Remote Desktop To Access Cadence via VNCconnect

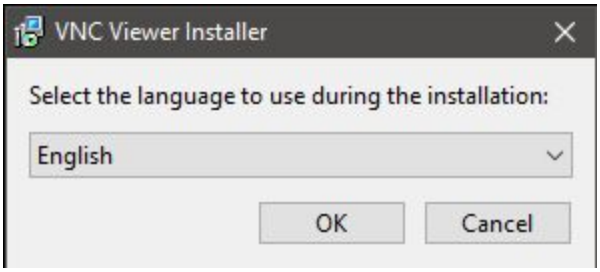
July 28, 2020
(Updated Sept 26, 2020)

Requirements:

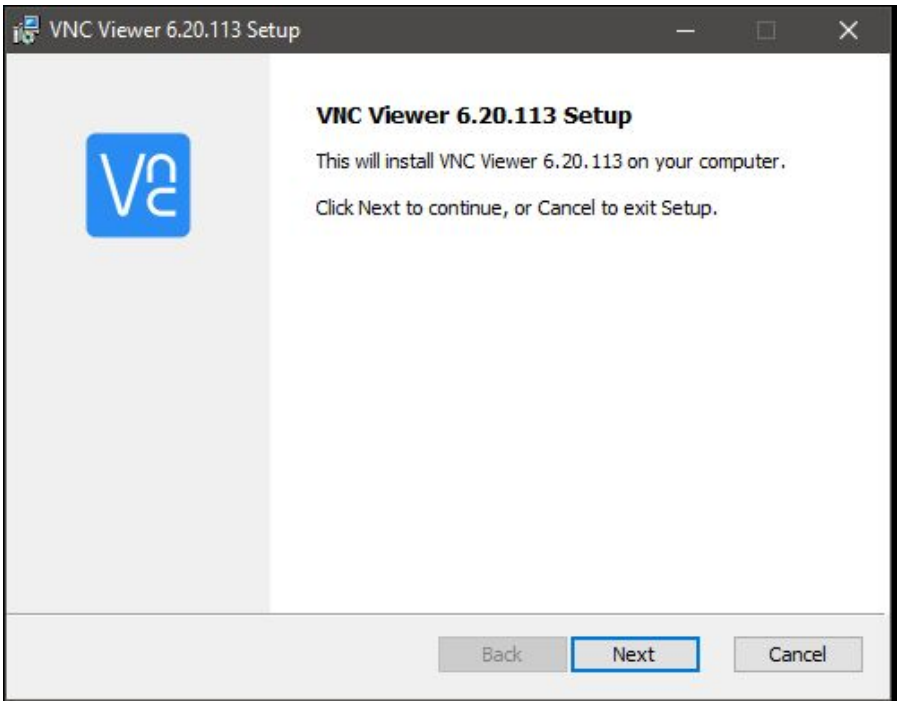
- Windows 10 Computer (or MacOS)
- Installed Real VNC Viewer from RealVNC (https://www.realvnc.com/en/connect/download/viewer/)

Installing the Client:

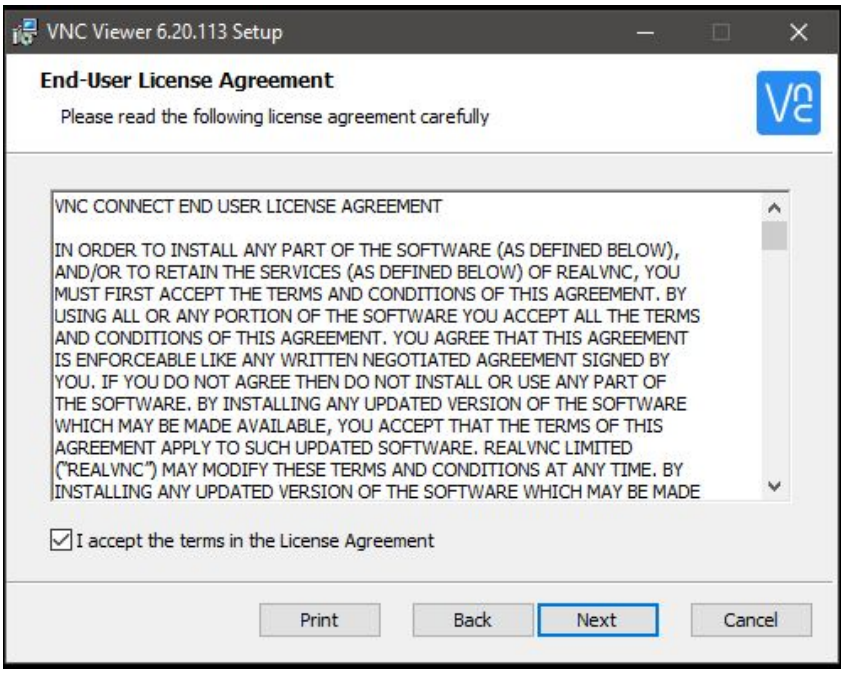
Once the vnc viewer client has been downloaded to the home desktop/laptop you will need to install and configure it. The installation here is specific to windows 10 but the installation under MacOS should be almost identical:



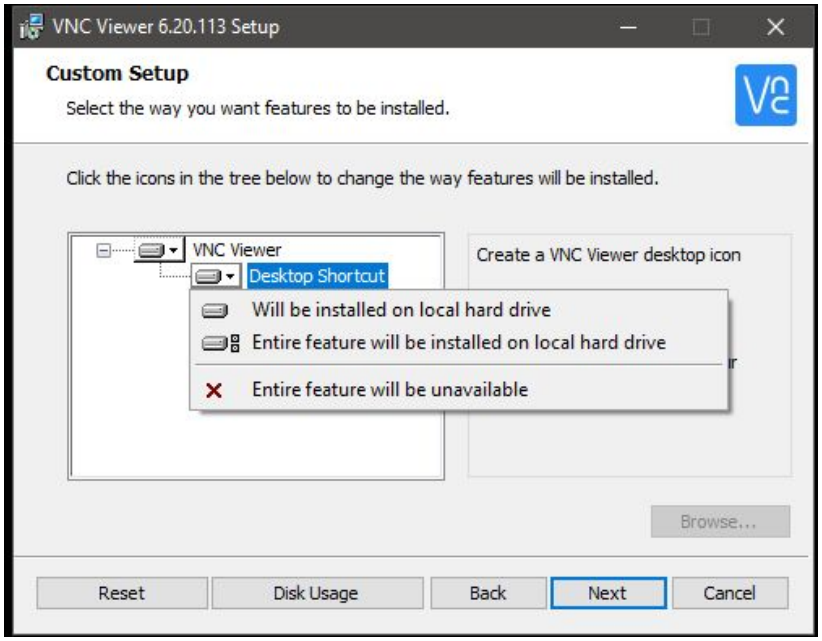
Click Ok



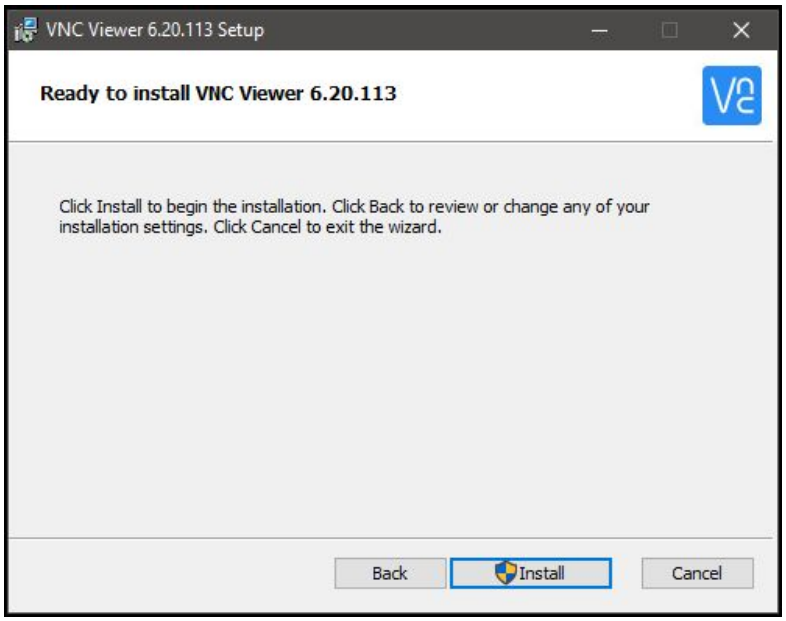
Click Next



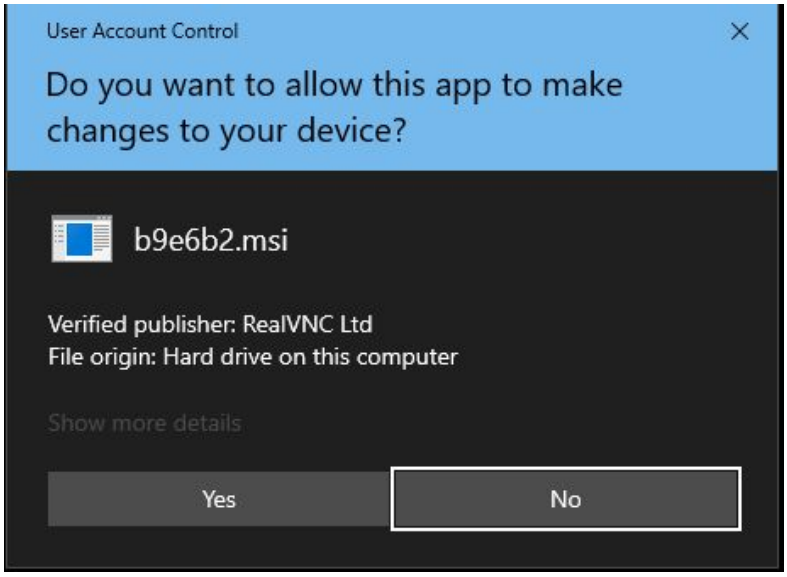
Agree to terms Click Next



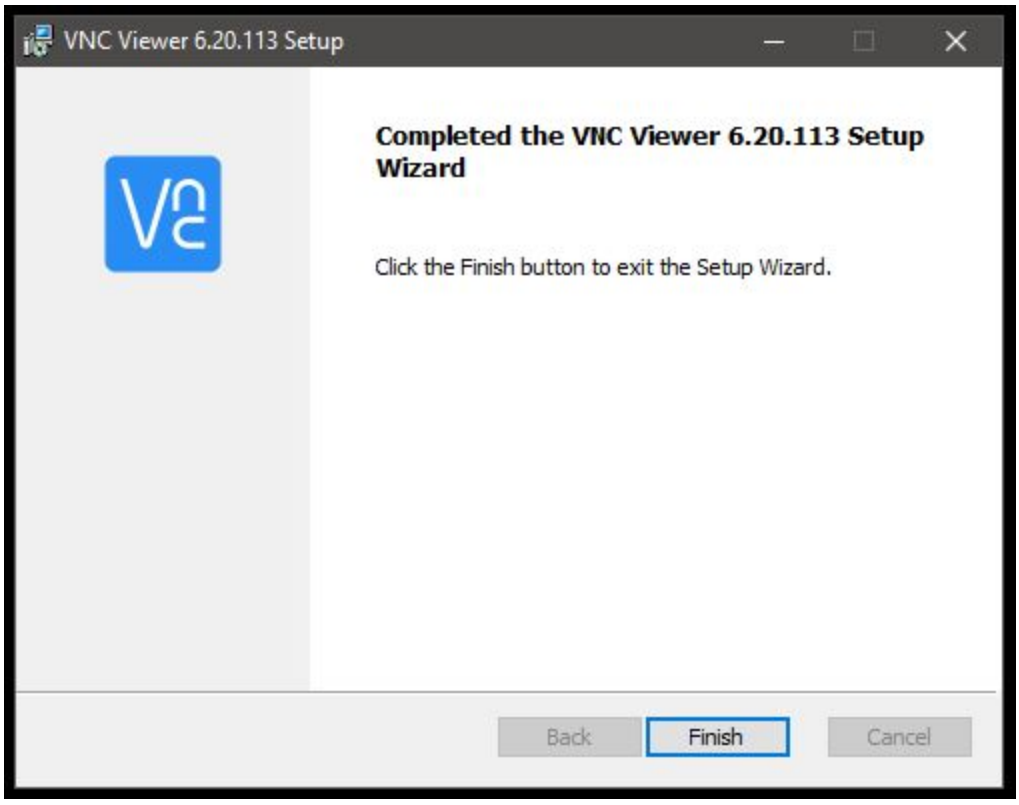
Install Entire feature will be installed on local drive,
then click Next



Click Install



Windows 10 will ask you whether you should accept the changes, Click Yes



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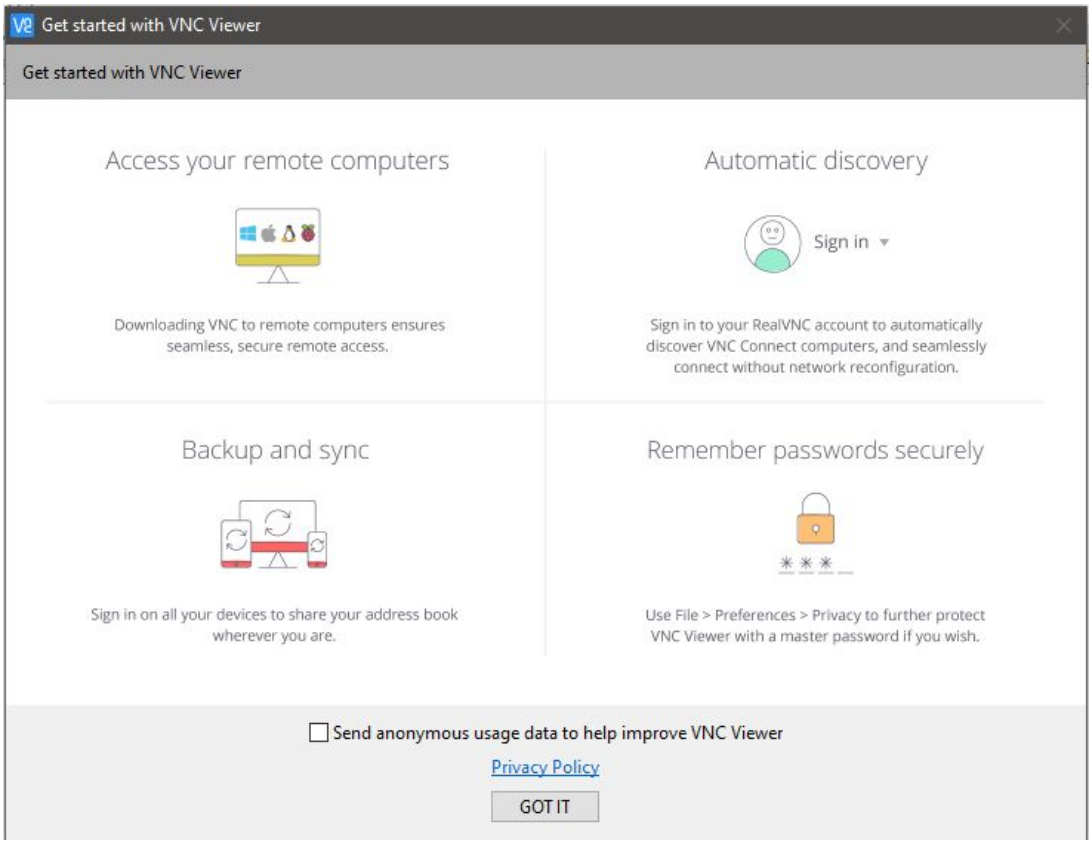
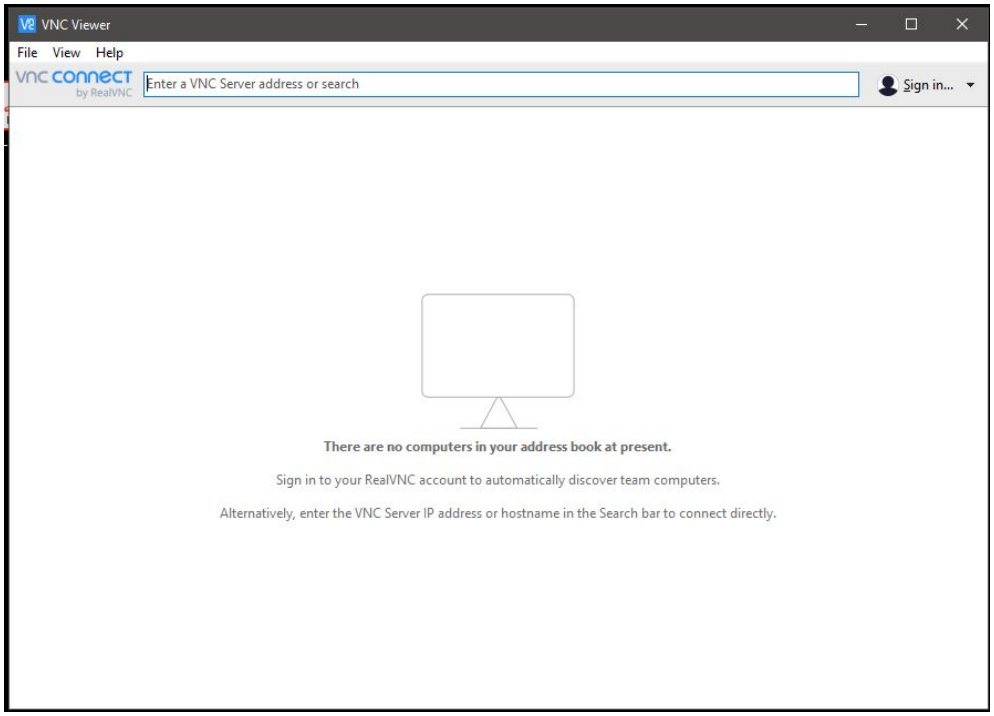
The installation will install and then Click Finish

You should have an ICON like the following on your desktop:

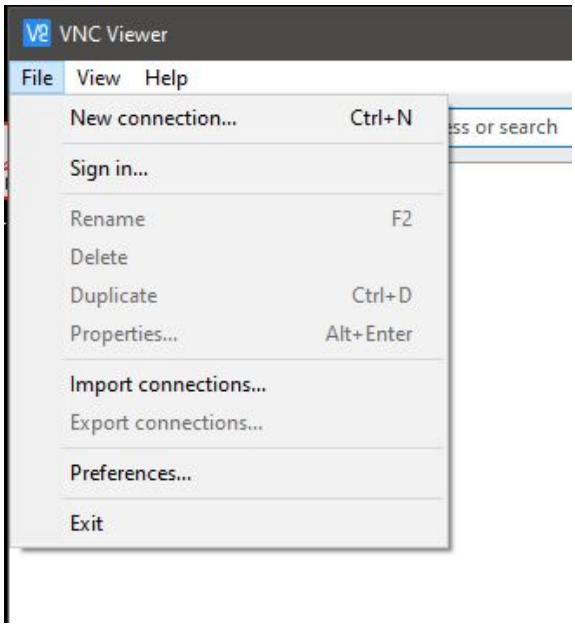
Click on the icon so we can configure the desktop client



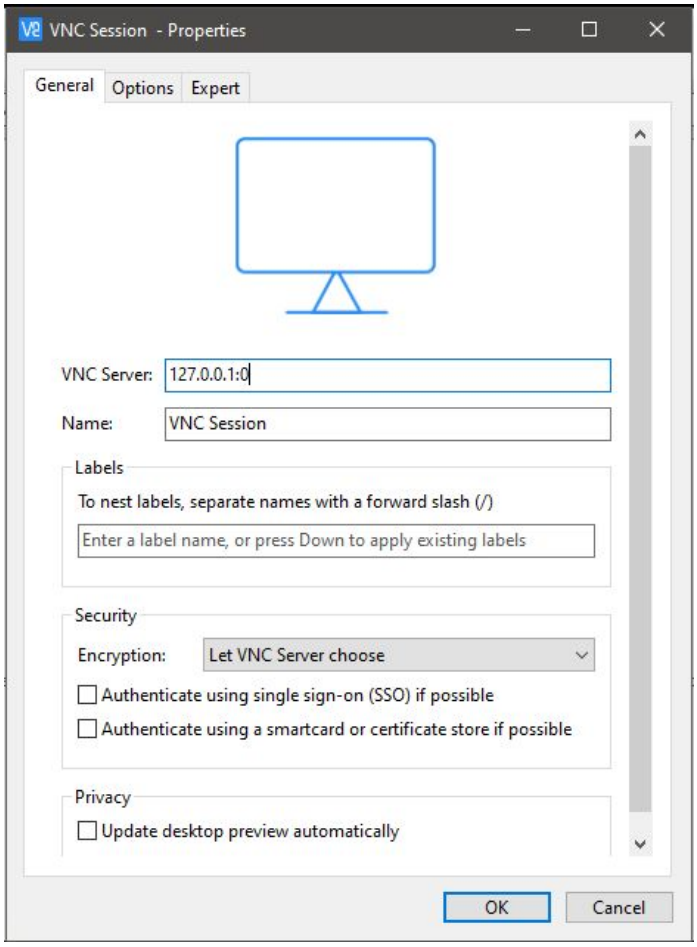
This is a bla bla, screen simply uncheck the “Send Anonymous usage data” and click “Got It”



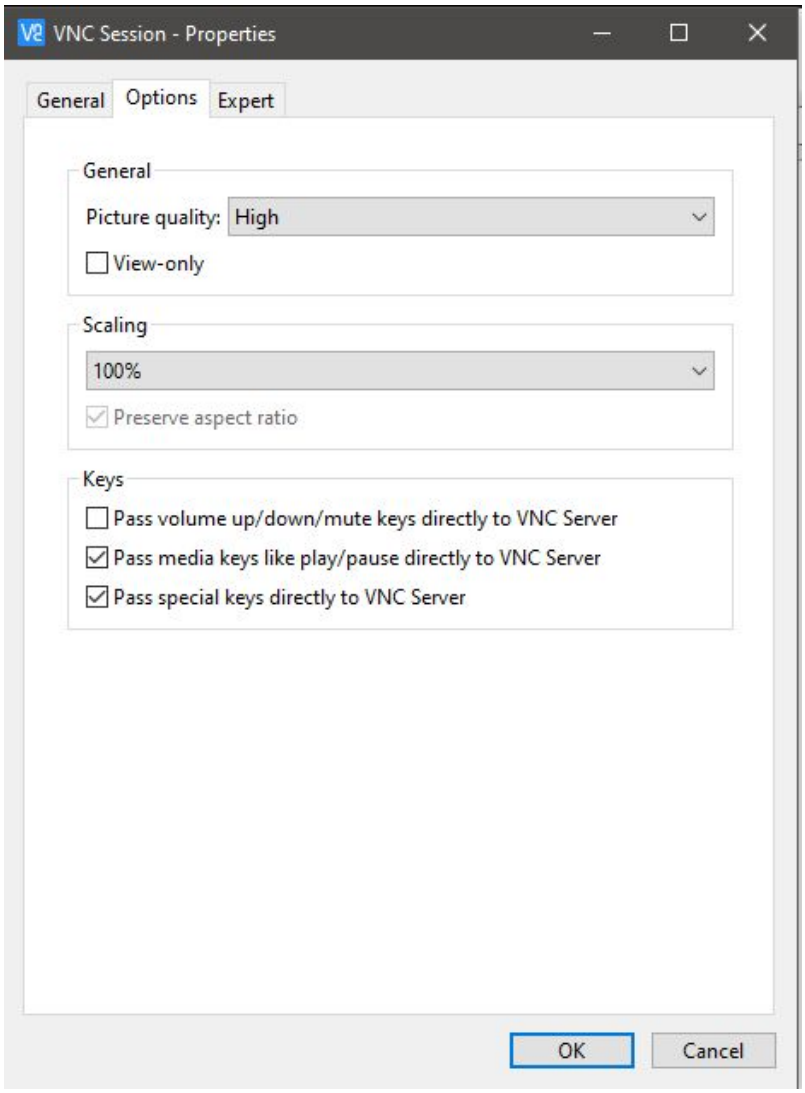
The initial screen is quite empty we need to create one profile
Click the File menu



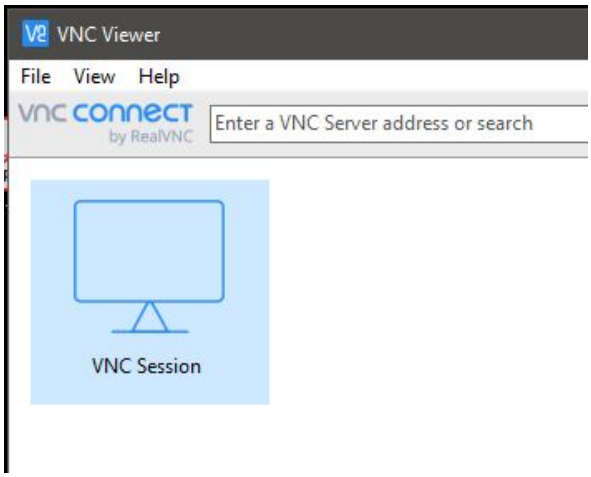
In the file Menu Click “New connection…”



Here all we're setting is the VNC server to **127.0.0.1:0**, giving the Session a name and unchecking the “Authenticate using SSO” and “Authenticate using smartcard”
Next Click The Expert Tab



Now I would suggest setting the Picture Quality to High as setting it to auto will sometimes have the connection constantly attempting to adjust the screen resolution.
Next click OK



Now we should have a VNC session client side setup.

Remote Server VNC Setup

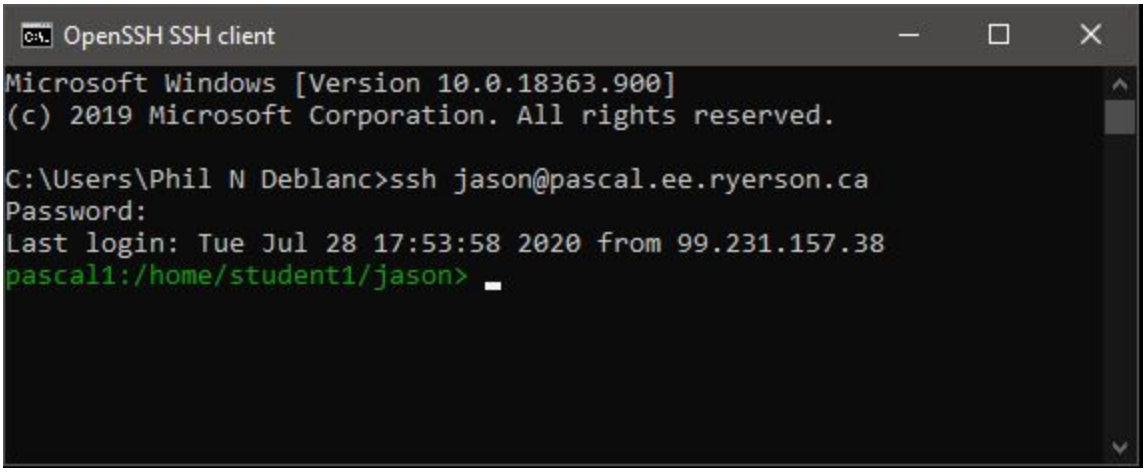
At home startup either a Windows 10 **cmd** window or MacOS **Terminal** window (under windows issue **cmd** in the search menu, under MacOS you can type **terminal** in the spotlight search menu). Regardless to what OS you should be able to get to a command line prompt. On that prompt issue the command:

```
ssh <username>@pascal.ee.ryerson.ca
```

Where username is your EE login name. For example:

```
ssh jason@pascal.ee.ryerson.ca
```

is what the user with the EE login of jason would issue to connect to pascal. Under windows it would look like:



Note if you have never issued the ssh command you will have to accept a set of ssh keys. When asked simply say yes on the command prompt. You will then proceed to be asked for your EE password.

Up to this point there has been no real discussion of what the VNC service will provide you and how it will assist you from working at home utilizing the departmental network. The VNC service setup up a persistent desktop for at least 12 hours. All the VNC sessions in the department will be disconnected every night at 3am. Yet if you're working away during the day you will be able to connect back to the same desktop that you were using prior and it will be in the exact same state that you left it.

The document that has been written attempts to illustrate how you can tunnel VNC traffic through an SSH connection into the department allowing you to have a secure encrypted connection while using the VNC service which is typically not so secure. You will be requested the first time you run vncconnect to setup a VNC specific password. This password will only be used to prevent other users from connecting to your VNC session while you initially start it up or when the desktop is logged into. When the session is running normally the Linux desktop screensaver will kick in and request you to use your EE login credentials to regain access to your desktop. You will also be able to set the VNC password to anything you wish.

If you run the command:

```
vncconnect help
```

at the pascal prompt it will produce the following output:

```
pascal1:/home/student1/jason> vncconnect help

Usage: vncconnect
       - Will attempt to create a VNC session to
         the next free host

Usage: vncconnect passwd
       - Change the VNC session password

Usage: vncconnect connect hostname
       - Will attempt to connect to a given host
         or reconnect if already running

Usage: vncconnect kill hostname
       - Kills off the VNC serice on hostname

Usage: vncconnect nextfree
       - show the next 4 free workstations for use

Usage: vncconnect list
       - Lists all active VNC sessions

Usage: vncconnect reset
       - Wipes entire VNC configuration and rebuilds it
```

By default if you give the vncconnect command no arguments at all it will attempt to dynamically setup a VNC server for you. If you haven't ever run the command it will also setup your VNC environment:

```
pascal1:/home/student1/jason> vncconnect

              ...Configurating your VNC environment...
              ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
You need to create a VNC connection password.  This password you will
only use to connect to vnc sessions once created.  Please do not use
your login password as this password.

Password:
```

Please do not use the same password you use for your EE account. This password will only be used to connect to your specific unique VNC session. Once you've setup a VNC password the vncconnect command will scan out on the network for a free host:

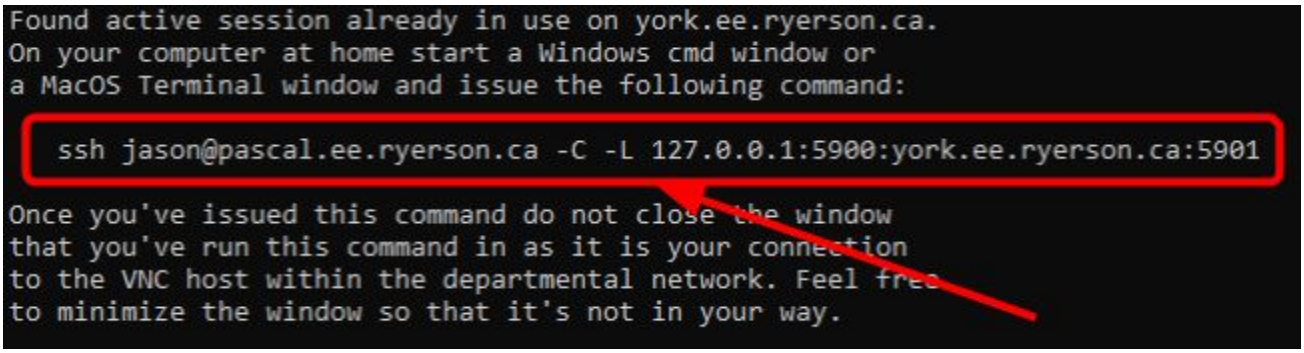
```
Password:
Verify:
Creating Startup scripts... Done.

 No active sessions found. Looking for free system...

Found system: zarabeth
Connecting you to the host.  You will be asked for your departmental
network password to envoke the VNC session on the host zarabeth.

Password:
```

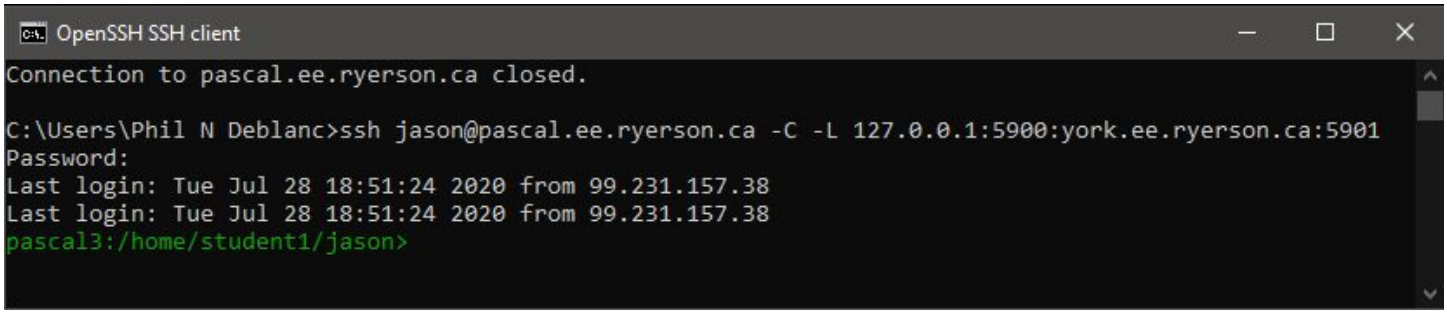
Seeing that there are no existing VNC sessions setup you will be asked for your departmental password so that the program will be able to run the VNC server process on the departmental host.



If you already have a session enabled the vncconnect command will not ask you for your password and will present you the ssh command that you will need to use on your home computer. Please note that daily all the VNC sessions will be terminated so you will be asked to provide your password at least once a day to setup a new VNC session.

Connecting the to the Remote VNC Session

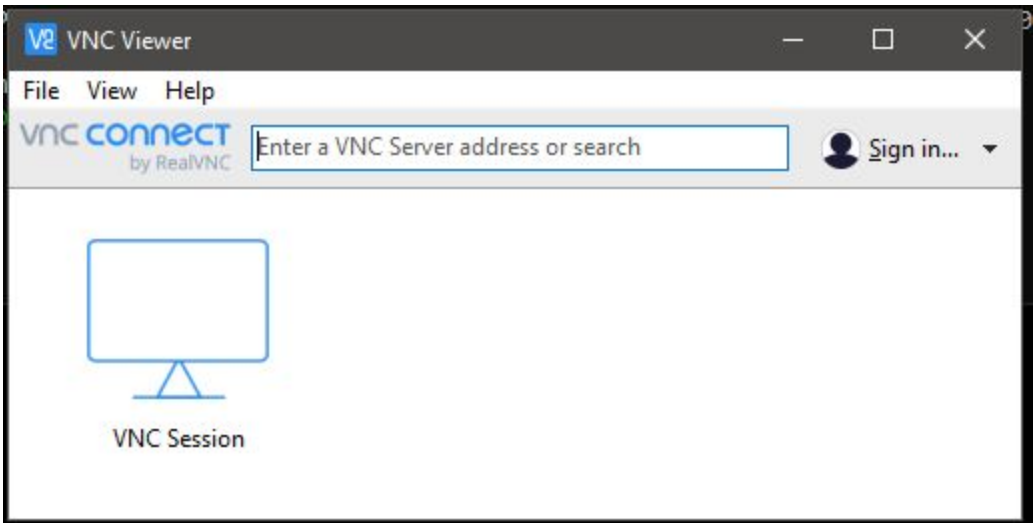
The vncconnect command will present you with a unique command to run on your computer at home. You can now exit out of the ssh session to pascal where you ran the vncconnect script. Now with the above command issue this from your Windows 10 **cmd** window or your MacOS **Terminal** window:



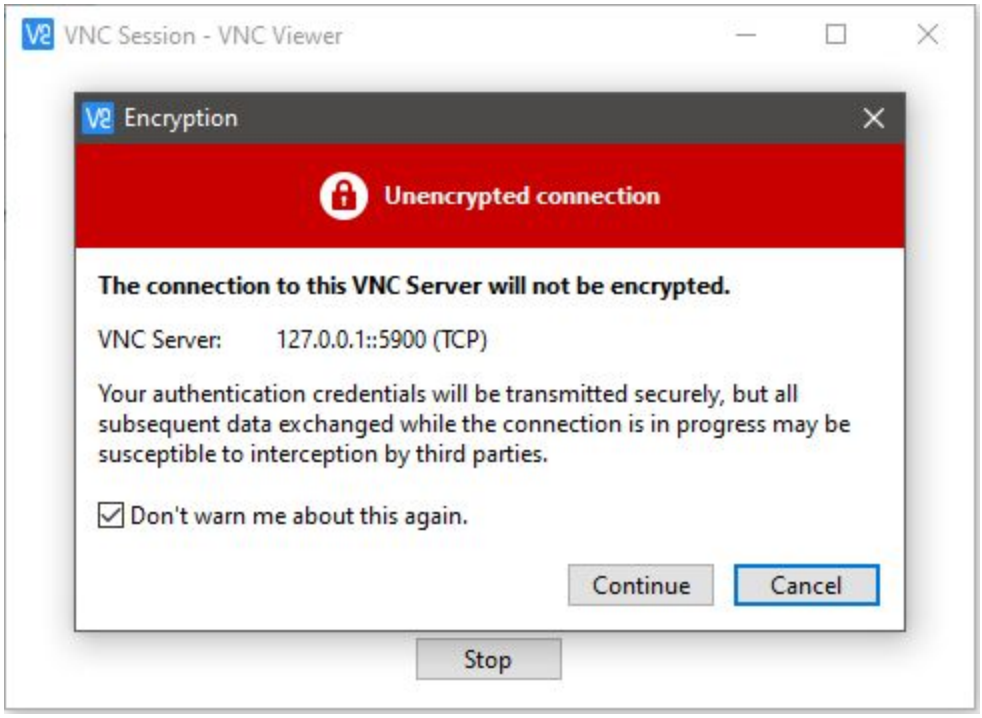
The client viewer is configured, our remote service is operational, we now simply need to connect the two. Now make sure you don't close this terminal window. You can minimize it, just don't close it. If you close the terminal window where we issued the ssh command that has the unique string to connect to your departmental workstation your link will be severed you will need to re-issue it.

Now click on that VNC Viewer icon on your desktop:

This time the window will startup right away with the pre-configured client:



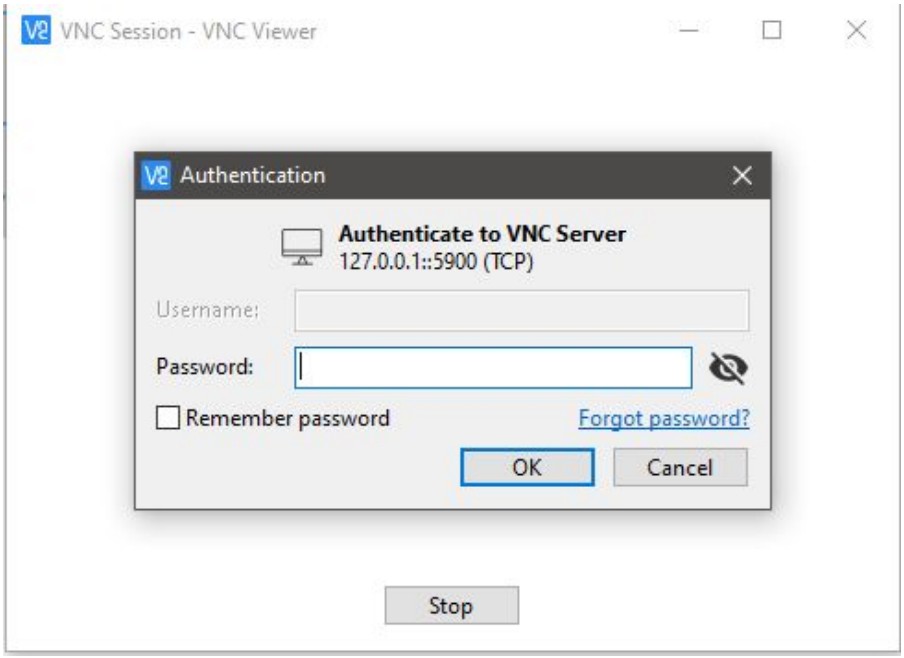
Now click on the VNC Session icon and you should see:



Simply click “don’t warn me about this again”

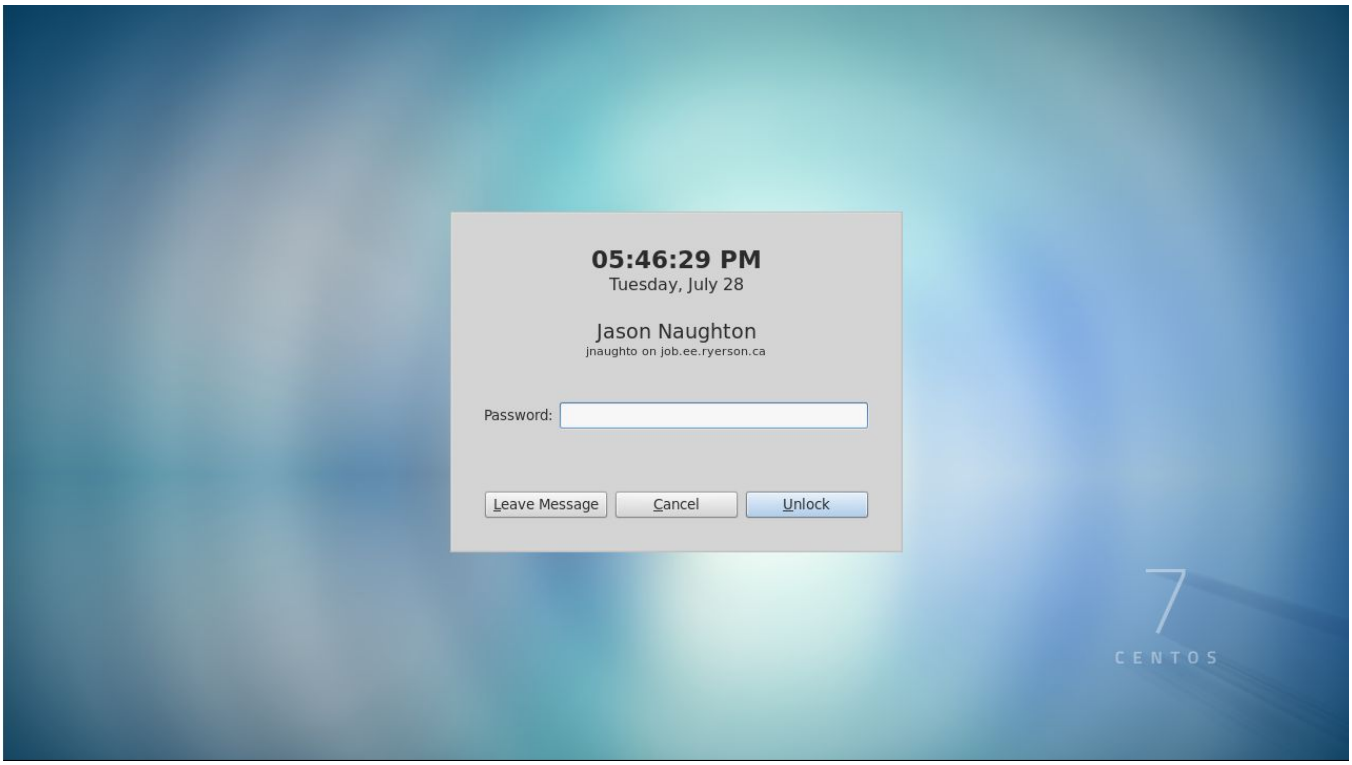
Essentially we are tunneling all the VNC traffic through an SSH tunnel so we don’t really care if the connection from your desktop to your desktop isn’t encrypted.

Next we'll see:



This Password is the VNC setup password that you created when you ran the vncsetup command. Enter that password and click OK.

Now typically the screen saver will have kicked in and you will be presented with a login screen where now you'll need to give your EE login password to get by the locked screen:



Once you've logged into the workstation you should be able to work as if you were working within the labs at Ryerson. **Remember not to logout of your workstation if you do you will not be able to reconnect to the desktop.** You will have to kill the session off (see Further Options).

Further Options

The vncconnect command has a number of other connection options that are provided to assist you accessing the department remotely.

1. Reset VNC Password

In the case that you cannot remember your VNC connection password you can reset the password by simply issuing the command:

```
vncconnect passwd
```

Please note that this password is the VNC client password NOT your departmental EE password.

2. List all Active VNC Sessions

You may wish to list any sessions that you have open. Some of those sessions may be stale from the day prior. When you run vncconnect again it will do some housekeeping and clear out any stale sessions but you can always list the sessions that you have by issuing the command:

```
vncconnect list
```

For example when I issued the above command:

```
pascal1:/home/student1/jason> vncconnect list

Vnc Host: job Connect with:
    ssh jason@pascal.ee.ryerson.ca -C -L 127.0.0.1:5900:job:5901

Vnc Host: tpau Connect with:
    ssh jason@pascal.ee.ryerson.ca -C -L 127.0.0.1:5900:tpau:5901
```

It shows all the active connections that you presently have setup. It also shows the command that you can issue from your computer at home to connect into the VNC session in the department.

3. Kill Off VNC Session

In the case that your VNC session becomes unusable or if you've accidentally logged out of your VNC session via the Linux menu you'll need to kill off the session so that you can start a new one. You could wait until the following day and your session will be automatically killed off. Or you can issue the command:

```
vncconnect kill hostname
```

where hostname corresponds to the departmental host that you were running your VNC session on. Now you are going to need to know the hostname that you were connecting to so you may wish to run the command:

```
vncconnect list
```

Using the example we provided in the ***vncconnect list*** example, say we wish to kill off the session on the workstation job we would issue:

```
vncconnect kill job
```

```
pascal1:/home/student1/jason> vncconnect kill job

Shutting down VNC Session on job Port: 1.
Password:
```

You will be asked for your **EE account password** as it will require it to remotely connect to the hostname job and kill the session running there.

4. Show Next Free System

If you already have an active VNC desktop configuration but wish to connect to a second workstation you'll need to know what system within the departmental network is free for use. To do so you can issue the command:

```
vncconnect nextfree
```

For example:

```
pascal1:/home/student1/jason> vncconnect nextfree

Next 4 free stations are: sybil svidler sulu stubbs
```

In the example above shows the next 4 workstations that are free for use.

5. Directly Target Connect to a System

By default the vncconnect command will find the next free workstation and present you with the SSH command that you would need to use at home in a command or terminal window depending on whether you're running Windows 10 or MacOS. Once a VNC session is in place on the network within the last 24 hours it will be presented with the same ssh command to connect back to it.

Yet let's assume you wish to connect to create a second session to another workstation other than the one you presently have configured. The first thing you'll need to know is which system is free. You can do this by using the **nextfree** command explained in the prior step. Select one of the 4 free machines that it will show you and then you would use the **vncconnect connect** command like:

```
pascal1:/home/student1/jason> vncconnect nextfree

Next 4 free stations are: soprano sonata sokolov snape

pascal1:/home/student1/jason> vncconnect connect soprano

 Attempting to connect to soprano
Password:
```

You will be asked for your EE account password as it will require it to remotely connect to the hostname theex and create another session there.

6. Displaying Multiple Departmental Desktops Simultaneously

This is an advanced feature and it is not expected that most students will use it. During the following documentation HOME computer will be a reference used to indicate the computer that is running the VNC client software. This is a computer owned by the student and not a departmental workstaiton.

To attempt to display multiple desktops to the same HOME computer will require the creation of multiple client configurations. To do so requires some understanding of what the SSH command is actually doing on the HOME computer.

The SSH command that is executed on the HOME computer maps an IP address and PORT on from the HOME computer to a VNC port on a departmental workstation. Page 6 requested the client configuration to be set to **127.0.0.1:0** which tells the VNC client software to connect through the HOME computer's local host IP address (127.0.0.1) with the port 5900. The **:0** represents a port offset from 5900 (ie port 5900 + 0). For example assuming the user jason had a VNC service running on the departmental host job, the text in **red** below shows the segment of the ssh command tells the HOME computer what IP address to use and port to use locally:

```
ssh jason@pascal.ee.ryerson.ca -C -L 127.0.0.1:5900:job:5901
```

If you wished to display to two departmental desktops simultaneously from your home computer, you would create a second client configuration. Instead of using **127.0.0.1:0** as instructed on page 6 of this document, you would create a second configuration but using **127.0.0.1:1**. By **127.0.0.1:1** also means you would also need to alter the ssh command that is displayed by default as the HOME computer would now have to bind the internal port of 5901 (ie 5900 + 1 the :1 offset) instead of 5900.

For example, let's say when you run **vncconnect list** you see:

```
Vnc Host: job Connect with:
    ssh jason@pascal.ee.ryerson.ca -C -L 127.0.0.1:5900:job:5901

Vnc Host: tpau Connect with:
    ssh jason@pascal.ee.ryerson.ca -C -L 127.0.0.1:5900:tpau:5901
```

Assuming you're presently running a VNC session on the workstation **job** through 127.0.0.1:0. To create a second session to the departmental workstation **tpau** so that it connects through the HOME computer's 127.0.0.1:1 configuration the default command that's displayed:

```
ssh jason@pascal.ee.ryerson.ca -C -L 127.0.0.1:5900:tpau:5901
```

would have to be altered to look like:

```
ssh jason@pascal.ee.ryerson.ca -C -L 127.0.0.1:5901:tpau:5901
```

Notice the 5901 instead of the 5900. Now you will be able to click on the second VNC host configuration that you setup to work with **127.0.0.1:1.** Remember that the window that the ssh command is run in must remain running as it provides the connection from the HOME computer to the departmental workstation.