

# How to Remotely Access SWITCAP using VNC via an ECE Workstation?

January 22, 2017

By Andrew Chang [ayachang@ucdavis.edu]

## Part I

# Introduction

The goal of this tutorial is to provide a step by step guide on how to access the ECE computers remotely and have the ability to work on your desktop (Apple or PC) as though you are sitting right in front of the ECE computer. This method gives you the ability to view the full WYSIWYG ECE computer desktop on your personal computer and allows you to run software on the ECE computers while not actively sitting in front of the ECE computers.

## 1 Test your connection

Begin by following the Remote Connection Tutorial on the ECE Computer Support Website to make sure your account is active and that you are able to connect to the ECE computers with your ECE login username and password (This should be your UCD campus username and Passphrase).

Link : <http://www.ece.ucdavis.edu/support/remote/>

## 2 Download the software for VNC setup

You need several pieces of FREE software.

1. REALVNC or VNC Viewer :
  - (a) Website Download link : <https://www.realvnc.com/download/viewer/>
  - (b) Make sure you download the version that correspond to your personal computer operating system

- (c) See Figure 1
- (d) Ignore the “Make sure you’ve downloaded VNC Connect to the computer you want to control” because all ECE computers have VNC server already installed and enabled.

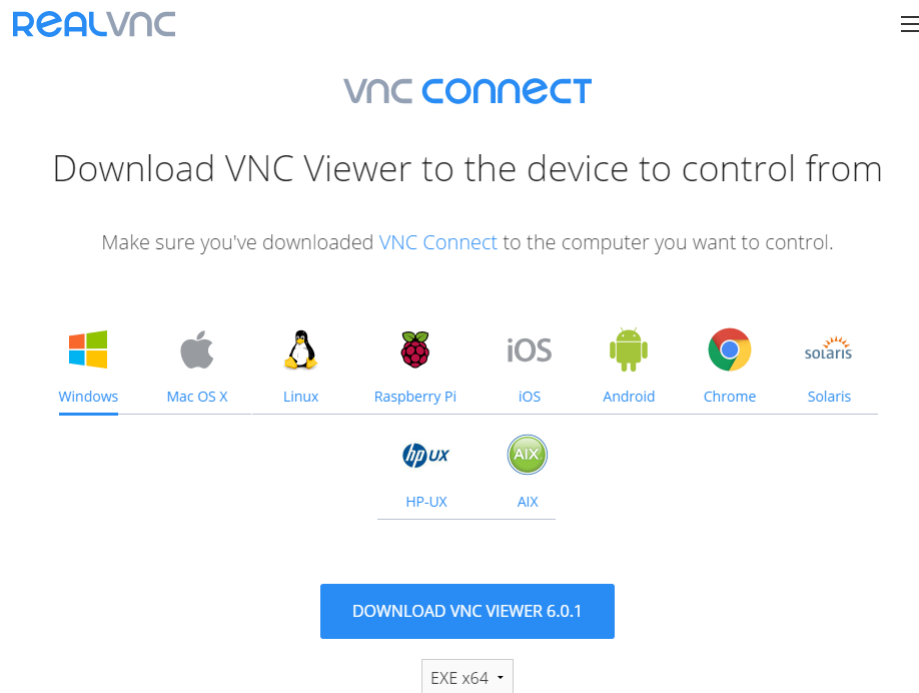


Figure 1: Webpage of download links for VNC Viewer Client for different operating systems.

## 2. SSH client

- (a) If you have already read through and followed the “Remote Connection Tutorial” on the ECE Computer Support Website, then you already have a SSH client installed called **MobaXterm**.
- (b) Alternatively, you can use the classic SSH client or other FREE alternatives
- (c) Website Download link : <https://www.ssh.com/ssh/download/>

## 3 Software Installation

On your personal computer, install the REAL VNC Viewer software. Follow the standard installation procedure for the software. If you do not have a SSH client

installed on your personal computer, please install that as well. From this point on, the remainder of this tutorial will assume you have installed REAL VNC Viewer and a SSH client. The tutorial also assumes you are able to connect to the ECE computers through your SSH client following the Remote Connection Tutorial on the ECE Computer Support Website.

## Part II

# Setup the VNC Server on the ECE Computer

From this point onward, all the software setups have been completed and you will **NOT** need to revisit any past steps. You will however, need to follow the instructions here every time the ECE computer restarts and has shutdown your VNC server (unless you are able to connect to an ECE computer that does not restart every night, your VNC server will need to be restarted every day you use it). Once the VNC server has started you do not need to restart the VNC server UNLESS the VNC server crashes or is shutdown by you. You can log into a VNC server as many times as you like while the VNC server is running.

This tutorial will use the MobaXterm SSH client on a Windows 10 computer for demonstration purpose. These steps are also the same on an iOS (Apple) computer.

1. Open the SSH client of your choice and connect to the ECE computers. For demonstration purposes this tutorial will use the MobaXterm SSH client.
  - (a) Host name: snake.ece.ucdavis.edu
  - (b) The snake.ece.ucdavis.edu host name is a general pool of host names that will redirect you to one of the ECE lab computers.

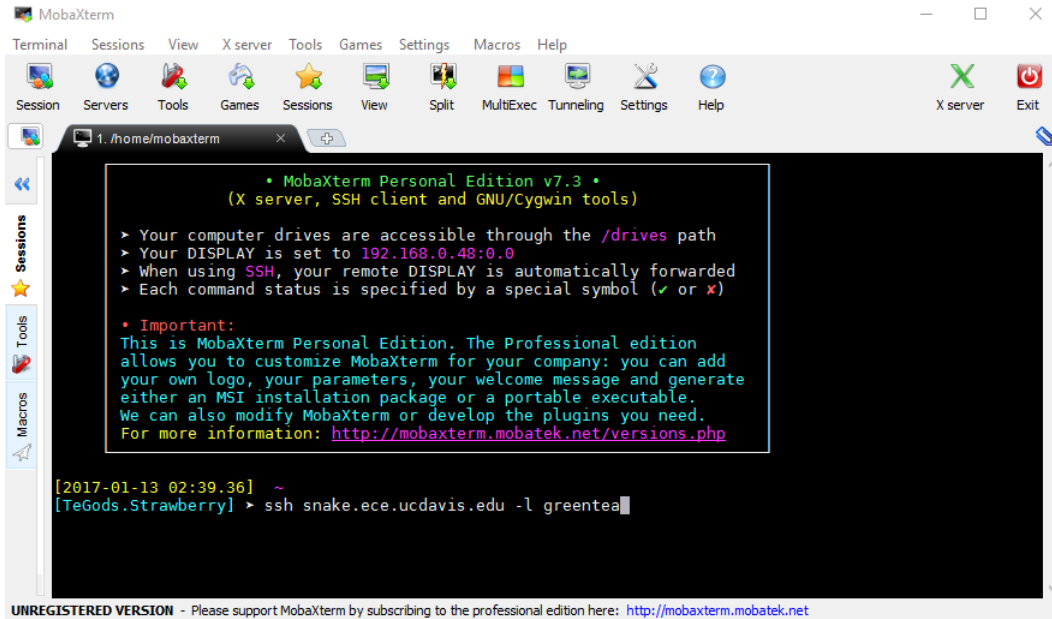


Figure 2: Login with SSH client to the ECE computers.

2. A successful SSH connection to the ECE computer will give you a Linux terminal prompt with the name of the specific ECE computer as the prompt header. For this example, the ECE computer name is boa
  - (a) To connect back to this specific ECE computer, use the Host Name **boa.ece.ucdavis.edu**
  - (b) You can try and open another SSH client window and connect to this specific computer. You will need to remember this host name because the VNC server that you will be starting is specific to this machine only.
  - (c) If you use MobaXterm and you obtain a host key ERROR, Figure 3, you need to delete the old host keys before starting a SSH connection.
    - i. See Figure 4, use the command:

```
rm -rf /home/mobaxterm/.ssh/known_hosts
```

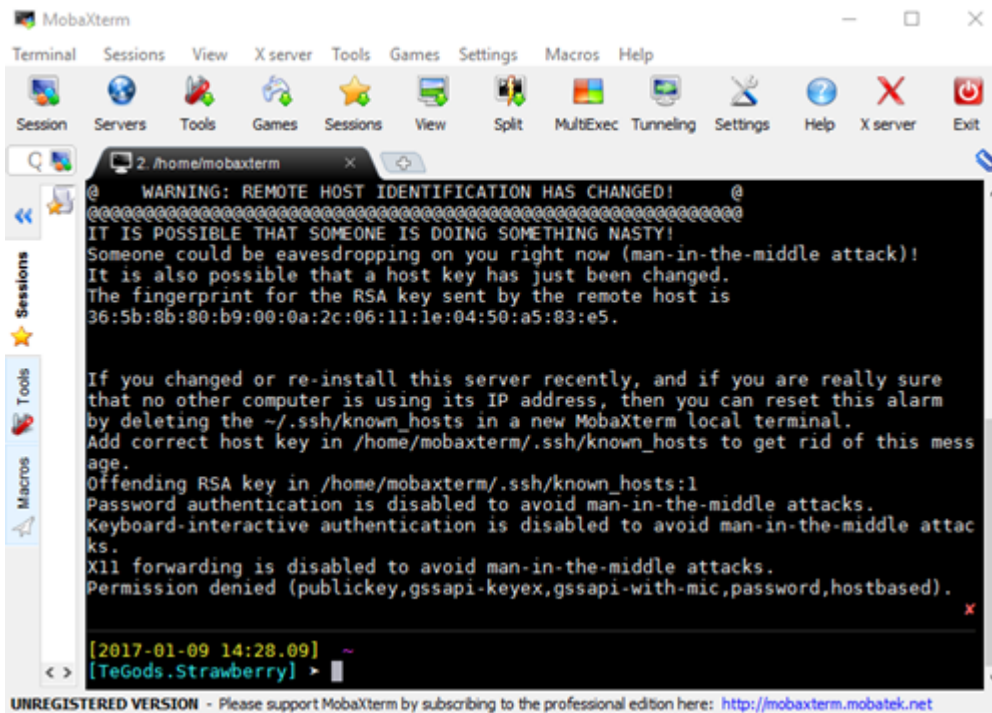


Figure 3: Default SSH client log-in ERROR or WARNING message due to Host Key Error.

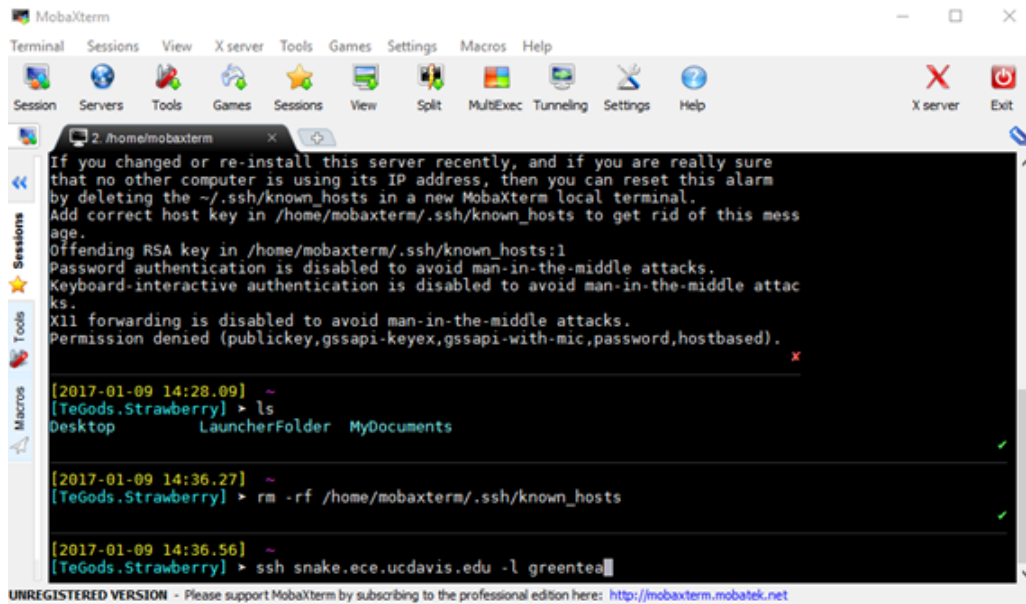


Figure 4: MobaXterm command that deletes old host keys.

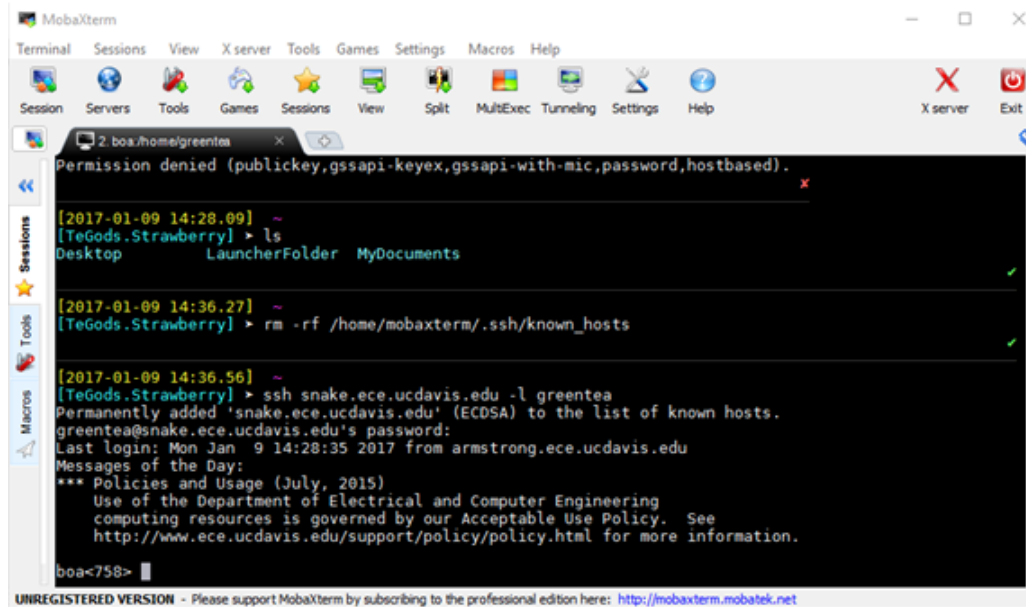


Figure 5: Successful log-in screen using the MobaXterm SSH client.

3. If you see the ECE Acceptable Use Policy text then you have successfully established a SSH connection using MobaXterm, see Figure 5, and can move forward to setting up the VNC server. If this is your first time setting up a VNC server in your ECE account, you will be prompted to setup a VNC server password. Please make sure you use a **STRONG** password, you can use your UCD Passphrase so you do not forget. If you forget your password, delete the password file in the .vnc directory, and you will be prompted to setup a password for future VNC server setups. Figure 6.
  - (a) To setup a new VNC server type, **vncserver -geometry 1850x1050**
  - (b) Press ENTER and you will be prompted for a password (only if this is your first time setting up a VNC server). The -geometry tag customizes the VNC server window size to the display size of your personal computer. This tutorial was created on a wide screen display; feel free to adjust the window size parameters to fit your particular personal display size. You can start any number of VNC servers by retying the command, however, each VNC server will take processing power and will slow down the machine so please be considerate and limit the number of VNC servers you use.

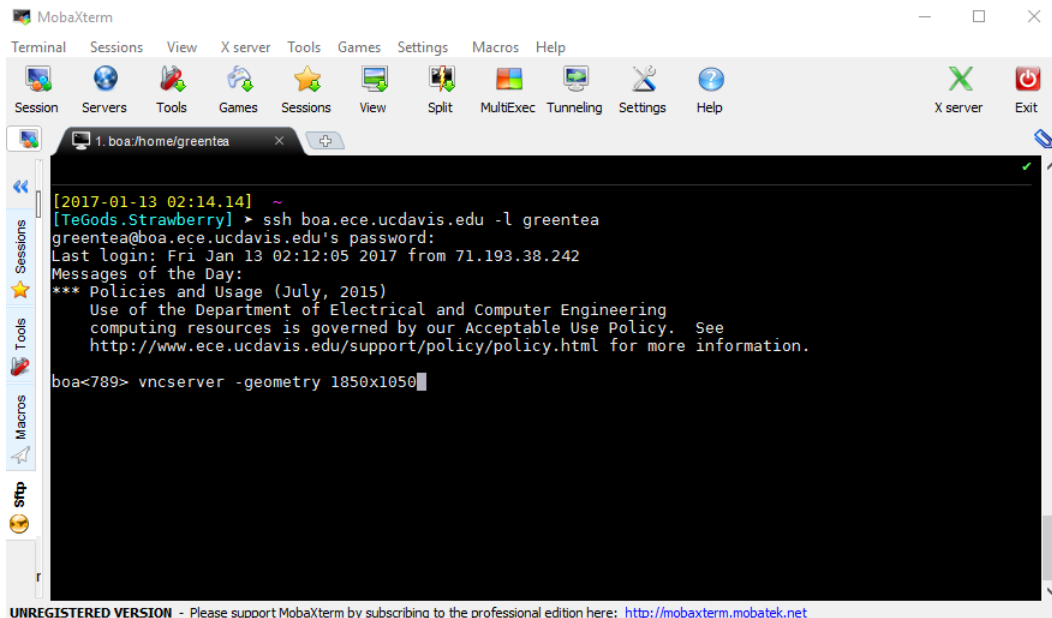


Figure 6: Setup command to setup the first VNC server.

4. Verify your password by retying your VNC server password, Figure 7.

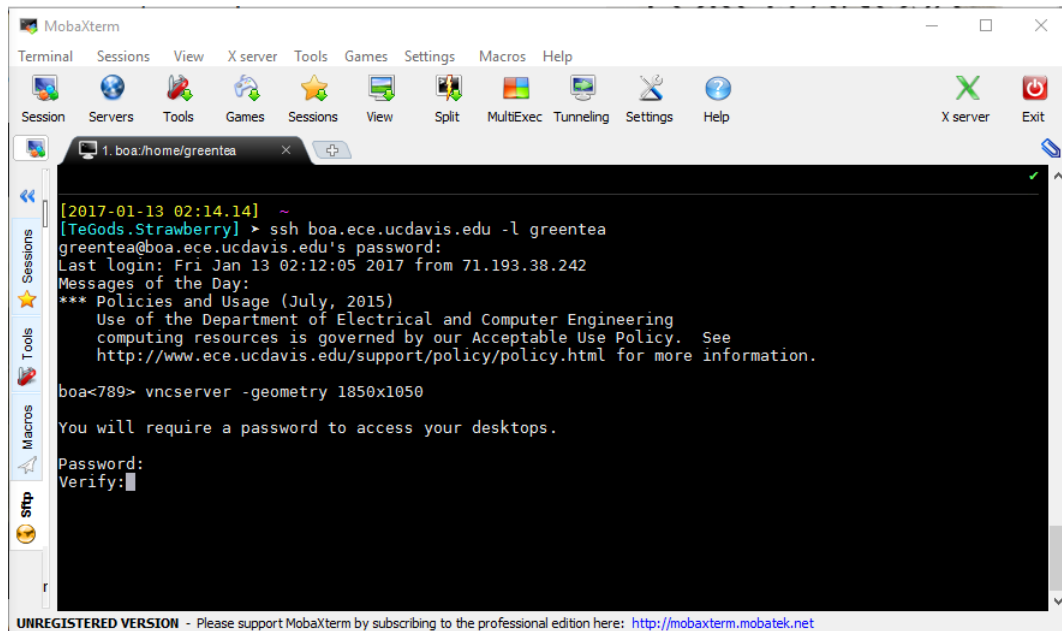


Figure 7: Prompt to setup your custom VNC password.

5. Your VNC server is successfully setup when the VNC server is started, Figure 8.



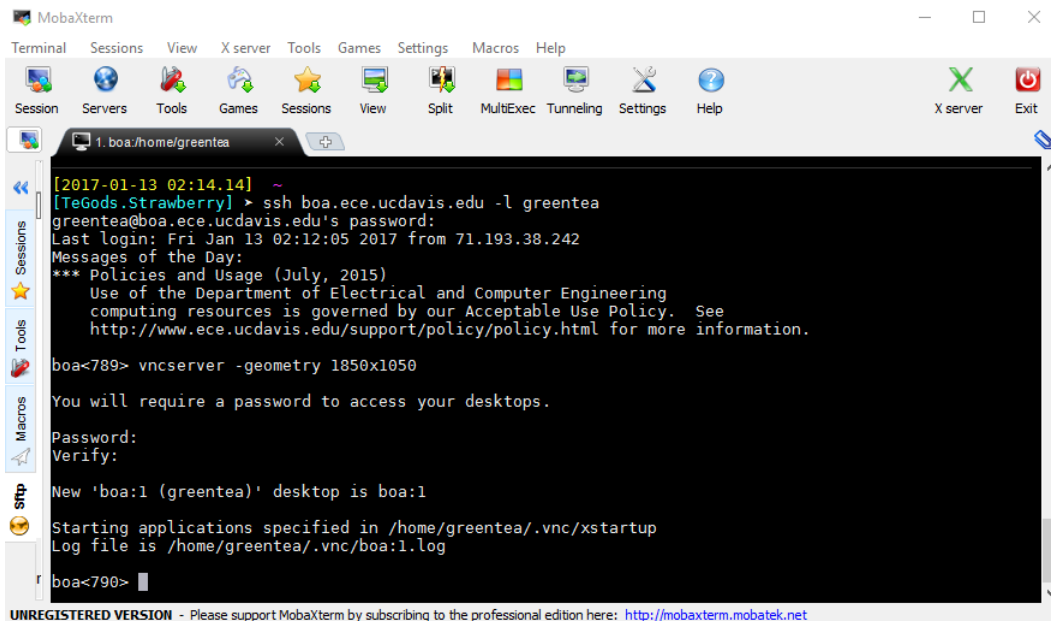


Figure 8: Retype to confirm your custom VNC password and confirmation of successful VNC server setup.

6. Just for practice, we will set up a second VNC server. You may skip this step if you prefer not to practice setting up multiple VNC servers. In the MobaXterm SSH client, the tutorial will start a second VNC server by retyping **vncserver -geometry 1850x1050**

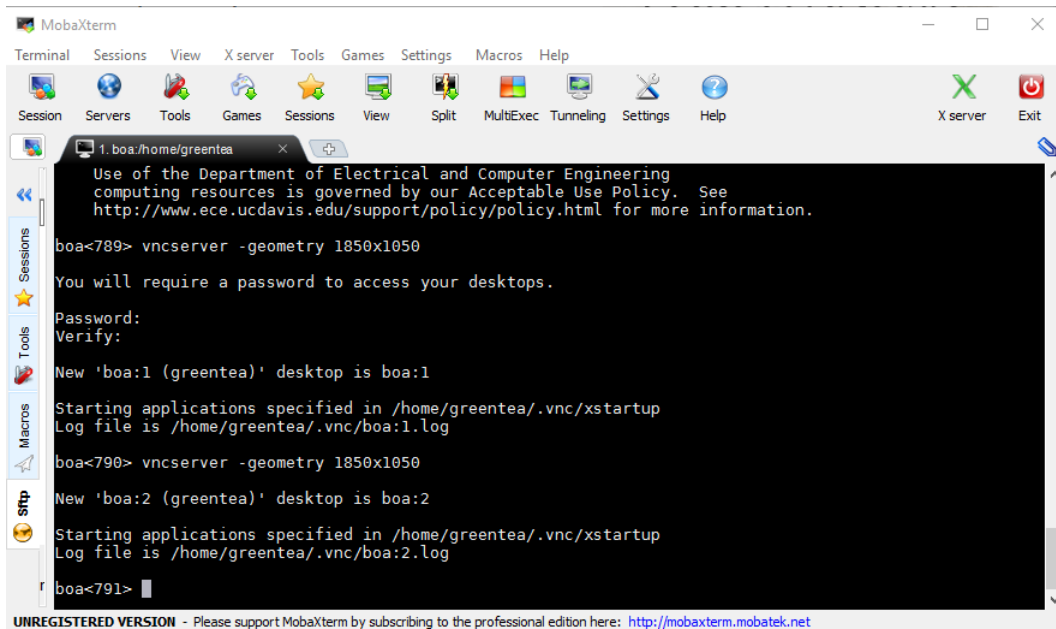


Figure 9: Setup a second VNC server using the MobaXterm SSH client.

7. Notice in Figure 9, that a second confirmation text is shown in the MobaXterm SSH client window indicating a VNC server has been successfully started. Additional VNC servers are indicated by a number. The numbers increase sequentially. Notice the first VNC server is indicated by **boa:1** (Figure 9) while the second VNC server is indicated by **boa:2** (Figure 9).
8. A good command to learn is how to find your VNC servers, especially when many VNC servers are being used.
  - (a) Type the command, **ps -ef | grep vnc**
  - (b) Press Enter and all active VNC servers will be listed in the search results as shown in Figure 10. Notice both VNC servers are listed and they are each indicated by a different number.

```

MobaXterm
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Settings Help
1. boa:/home/greentea
You will require a password to access your desktops.
Password:
Verify:
New 'boa:1 (greentea)' desktop is boa:1
Starting applications specified in /home/greentea/.vnc/xstartup
Log file is /home/greentea/.vnc/boa:1.log
boa<790> vncserver -geometry 1850x1050
New 'boa:2 (greentea)' desktop is boa:2
Starting applications specified in /home/greentea/.vnc/xstartup
Log file is /home/greentea/.vnc/boa:2.log
boa<791> ps -ef | grep vnc
greentea 28009 1 0 02:17 pts/0 00:00:01 /bin/Xvnc :1 -desktop boa:1 (greentea) -auth /home/gre
greentea 28014 1 0 02:17 pts/0 00:00:00 /bin/vnccfg -iconic
greentea 28548 1 0 02:20 pts/0 00:00:01 /bin/Xvnc :2 -desktop boa:2 (greentea) -auth /home/gre
greentea 28553 1 0 02:20 pts/0 00:00:00 /bin/vnccfg -iconic
greentea 29113 27889 0 02:27 pts/0 00:00:00 grep -i --color=auto vnc
boa<792>
UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: http://mobaxterm.mobatek.net

```

Figure 10: Search result from executing `ps -ef | grep vnc` command listing all active VNC servers.

9. To shutdown the VNC server, type `vncserver -kill :number`

- (a) The **number** parameter in the `vncserver -kill` command is the VNC server number you would like to shutdown.
- (b) For the example in this tutorial, let's shutdown VNC server `boa:2` as shown in Figure 11 (right).
  - i. To shutdown VNC server `boa:2`, type `vncserver -kill :2`
  - ii. Press Enter and type `ps -ef | grep vnc`
  - iii. Notice the search list now only includes **boa:1** indicating only **boa:1** is the only active VNC server.

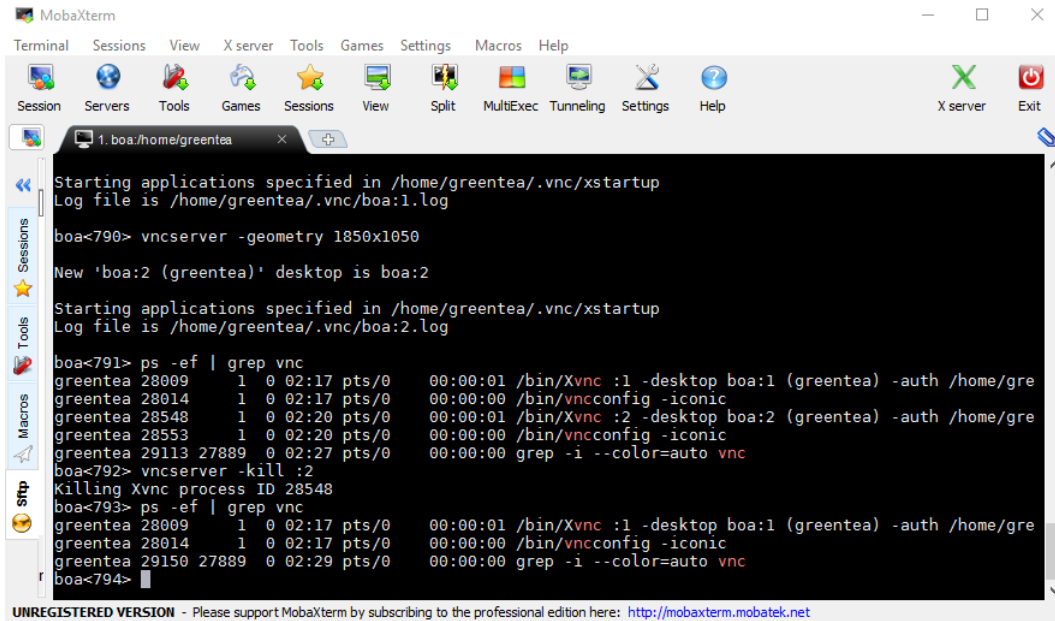


Figure 11: Shutdown one VNC server.

10. Congratulations! You have completed the VNC server setup on the ECE computers for your account, and have familiarized yourself with several useful vncserver commands. Next, you will learn how to connect to your VNC server from your personal computer.

## Part III

# Remotely Accessing your VNC server from your Personal Computer

1. Up to this step, you will have only one active VNC server and have completed the ECE computer side setup of the VNC server. You can close the SSH clients or leave them open, either way it will not affect the VNC server already running on the ECE computer. Next, FIND and OPEN the VNC Viewer on YOUR personal computer. You can either right click on the VNC icon in the quick start bar, Figure 12, or search for the program in the Start Menu, Figure 13.

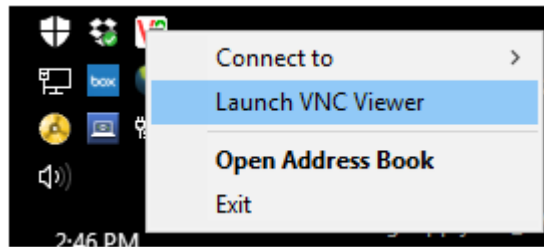


Figure 12: VNC Viewer quick start icon.

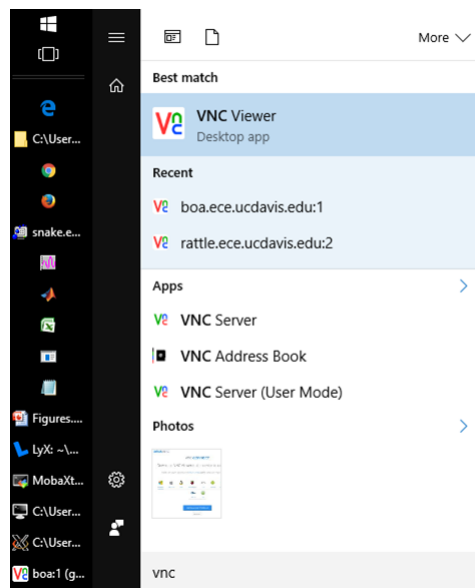


Figure 13: VNC Viewer program icon search result from Windows 10 start menu.

2. A VNC Viewer window will open. In the VNC Server field, enter the ECE computer Host Name that you used to setup your VNC server on to and the VNC server number. For this tutorial the VNC server was setup on **boa.ece.ucdavis.edu** with a VNC server number **1**
  - (a) Therefore, in the VNC Server field, type **boa.ece.ucdavis.edu:1**
  - (b) Notice the Host Name and the VNC server number is separated by a colon :
  - (c) See Figure 14.

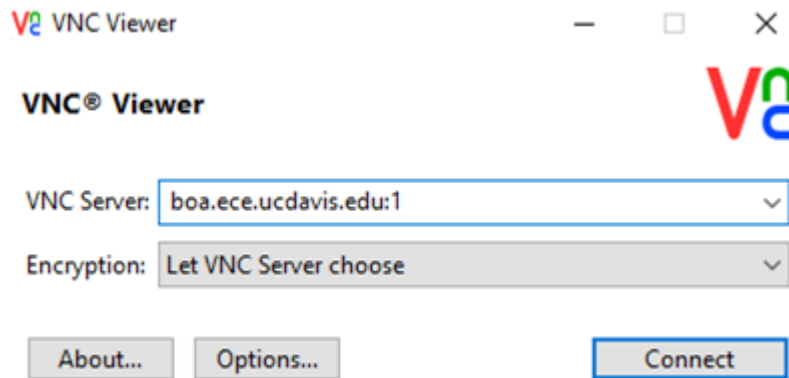


Figure 14: VNC Viewer setup window.

3. An Encryption window will appear notifying you the connection to the VNC Server is not encrypted. This is not a problem because the ECE account is used for educational purposes where sensitive private information should not be stored, Figure 15. Press Continue.

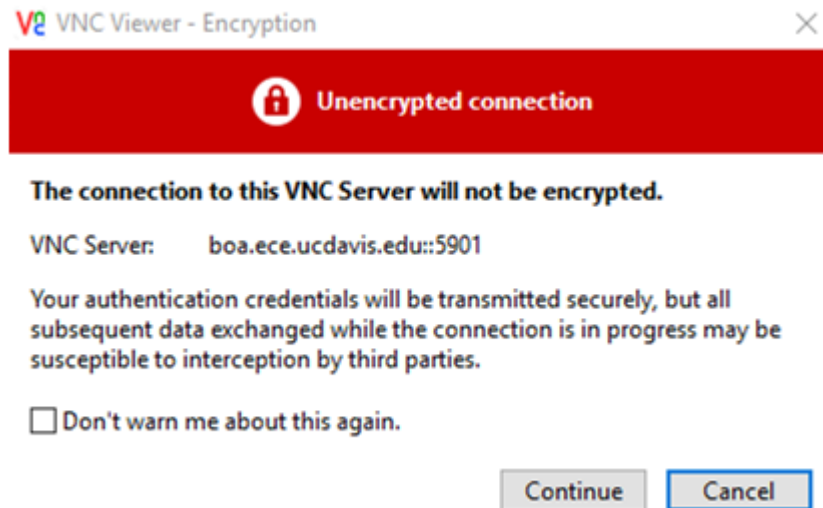


Figure 15: VNC Viewer connection encryption prompt.

4. A password pop-up window will appear (Figure 16). This is where you enter your VNC server password that you selected and typed in the previous VNC server setup steps on the ECE computers. It was recommended that you use your UCD Passphrase. If you forgot your password, you will

need to SSH back into the ECE computers, shutdown the VNC, delete the password file in the .vnc directory and restart a new VNC server, where you will be prompted to select and type a new password.

- (a) Enter your VNC server password and press OK.

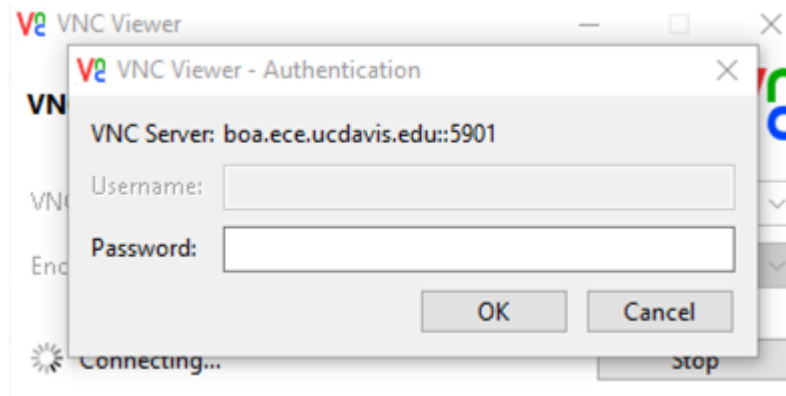


Figure 16: VNC Viewer password prompt where the VNC server password is entered.

5. Once you have logged into your VNC server, a new window will appear and you will notice the window resembles the Linux log-in screen on the ECE computers. This log-in screen is in fact the same log-in screen as seen from the ECE computers. Just enter your normal ECE computer password and you will have a fully functional Linux desktop of the ECE computer on your remote personal computer, Figure 17. You can now do anything you like to the Linux desktop as if you were physically present in front of the ECE computer. For this tutorial and presented in Figure 17, the SWITCAP program and DOS emulator was opened as an example program. You can upload files to the ECE computers using FTP just as you would normally do and they would show up on your VNC server. For a tutorial on how to setup and run SWITCAP please see the **“How to run SWITCAP1 on Linux”** tutorial on the EEC212 website.

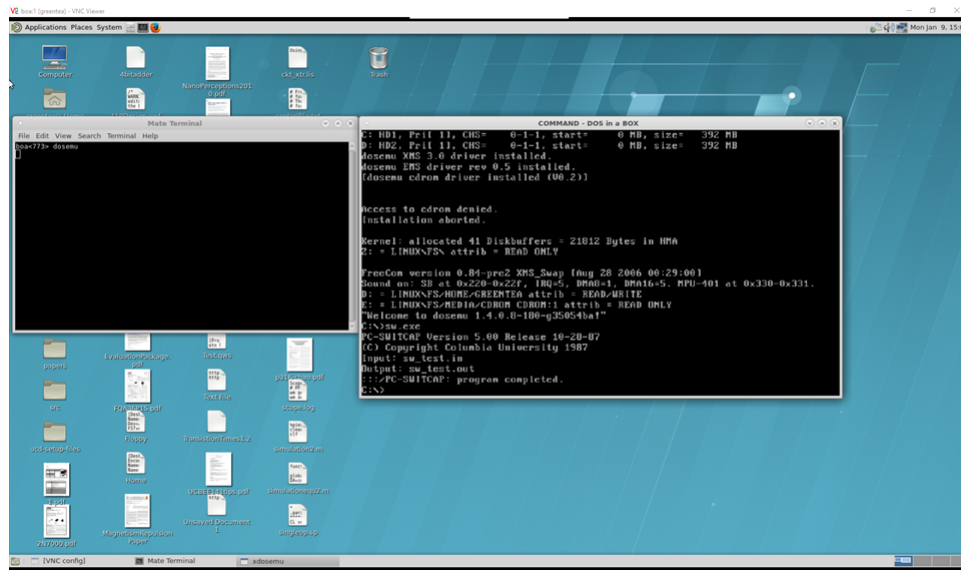


Figure 17: Successful VNC server desktop log-in and running SWITCAP example program.

6. Congratulations! You have successfully setup VNC server, logged into your VNC server, opened a terminal on the desktop of the ECE computer, and executed SWITCAP software natively on the ECE computer but at a remote location. This VNC remote access tutorial applies to any software you would like to run on the ECE computers like Cadence, HSPICE, MATLAB, etc.