Cadence Virtuoso Setup Guide

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Abstract

This document provides step-by-step instructions for MSU engineering students to setup and run *Cadence Virtuoso Custom IC 6.1.x.* This tutorial is intended for ECE students enrolled in ECE410, ECE412, ECE813, or ECE832, however, anyone in engineering can follow it to achieve the same goal.

Contents

1 Quick Setup

The steps below should be executed in **order**:

1. Connect to any EGR server [refer to section 4].

2. Change to the directory where you want/have your Cadence Virtuoso files [refer to section 5] e.g. type `cd /egr/courses/personal/`***COURSENAME*** `/` ***USERNAME***

3. Launch Virtuoso by typing `source $SOFT/cadence-auto virtuoso` [refer to section 6]

2 Introduction

Cadence Virtuoso is a software suite targeting custom IC designers. It provides schematic capture, layout editor, various circuit simulators, and many other features for analog and mixed signal designs.

3 Prerequisites

- Active EGR account.

- Sufficient disk space.

- A workstation running MS Windows with Putty and Xming installed. Mac OS X and Unix variants should already have X11 and ssh, so users will not need to install extra software.

- A server running GNU/Linux from DECS. ATTOW, you can use *sati, byron, brock, rusty*, etc.

4 Connecting to a Server

Everytime you want to use *Cadence Virtuoso* you have to connect to one of the DECS servers. ECE students should use the designated lab assigned to their course or any of the public Windows EGR labs in EB then follow the instructions in subsection 4.1.

4.1 MS Windows

The EGR labs already have the required software installed. ECE students should first run **Xming** then **Putty** as shown in figure 1. After running Xming you should see Xming's icon in the "tray" beside the clock.
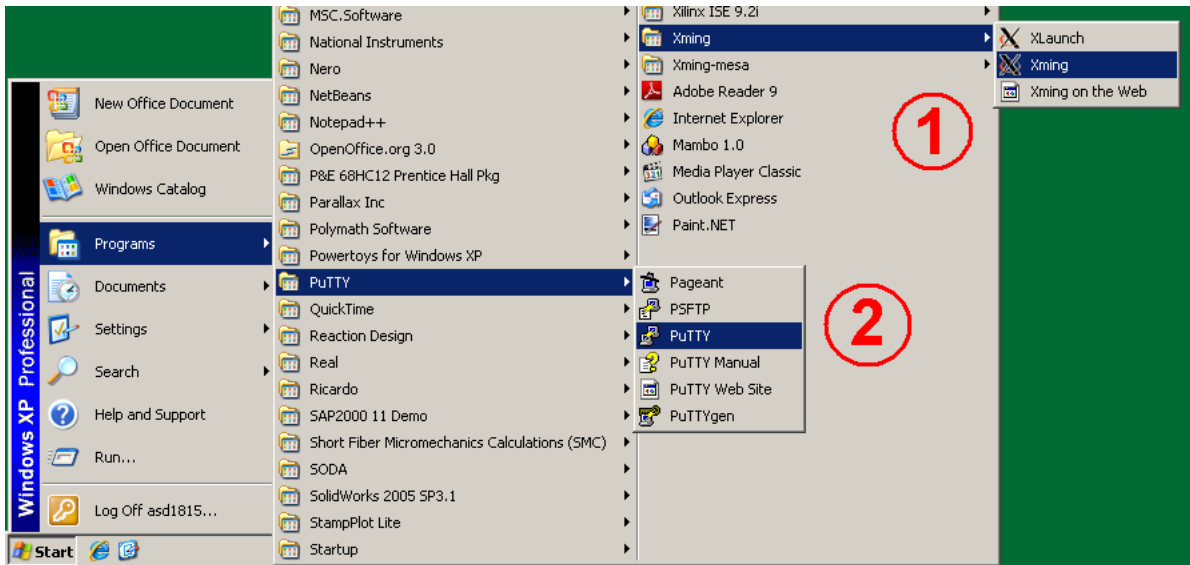

Figure 1: Starting Xming then Putty in MS Windows XP

Using Putty you can connect to a server by typing the name in the "**Host Name**" text box as highlighted in figure 2. In this guide we chose to use **rusty**.
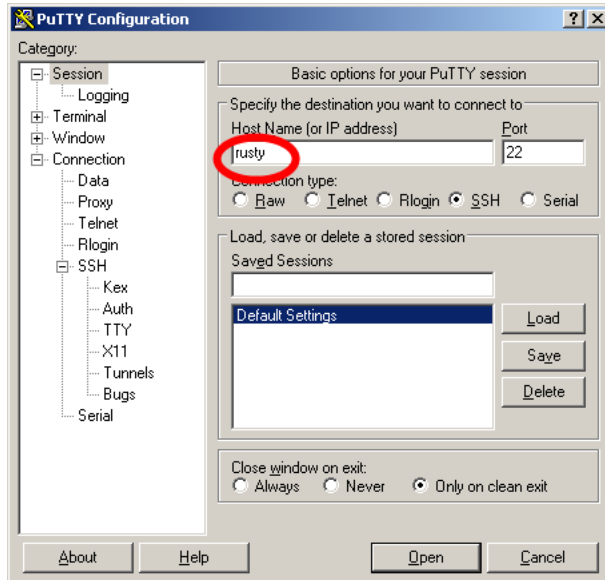
Figure 2: Connecting to rusty

Before openning a connection to the server you have to make sure that X11 forwarding is enabled in Putty. So, on the left side menu go to **Connection⇒ SSH⇒ X11** and make sure that "**Enable X11 forwarding**" is checked, as seen in figure 3. Once you verify these settings you can connect to **rusty** by clicking on "**Open**". Also, you can save these settings for the future by going back to **Session** menu and typing the name of the session then clicking on "**Save**".
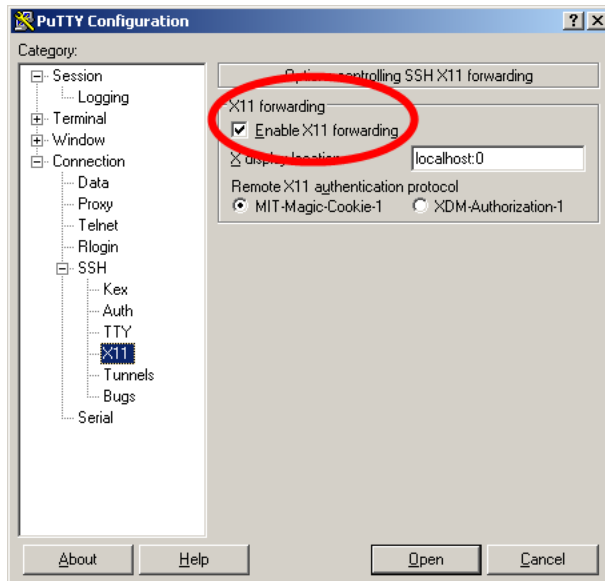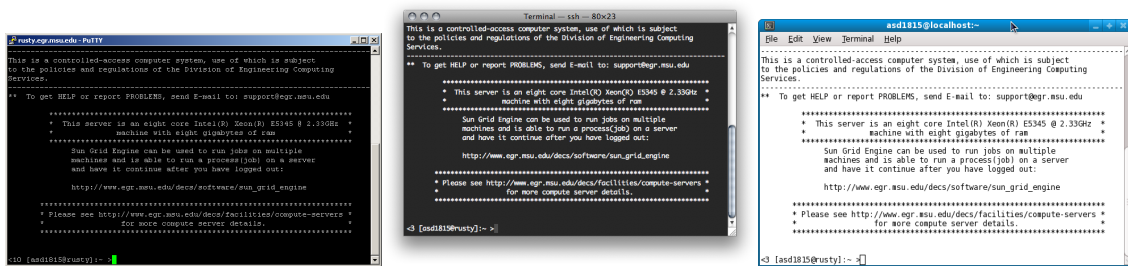

Figure 3: Enable X11 Forwarding

4.2 Mac OS X

If you are using Mac OS X 10.4 (Tiger) or above you should have X11 pre-installed on your Mac. To connect to a server: Go to **Finder**⇒ **Applications**⇒ **Utilities** then run **Terminal** and type the following command ssh -X *USERNAME*@rusty
where *USERNAME* is your engineering username and *rusty* is the server you want to connect to.

4.3 Unix Variants

Users running Unix variants like GNU/Linux Fedora, Ubuntu, or FreeBSD can connect to any of the servers using their favorite console application then running ssh -X *USERNAME*@rusty
where *USERNAME* is your engineering username and *rusty* is the server you want to connect to.

4.4 Successful Connection

A successful connection is established when you see the command prompt as shown in figure 4

(a) Windows successful connection (b) Mac OS X successful connection (c) Fedora successful connection

Figure 4: Command prompt for several operating systems

5 File System

Before running Virtuoso you have to make sure that you have enough disk space as well as the correct file system setup. The directory where you start Virtuoso will contain all library files, startup files, editor environment and settings, simulation data, etc. Therefore, you **have to run Virtuoso in the same directory each time you want to use it**.

5.1 ECE Students

ECE students enrolled in ECE410, ECE412, etc should use this directory to start Virtuoso
 /egr/courses/personal/*COURSENAME*/*USERNAME*/ . For example, if your username is *asd1815* and you are enrolled in ECE412 then **before** you start Cadence Virtuoso you **have** to change to the correct directory in the file system by typing
 cd /egr/courses/personal/**ece412**/**asd1815**/ . Note that once the course ends these files will be

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deleted. So, if you are going to use them beyond the course make sure that you have a copy/backup before the end of the semester.

5.2   Other Students

Other students who have an EGR account can use their Home Directory, however, it is highly recommended that you don't run long simulations that can use up all your quota. If you need to run such simulations then use the "scratch" directory e.g. /egr/scratch/**USERNAME** . Note that EGR periodically deletes any file in scratch older than 3 days.

6   Running Virtuoso

Once you have decided which directory you want to run Virtuoso in and store all related files as described in section 5, you can load the Cadence environment, NCSU CDK libraries, and start Virtuoso simply typing:
source $SOFT/cadence-auto virtuoso this command will copy the required environment files, simulator model paths, and cds.lib then it will launch Virtuoso. if you just want to load the environment without launching Virtuoso just type source $SOFT/cadence-auto .

For EGR students who don't want to load/copy any extra files or want to load their own CDK/PDK type source $SOFT/cadence then run Virtuoso as usual by typing virtuoso & .

After running Virtuoso you should see two screens. A CIW screen as shown in figure 5 and the Library Manager as depicted in figure 6. Please verify that you have NCSU_Analog_parts and NCSU_TechLib_ami06 otherwise your setup was not successful.
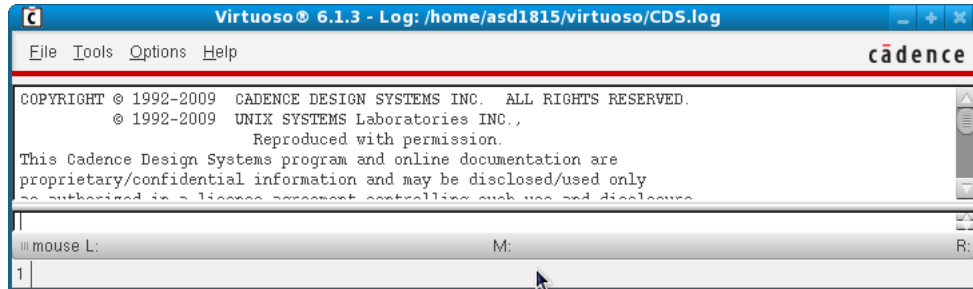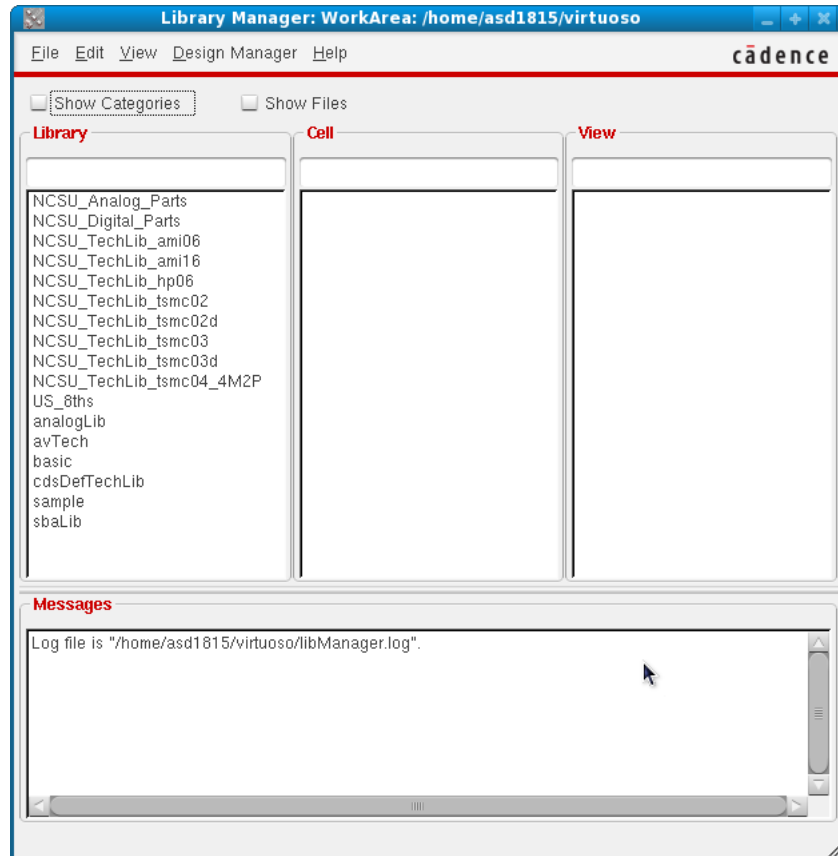

Figure 5: Virutoso CIW Window

Figure 6: Virtuoso Library Manager

7 Troubleshooting

- I get an error "**bash: setenv: command not found**" when I *source* the environment file.

  – Make sure that you are running *tcsh* shell not *bash*, so just type `tcsh` before sourcing or contact support to change your shell perminantly.

- I accidently deleted my .cshrc file! What should I do?

  – To update/restore your dotfiles type `/opt/bin/newdots`

- When I run Virtuoso it fails with this error:
  WARNING* X Window Display Initialization failure
  WARNING* (DISPLAY not defined)

  – If you are running on Windows make sure you that Xming is running and preferably run it before Putty. If you are running on a Mac or Unix then verify that you pass -X when running ssh e.g. "ssh -X"