

## INTRODUCTION

Welcome to the CSULB Mathematics and Statistics cluster, Pyramid (8 quad-core Intel Processor Blade Cluster)! From here you will be able to run some of the open source software (e.g., vim, Openoffice, and xfig), perform intense calculations (via e.g., MATLAB and Maple), and even compile your LaTeX documents. Some of the programs can be accessed with a graphical user interface (GUI) via the help of a Linux-like environment client called Cygwin. This tutorial provides Windows users a guide to set up their system to connect to Pyramid assuming that the user(s) have already obtained account access from the system administrator (Dr. Jen-Mei Chang: jchnag9@csulb.edu).

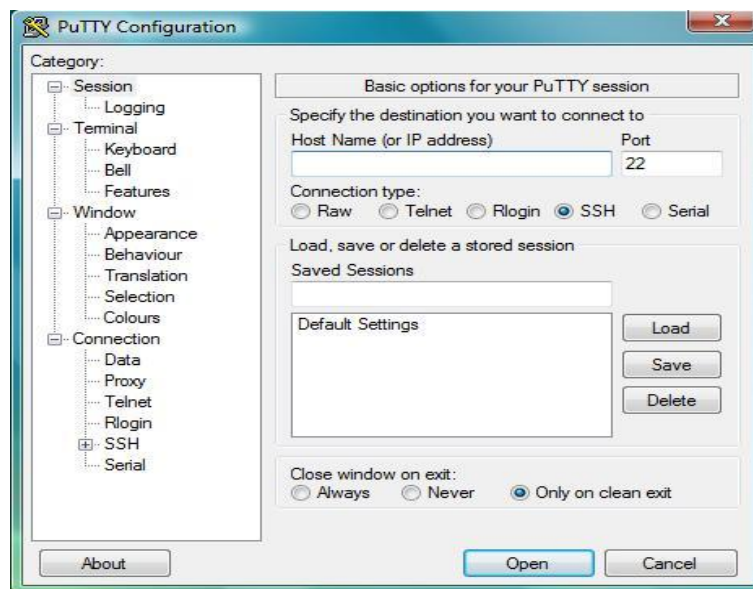
To start, you will need to download the following two programs:

- Putty <http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>
- Cygwin <http://www.cygwin.com/>

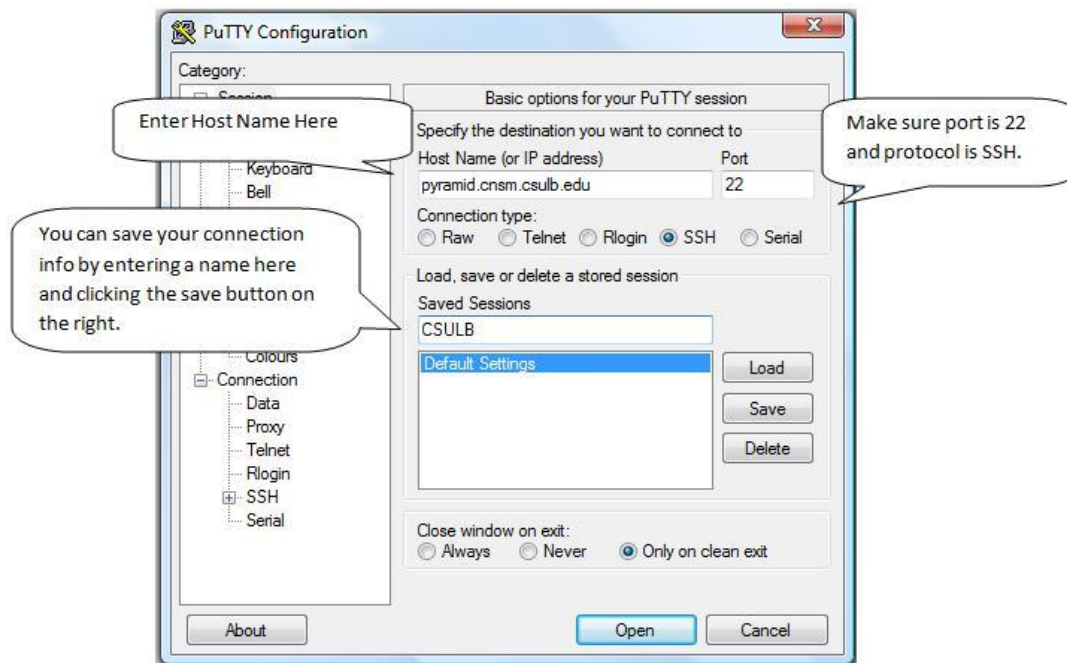
You will then learn how to install and use these programs.

## Install and use PUTTY

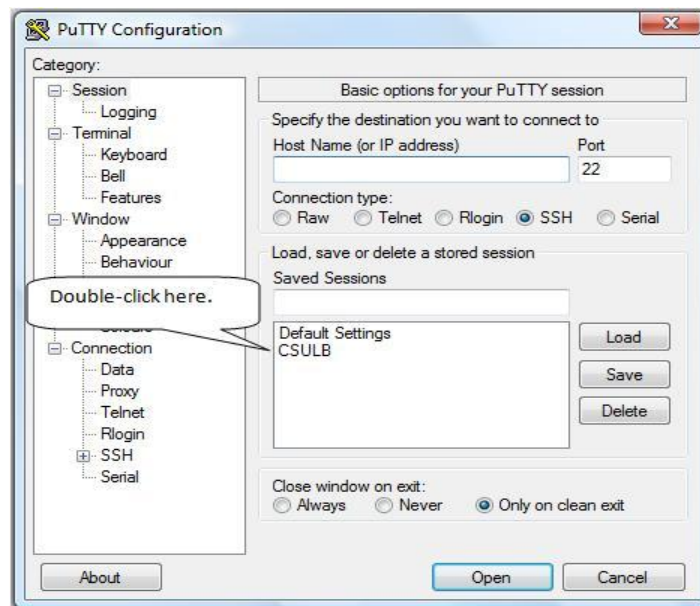
Let's start by downloading Putty. Click on the link above and download putty.exe. I recommend saving it to your Desktop since this is how you will access the cluster. Once you have downloaded it, double-click on the putty icon. You will see the following screen:



To connect to the cluster you must enter the host name: **pyramid.cnsn.csulb.edu**. Make sure that the port listens in on 22 and the protocol is set to SSH. To avoid entering this information every time you need to connect to the cluster, you can save it by entering a name into the text box labeled "Saved Sessions" and clicking the button labeled "Save" on the right.



Now that you have saved the information, you should see the name you entered in the box below, the one labeled "Saved Sessions". Simply double-click on it to connect.



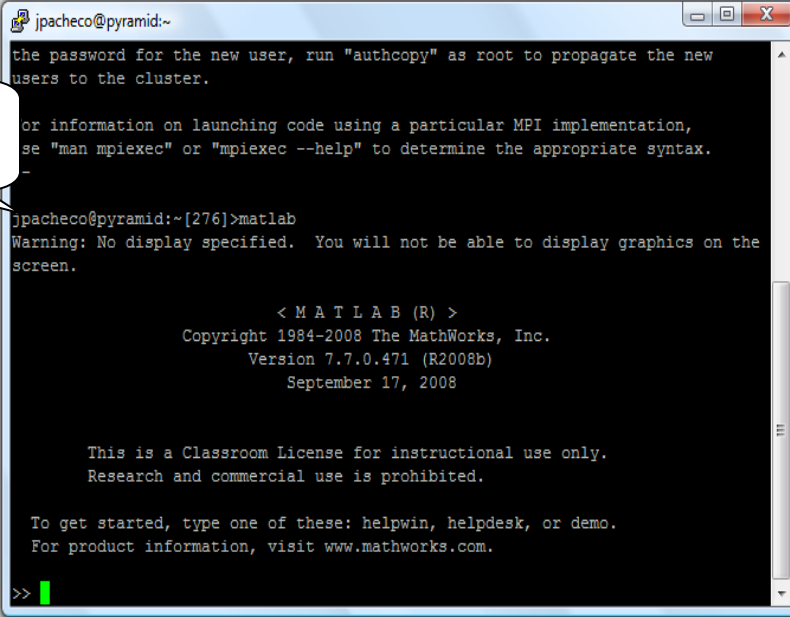
If you are logging in for the first time, you may see the following dialogue box:



Since you trust the machine that you are connecting to, click "Yes." This box will never appear again. After this, a black window will appear asking you to "**login as:** ". Here you will type in your username and press "Enter". After this you will be asked to enter your password. Type it in, and press "Enter" once again. If you have done this successfully, you will see the following prompt:

```
jpacheco@pyramid:~  
login as: jpacheco  
jpacheco@pyramid.cns.csulb.edu's password:  
Last login: Mon May 24 11:38:49 2010 from cpe-75-83-171-246.socal.res.rr.com  
--  
Welcome to the Cal State blade cluster. This cluster utilizes environment modules to  
control paths needed by the user. "man module" will give you all the gory  
details, but a short list of module commands are:  
  
module avail          -- see what is there to load  
module list           -- see what module(s) is/are loaded in this shell  
module load modulename -- load that env. module into your current shell  
module initadd modulename -- load that env. module every time a new shell  
is opened. **Important to do this for paths and env. settings that you  
want to be available on the nodes when they're running a job!**  
  
Add non-root users and log in as them! After you add the user and change  
the password for the new user, run "authcopy" as root to propagate the new  
users to the cluster.  
  
For information on launching code using a particular MPI implementation,  
use "man mpiexec" or "mpiexec --help" to determine the appropriate syntax.  
--  
jpacheco@pyramid:~[274]>
```

Now that you are connected you can run the available applications off of the server. For example, at the prompt, type "matlab". You will see the screen below:



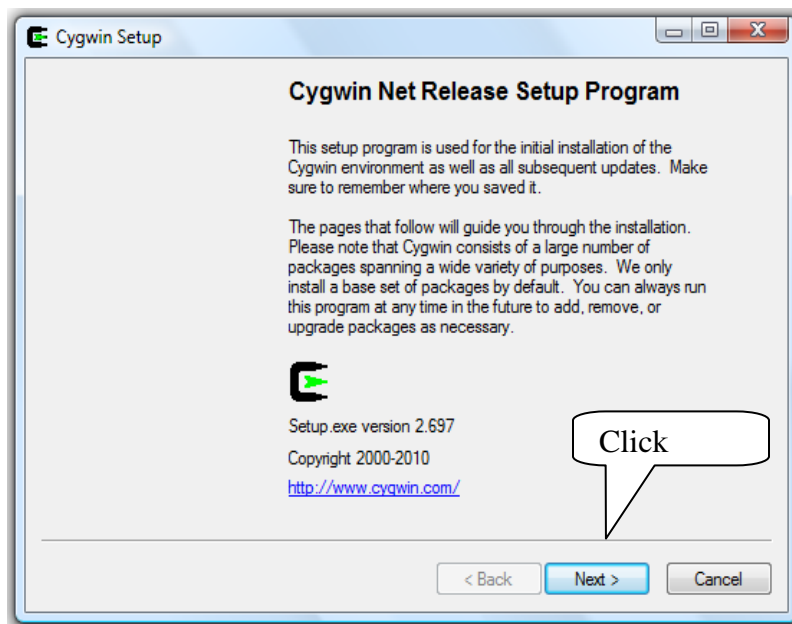
A terminal window titled 'jpacheco@pyramid:~' shows the output of the 'matlab' command. A speech bubble points to the warning message: 'Warning: No display specified. You will not be able to display graphics on the screen.'

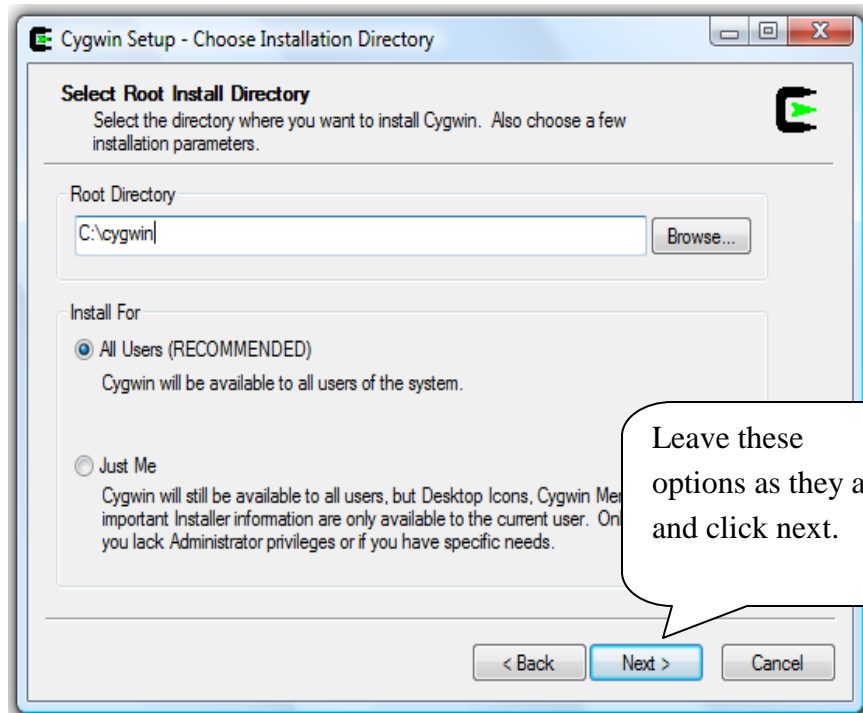
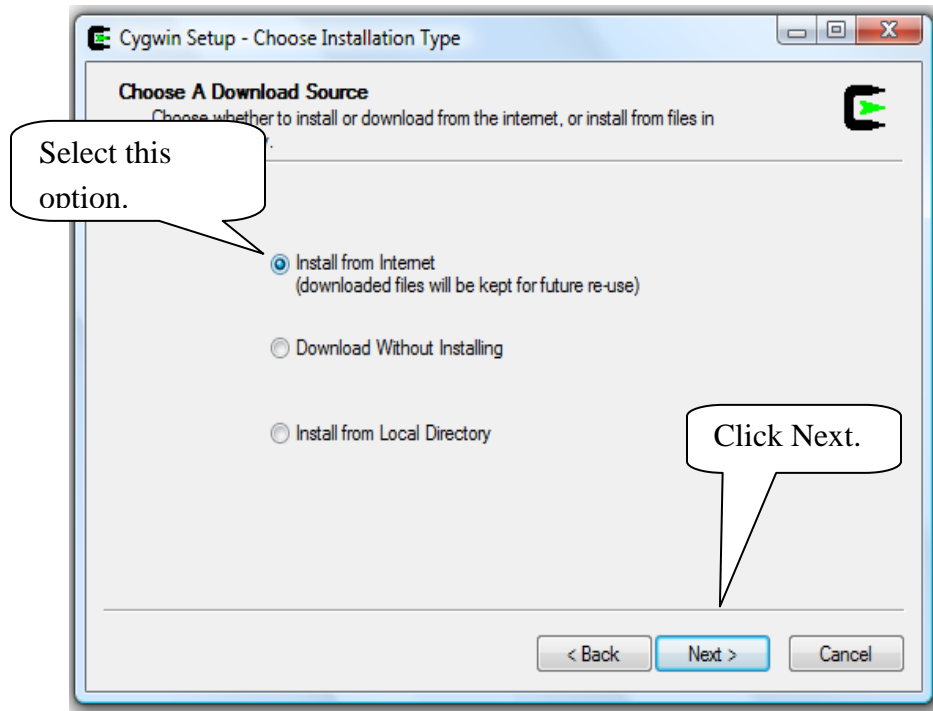
```
jpacheco@pyramid:~  
the password for the new user, run "authcopy" as root to propagate the new  
users to the cluster.  
or information on launching code using a particular MPI implementation,  
se "man mpiexec" or "mpiexec --help" to determine the appropriate syntax.  
-  
jpacheco@pyramid:~[276]>matlab  
Warning: No display specified. You will not be able to display graphics on the  
screen.  
  
      < M A T L A B (R) >  
      Copyright 1984-2008 The MathWorks, Inc.  
      Version 7.7.0.471 (R2008b)  
      September 17, 2008  
  
      This is a Classroom License for instructional use only.  
      Research and commercial use is prohibited.  
  
      To get started, type one of these: helpwin, helpdesk, or demo.  
      For product information, visit www.mathworks.com.  
      >>
```

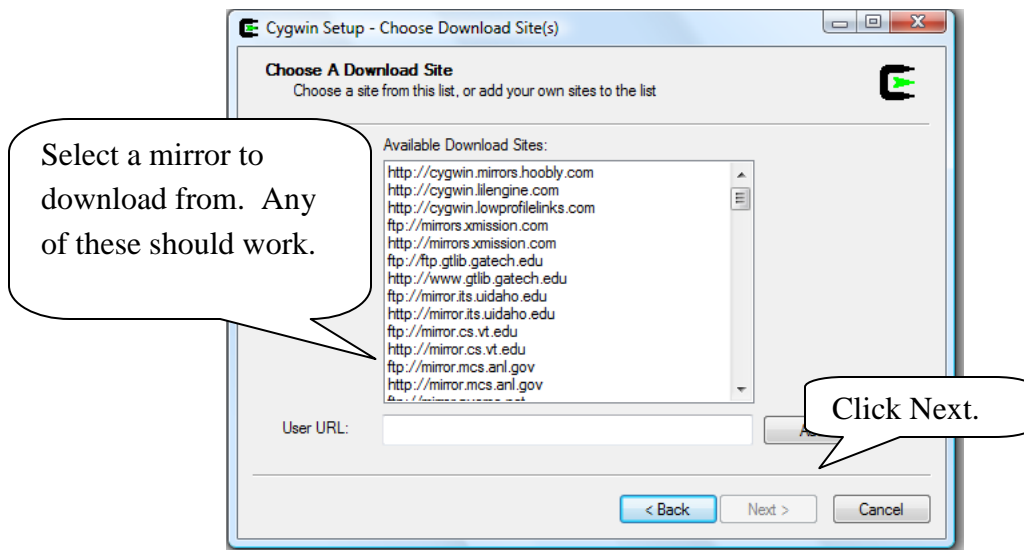
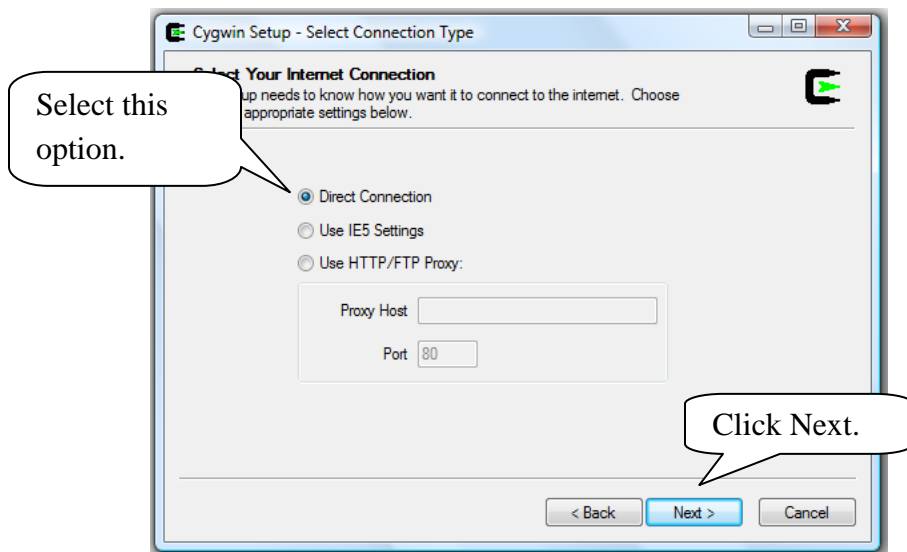
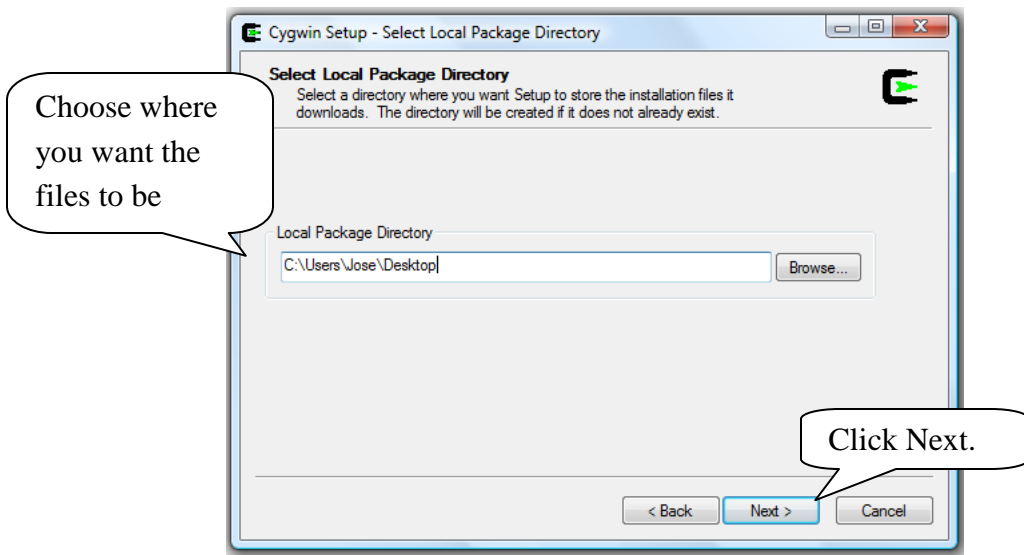
Notice the warning about the graphics display. This is because the GUI is not available via Putty alone. In order to enable the graphical components in MATLAB, i.e., the ability to manipulate figures, you need to install Cygwin/X, which is described next.

## INSTALLING CYGWIN/X

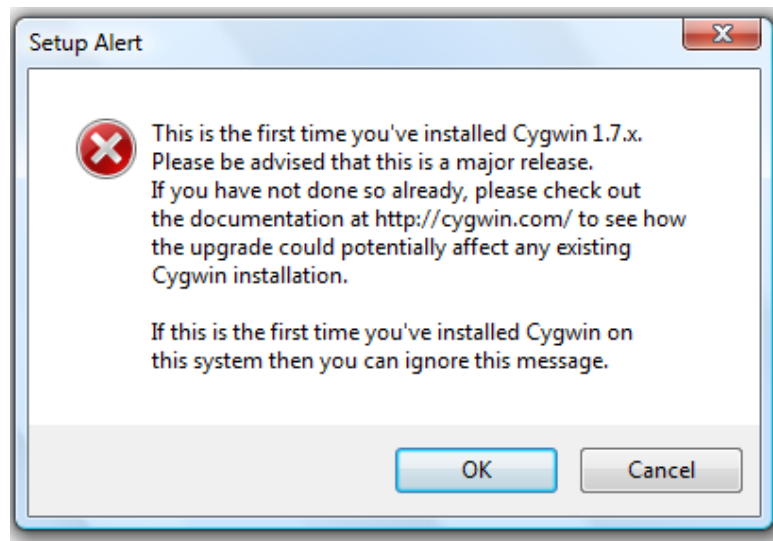
Click on the link above and scroll to the middle of the page. Click the link that says “Install or update now”. Save the **setup.exe** file and run it. This will be the first screen you see:



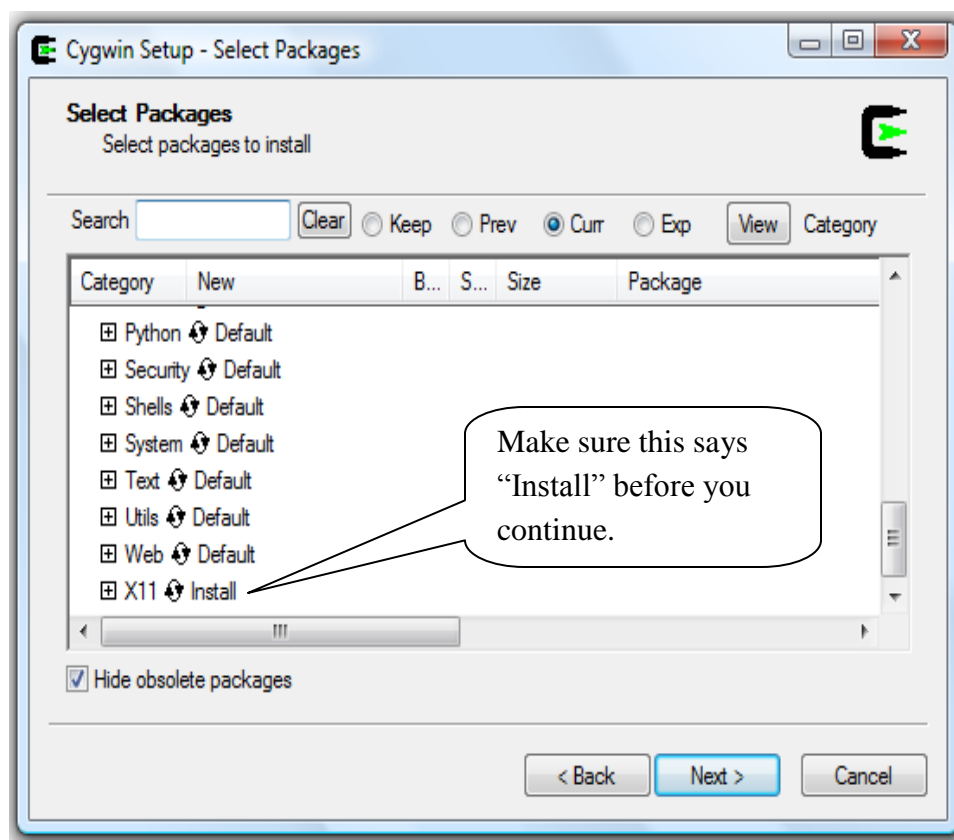




After clicking next you may or may not get the following warning:

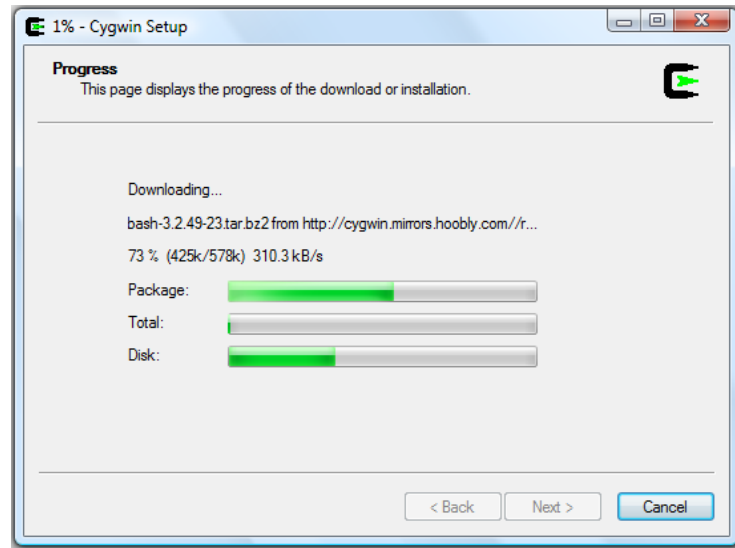


This is not important for our purposes, so you can simply ignore it and click “Next”. You will then be shown a long list of packages that are available for download and installation. To ensure we download the one we want, scroll all the way to the bottom of the list to package named **X11**. Click on the word “**Default**” once so that it changes to “**Install**”. Click “Next” to continue.

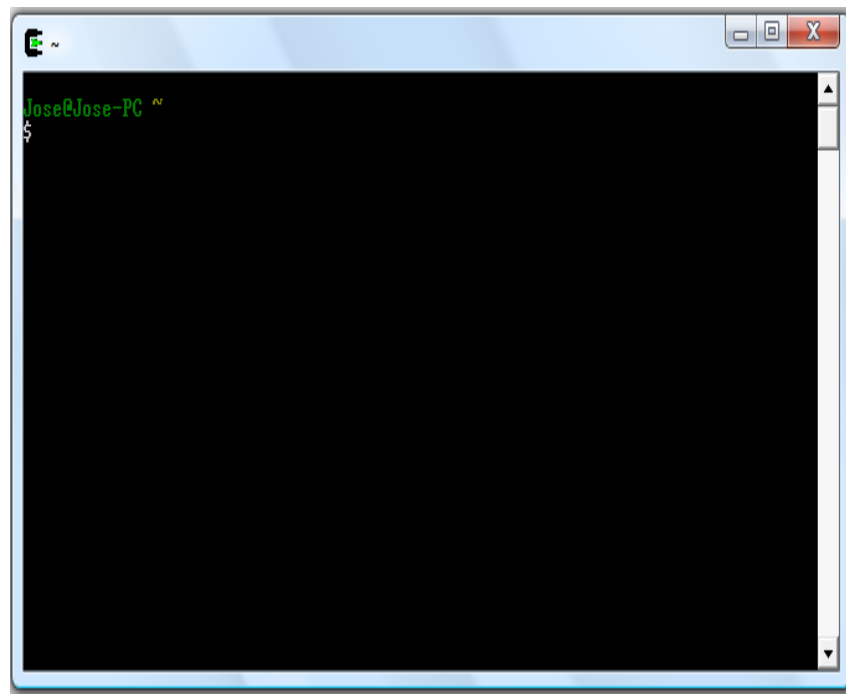




From here, the installation process will begin. This will take quite a bit of time since the package is roughly 500MB.

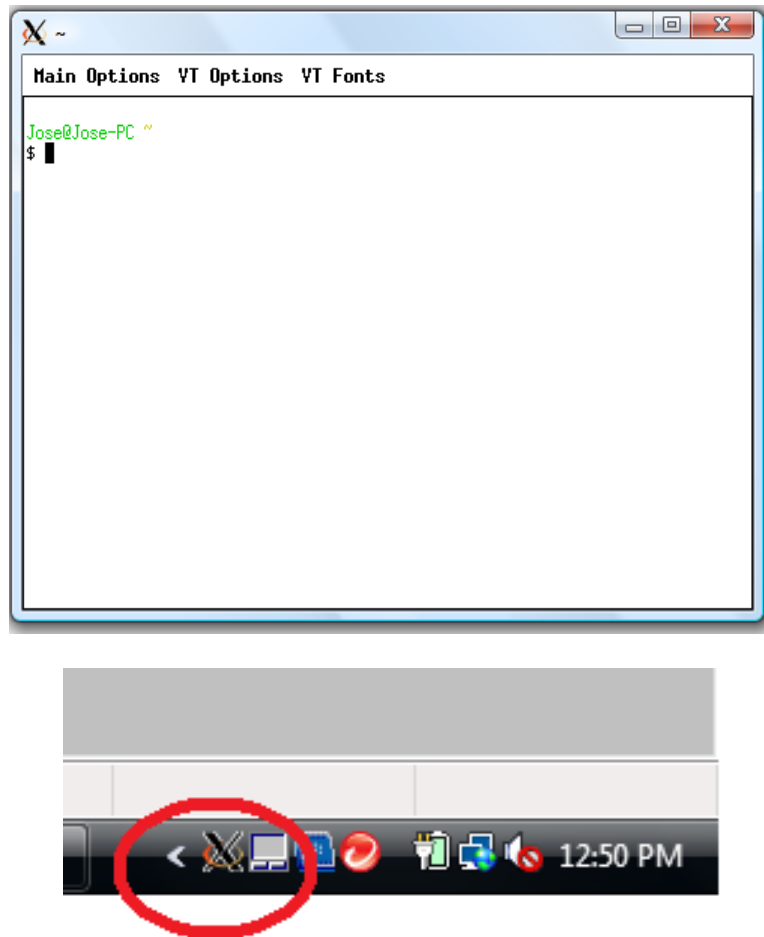


When the download finishes you will be asked if you would like an icon on your Desktop and on the Start Menu. I recommend selecting at least one of these options for easy access in the future. Simply make your selections and click “Finish” to complete the installation. The Cygwin icon should appear on your desktop and/or on your start menu depending on your selection. If you do not see them, restart your computer and they should be visible then. Double-click on the Cygwin icon and you should see a shell like this one:

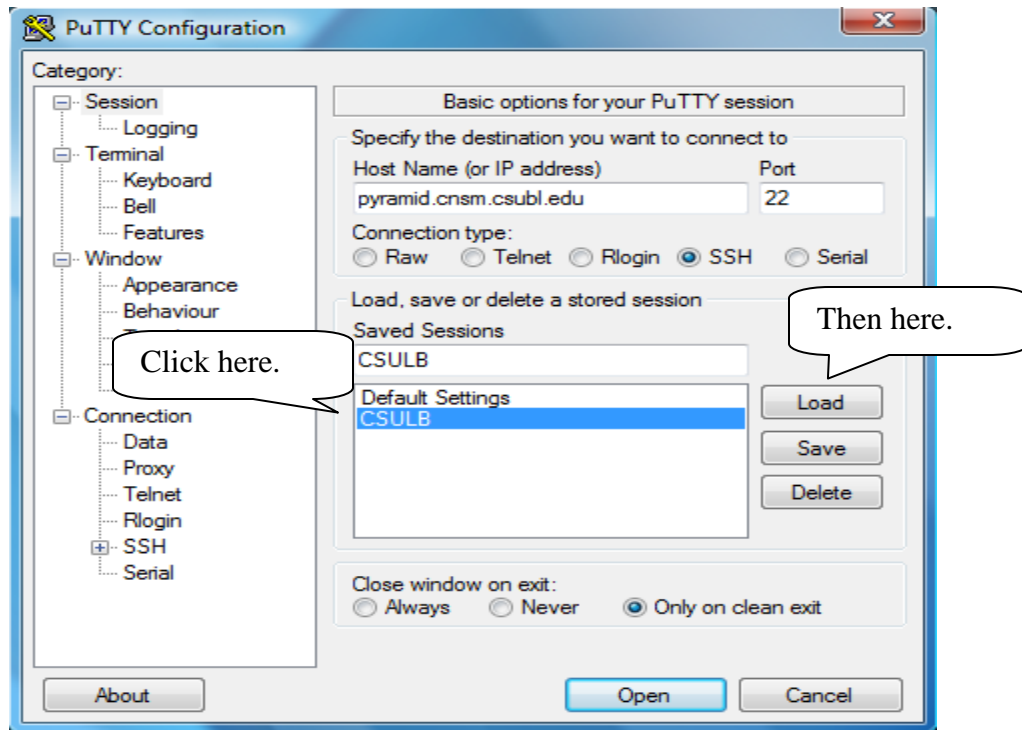




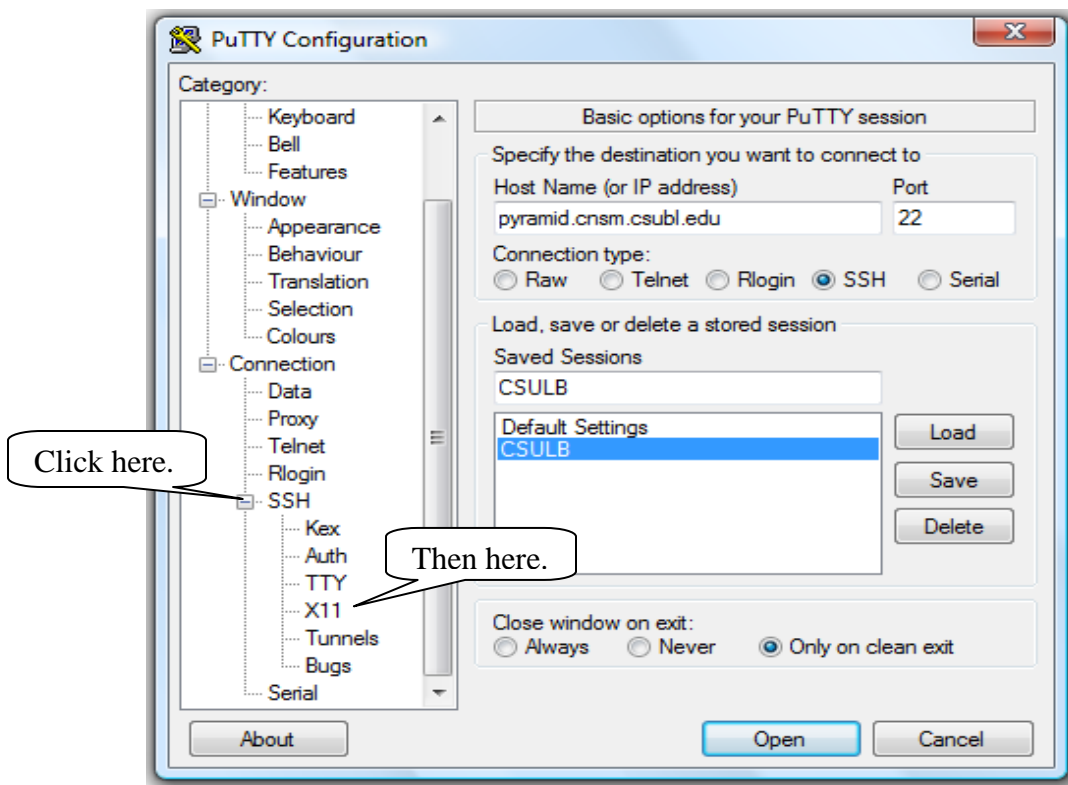
At the prompt, type “**startxwin**” and press “Enter”. Two things should happen: A white XWin shell should pop up and the XWin logo will appear in the tray on the bottom right of your screen.



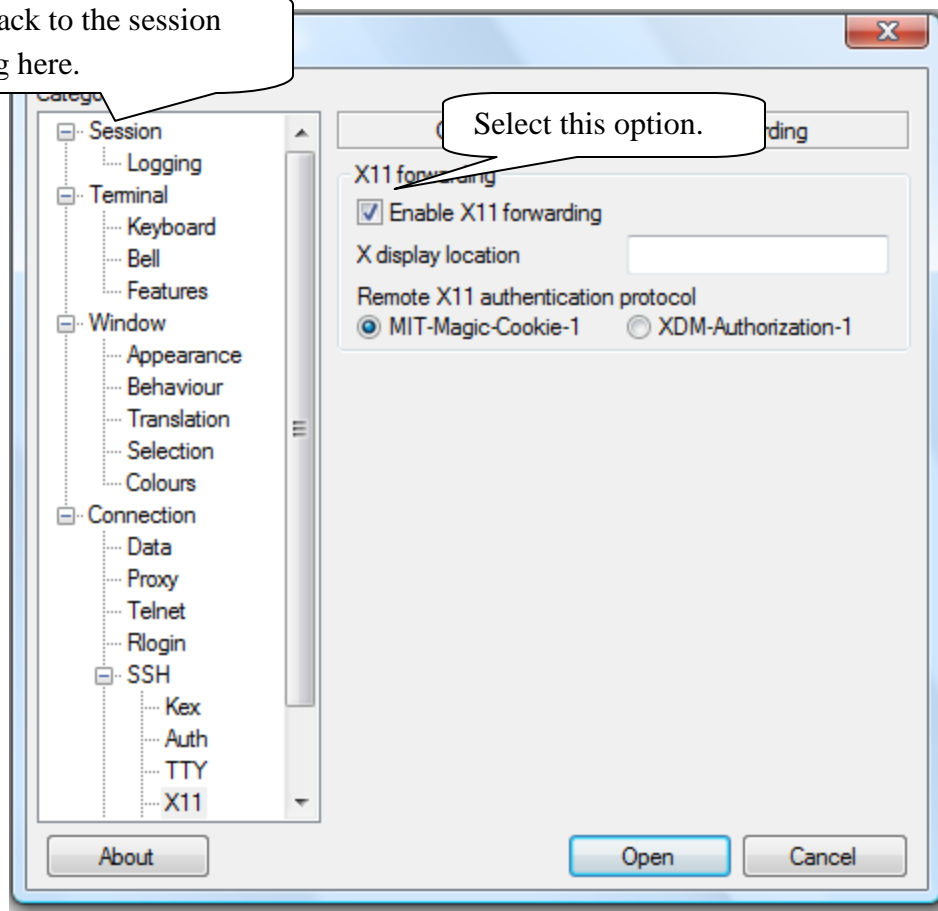
This means you have successfully opened XWin. Now close both the XWin shell and the Cygwin shell; the XWin logo will still appear in the tray indicating that XWin is running in the background. It is now time to go back to putty. Open putty and load the connection information you saved earlier.



Then click on “SSH” on the left side of the box. Look for “X11” and click on it.



Then go back to the session by clicking here.



Once you are back at the home screen click “Open” to connect to the cluster. Log in as you did earlier with your username and password. Once you have done this, type MATLAB at the prompt and within a few seconds you should see MATLAB open up as you are used to seeing it! Now you are ready to enter the wonderful world of cluster computing!!!

A tool that is not totally necessary, but extremely useful is WinSCP. WinSCP allows you to transfer files from your local machine to the cluster by simply clicking and dragging. You can download it at <http://winscp.net/eng/download.php> and the installation is very straightforward and uses the same information as we have described here. Questions and comments should be sent to Jen-Mei Chang via [jchang9@csulb.edu](mailto:jchang9@csulb.edu).