CompTIA Linux + (Exam XK0-005), Skill Labs

Course Specifications

Course Number: ACI76-009SL_rev1.0
Lab Length: Approximately 24 hours

Introduction to Linux

Introduction
Objective

Welcome to the Introduction to Linux practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview
Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Review the System Requirements for an Ubuntu Installation
- Exercise 2 - Install Ubuntu using Installer Media
- Exercise 3 - Complete the Post-installation of Ubuntu with Additional Software and Updates

After completing this module, you should be able to:

- Identify System Installation Requirements
- Determine System Requirements
- Obtain Ubuntu Desktop Installation Files and Perform the Installation
- Prepare Ubuntu for User

Exam Objectives:

The following exam objectives are covered in this module:

1.6 Given a scenario, build and install software

- Package management
- System updates

File and Directory Management in Linux

Introduction
Objective

Welcome to the File and Directory Management in Linux Practice Lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Using the Linux Terminal
- Exercise 2 - Navigate the Linux File System
- Exercise 3 - Create Files in the Linux File System
- Exercise 4 - Move Files and Create Links

After completing this module, you should be able to:

- Launch the GNOME Terminal
- Customize the Terminal
- Use Basic Commands to Navigate the Linux File System
- Create Directories in the Linux File System
- Create and View Files using Linux Commands
- Move and View Files using Linux Commands
- Create Hard Links and Soft Links

Exam Objectives:

The following exam objectives are covered in this module:

1.2 Given a scenario, manage files and directories

- Copying files between systems
- File and directory operations
- Soft and hard links

Editing Files in Linux

Introduction
Objective

Welcome to the Editing Files in Linux practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Work with Vi Text Editor
- Exercise 2 - Use the Vim Text Editor
- Exercise 3 - Use the Nano Text Editor

After completing this module, you should be able to:

- Create and Manipulate a File using Vi Text Editor
- Manipulate Text and Edit Files using the Vim Text Editor
- Manipulate Text and Edit Files using the Nano Text Editor

Exam Objectives:

The following exam objectives are covered in this module:

1.2 Given a scenario, manage files and directories

- File editing

Access Control Utilities

Introduction
Objective

Welcome to the Access Control Utilities practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Controlling Access to Directory and Files with Standard Permissions
- Exercise 2 - Controlling Access to Directory and Files with Advanced Permissions

After completing this module, you should be able to:

- Create Files and View Permissions
- Modify File Permissions
- Configure Permissions using Setfacl and Create Inheritable Permission
- Set Sticky Bit to Control Access

Exam Objectives:

The following exam objectives are covered in this module:

2.5 Given a scenario, apply the appropriate access controls

- Command-line utilities

Linux Backup and File Compression Concept

Introduction
Objective

Welcome to the Linux Backup and File Compression Concepts Practice Lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Use Tar to Backup and Compress Files
- Exercise 2 - Use the Dd Command to Backup an Entire Disk

After completing this module, you should be able to:

- Use the Tar Command to Archive and Compress Files
- Backup an Entire Disk using the Dd Command

Exam Objectives:

The following exam objectives are covered in this module:

1.2 Given a scenario, manage files and directories

- File compression, archiving, and backup

Package Management and Updating Linux Devices

Introduction
Objective

Welcome to the Package Management and Updating Linux Devices practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Install and Update Software using Dnf
- Exercise 2 - Install and Update Software using Apt

After completing this module, you should be able to:

- Use dnf to explore and install a current repository.
- Install a custom repository.
- Remove an installed software package.
- Use apt to explore and install a current repository.
- Install a third-party repository.
- Upgrade and remove installed software.

Exam Objectives:

The following exam objectives are covered in this module:

1.6 Given a scenario, build and install software

- Package management

Linux Identity Management

Introduction
Objective

Welcome to the Linux Identity Management Practice Lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Create and Configure User Accounts in Linux
- Exercise 2 - Create and Configure Groups in Linux

After completing this module, you should be able to:

- Create a User Account
- Modify the User Account
- Delete the User Account
- Create Groups
- Add Users to Groups

Exam Objectives:

The following exam objectives are covered in this module:

2.2 Given a scenario, implement identity management

- Account creation and deletion
- Account management

Elevated User Privilege Management

Introduction
Objective

Welcome to the Elevated User Privilege Management practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Use Elevated Privileges in Linux
- Exercise 2 - Manage Authentication in Linux

After completing this module, you should be able to:

- Use the su command.
- Use the sudo command.
- Elevate privileges for a user.
- Manage passwords on a system.
- Modify the password policy.
- Create a PAM policy.

Exam Objectives:

The following exam objectives are covered in this module:

2.2 Given a scenario, implement identity management

- Account creation and deletion

2.4 Given a scenario, configure and execute remote connectivity for system management

- Executing commands as another user

Remote Connectivity Management

Introduction
Objective

Welcome to the Remote Connectivity Management Practice Lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Install an SSH Server on Linux Systems
- Exercise 2 - Harden the SSH Server on Linux Systems
- Exercise 3 - Install the SSH Client on Linux Systems

After completing this module, you should be able to:

- Install an SSH Server on a Debian Linux
- Install an SSH Server on an Alma Linux
- Harden the SSH Server using Linux Commands
- Install the SSH Client on a Debian Linux
- Install the SSH Client on an Alma Linux

Exam Objectives:

The following exam objectives are covered in this module:

2.4 Given a scenario, configure and execute remote connectivity for system management

- SSH

Managing Processes in Linux

Introduction
Objective

Welcome to the Managing Processes in Linux practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Find a Runaway Process in Linux
- Exercise 2 - Stop a Runaway Process in Linux

After completing this module, you should be able to:

- Identify CPU performance hits.
- Identify memory performance hits.
- Identify disk performance hits.
- Identify and kill a process.

Exam Objectives:

The following exam objectives are covered in this module:

1.3 Given a scenario, configure and manage storage using the appropriate tool

- Monitoring storage space and disk usage.

1.4 Given a scenario, configure and use the appropriate processes and services

- Process management.

Managing & Configuring Linux System Services

Introduction
Objective

Welcome to the Managing & Configuring Linux System Services practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - View and Change the Locale on the System
- Exercise 2 - Explore the Linux Kernel

After completing this module, you should be able to:

- View the Locale Settings
- Configure the System Clock
- Identify the Kernel Location and Work with Modules

Exam Objectives:

The following exam objectives are covered in this module:

1.4 Given a scenario, configure and use the appropriate processes and services

- System services

1.7 Given a scenario, manage software configurations

- Configure kernel options

Storage Management Concepts

Introduction
Objective

Welcome to the Storage Management Concepts practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Create Partitions on a Disk Drive
- Exercise 2 - Create a Filesystem on a Disk Drive
- Exercise 3 - Mount a Filesystem on a Disk Drive

After completing this module, you should be able to:

- View Partitions on a Disk
- Create Partitions on a Disk
- Create an ext4 Filesystem on a Partition
- Create an xfs Filesystem on a Partition
- Create Labels for ext4 and xfs Filesystem
- Create a Temporary Filesystem Mount Point
- Create a Persistent Filesystem Mount Point

Exam Objectives:

The following exam objectives are covered in this module:

1.3 Given a scenario, configure and manage storage using the appropriate tools

- Disk partitioning
- Mounting local and remote devices
- Filesystem management

Logical Volume Manager Commands

Introduction
Objective

Welcome to the Logical Volume Manager Commands practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Prepare the System for LVM (Logical Volume Manager)
- Exercise 2 - Create Volumes
- Exercise 3 - Format and Mount the Logical Volume
- Exercise 4 - Remove the LVM

After completing this module, you should be able to:

- Create Partition and Install LVM
- Create a Physical Volume
- Create a Volume Group
- Create a Logical Volume
- Format the Logical Volume
- Mount the Logical Volume
- Make the Volume Persistent
- Remove the LVM Volume

Exam Objectives:

The following exam objectives are covered in this module:

1.3 Given a scenario, configure and manage storage using the appropriate tools

Creating and modifying volumes using Logical Volume Manager (LVM)

Managing Linux Shared Storage

Introduction
Objective

Welcome to the Managing Linux Shared Storage practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Create a RAID Array
- Exercise 2 - Create a Filesystem on the RAID Array
- Exercise 3 - Mount the RAID Array
- Exercise 4 - Make the RAID Array Persistent

After completing this module, you should be able to:

- Use mdadm to Create a RAID Array
- Create an ext4 Filesystem
- Create a Mount Point and Mount the RAID Array
- Reassemble the RAID at Boot

Exam Objectives:

The following exam objectives are covered in this module:

1.3 Given a scenario, configure and manage storage using the appropriate tools

- Inspecting RAID implementations

Linux Scripting Techniques

Introduction
Objective

Welcome to the Linux Scripting Techniques practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Search Files using grep
- Exercise 2 - Working with Regular Expressions
- Exercise 3 - Create a Non-interactive Script
- Exercise 4 - Create an Interactive Script
- Exercise 5 - Create Scripts using Loops and Conditions

After completing this module, you should be able to:

- Find a String Pattern using grep
- Search for Lines
- Use Regular Expressions to Escape Special Characters
- Use Regular Expressions with Ranges
- Use Regular Expressions with Wildcards
- Use Regular Expressions in a Text Editor
- Create a "Hello, world!" Script
- Use Variables in a Script
- Test the Scope of the Variables
- Create a Script that requires User Input
- Generate a Log once the Script is Executed
- Redirect Errors
- Create Scripts using Loops
- Create Scripts using Conditions and User Interaction

Exam Objectives:

The following exam objectives are covered in this module:

3.1 Given a scenario, create simple shell scripts to automate common tasks

- Shell script elements
- Common script utilities

Container Creation & Management

Introduction
Objective

Welcome to the Container Creation & Management practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Run Containers on a Linux System
- Exercise 2 - Automate Containers

After completing this module, you should be able to:

- Install and Configure a Docker
- Get an Image from Docker Hub
- Install Docker-compose and Automate Containers

Exam Objectives:

The following exam objectives are covered in this module:

3.2 Given a scenario, perform basic container operations

- Container management

Versioning Control using GIT

Introduction
Objective

Welcome to the Versioning Control using GIT practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Create a Git Repository
- Exercise 2 - Demonstrate Version Control using Git

After completing this module, you should be able to:

- Install Git and Create a Git Repository
- Prepare the System
- Clone a Repository and Work with the Cloned Repository
- Track another User's Changes

Exam Objectives:

The following exam objectives are covered in this module:

3.3 Given a scenario, perform basic version control using Git

- clone
- push
- pull
- commit
- add
- checkout
- branch

Configuring Networking in Linux

Introduction
Objective

Welcome to the Configuring Networking in Linux practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Configure Network Adapter in Alma
- Exercise 2 - Configure Network Adapter in Ubuntu

After completing this module, you should be able to:

- Identify and Configure Network Adapter Settings
- Configure Network Adapter using NetPlan

Exam Objectives:

The following exam objectives are covered in this module:

1.5 Given a scenario, use the appropriate networking tools or configuration files

- Interface management

Name Resolution Concepts & Tools

Introduction
Objective

Welcome to the Name Resolution Concepts & Tools practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Configure Name Resolution on a Linux System

After completing this module, you should be able to:

- View and Configure Name Resolution

Exam Objectives:

The following exam objectives are covered in this module:

1.5 Given a scenario, use the appropriate networking tools or configuration files

- Name resolution

Remote Access Tools

Introduction
Objective

Welcome to the Remote Access Tools practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Secure Remote Access to Alma and an Ubuntu Device

After completing this module, you should be able to:

- Install and Configure an SSH Server on Alma Linux
- Install the SSH Client on Ubuntu
- Transfer Files using SFTP to an Ubuntu Server

Exam Objectives:

The following exam objectives are covered in this module:

1.5 Given a scenario, use the appropriate networking tools or configuration files

- Remote networking tools

Securing Linux Devices

Introduction
Objective

Welcome to the Securing Linux Devices practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Secure an Alma Device
- Exercise 2 - Secure an Ubuntu Device

After completing this module, you should be able to:

- Modify Security-enhanced Linux (SELinux)
- Verify SELinux is Operational
- Configure SELinux

- View the Status of Apparmor
- View Apparmor Profiles
- Install Apache2 Server and Test Apparmor

Exam Objectives:

The following exam objectives are covered in this module:

2.5 Given a scenario, apply the appropriate access controls

- Security-enhanced Linux (SELinux)

Configuring Linux Firewalls

Introduction
Objective

Welcome to the Configuring Linux Firewalls Practice Lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Setup a Linux Firewall in Ubuntu
- Exercise 2 - Setup Firewall Rules in Ubuntu

After completing this module, you should be able to:

- Install the Ufw Firewall
- Create a Simple Firewall Rule using Ufw
- Create a Specific Rule with Ports and Protocols
- Manipulate a List of Firewall Rules

Exam Objectives:

The following exam objectives are covered in this module:

2.3 Given a scenario, implement and configure firewalls

- Firewall use cases

Certificate Configuration & Management

Introduction
Objective

Welcome to the Certificate Configuration & Management practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Enable Certificate-based Authentication
- Exercise 2 - Configure Server Keys SSH Certificates for Authentication

After completing this module, you should be able to:

- Configure SSH Server and Client
- Configure Secure Access with Certificate Keys
- Remove Existing Keys
- Generate New SSH Keys

Exam Objectives:

The following exam objectives are covered in this module:

2.1 Summarize the purpose and use of security best practices in a Linux environment

- Managing Public Key Infrastructure (PKI) certificates

Authentication Methods

Introduction
Objective

Welcome to the Authentication Methods practice lab. In this module, you will be provided with the instructions and devices needed to develop your hands-on skills.

Overview

Learning Outcomes:

In this module, you will complete the following exercises:

- Exercise 1 - Configure MFA in Linux
- Exercise 2 - Configure Linux system to Join Microsoft Active Directory Domain for Authentication

After completing this module, you should be able to:

- Update Ubuntu and Install the Google Authenticator for MFA
- Configure SSH to Work with the Google Authenticator
- Configure DNS Server Settings
- Install Basic Linux Domain Joining Tools
- Domain join a Linux device to Microsoft Active Directory

Exam Objectives:

The following exam objectives are covered in this module:

2.1 Summarize the purpose and use of security best practices in a Linux environment

- Authentication