Linux Operations

Index: **TR002**
Duration: **24 hours**

Description
This course explores the various tools and techniques commonly used by Linux system administrators and end-users to achieve their day-to-day work in a Linux environment using automation techniques. Linux Operations course is designed for experienced computer users who have limited or no previous exposure to Linux, whether they are working in an individual or Enterprise environment.

Target Audience
The course targets participants with basic knowledge in IT or networking environment:

- IT security personnel
- Incident responders
- Security analysts

Pre-requisites

- None

Objectives

- Using Linux command-line operations
- Understand system configurations and graphical interface of Linux
- Using automation in Linux

Module 1: Advanced Command-Line

During this model, we will explore the advanced features of the Linux Command-Line. Students will learn to control it, as well as advanced text manipulation. The goal of this module is to allow students to master the command-line fully.

- **The Terminal - CLI (Command Line Interface)**
  - Shell Types
  - Exploring Distributions
  - File Manipulation Commands
  - Compressing and Archiving Files
  - Managing Links
  - Advanced File Search - FHS
- **Advanced Log Parsing**
  - Using Cut, Sort, Uniq, Tail, and Head
  - Basic and Extended Regular Expressions
  - Streams, Redirection, and Pipes

Module 2: Administering the System

This module will teach the students to gain full control of the Linux Environment. The students will learn to administrate their system and manage software and services.

- **Network Troubleshooting**
  - Network Configuring
    - Netplan vs. Interfaces
  - Basic Network Troubleshooting
    - Examining Sockets
    - Sending Packets Using /DEV/TCP and UDP
    - Traceroute and Dublin-Traceroute
  - Advanced Network Troubleshooting
    - Advanced Networking Commands
    - Ncat Command
- **Environment Control**
  - Automating Using Cron
  - Job Control
  - Managing Process and Services
  - Logs and Journals

Module 3: Linux Administrator

During this module, participants will study how to manage the administrative side of the system, ensure proper configuration and system update management.

- **Hardware Management**
  - Storage and Drive Control
  - Advanced Dive into the Structure of the Linux Filesystem
  - Partitioning Tools in Linux
  - Mounting Basics
- **Advanced Bash Shell Scripting**
  - Introduction to Programming
  - Writing First Bash Scripts
    - The Exit Status
    - Getting User Input
    - Performing Math
    - Logic Statements
  - System Administration Automation
  - Shell Variables
    - Global vs. Local Environment Variables
    - The Declare Command

Module 4: Installing Packages

In this module, students will learn about essential package management in the Linux environment. In addition, students will learn to run and manage containerized applications inside the Docker environment.

- **Package Management**
  - Installing Deb Packages
  - Using APT
    - Understanding Repository Format
    - System Updates
    - Distribution Upgrade
- **The Docker Application**
  - Introduction and Installing Docker
  - Introduction to Docker-Images
    - Docker-Hub
    - Pulling Images
    - Running Images
    - Setting Arguments
  - Building the Dockerfile
    - Understanding the Dockerfile
    - Building a Webserver using the Dockerfile

Module 5: Linux Services and Attacks

During this module, participants will study about the standard and familiar services in the Linux environment, as well as how to find these services and whether they run on remote computers to collect information about them and even about the computer on which they rely, this module will present familiar attacks on Linux systems

- **Local Linux Security**
  - Understanding 'systemctl' and 'service'
  - Different Linux Firewalls
  - Understanding Chains and Tables
  - Creating Basic Security Rules and Agenda
  - Cracking Local Linux Password via Startup