Linux Tools for Software Development (LFD108x)

Learn the tools you need to do your everyday work in Linux development environments and beyond.

Course Overview

Linux Tools for Software Development is designed for developers with experience working on any operating system who want to understand the basics of open source development. Experience with the command line is not necessary, but would be helpful.

The course begins by introducing you to numerous essential command line tools that are used daily. Then, it focuses on bash scripting - you will learn how to construct scripts and how to do very complicated tasks in an automated way. The course looks at files and filesystems and focuses on compiling programs in Linux, using gcc and other compilers, and using libraries of different types. This course also covers building packages out of software in Linux, and more.

This course helps you familiarize yourself with essential command line tools, so you can work comfortably and productively in Linux environments, showing that you have mastered important Linux methods and requisite tools.

Course Instructor(s)

Jerry Cooperstein, Ph.D. has been working with Linux since 1994, developing and delivering training in both the kernel and user space. He has overall responsibility for all training content at The Linux Foundation. During a two-decade career in nuclear astrophysics, he developed state-of-the-art simulation software on many kinds of supercomputers and taught at both the undergraduate and graduate levels. Jerry joined The Linux Foundation in 2009. He is currently working as a Senior Content Manager for the Linux Foundation.

Audience

This course is designed for computer users who have limited or no experience working in a Linux environment; and/or for those who already have done some work on Linux systems and are looking to gain a good grasp on Linux tools for software development.

Prerequisites

To make the most of this course, a Linux system is necessary. Either a physical or a virtual machine, and any modern distribution will work. You will need to have experience as a developer on any operating system. You will need some experience in working at the command line is not necessary, but would be helpful.

Course Length

15-20 hours

Course Learning Objectives

By the end of this course, you should be able to:

- Use essential command line tools for every day tasks.
- Construct scripts and perform complicated tasks in an automated way.
- Discuss how Linux works with various types of filesystems through the use of a virtual filesystem.
- Compile programs in Linux using gcc and other compilers.
- Use different types of shared and static libraries.
- Build packages out of software in Linux in both RPM and Debian systems, to be readily distributed to other developers of Linux distributions.
- And more.

Course Outline

Welcome!

- Welcome!

Chapter 1. Essential Command Line Tools

- Introduction and Learning Objectives
- Essential Command Line Tools
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 2. File and Text Manipulation Utilities

- Introduction and Learning Objectives
- ‘cat’ and ‘echo’
- Working with Large and Compressed Files
- ‘sed’ and ‘awk’
- File Manipulation Utilities
- ‘grep’ and strings
- Miscellaneous Text Utilities
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 3. Bash Scripting

- Introduction and Learning Objectives
- Bash Scripting
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 4. Networking

- Introduction and Learning Objectives
- Networking Overview
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 5. Processes and System Monitoring

- Introduction and Learning Objectives
- System Monitoring
- Processes
- Memory Monitoring and Tuning
- Network Monitoring
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 6. Files and Filesystems

- Introduction and Learning Objectives
- Files and Filesystems
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 7. Linux Filesystems

- Introduction and Learning Objectives
- Linux Filesystems
- Lab Exercises

- Knowledge Check (verified track only)

Chapter 8. Compiling, Linking and Libraries
- Introduction and Learning Objectives
- Compiling, Linking and Libraries
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 9. Building RPM and Debian Packages
- Introduction and Learning Objectives
- Building RPM and Debian Packages
- Lab Exercises
- Knowledge Check (verified track only)

Chapter 10. Printing and PDF Files
- Introduction and Learning Objectives
- Printing
- Manipulating Postscript and PDF Files
- Lab Exercises
- Knowledge Check (verified track only)
- Course Feedback

Final Exam

edX Platform

If you are using edX for the first time, we strongly encourage you to start by taking a free 'how to use edX' course that the team at edX has made available. In this course, you will learn how to navigate the edX platform, how to connect with other edX learners, how to answer problems on the edX platform, how grades work in edX courses, and how to complete your first course.

Click here to register for "*DemoX*" and you will be on your way. You will find the edX platform simple and intuitive.

Getting Help

For any **technical issues** with the edX platform (including login problems and issues with the Verified Certificate), please use the **Help** icon located on the upper right side of your screen.

One great way to interact with peers taking this course and resolving any **content-related issues** is via the **Discussion Forums**. These forums can be used in the following ways:

- To discuss concepts, tools, and technologies presented in this course, or related to the topics discussed in the course material.
- To ask questions about course content.
- To share resources and ideas related to Linux tools for software development and more.

We strongly encourage you not only to ask questions, but to share with your peers opinions about the course content, as well as valuable related resources. The Discussion Forums will be reviewed periodically by The Linux Foundation staff, but it is primarily a community resource, not an 'ask the instructor' service.

To learn more tips on how to use them, read the following article: "*Getting the Most Out of the edX Discussion Forums*".

Course Timing

This course is entirely self-paced; there is no fixed schedule for going through the material. You can go through the course at your own pace, and you will always be returned to exactly where you left off when you come back to start a new session. However, we still suggest you avoid long breaks in between periods of work, as learning will be faster and content retention improved.

The chapters in the course have been designed to build on one another. It is probably best to work through them in sequence; if you skip or only skim some chapters quickly, you may find there are topics being discussed you have not been exposed to yet. But this is all self-paced and you can always go back, so you can thread your own path through the material.

Learning Aids

Besides simple exposition through text and figures, this course uses several additional methods to present and solidify the learning material, including videos, external resources, and knowledge check questions (Verified Certificate track only).

Audit and Verified Tracks

You can enroll into an audit or a verified track. In an audit track, you will have access to all ungraded course content: course readings, videos, and learning aids, but no certificates are awarded when auditing. You will not be able to access any graded content (knowledge check questions at the end of each chapter, and the final exam).

In order to receive a certificate, you will need to obtain a passing grade (please refer to the "Grading" section below), verify your identity with edX, and pay a fee. Once all edX requirements have been met, you can download your certificate from the Progress tab.

To learn more about audit and verified tracks, visit edX Help Center > Certificates.

Grading (Verified Certificate track only)

At the end of each chapter, you will have a set of graded **knowledge check questions**, that are meant to further check your understanding of the material presented. The grades obtained by answering these knowledge check questions will represent **20%** of your final grade.

The remaining **80%** of your final grade is represented by the score obtained in the **final exam**. The final exam is located at the end of the course and it consists of 19 questions.

You will have a maximum of two attempts to answer each knowledge check and final exam question (other than True/False questions, in which case, you have only one attempt). You are free to reference your notes, screens from the course, etc., and there is no time limit on how long you can spend on a question. You can always skip a question and come back to it later.

In order to complete this course with a passing grade, you must obtain a passing score (knowledge check and final exam) of minimum 70%.

Course Progress and Completion (Verified Certificate track only)

Once you complete the course (including knowledge check questions and final exam), you will want to know if you have passed. You will be able to see your completion status using the **Progress** tab at the top of your screen, which will clearly indicate whether or not you have achieved a passing score.

About The Linux Foundation

The Linux Foundation provides a neutral, trusted hub for developers to code, manage, and scale open technology projects. Founded in 2000, The Linux Foundation is supported by more than 1,000 members and is the world's leading home for collaboration on open source software, open standards, open data and open hardware. The Linux Foundation's methodology focuses on leveraging best practices and addressing the needs of contributors, users and solution providers to create sustainable models for open collaboration.

The Linux Foundation hosts Linux, the world's largest and most pervasive open source software project in history. It is also home to Linux creator Linus Torvalds and lead maintainer Greg Kroah-Hartman. The success of Linux has catalyzed growth in the open source community, demonstrating the commercial efficacy of open source and inspiring countless new projects across all industries and levels of the technology stack.

As a result, the Linux Foundation today hosts far more than Linux; it is the umbrella for many critical open source projects that power corporations today, spanning virtually all industry sectors. Some of the technologies we focus on include big data and analytics, networking, embedded systems and IoT, web tools, cloud computing, edge computing, automotive, security, blockchain, and many more.

The Linux Foundation Events

The Linux Foundation hosts an increasing number of events each year, including:

- Open Source Summit North America, Europe, Japan and China
- Embedded Linux Conference + OpenIoT Summit North America and Europe
- Open Source Leadership Summit
- Open Networking Summit North America and Europe
- KubeCon + CloudNativeCon North America, Europe and China
- Automotive Linux Summit
- KVM Forum
- Linux Storage Filesystem and Memory Management Summit
- Linux Security Summit North America and Europe
- Cloud Foundry Summit
- Hyperledger Global Forum
- And many more.

To learn more about The Linux Foundation events and to register, click here.

The Linux Foundation Training

The Linux Foundation offers several types of training:

- Classroom
- Online
- On-site
- Events-based.

To get more information about specific courses offered by The Linux Foundation, click here.

The Linux Foundation Certifications

The Linux Foundation certifications give you a way to differentiate yourself in a job market that's hungry for your skills. We've taken a new, innovative approach to open source certification that allows you to showcase your skills in a way that other peers will respect and employers will trust:

- You can take your certification from any computer, anywhere, at any time
- The certification exams are either performance-based or multiple choice
- The exams are distribution-flexible
- The exams are up-to-date, testing knowledge and skills that actually matter in today's IT environment.

For a list of currently offered certifications, click here.