

Cadence Virtuoso Setup

ENGN2912E Fall 2017

Introduction

This is a guide to connecting to your CCV account and setting up Cadence Virtuoso tools. This semester we are also using a 45nm freePDK45 process design kit.

Please keep in mind that CCV is a service used by people across the Brown campus, not just for this class. Occasionally the systems are unavailable. Please plan ahead and do not try to do everything the night before it needs to be finished. If you lose your password, email support@ccv.brown.edu and they can reset it.

Connecting to CCV

The preferred method to connect to CCV is using the VNC 1.7b client available here: <https://www.ccv.brown.edu/technologies/vnc>. Make sure you are using the recommended version of Java (version 8). Fast wired network connections are recommended.

Your login and password are the **guestABC** accounts that you received on paper in class. (Not your normal Brown accounts.)

Sometimes you may see a message that a VNC session cannot be created. In these cases, you can try:

1. Wait and try again
2. Connect via ssh (see below), run these two commands: "groupcancel vnc" and "vnc-cleanup". Then exit ssh and try the VNC client again.

If VNC is truly not working, you can also connect to CCV by SSH with X-forwarding. The downside of SSH is that if your internet connection crashes, your work will not be saved (!). Save your files often.

On a Mac:

1. Open the Terminal application
2. Connect to CCV with your username **guestABC** using "ssh -X guestABC@ssh.ccv.brown.edu". Press Yes to any authenticity questions. Enter your password when prompted.
3. You should now have an open linux terminal session. You next need to use the interact command to get a compute node.
interact (this will get you 1 hour of compute time as a default). If you want more information on interact, type interact -h
4. Continue with the terminal commands as if you had opened a terminal through VNC. ("module load cadence" "cadence_tsmc")
5. After a few seconds the Virtuoso GUI should appear in another window on your desktop.

On a PC (written for the B&H lab PCs):

1. If you don't see Putty in the start menu, download it to your user directory
<http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>
<http://the.earth.li/~sgtatham/putty/latest/x86/putty.exe>
2. Open a X11 server program. The lab computers have one called "Xming". You may need to run the Xming install script before being able to run it. Other X11 server programs should work as well.
3. Open Putty.
4. In Putty, set the hostname to ssh.ccv.brown.edu.
5. Go to the options for Connection --> SSH --> X11. Check "Enable X11 forwarding." Optionally, in "X display location", type "localhost:0".
6. Save your Putty session in the Session options for next time. (Type a session name and press Save.)
7. In Putty, press "Open"
8. Type in your **guestXXX** username and password.
9. You should now have an open linux terminal session.
10. You next need to use the interact command to get a compute node.
`interact` (this will get you 30 minutes of compute time as a default).
If you want more information on interact, type `interact -h`
11. Continue with the terminal commands from the VNC-based tutorial. Preview the document. View in a new window. (module load cadence cadence)
12. After a few seconds the Virtuoso GUI should appear in another window on your desktop.

Issues with Fonts

Some have reported issues with fonts within Virtuoso windows not displaying correctly over SSH+X, particularly with Xming on Windows. This may be fixable by downloading the fonts for Xming.

For example: <https://sourceforge.net/projects/xming/files/Xming-fonts/7.7.0.10/>

Changing your password

If you want to change your password, type:

```
> passwd
```

Then this will be your password for the next time you log in.

Launching Virtuoso

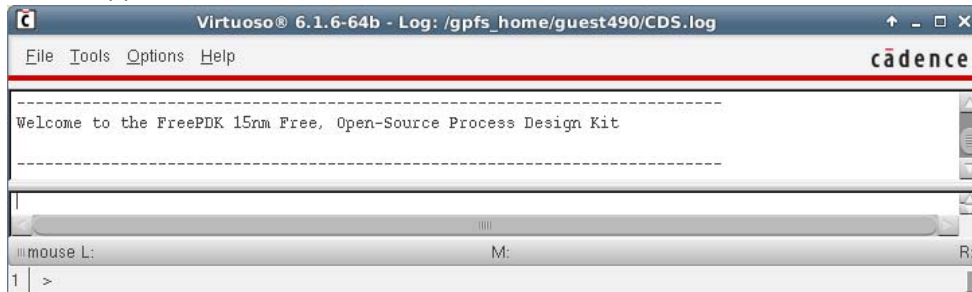
Once you have a VNC session open, open a terminal from the black icon at the bottom of the screen. Or, right click on the desktop and start a terminal. Then type:

```

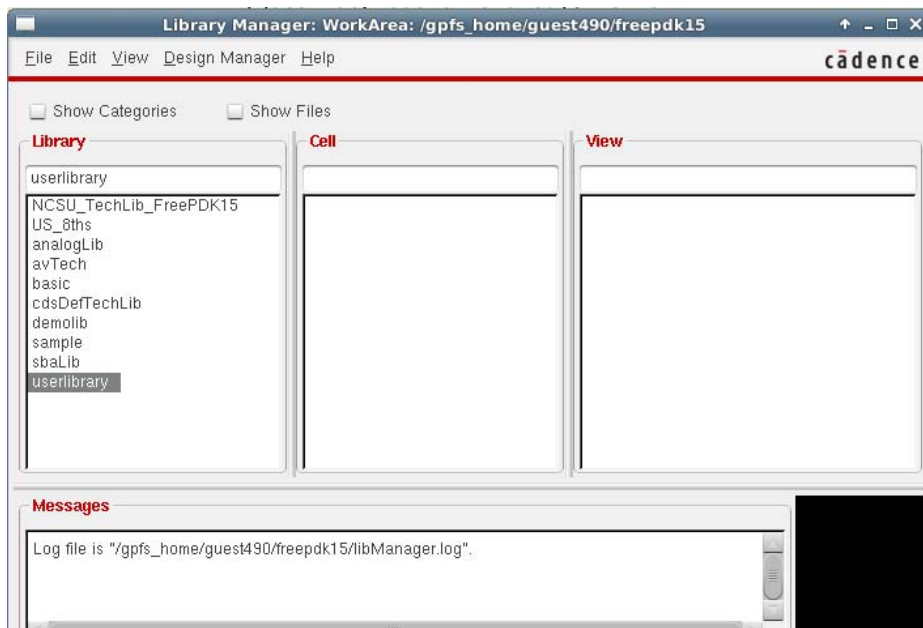
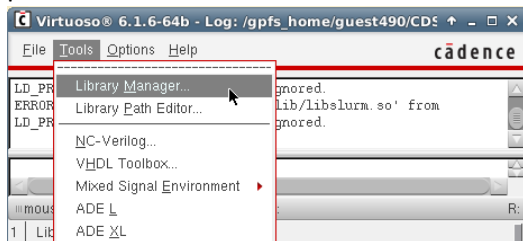
> cd ~
> module load cadence
> cadence_freepdk45

```

In a minute or so you should see a Cadence splash screen and then the Virtuoso command window should appear:



Open the menu Tools ... Library Manager to see the design libraries. This will often be your starting point.



Pay attention to the libraries.

basic and **analogLib** have useful generic parts for you to use.

NCSU_TechLib_FreePDK45 is the freepdk45 technology library and has all of the transistors you will use.

demolib has some examples for you to look at.

userlibrary is your personal design library, located in your ~/freepdk45/userlibrary/ directory. This is where your new designs should go. (You can also create new libraries if you like, but this is not necessary until you have large designs that need better organization.)

If you ever create a new user library, you can also attach the technology when you create it. When prompted, choose Attach to an Existing Technology. If you forget to do this, just attach the technology as above.

That's all for connecting and initial setup! Time to move on to the schematic and simulation tutorials.