



ECE 429 Laboratory 1

Setup, Basic UNIX

(Report is not required for lab1, but please sign a signing sheet in the lab.)

Announcements:

1. Teaching Assistants

Lab-1: Yunlong Zhang (yzhan167@hawk.iit.edu), Office Hours: 11:30 AM. - 1:30 PM. at SH309 on Mondays

Lab-2 &3: Shuai Li (sli97@hawk.iit.edu), Office Hours: 11:30 AM. - 1:30 PM. at SH309 on Fridays

2. Time Frame for Lab-01

- In-Class students
 - ECE-429-01 (Monday 1:50 - 4:30 PM.) -09/14/2015
 - ECE-429-02 (Wednesday 6:25 - 9:05 PM.) -09/09/2015
 - ECE-429-03 (Friday 1:50 - 4:30 PM.) -09/11/2015
- Internet Students
 - For main campus students, Lab report due is one week from each Lab Session (For example, if you conduct the Lab-1 on 9/9, then, report due is next week on 9/16)
 - For internet students, every Wednesday is your report due.

3. Account Administrator

If you have account issues or remote access problems, please contact Mr. Upendra Gandhi (support@ece.iit.edu).

1. Introduction

Welcome to ECE 429!

This document presents a preliminary laboratory which prepares you for a semester full of work. There is no VLSI design material introduced in this lab. It will help you to understand the whole lab system and to verify your lab setup before the busy semester starts. It also contains information that you may want to reference later in the semester. For example, it contains a list of various Unix commands and tools that would be used frequently.

All the labs and projects should be done individually. Discussions are encouraged. However, all the writings and screenshots should be by yourself. COPY without proper



CITATION will be treated as PLAGIARISM and called for DISCIPLINARY ACTION. NEVER share your writings/screenshots with others. The requirement of the lab /project reports with a template can be found on the Blackboard (blackboard.iit.edu). We prefer to receive reports electronically as either .pdf or .doc files through the Assignments section on the Blackboard.

2. Setup of the ECE User Accounts

If you have registered for this course, an account on the ECE UNIX network has been created for you. Your *login name* is assigned with 1-character representing your first name concatenated up to 7-characters of your last name. If your name is Albert Einstein, then your login name is 'aeinstei'. The password will be ss concatenated with the last four digits of your ID. For example, if your ID is 123-45-6789, then your password is ss6789. If you already have an account on the ECE UNIX network, you must use your pre-existing user name and password. If you have forgotten your password, please contact the system administrator at ugandhi@ece.iit.edu.

All of the laboratories will be held in the VLSI workstation laboratory, in Siegel Hall 310A. All of the machines in this room are SUN workstations. Therefore, you will have to learn UNIX to use them efficiently. All workstations can be accessed via the internet using programs such as *ssh*, however, a program to handle communication between the MS-Windows and UNIX operating systems is needed. This can be Xwin32, Cygwin installation or VNC viewer. The hostname for the remote connection is 'uranus.ece.iit.edu' or 'saturn.ece.iit.edu'. Unix workstations in the lab are only accessible from the ECE Department. You may consult web page at <http://www.ece.iit.edu/ecesysdocs/> to obtain more information how to login via a PC.

In order to login to ECE lab or establish a remote connection (using **uranus** or **saturn** servers) note that the user accounts were created as follows:

Username: First name initial + up to 7 letters of last name

Password: ss + last 4 digits of CWID

After you login to ECE lab system, you can use Firefox (Applications > Internet > Firefox) for internet access, and Linux terminal for doing your lab work. You can open a terminal by clicking the right key of your mouse on the Desktop, and then select "Open Terminal".

To do list:

- Change your password. Please just use "passwd" command in terminal to change your password as follows:

username@host:~% passwd

current password:



new password:

re-enter new password:

- Get familiar with Linux commands and tools. Please refer to lab instruction Section 4. If you are not familiar any text editor in Linux, I highly recommend “gedit”. It is a simple text editor similar to Notepad in Windows. To use “gedit”, just type “gedit filename” in the terminal. It will open “filename”, if that file already exists, otherwise, it will create a new file for you.
- Setup your remote access. You must setup your remote access because you will need extra time for your lab work. Please refer to <http://www.ece.iit.edu/ecesys-docs/> for detailed instruction of remote access from your laptop. You should use method (8) if you are using a Windows computer. There are two ECE servers for this course: uranus and saturn. Their IP addresses are ‘**uranus.ece.iit.edu**’ or ‘**saturn.ece.iit.edu**’.

Besides, you may also need to install the file transfer tool WinSCP or Filezilla to be able to transfer tools from the lab server and your computer. Please refer to the lab instruction Section 4.4.

The laboratory will be only opened if there is a TA or lab monitor available. It should be open most weekdays, however, during the weekend it might be closed. Special arrangements might be made if asked in advance. You may also access any of the workstations in our ECE network via any PC.

3. Basic UNIX

The operating systems used on the machines within the ECE UNIX network are UNIXlike systems, among which most are Linux desktops and Solaris from Sun Microsystems. The default shell is `csh`. Other shells may be invoked if typed at a prompt. The default directory after logging in is your home directory, also represented by `~`. Your home directory is mounted through NFS (Network File System) to all machines. This means that your files will be accessible on any ECE machine that you log into.

3.1 Basic Commands

The following are a list of basic commands that help you to organize and to process your files. Words in bold font are commands you need to type exactly. However, words in italic font are to be substituted with appropriate words for your intended purpose and words within brackets `[]` are optional.

- **ls** [directory]
List the content of a given directory. If no directory name is supplied, the content of the current directory is listed.



- **cp** source-file target-file
Copy the source-file to a new file named target-file. That is, an exact duplicate of source-file is created with the new filename as target-file.
- **mv** old-filename new-filename
Move or rename the old-filename to a new file named new-filename.
- **rm** trash-file
Remove or delete the unwanted trash-file. ONCE A FILE IS DELETED IT CANNOT BE RESTORED. BE VERY CAREFUL WITH THIS COMMAND.
- **mkdir** new-directory
Make or create a new subdirectory name new-directory within the current directory.
- **cd** [directory]
Change the current directory to the given directory. If no directory is supplied, the current directory will be changed to the users home directory.
- **rmdir** trash-directory
Remove or delete the unwanted trash-directory. Please note that there must be no files left in the subdirectory, before rmdir will work correctly.
- **lp** print-filename [-d printer]
Print the file print-filename to the specified printer. If no printer is specified, the file will be printed to the default printer.
- **man** command
Show the manual (man page) of the command. This is the UNIX equivalent of online help, and is extremely helpful. For example, **man ls** would supply you with the manual page for the UNIX command ls.

These are just a few UNIX commands you need to get started. You are encouraged and advised to learn other UNIX command on your own as proficiency in additional UNIX commands will increase your productivity, i.e. the more you know, the more efficient you will be. Please use a search engine in the Internet for ‘UNIX Basics’ or ‘UNIX Tutorial’ to get more information about UNIX and practice in the lab.

3.2 Text Editors

You will need to be proficient in at least one text editor. Currently, there are multiple text editors being supported, namely emacs, vi, and gedit. While the first two are very powerful and are used by most professionals, they require weeks to learn so the last one, gedit, is recommended if you don’t have any previous experience with emacs or vi. It is a simple text editor similar to Notepad in Windows. To use ”gedit”, just type ”gedit filename” in the terminal. It will open ”filename” if that file already exists, otherwise, it will create a new file.



Please note that a text editor is not a word processor. A text editor only creates ASCII text files which you will need in this class. Again, mastering the use of one text editor will increase your productivity and save you time.

Once you mastered how to use a text editor, there may be certain commands you would like to add to the shell environment and run them every time you log in. This can be accomplished by adding items to your `.cshrc` file which is in your home directory.

3.3 Graphical User Interface

Many EDA tools require the use of graphical user interface (GUI). GUIs are available on all ECE machines either in SH 310A or remotely. There are many methods to access the GUI remotely as seen at: <http://www.ece.iit.edu/ecesysdocs/>.

In particular, we recommend (8) VNC using Microsoft Remote Desktop Connection for Windows. Past experiences show this method is the best one when the network setup is complicated (e.g. with firewalls) and when the network connection is slow and unreliable (e.g. when you are traveling).

Depending on the choice of GUIs, when you need the access to the UNIX command window, look for applications with the name “console” or “terminal”. For example, you can bring up the command window by right-clicking the desktop and then selecting Terminal.

3.4 File Transfer

At times, you may want to transfer files between your computer and the ECE machines for purposes like report writing and easy text editing. Since file transfers are directly supported through the SFTP protocol on the ECE machines, what you need is a SFTP client on your own computer. For Windows systems, you can install WinSCP (<http://winscp.net>); for other systems, usually the SFTP client is available as the program `sftp`.

3.5 Screenshots

Although many tools allow you to save or print your drawings or waveforms, occasionally you may need to capture the whole screen or a single window. Depending on the choice of GUIs, there are tools/hot-keys available for such purpose. On the other hand, if you are accessing the GUI remotely through VNC, the screenshot capability of your own computer may be utilized.



4. Help

If you need help, please feel free to contact the lab TAs and Professor. A very important piece of advice is to backup often.

One of the big problems with many of the tools we will be using is they consume disk space. This may or may not be a problem. However, if you are nearing your disk quota and you exceed this value, your design will probably bite dust. Therefore, please check your quota and backup often. To check your quota, the following command will work:

quota -v

Another suggestion is to communicate between your peers. Do not ask for answers directly, however, ask for advice or suggestions to get through a problem that perhaps they have encountered. Your peers are your greatest asset.