Department of Electrical and Computer Engineering, University of Arizona

ECE 492 Summer 2020

Lesson 1

Software Downloads

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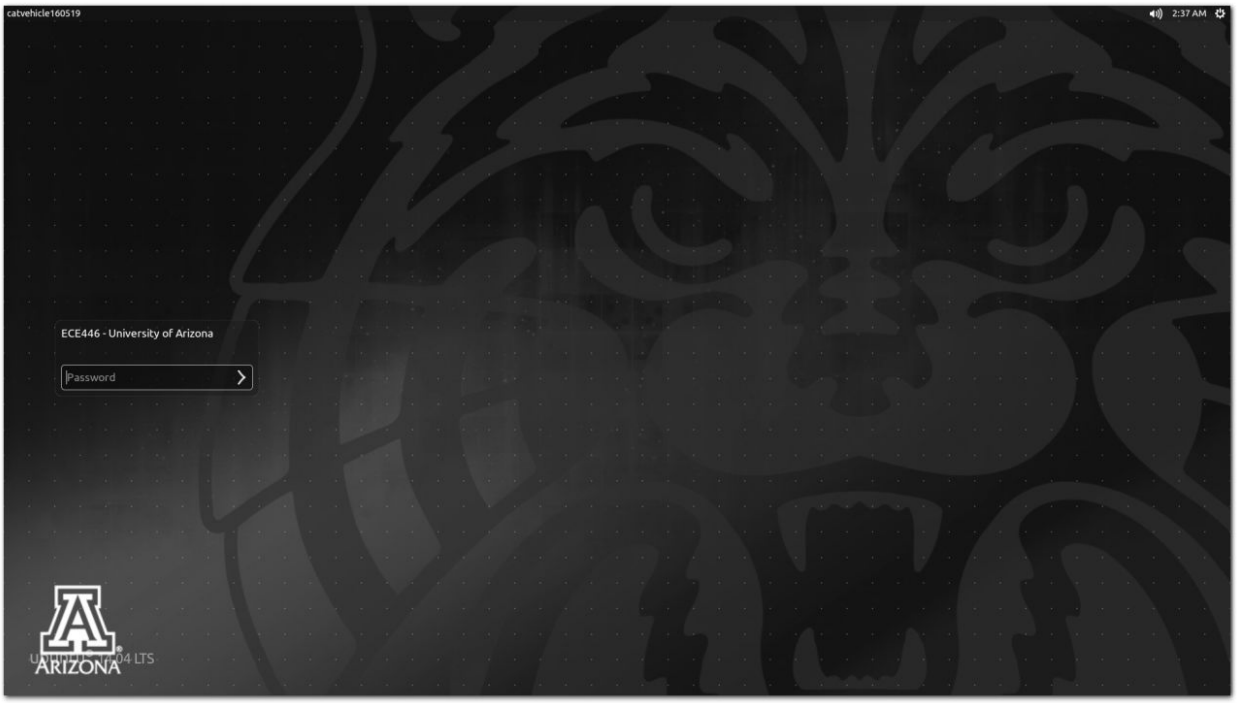


1 Overview

In this chapter, we will go through step by step on to how to set up the development environment for the project on which students will work throughout the summer.

1.1 System Prerequisite

1. Computer system with one of three operating systems: Ubuntu, Windows, or Mac.

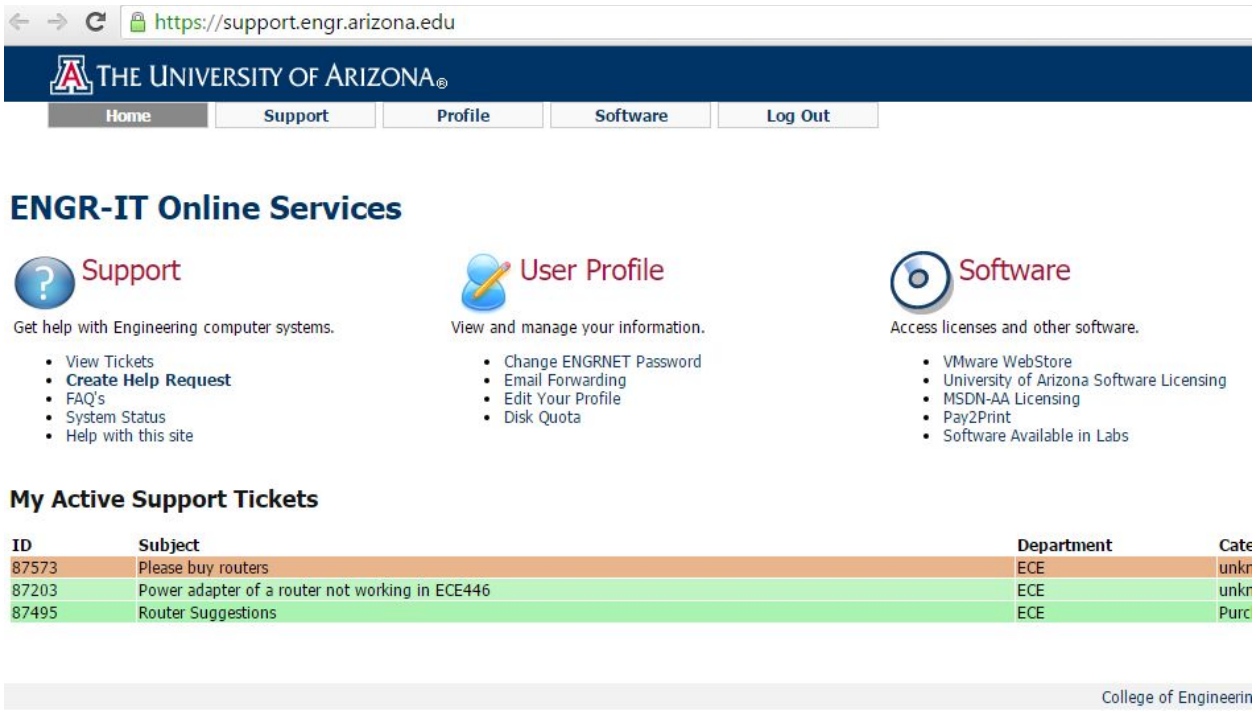
2. Minimum 40 GB of hard disk space available in the system. 100 GB Recommended.
3. 4 GB RAM is the minimum requirement but 8GB is highly recommended.

2 Downloading and installing VMWare Workstation

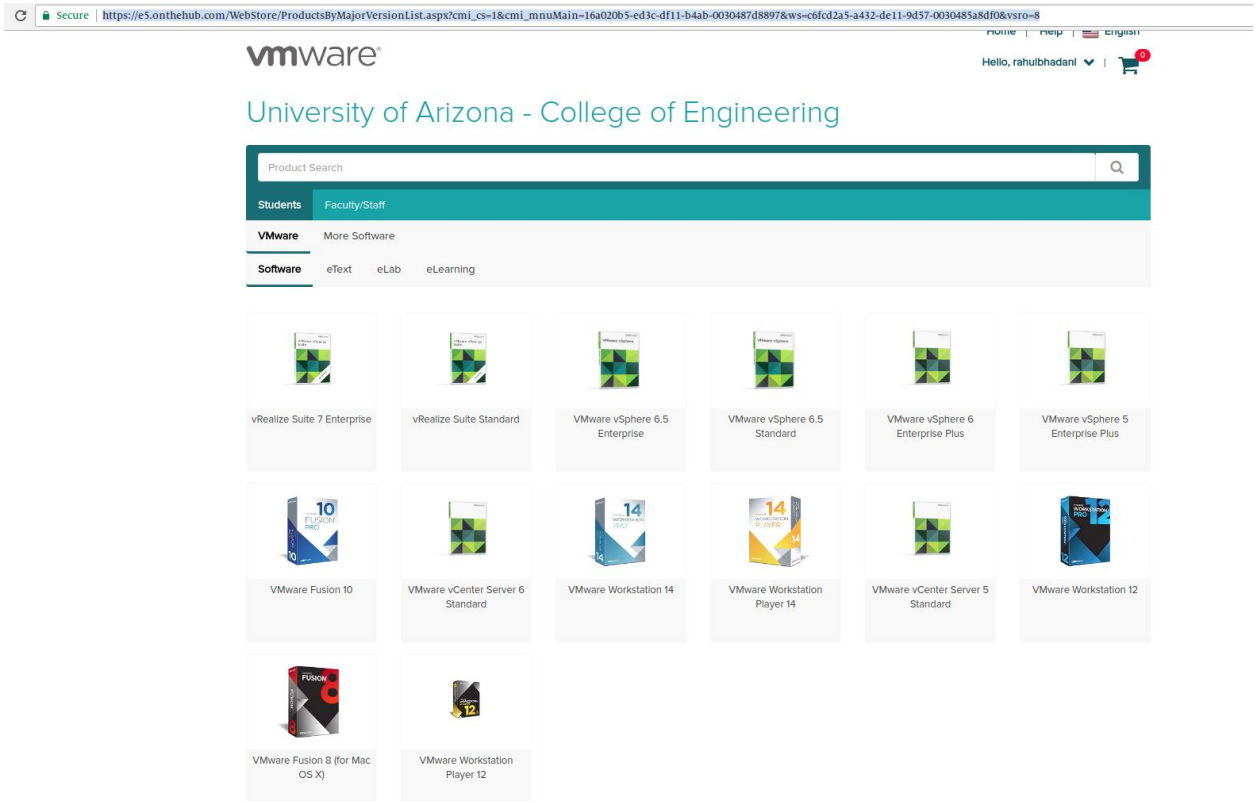
VMWare is only required when no native Ubuntu is installed on the computer system being used. If you are already using Ubuntu 18.04 installed natively, then you don't need to install VMWare workstation on your system.

Currently the University of Arizona has lapsed the license for VMWare Workstation, hence you will not be able to follow the instructions below. We are in the process of renewing the license. In the meantime, download VMWare Player for free from https://my.vmware.com/en/web/vmware/free#desktop_end_user_computing/vmware_workstation_player/15_0 for Windows or Linux. Mac users will need VMWare Fusion. You can download the VMWare Fusion Pro Trial from https://www.vmware.com/products/fusion/fusion-evaluation.html

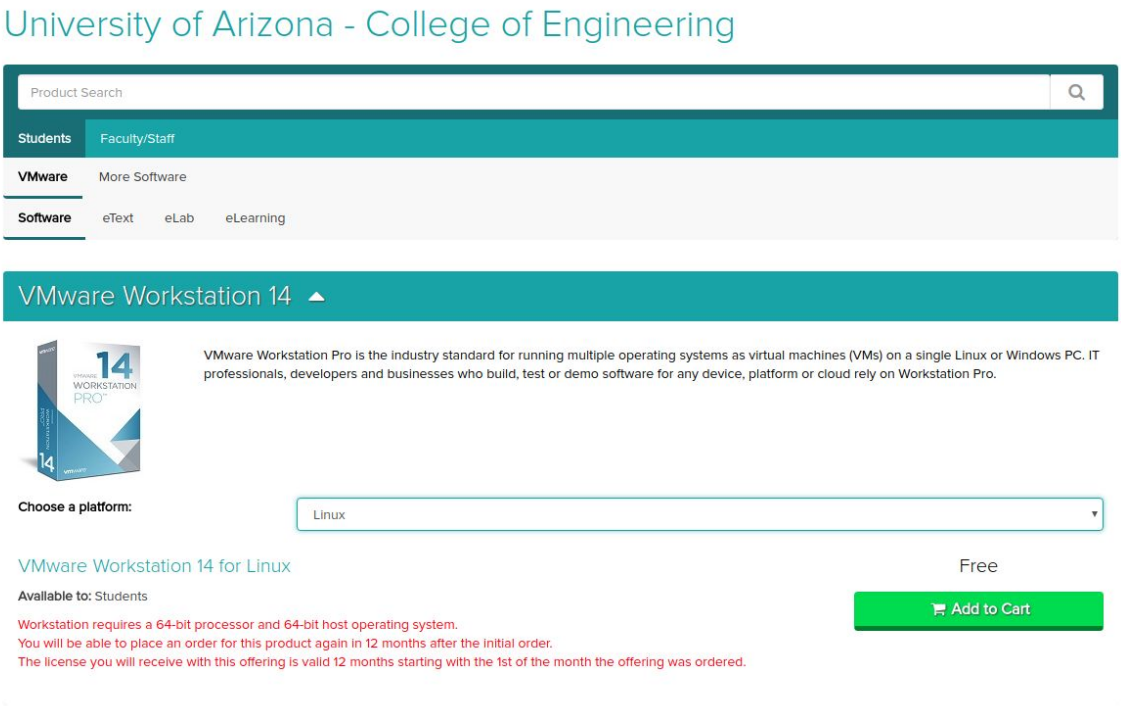
1. In order to obtain the licensed version of VMWare, students must go to https://support.engr.arizona.edu/
2. In the Software section, click on the VMWare WebStore:



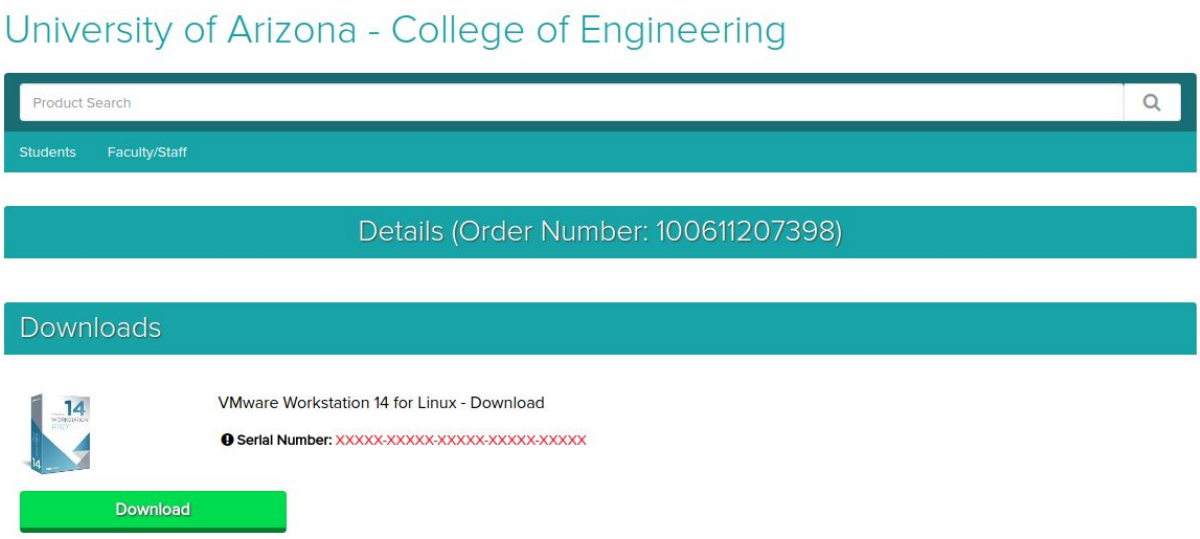
You may be asked to login with your netid/catmail. Once you are logged in successfully and authenticated, you will be navigated to the VMWare webstore. Click on the software:



If you are a windows/linux user, then download VMWare Workstation 15 (or VMWare Workstation 12 or higher), if you are a Mac user, then download VMWare Fusion 8 or higher. Add it to the cart and checkout.



3. Upon checking out, accept the license agreement, fill up your information and proceed with the order. You will be directed to the new page with a link to download the software.



4. Note down the serial key and download the software.
5. Once are finished downloading, install the software, enter key and activate

3 Downloading the Ubuntu 18.04

Ubuntu 18.04 can be downloaded from https://releases.ubuntu.com/bionic/. Choose 64-bit PC (AMD64) desktop image. Clicking the link on Ubuntu page will download an iso file.

Once you install the VMWare Player or Fusion, you will need to restart the system. Additionally, you will need to enable VT-X virtualization through BIOS Boot menu. Every system (Lenovo, HP, DELL, etc.) has different ways to do, hence it is not possible to include those instructions here. Please look up online on how to do that for your system.

Once VT-X virtualization is enabled, start your VMWare Player or Fusion, and follow the steps in the video https://youtu.be/lIhRkea8LpA to create a Ubuntu Virtual Machine.

4 Installing ROS in a new system

Following the tutorial mentioned in the https://cps-vo.org/node/26602 to install the necessary package to set the ROS environment in a new operating system or a new virtual environment.

5 Configuring System variable to use ROS

1. Change the hostname from REU to your favorite hostname in `/etc/hostname` folder. E.g. You can choose `firstnamelastname`

Go to terminal or command line and type:

```
sudo gedit /etc/hostname
```

And change the hostname as described above

2. Go to terminal or command line and type:

```
sudo gedit /etc/hosts
```

And add following line:

```
127.0.1.1 firstnamelastname
```

3. In .bashrc file set the same hostname for `ROS_HOSTNAME` to the same name you used for system hostname.

```
gedit ~/.bashrc
```

E.g. If you have set machine's hostname to `firstnamelastname`, then in .bashrc file, set the `ROS_HOSTNAME` to `firstnamelastname`.

Search ROS_HOSTNAME in the file .bashrc and change

```
export ROS_HOSTNAME=reu.local
```

to

```
export ROS_HOSTNAME=firstnamelastname.local
```

4. If you want to run roscore on the local machine, then change

```
export ROS_MASTER_URI=http://reu.local:11311/
```

to

```
export ROS_MASTER_URI=http://firstnamelastname.local:11311/
```

At this point you will need to start your system or virtual machine (if you are using virtual machine).

6 Downloading MATLAB

In order to download MATLAB, you need to sign up for a MATLAB account with your official University of Arizona email id. After signing in with your U of A email id, download MATLAB installer for MATLAB R2020a. You can download MATLAB in your native system but I also recommend you to download MATLAB inside your virtual machine.

After downloading the installer which is a zipped file, extract it to a folder.

From the command line :

```
cd <nameofmatlabdownloadeddfolder>
```

```
sudo ./install
```

Log in with your catmail and proceed with the installation.

After installing, follow the following steps:

```
cd
```

```
gedit .bashrc
```

Add the following lines to the .bashrc file:

```
alias matlab="/usr/local/MATLAB/R2020a/bin/matlab"
```

7 Create GitHub.com user ID

Go to github.com and sign up for an account. If you already have a GitHub.com account, no need to create one. You can always change your used ID. Please provide your GitHub.com user ID in the slack channel.

8 Download Anaconda

Download and install anaconda from https://www.anaconda.com/products/individual

9 Download Visual Studio Code (VS Code)

Download and instal Visual Studio Code from https://code.visualstudio.com/. We will be using VS Code for writing code.