ComS 252 Homework 1: Build a custom Linux VM

Individual assignment

Due September 5, 2023

1 Objectives

For this assignment, you will create a **virtual machine** in VirtualBox, install a simplified and customized version of Linux, and submit your work. Most other assignments will require these steps.

2 Downloads

Download the ISO file to initialize the virtual machine for homework. This is a disk image for optical media, and can be used directly in the VirtualBox (virtual) optical drive.

3 Create a virtual machine

In VirtualBox, create a new virtual machine. Suggestions are given below for the various settings in "Expert mode".

- While the "Name" is irrelevant, you will use many virtual machines throughout the semester, so you should use a descriptive name like "Homework 01".

- You'll need about 1-2 GB of space for each virtual machine for the homework assignments. The Machine Folder setting controls where the virtual disks and other information for the virtual machine are stored. The default location is fine, assuming you have enough storage space.

- For the machine Type, select Linux.

- For the machine Version, select Fedora 64-bit. (This setting is not criticial, but it does select reasonable defaults for some of the later settings.)

- For Memory size, 512 to 1024 MB should be sufficient. Do **not** select more memory than your physical host machine has available.

- For Hard disk, select "Create a virtual hard disk now".

Use the following settings for the virtual hard disk.

- Use VDI (preferred), VHD, or VMDK as the file type.

- Use "Dynamically allocated" as the storage method. This means the virtual disk file will only be as large as needed (i.e., empty portions of the virtual disk will not take up physical disk space).

- For "Dynamically allocated" storage, the disk size setting should be viewed as an upper limit of the physical space used by the virtual machine. Most assignments will require a fairly small virtual disk, where 5 to 10 GB of drive space is plenty.
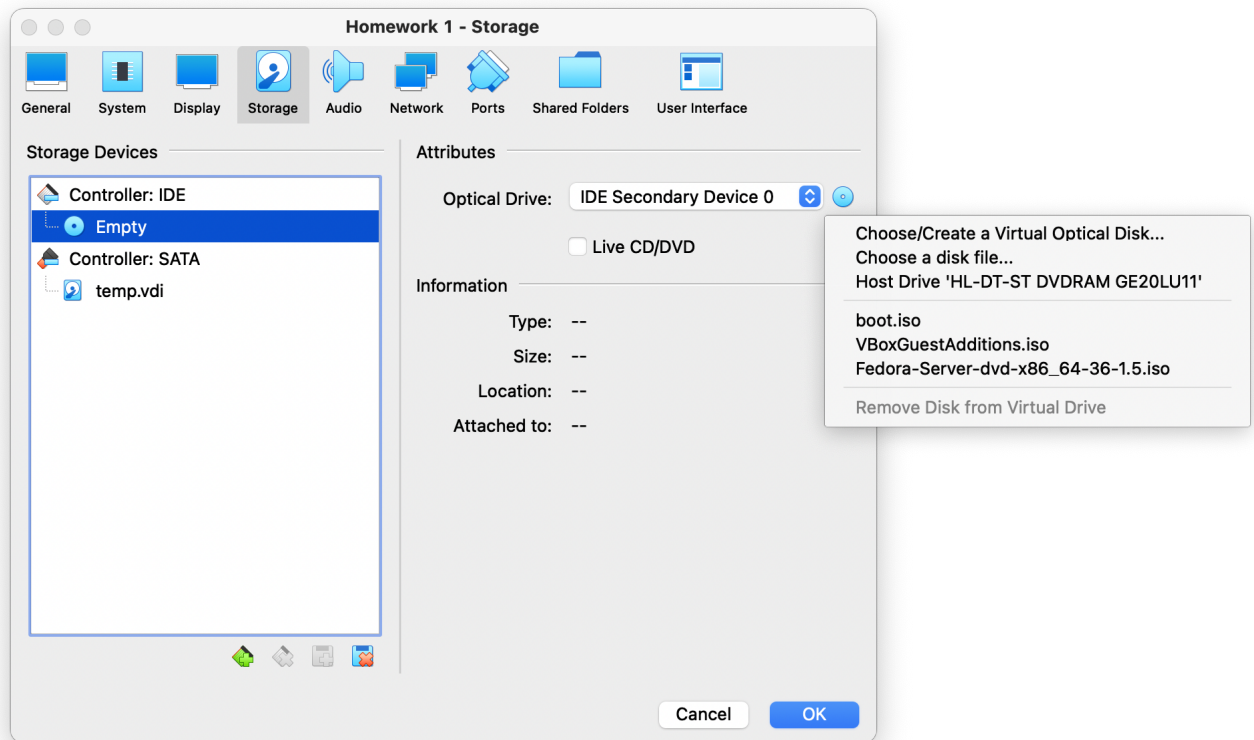
Figure 1: Screenshot of the Optical Drive settings

4 Check virtual machine settings

After creating the virtual machine, you may need to adjust its settings. The most important settings for this assignment are below.

- Display / Scale Factor. Depending on your screen resolution, you may want to crank up the scale factor (100% and 200% run the fastest) to make it easier to read the VM screen.

- Network / Adapter 1. You will need a (virtual) network adapter to initialize your VM and to submit your work. Make sure Adapter 1 is "Enabled", and attached to "NAT".

- Storage. You will need to change the contents of the virtual optical drive, and unfortunately this is not very intuitive. In the storage menu, under "Storage Devices" in the left half of the window, there should be a Controller (probably IDE) with a CD icon under it. Highlight this, and then under the "Attributes" in the right half of the window, click the CD icon next to the "Optical Drive" settings. This allows you to select an ISO file on your physical host machine, to use in the optical drive, or to remove the media from the optical drive. See Figure **??**.

5 Install Linux

1. Select the homework initialization ISO as the Optical Drive media.

2. Start the Virtual machine.

3. Select "Build Hw01 virtual machine" from the boot menu and press enter.

4. The installer will configure and install Linux automatically. After installation completes, remove the homework initialization ISO from the Optical Drive.

5. You are encouraged to take a snapshot of the VM at this point, in case you need to roll back to a fresh install.

6   Initialize the VM

When you boot up the VM for the first time, the VM will automatically run an initialization script that will finish the setup of the VM for the homework assignment. This requires Internet access (and VPN access, from off campus), as the script will fetch necessary configuration options from the homework server.

After successful initialization, the VM will shut down. You are again encouraged to take a snapshot of the VM at this point.

7   Submitting your work

Start up the VM, and login with your user account (this should have been set up during the Initialization step). Note that your initial password is **not** your ISU password, but is instead your account name followed by "`pw`". This is the password **only** on the virtual machine you built. If you wish to change the password, run the `passwd` command.

After logging in, run "`sudo Turnin`" to submit your work. Again, this requires Internet access (and VPN access, from off campus), as this will collect and upload your work to the homework server.

Feedback on your submission is collected in a text file, that you can view later using "`cat submit.log`" or "`less submit.log`".

To shutdown the VM cleanly, run "`poweroff`".