the network.
3	Server	A network server is a specialized computer that provides services (i.e., files/folders, Web, e-mail, etc.).
4	Peer	A peer is a computer that requests and provides services/resources to other computers.
5	Network Interface Card (NIC)	A network interface card is communication hardware that allows a computer to communicate on a network.
6	MAC Address	A MAC address is a specialized address on an NIC that allows a computer to communicate on a network.
7	IP Address	An IP address is a specialized address that defines a computer on the network. Usually, it looks like 192.168.1.1 where part of the address defines the network ID and the rest of the address is called a host ID.
8	Domain name	A domain name is the name that a computer uses to identify itself on the network. Usually, it looks like www.google.com.
9	DHCP	Dynamic Host Configuration Protocol (DHCP) is a specialized service that allows a gateway device to assign IP addresses to host computers. A DHCP client is software that is used to request an IP address for a computer/host.
10	DNS	The Domain Name System is a specialized service that provides a mapping between a domain name and an IP address.

Mobile Operating Systems

Introduction
Objective

CompTIA A + (220-1102) Domain:
Domain 1.0: Operating Systems
Domain 2.0: Security

CompTIA A+ (220-1102) Objective:

Objective 1.7: Given a scenario, apply application, installation, and configuration concepts.
Objective 2.7: Explain common methods for securing mobile and embedded devices.

Overview

Android is an operating system that was created by Google and is now developed by the Android Open Source Project (AOSP). It can be integrated into devices such as tablets and smartphones. as well as smartwatches, video game consoles, and televisions. This lab is an introduction to working with mobile operating systems such as Android. You will also configure Android mobile security features.

Outcomes

In this lab, you will learn to:

1. Start up BlueStacks.
2. Work with Google settings
3. Install and removing Android apps
4. Configure local security in Android

Note: The Google Play Store and other parts of this lab are always changing and some of the screen shots might not exactly match.

	Key Term	Description
1	BlueStacks	An Android emulator that runs in Windows which allows you to use Android.
2	App Store	Google Play is the app store for an Android device. This is where you buy and download apps for use with your mobile device.

File management in the Cloud

Introduction
Objective

CompTIA A + (220-1102) Domain:

Domain 1.0: Operating Systems

CompTIA A+ (220-1102) Objective:

Objective 1.2: Given a scenario, use features and tools of the Microsoft Windows 10 operating system.

Overview

This lab is an introduction to installing, configuring, and managing a cloud storage provider. Cloud storage is a type of storage that exists on the Internet. In this lab, students will learn how to use file management in the cloud with Dropbox and Google Drive.

Outcomes

In this lab, you will learn to:

1. Install and configure cloud storage (e.g., Dropbox, Google Drive)
2. Use the features of cloud storage
3. Manage a cloud storage software

	Key Term	Description
1	cloud storage	Cloud storage is a type of cloud computing that stores data on remote computers run by a service provider.
2	dropbox	Dropbox is a popular software that provides cloud storage for all of your files. Dropbox can be accessed from any device and from any location, as long as you have an internet connection.
3	google drive	Google Drive is a free application that lets you create and edit folders and files in the cloud.