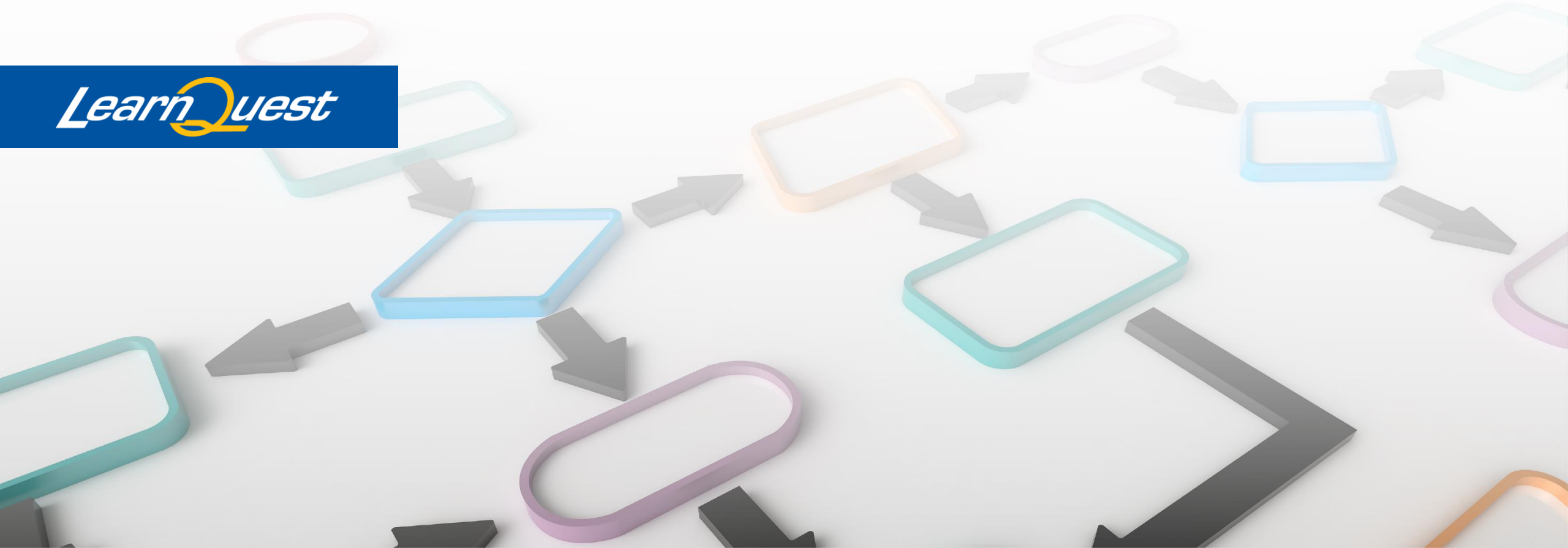
Linux Fundamentals

- 1st Course in Linux Foundations Specialization



Linux Operating System

Welcome to Linux Operating System, the first course of the Linux Fundamentals specialization. By enrolling in this course, you are taking the first step to kick start your career in information technology.

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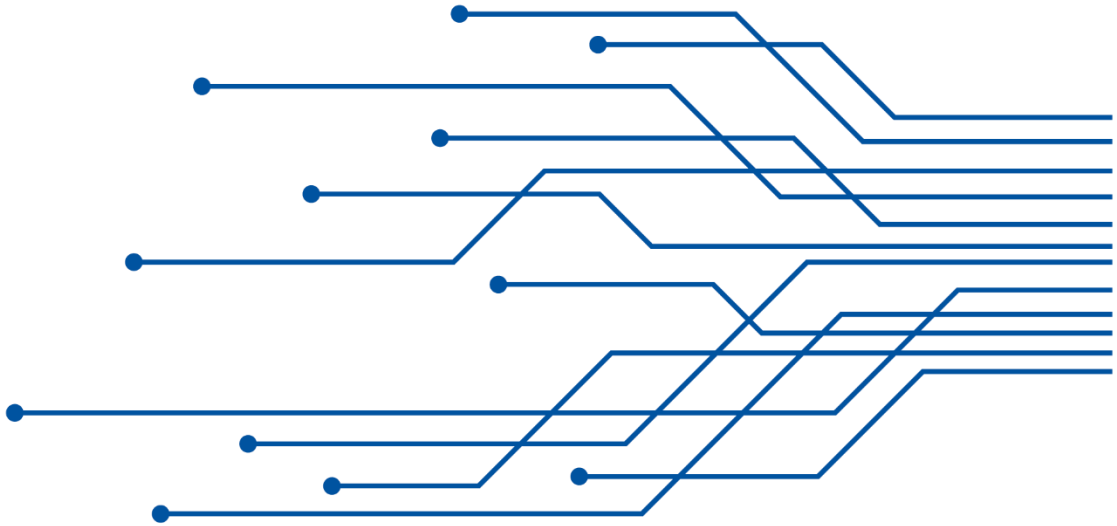


Learning Objectives

Linux Operating System

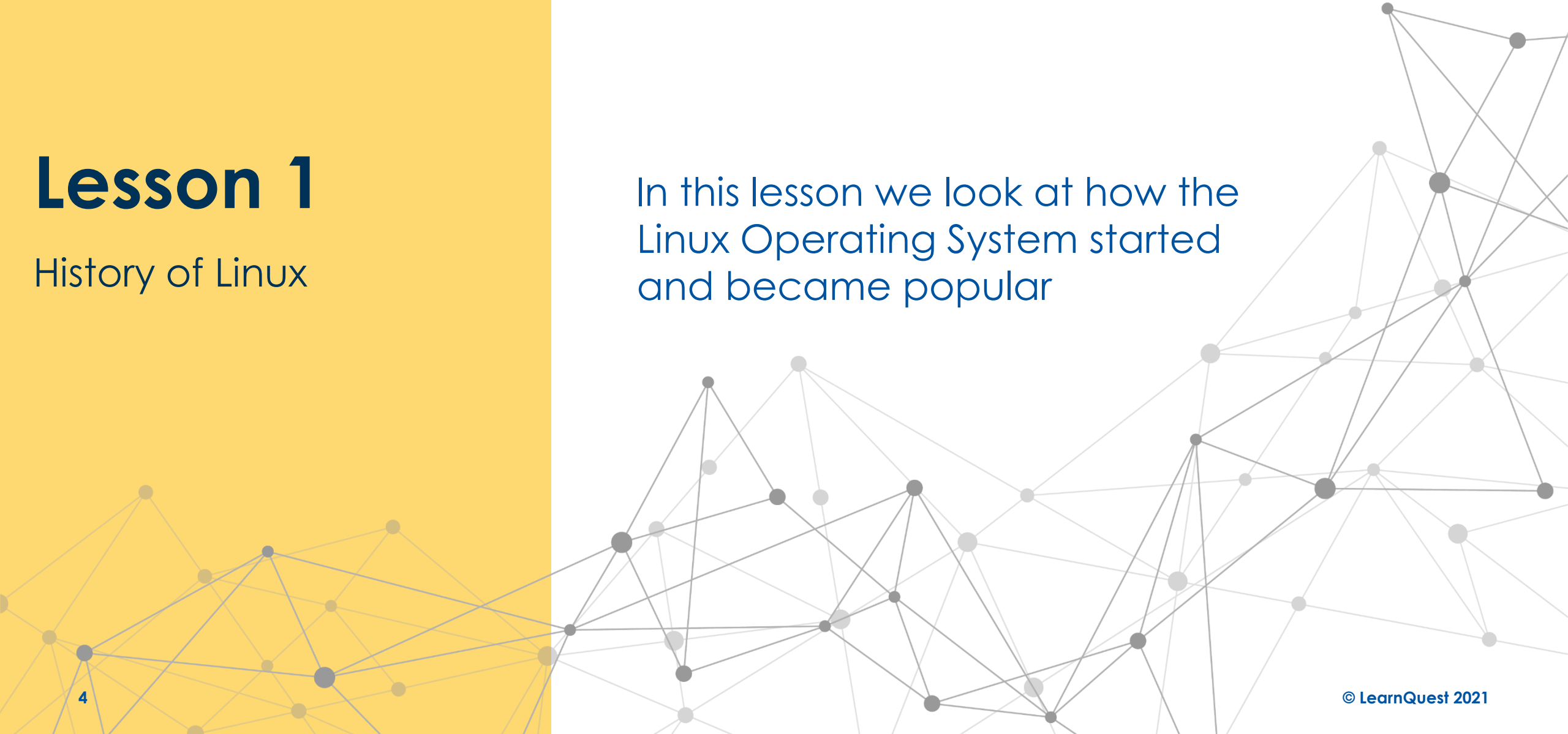
Upon completion of this module, learners will be able to:

- List Several Linux Distributions
- Describe Linux Services
- View, Create, Copy, Move and Remove Files
- Search and Analyze Text

Lesson 1

History of Linux

In this lesson we look at how the Linux Operating System started and became popular



What is Linux?

Linux is a family of open-source Unix-like operating systems based on the Linux kernel by Linus Torvalds. Linux is typically packaged in a Linux distribution.

- Linux was originally developed for personal computers based on the Intel x86 architecture
- Ported to more platforms than any other operating system
- Linux-based Android on smartphones
- Chromebook runs the Linux kernel-based Chrome OS
- Linux also runs on embedded systems
- 90% of all cloud infrastructure is powered by Linux

Embedded Systems

- routers
- automation controls
- smart home technology
- televisions
- automobiles
- digital video recorders
- video game consoles
- smartwatches

How is Linux Different?

Linux has many advantages over other operating systems including:

- Open Source
- Community Support
- Support for Older Hardware

Linux Precursors

The Unix operating system was conceived and implemented in 1969, at AT&T's Bell Labs

AT&T was required to license the Unix operating system's source code to anyone who asked

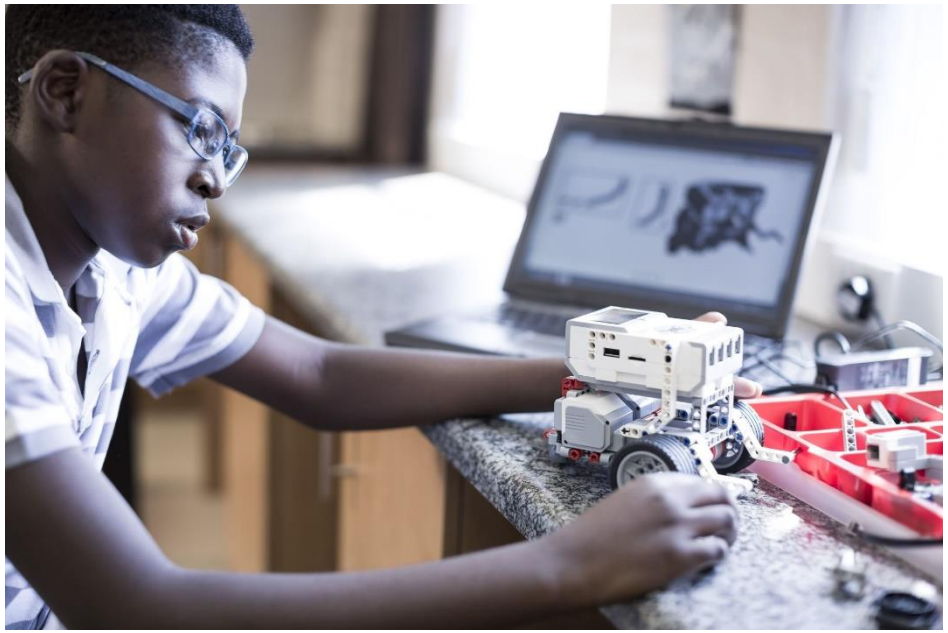
In 1984, AT&T divested itself of Bell Labs - Bell Labs began selling Unix as a proprietary product

GNU Project

- Goal of creating a "complete Unix-compatible software system" composed entirely of free software
- In 1985, Richard Stallman started the Free Software Foundation
- In 1989, Stallman wrote the GNU General Public License (GNU GPL)
- By the early 1990s, many of the programs required in an operating system were completed:
  - Libraries
  - Compilers
  - Text editors
  - Command-line shell
  - Windowing system

MINIX

- In 1987, MINIX was created by Andrew S. Tanenbaum
- A minimal Unix-like operating system targeted at students and others who wanted to learn operating system principles.
- The complete source code of MINIX was freely available but the licensing terms prevented it from being free software
- Today, MINIX 3 is a free, open-source, operating system



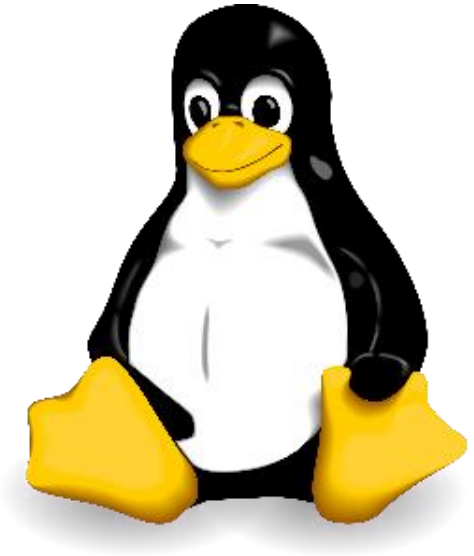
Linus Torvalds

In 1991, while attending the University of Helsinki, Torvalds became curious about operating systems

Worked on his own operating system kernel, which eventually became the Linux kernel.

Originally developed for Minix and Minix Tools

Switched license to GNU GPL and tools to GNU Tools



Lesson 1 Review

Unix was owned and licensed by Bell Labs

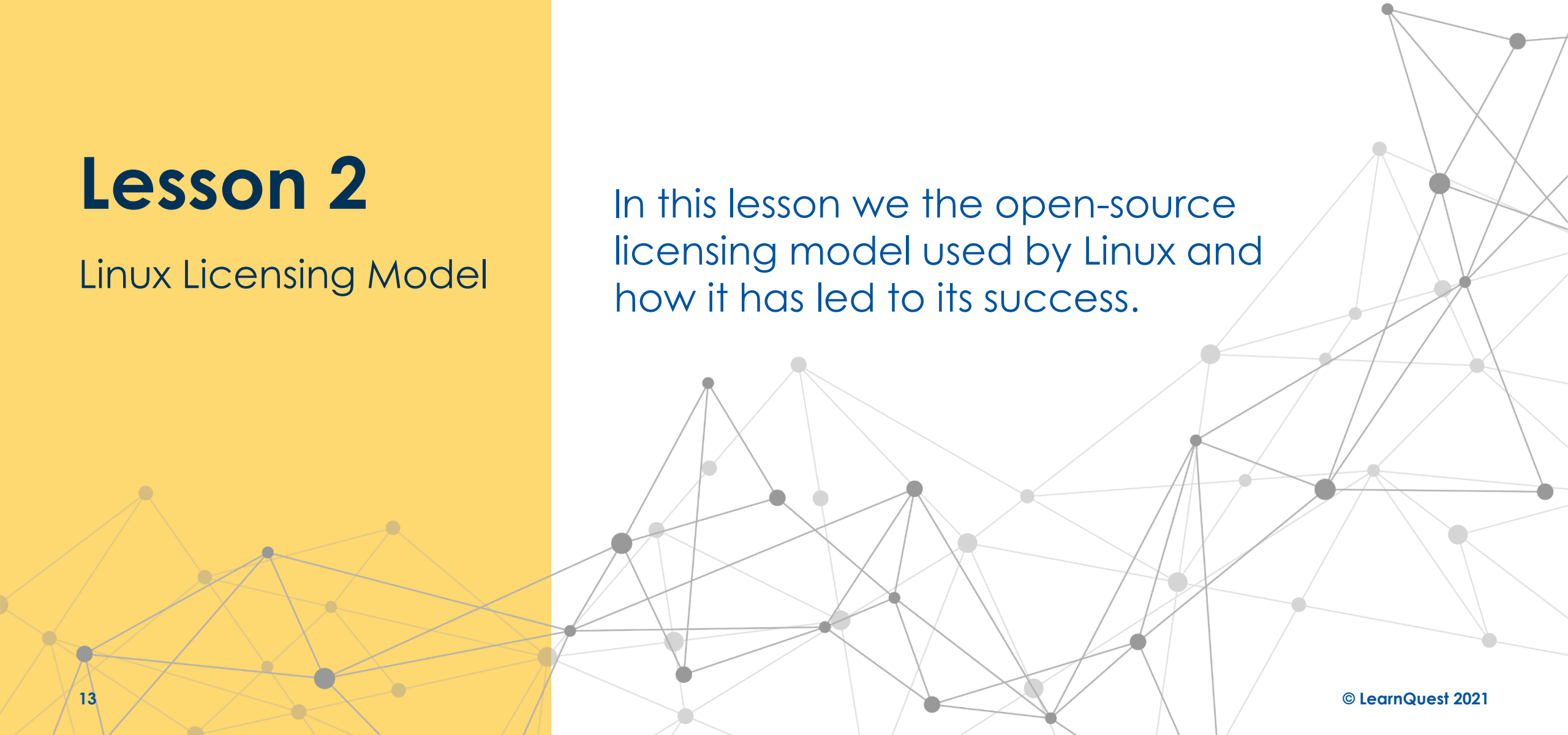
FSF created GNU tools as part of GNU Project

Linus Torvalds created Linux Kernel and used the GNU Tools

Lesson 2

Linux Licensing Model

In this lesson we the open-source licensing model used by Linux and how it has led to its success.



GNU GPL

- GPL Stands for General Public License
- Linux Kernel and code from GNU Project is licensed under GNU GPL
- Freely copy, change, and distribute it
- You may not impose any restrictions on further distribution
- Must make the source code available.

How do Companies Make Money on Linux?

Some Distributions Charge for a Supported Release

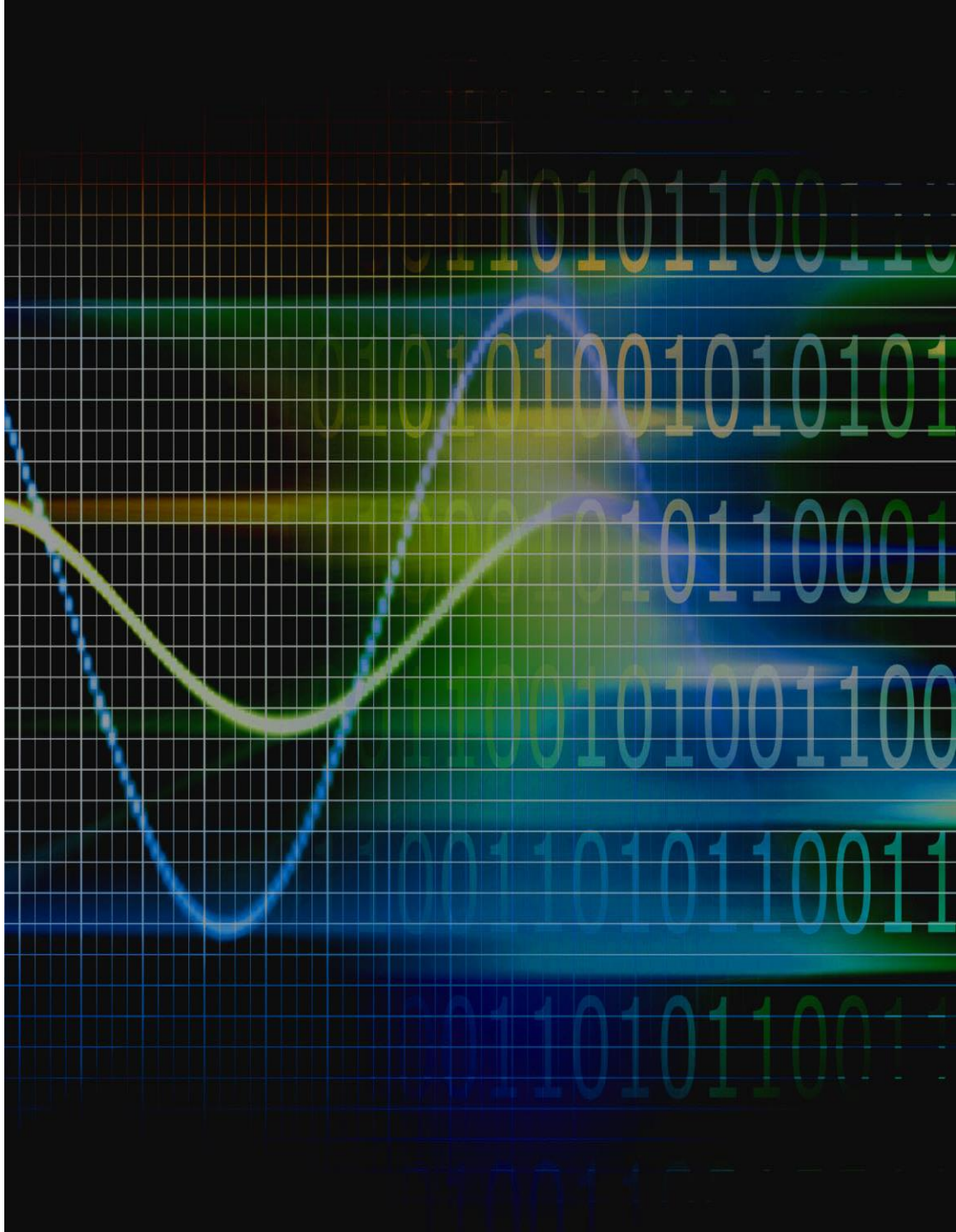
Consultants charge for installation and customization

Cloud companies do not distribute so do not need to share source code

Competing With Microsoft

Many commercial companies gave up their own OS work and embraced Linux to compete with Windows

- IBM
- Hewlett-Packard
- Dell



Lesson 2 Review

Open source does not mean you cannot charge for Linux

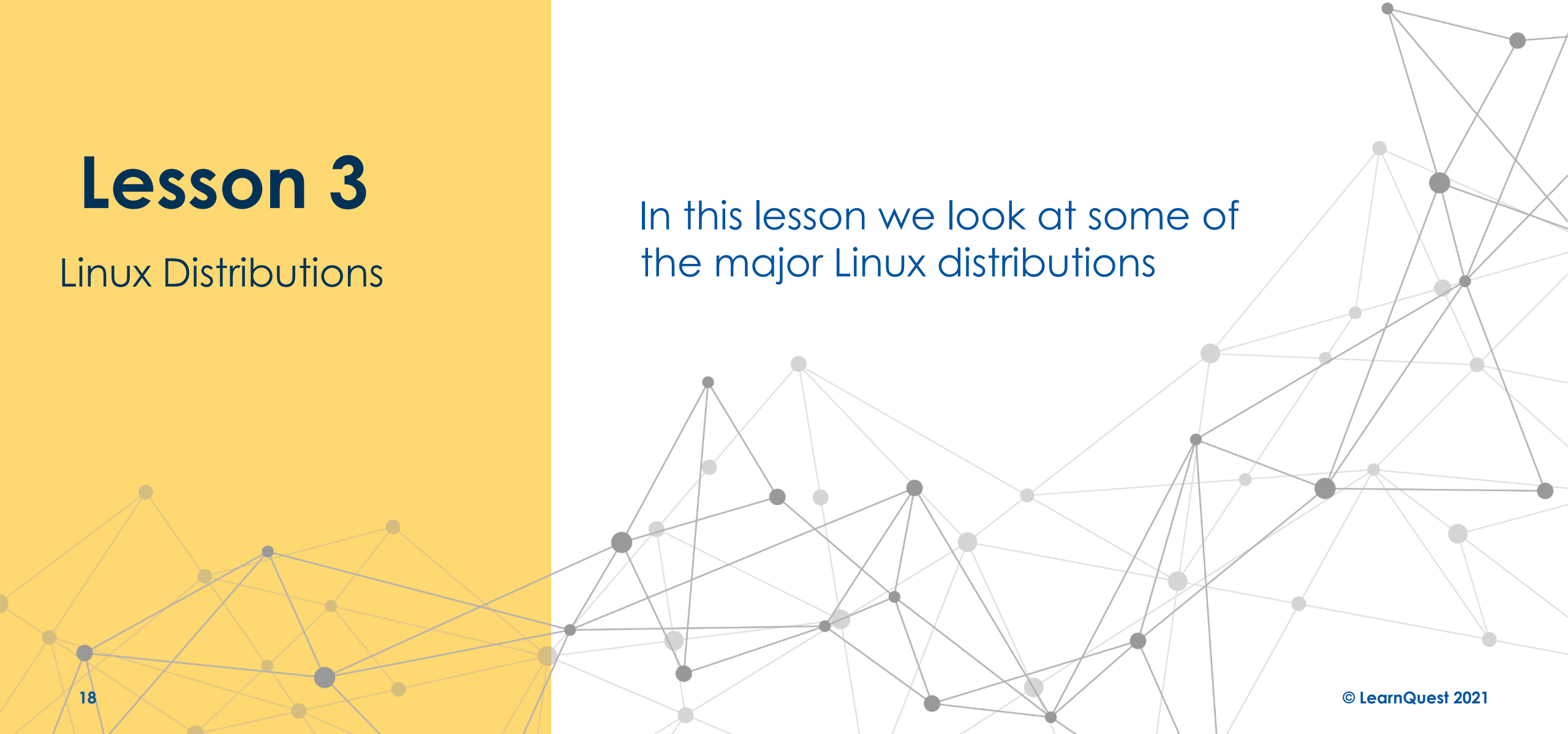
If you give someone your changed Linux executable you have to give the source code

Everyone has the right to change and add to Linux

Lesson 3

Linux Distributions

In this lesson we look at some of the major Linux distributions



Red Hat Enterprise Linux

Abbreviated to RHEL	Developed by Red Hat for the commercial market	Price include Support
Initial Release - February 22, 2000	Today, Red Hat is a subsidiary of IBM	Server versions for x86-64, Power, ARM64, and IBM Z
Desktop version for x86-64	Designed to be stable and with long-term support for enterprise users	CentOS is a redistribution with RedHat IP stripped out

Fedora Linux

Linux distribution developed by the community-supported Fedora Project

Sponsored primarily by Red Hat

Initial Release - November 6, 2003

Over 30 Releases

Focuses on innovation by integrating new technologies early

German-based multinational open-source software company

Distributes Several Linux Products Including:

- SUSE Linux Enterprise Server (SLES)
- openSUSE
- SUSE Linux Enterprise Desktop

Initial Release – September 2, 1992

Owned by Novell from 2003-2011

Ubuntu

Based on Debian

Free to Download

Paid Support Available

Three editions: Desktop, Server, and Core for Internet of things devices and robots.

Long Term Support (LTS) releases are supported for five years, and are released every two years

Lesson 3 Review

There are hundreds of Linux Distributions out there

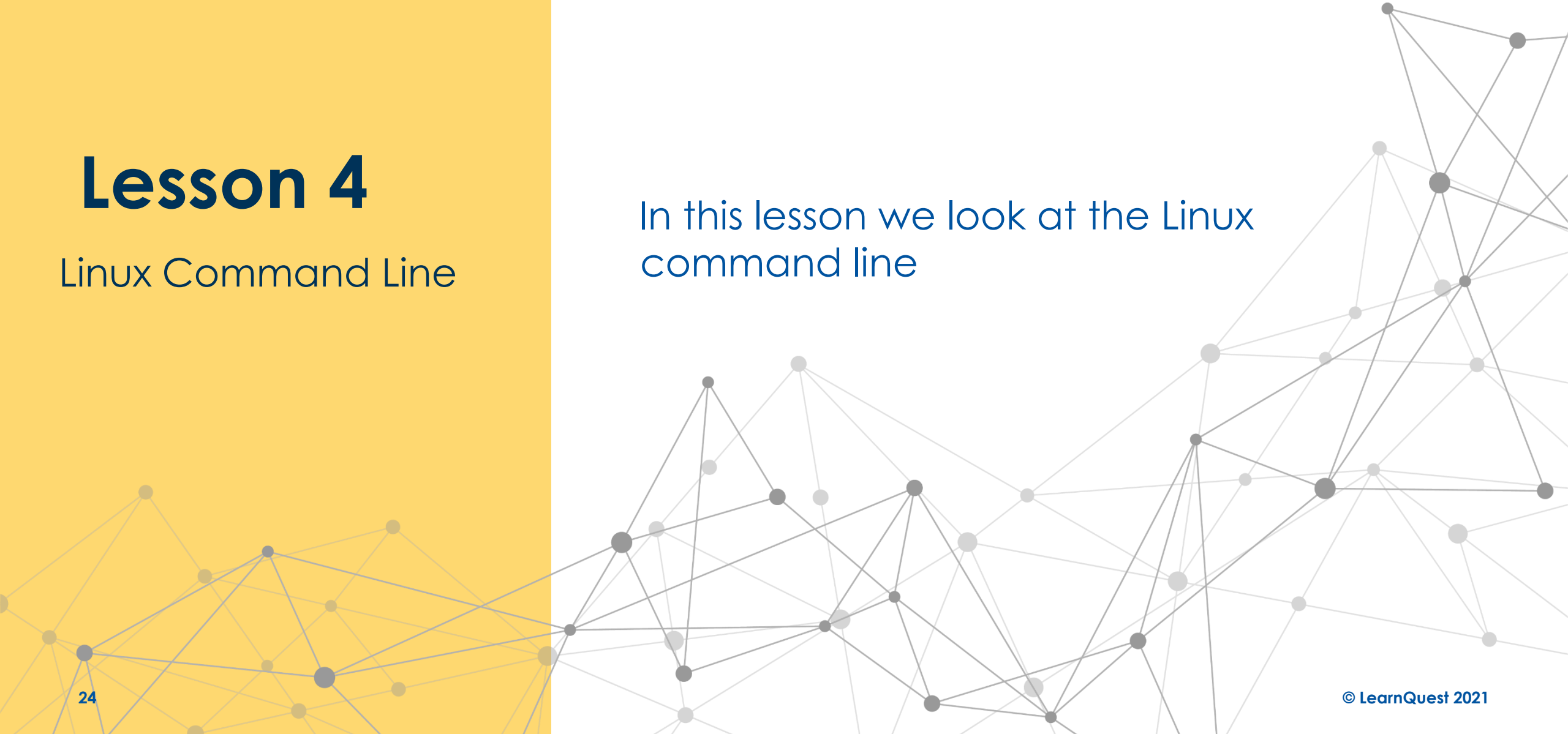
Some require money to download others are free to download

All are open source, but they may include content that is not open source

Lesson 4

Linux Command Line

In this lesson we look at the Linux command line



Linux Command Line

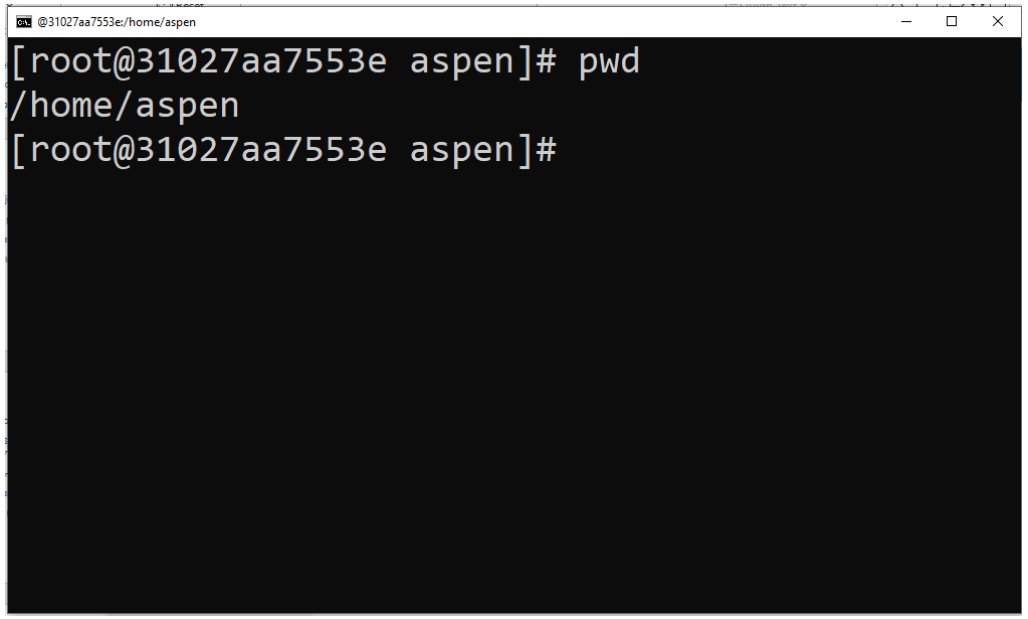
Linux Desktop has a GUI but most installations use the Command Line

A Shell provides you with an interface to the Unix system.

Bourne shell – the $ character is the default prompt.

Common Commands (part I)

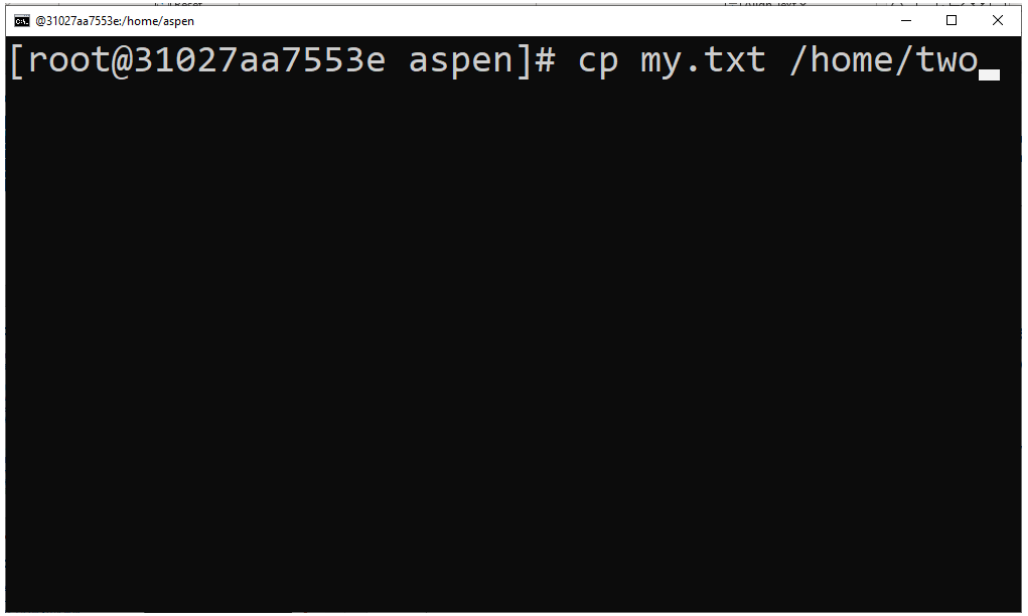
- pwd – returns the path of the current working directory



- cd – change directory
  - cd .. (with two dots) to move one directory up
  - cd to go straight to the home folder
  - cd- (with a hyphen) to move to your previous directory
- ls - view the contents of a directory
  - ls -R will list all the files in the sub-directories as well
  - ls -a will show the hidden files
  - ls -al will list the files and directories with detailed information like the permissions, size, owner, etc.

Common Commands (part II)

- cat – list the contents of a file on the standard output
  - cat > filename creates a new file
  - cat filename1 filename2>filename3 joins two files and stores the output of them in a new file
- cp – copy files
- mv – move or rename files
- mkdir – create a new directory in the current directory
- rm – remove file and directories
  - rm –r to remove directory and all files inside



Lesson 4 Review

The pwd command will show the current directory

The ls command will list the contents of a directory

The cat command will list the contents of a file