LFS101x - Introduction to Linux

Course Overview

Develop a good working knowledge of Linux using both the graphical interface and command line, covering the major Linux distribution families.

Linux powers 100% of the world's supercomputers, most of the servers powering the Internet, the majority of financial trades worldwide and a billion Android devices. In short, Linux is everywhere. It appears in many different architectures, from mainframes to server to desktop to mobile and on a staggeringly wide variety of hardware.

Moreover, 80% of hiring managers reported that they will prioritize hiring Linux talent relative to other skills areas in the next six months, and 47% of hiring managers saying they are more likely to hire a candidate with Linux certification.

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. It 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.

Upon completion of this training you should have a good working knowledge of Linux, from both a graphical and command line perspective, allowing you to easily navigate through any of the major Linux distributions. You will be able to continue your progress as either a user, system administrator or developer using the acquired skill set.

Join the 800,000+ students who are already enrolled in this course and start your Linux journey.

Course Instructor

Jerry Cooperstein, PhD 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 level. Cooperstein joined The Linux Foundation in 2009 as the Training Program Director.

Audience

LFS101x - Introduction to Linux 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.

Prerequisites

No previous Linux experience required for this course. However, the course does assume familiarity with computers and common software, such as would be had from daily computer use.

Course Length

40-60 hours.

Course Learning Objectives

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

- Have a good working knowledge of Linux.
- Navigate through major Linux distributions.
- Understand configurations and graphical interface of Linux.
- Use basic command-line operations.
- Explain common applications of Linux.

Course Outline

Welcome!

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Chapter 1. The Linux Foundation

- Introduction and Learning Objectives
- The Linux Foundation
- The Linux Foundation Training
- Course Linux Requirements
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 2. Linux Philosophy and Concepts

- Introduction and Learning Objectives
- Linux History
- Linux Philosophy
- Linux Community
- Linux Terminology
- Linux Distributions
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 3. Linux Basics and System Startup

- Introduction and Learning Objectives
- The Boot Process
- Kernel, init and Services
- Linux Filesystem Basics
- Linux Distribution Installation
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 4. Graphical Interface

- Introduction and Learning Objectives
- Graphical Desktop
- Session Management
- Basic Operations
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 5. System Configuration from the Graphical Interface

- Introduction and Learning Objectives
- System, Display, Date and Time Settings
- Network Manager
- Installing and Updating Software
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 6. Common Applications

- Introduction and Learning Objectives
- Internet Applications
- Productivity and Development Applications
- Multimedia Applications
- Graphics Editors and Utilities
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 7. Command Line Operations

- Introduction and Learning Objectives
- Command-Line Mode Options
- Basic Operations
- Working with Files
- Searching for Files
- Installing Software
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 8. Finding Linux Documentation

- Introduction and Learning Objectives
- Documentation Sources
- The man pages
- GNU Info
- The **`--help`** Option and **`help`** Command
- Other Documentation Sources
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 9. Processes

- Introduction and Learning Objectives
- Introduction to Processes and Process Attributes
- Process Metrics and Process Control
- Listing Processes: ps and top
- Starting Processes in the Future
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 10. File Operations

- Introduction and Learning Objectives
- Filesystems
- Filesystem Architecture
- Comparing Files and File Types
- Backing Up and Compressing Data
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 11. Text Editors

- Introduction and Learning Objectives
- Basic Editors: nano and gedit
- More Advanced Editors: vi and emacs
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 12. User Environment

- Introduction and Learning Objectives
- Accounts, Users and Groups
- Environment Variables
- Recalling Previous Commands
- File Permissions
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 13. Manipulating Text

- 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

- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 14. Network Operations

- Introduction and Learning Objectives
- Network Addresses and DNS
- Networking Configuration and Tools
- Browsers, wget and curl
- Transferring Files
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 15. The Bash Shell and Basic Scripting

- Introduction and Learning Objectives
- Features and Capabilities
- Syntax
- Constructs
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 16. More on Bash Shell Scripting

- Introduction and Learning Objectives
- String Manipulation
- The case Statement
- Looping Constructs
- Script Debugging
- Some Additional Useful Techniques
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 17. Printing

- Introduction and Learning Objectives
- Configuration
- Printing Operations
- Manipulating Postscript and PDF Files
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Chapter 18. Local Security Principles

- Introduction and Learning Objectives
- Understanding Linux Security
- When Are root Privileges Required?
- sudo, Process Isolation, Limiting Hardware Access and Keeping System Current
- Working with passwords
- Securing the Boot Process and Hardware Resources
- Knowledge Check (Verified Certificate track only)
- Learning Objectives (Review) and Summary

Final Exam (Verified Certificate track only)

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.

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 the learning material, including videos, Try-It-Yourself, labs and knowledge check questions (Verified Certificate track only).

Course Formatting

In order to make it easier to distinguish the various types of content in the course, we use the color coding and formats below:

- Bold: names of programs and services (or used for emphasis).
- Light blue: designates hyperlinks
- Dark blue (bold, Courier New font): text typed at the command-line, system output at the command-line.
- Purple (bold, Courier New font): command output
- Light brown (bold, Courier New font): file and directory names.

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 30 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.

Professional Certificate Program

Professional Certificate programs are a series of courses designed by industry leaders and top universities to build and enhance critical professional skills needed to succeed in today's most in-demand fields.

To learn more about our Professional Certificate, click here.

About The Linux Foundation

The Linux Foundation partners with the world's leading developers and companies to solve the hardest technology problems and accelerate open technology development and commercial adoption. The Linux Foundation makes it its mission to provide experience and expertise to any initiative working to solve complex problems through open source collaboration, providing the tools to scale open source projects: security best practices, governance, operations and ecosystem development, training and certification, licensing, and promotion.

Linux is the world's largest and most pervasive open source software project in history. The Linux Foundation is home to Linux creator Linus Torvalds and lead maintainer Greg Kroah-Hartman, and provides a neutral home where Linux kernel development can be protected

and accelerated for years to come. 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.

The Linux Foundation's work today extends far beyond Linux, fostering innovation at every layer of the software stack. The Linux Foundation is the umbrella organization for many critical open source projects that power corporations today, spanning all industry sectors:

- Big data and analytics (ODPi, R Consortium)
- Networking (OpenDaylight, ONAP, OPNFV)
- Embedded (Dronecode, Zephyr)
- Web tools (JS Foundation, Node.js)
- Cloud computing (Cloud Foundry, Cloud Native Computing Foundation, Open Container Initiative)
- Automotive (Automotive Grade Linux)
- Security (The Core Infrastructure Initiative)
- Blockchain (Hyperledger)
- And many more.

To learn more about The Linux Foundation, click here.

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 performance-based
- The exams are distribution-flexible
- The exams are up-to-date, testing knowledge and skills that actually matter in today's IT environment.

The Linux Foundation and its collaborative projects currently offer the following certifications:

- Linux Foundation Certified System Administrator (LFCS)
- Linux Foundation Certified Engineer (LFCE)
- Certified Kubernetes Administrator (CKA)
- Certified Kubernetes Application Developer (CKAD)
- Cloud Foundry Certified Developer (CFCD)
- Certified Hyperledger Fabric Administrator (CHFA)
- Certified Hyperledger Sawtooth Administrator (CHSA)
- OpenJS Node.js Application Developer (JSNAD)
- OpenJS Node.js Services Developer (JSNSD)

Open Source Guides for the Enterprise

The Linux Foundation in partnership with the TODO Group developed a set of guides leveraging best practices for:

- Running an open source program office, or
- Managing an open source project in your organization.

To learn more, you can visit the following webpage: "*Open Source Guides for the Enterprise*".

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