Tutorial 1 – Introduction to Linux

Disclaimer: Subject to updates as corrections are found

Version 0.10

Scoring: 20 pts maximum

The purpose of this tutorial is to introduce the Linux operating system and BASH scripting environment. Open-source distributions of the Linux operating system such as Ubuntu and SUSE Linux are broadly used in cloud computing as the guest operating system on virtual machines (VMs) and as the host operating system for cloud services. The use of Linux provides cost savings as there are generally no licensing costs involved with launching VM instances in the cloud. This enables tremendous savings when the number of VM instances must be scaled up for application hosting (e.g. 100 VMs). Linux has even become quite popular on the Microsoft Azure cloud.

Recent article describing Microsoft adoption of Linux on the Azure cloud:
https://www.zdnet.com/article/microsoft-developer-reveals-linux-is-now-more-used-on-azure-than-windows-server/

Linux is the preferred environment to work with Cloud provider APIs (from AWS, Azure, Google, etc.)

To complete this tutorial, first gain access to an Ubuntu Linux environment by installing a local Ubuntu Virtual Machine.

The recommended approach is to install Oracle VirtualBox (free), and then download Ubuntu 22.04 LTS (iso file) to create an Ubuntu Virtual Machine.

Oracle VirtualBox can be downloaded here:
https://www.virtualbox.org/

The Ubuntu 20.04 LTS ISO file can be downloaded here:
https://releases.ubuntu.com/22.04/ubuntu-22.04.1-desktop-amd64.iso (3.6 GB)

Another download approach is to obtain Ubuntu using a bit torrent stream by downloading (OPTIONAL):
https://releases.ubuntu.com/22.04/ubuntu-22.04.1-desktop-amd64.iso.torrent

If unfamiliar with BitTorrent, a popular mechanism for downloading and sharing large files, read the Wikipedia page here: https://en.wikipedia.org/wiki/BitTorrent
The BitTorrent client can be downloaded from here: https://www.bittorrent.com/products/

If wanting additional help installing Oracle Virtual Box, try searching the internet for installation instructions using search engines such as bing or google, or try finding a video with instructions at video.google.com.

Here are two helpful **videos**:

Introduction to Oracle VirtualBox for creating Virtual Machines: https://youtu.be/VZJ6KZUc25M

Installing Ubuntu 22.04 on Windows 10 Oracle VirtualBox: https://youtu.be/zHwFtyxJsog

And here are written instructions for installing Ubuntu 22.04 on Oracle VirtualBox for Windows:

Instructions for installing Ubuntu 22.04 on Windows VirtualBox:
https://trendoceans.com/install-ubuntu-on-virtualbox/

And here is a video for installing Ubuntu 22.04 on M1 Mac with Parallels*:
https://youtu.be/1vht7h3EQtc

* - note for Mac users, Parallels is recommended (required?) for virtual machines over Oracle Virtual Box. There is a student edition: https://www.parallels.com/landingpage/pd/education/

Virtual Box (free) can be installed on Intel Macs:
https://help.cyberstart.com/help/installing-and-setting-up-virtualbox-intel-mac-users

With VirtualBox installed, a Ubuntu 22.04 VM can be installed on an Intel Mac.

Instructions including how to install Virtual Box Guest Additions:

When working with Virtual Machines, the base operating system (e.g. Windows 10/11) on your laptop that hosts the virtual machine is called the **host operating system.** The operating system used by the VM is called the **guest operating system.**

Many people will use the following configuration:
Guest operating system (VM) = Ubuntu 22.04 LTS
Host operating system = Windows 10/11 or Mac OSX

Once your VM is installed, it is highly recommended to install the Ubuntu 22.04 VirtualBox "Guest Additions". These guest additions provide important features such as sharing clipboards between the host and the guest, as well as file system sharing, and mouse pointer integration. For instructions on installing the guest additions here is an article:

https://www.itzgeek.com/how-tos/linux/ubuntu-how-tos/how-to-install-virtualbox-guest-additions-on-ubuntu-22-04.html

https://linuxconfig.org/virtualbox-install-guest-additions-on-ubuntu-22-04-lts-jammy-jellyfish

Please do yourself a favor, and do not go the entire quarter without installing the guest additions.
Be sure to enable the shared clipboard on any VMs you create on Virtual Box. Select your VM in Virtual Box, and click on settings. On the general tab, under Advanced, set the clipboard to "bidirectional".

Leveraging your newly created Linux VM, please review sections 1 – 12 of the online Linux tutorial:

Linux Tutorial:
https://ryanstutorials.net/linuxtutorial/

While reviewing the tutorial, try practicing some of the commands described.
After reviewing the tutorial, complete an online quiz on Canvas that is based on the online tutorial. Those already familiar with Linux may be able to skip the tutorial or review just some portions to complete the online quiz.

Tutorial Sections include:

1. The Command Line
2. Basic Navigation
3. More About Files
4. Manual Pages
5. File Manipulation
6. VI – Text Editor
7. Wildcards
8. Permissions
9. Filters
10. Grep and regular expressions
11. Piping and Redirection
12. Process Management

At the conclusion of the online Linux tutorial, please complete the tutorial 1 quiz on Canvas for TCSS 462/562.