
ELEC 401

Session 1

Introduction





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Specializing in CMOS Circuit Design for High-Frequency Wireless/Wireline Communications



Session Details:

Wednesdays 1pm–2 pm, MCLD 2018



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Tutorials

Goals:

- Part 1. Support for course material, assignments, and questions.
 - Feel free to ask anything: concepts, assignments, projects.
 - Office hours before midterm and final.
 - Piazza
- Part 2. Cadence – IC Design Software tutorials:
 - Industry standard for IC design; the most expensive software
 - Essential for your final design project

Transistor

Light Bulbs:

https://www.youtube.com/watch?v=FU_YFpfDqqA

Transistor: invention

<https://www.youtube.com/watch?v=OwS9aTE2Go4&t=89s>

How does a transistor work?:

<https://www.youtube.com/watch?v=lcrBqCFLHIY&t=117s>

Analog computing: future of a real AI

<https://www.youtube.com/watch?v=GVsUOuSjvcg>

Cadence

Goals:

- Access to the UBC ECE SSH server through VPN and X2GO.
- Linux Mini Tutorial.
- Launching Cadence.

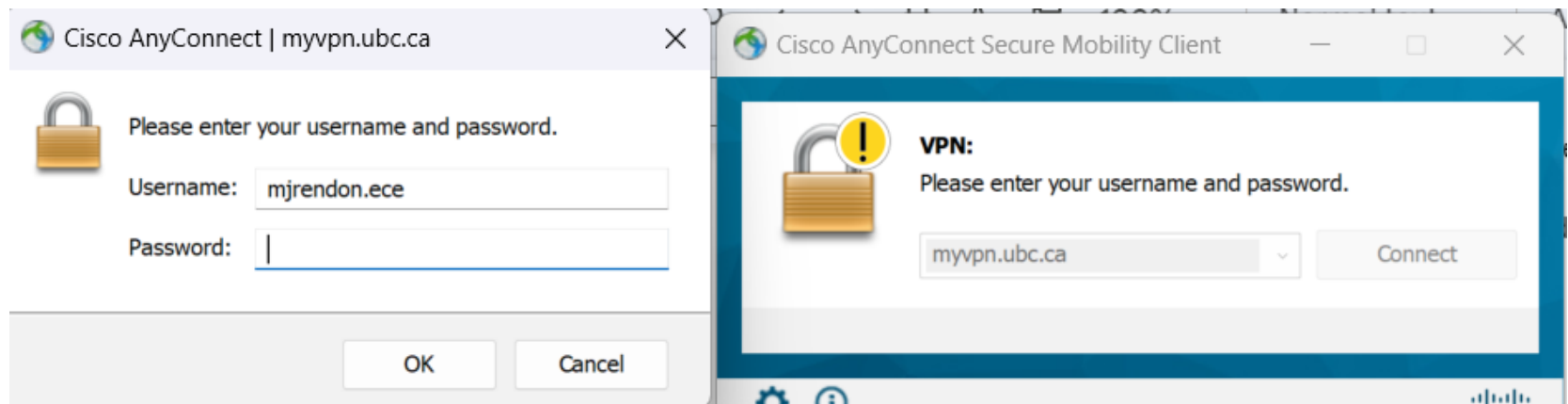


Access to the UBC SSH Server

- **Key resources:**
 - ***AnyConnectVPN:***
 - Official Help ECE UBC [Tutorial](#).
 - Or X2GO proxy option.
 - ***X2GO:***
 - Official Help ECE UBC [Tutorial](#).
 - If the download blocked by the Chrome, just click on the keep the files in the downloads tab.

Access to the UBC SSH Server

- **1 - AnyConnect VPN**
 - Needed to avoid being blocked by the ECE firewall.
 - For access to the ECE VPN contact it@ece.ubc.ca and specify:
 - Download Cisco ACWL username.
 - Affiliation with ECE.
 - AnyConnect VPN client from <https://myvpn.ubc.ca>.
 - To connect:
 - The username is <CWL.ece>
 - The password is the same as your CWL.



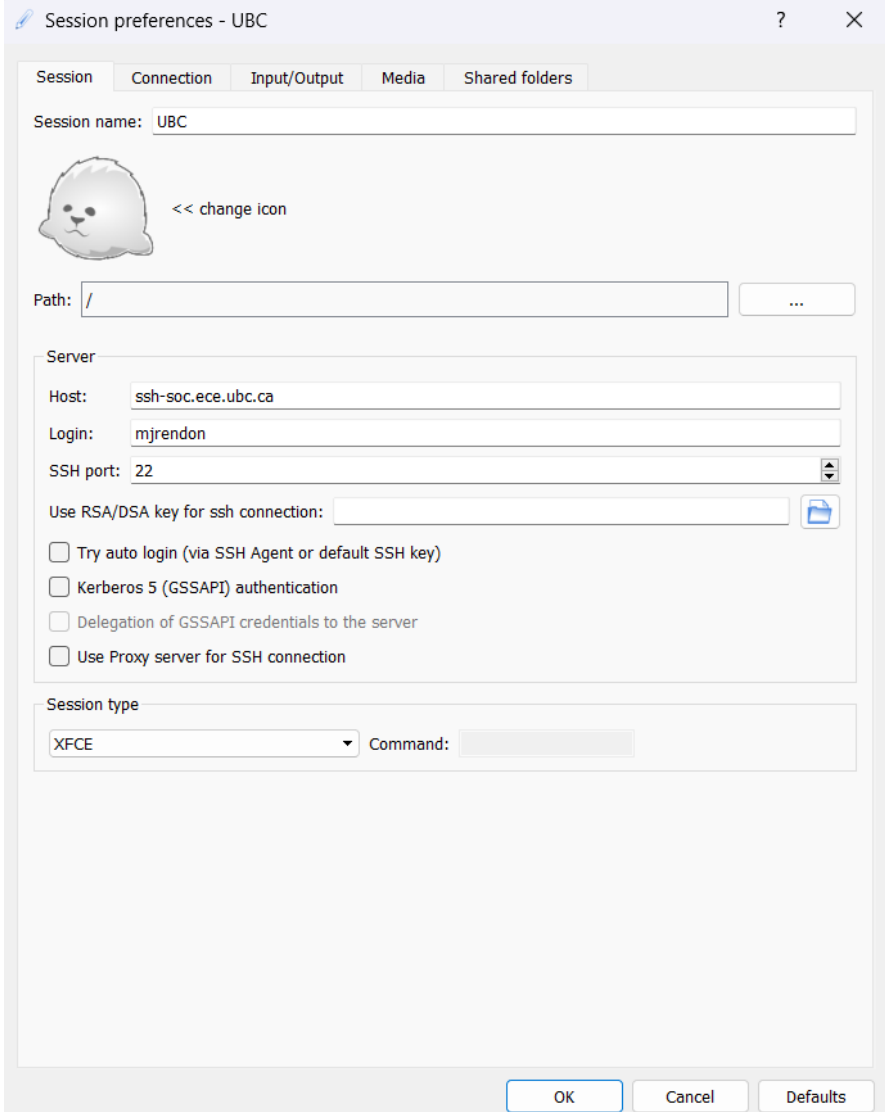
Access to the UBC SSH Server

- **2 - X2GO**

- macOS users should download XQuartz (see official UBC tutorial).

- **Steps:**

- Download X2GO Client (see official UBC tutorial for links)
- Install X2GO Client.
- Configure a new X2GO Session.
- Once configured, click on the seal and login with you **ECE CREDENTIALS** (Not your CWL credentials).
- For proxy use: click on use proxy check box and fill



The screenshot shows the 'Session preferences - UBC' window. It has tabs for 'Session', 'Connection', 'Input/Output', 'Media', and 'Shared folders'. The 'Session' tab is active. The 'Session name' is 'UBC'. There is a seal icon with the text '<< change icon'. The 'Path' is '/'. The 'Server' section contains: 'Host: ssh-soc.ece.ubc.ca', 'Login: mjrendon', 'SSH port: 22', and a field for 'Use RSA/DSA key for ssh connection:'. Below these are four unchecked checkboxes: 'Try auto login (via SSH Agent or default SSH key)', 'Kerberos 5 (GSSAPI) authentication', 'Delegation of GSSAPI credentials to the server', and 'Use Proxy server for SSH connection'. The 'Session type' is set to 'XFCE' in a dropdown menu, and the 'Command' field is empty. At the bottom are 'OK', 'Cancel', and 'Defaults' buttons.

Access to the UBC SSH Server

- **2 - X2GO**

- It is recommended to change the shell of your ECE account from bash to tcsh through this [link](#).

Unix	
Username	mjrendon
User ID	2 [REDACTED]
Group ID	6 [REDACTED]
Home directory	/ubc [REDACTED]mjrendon
Login shell	<input type="text" value="/bin/tcsh"/> <input type="button" value="Change Shell"/>

- **Additional Information:**

- If you need to exchange files between your Windows/macOS and the ECE Server, follow this [tutorial](#).

Access to the UBC SSH Server

- **2 - X2GO**
 - Instead of using AnyConnect for remote connection, click on use proxy check box and fill it as follows.

Session preferences - ssh-server-ubc

Session name: ssh-server-ubc

Path: /

Server

Host: ssh-soc.ece.ubc.ca

Login: bjafari

SSH port: 22

Use RSA/DSA key for ssh connection:

☐ Try auto login (via SSH Agent or default SSH key)

☐ Kerberos 5 (GSSAPI) authentication

☐ Delegation of GSSAPI credentials to the server

☒ Use Proxy server for SSH connection

Proxy server

Type: ☒ SSH ☐ HTTP

Host: ssh-soc.ece.ubc.ca

Port: 22

Login: bjafari

Same login as on X2Go Server ☐

Same password as on X2Go Server ☐

RSA/DSA key:

☐ SSH Agent or default SSH key

☐ Kerberos 5 (GSSAPI) authentication

Session type

XFCE

Command:

OK Cancel Defaults

Linux Mini Tutorial - Paths

- In Linux, the most important thing is to navigate through directories.
- **Directories** end with a "/" while **files** do not.
- Each directory (similar to a folder) and file is described by a path.
 - **Absolute paths** start with "/" from the root directory
 - **Relative paths** start with "./" from the current directory.
- The two most important directories are the following:
 - "." **current** directory
 - ".." **upper** directory
- Some commands have flags "-" next to them.
- Use the TAB button to autocomplete commands, filenames, and paths.

Linux Mini Tutorial - Navigation

- `pwd`
 - Shows the current working directory
- `ls`
 - Displays the contents of the current directory
 - It hides contents beginning with "."
- `ls -la`
 - Displays all the contents on a list format
- `cd <directory_path>`
 - Changes the directory to `<directory_path>`
 - Similar to going to another folder
 - For example, "`cd ..`" returns to the upper directory

Linux Mini Tutorial - Directories

- `mkdir <directory_name>`
 - Creates a new directory with the name of `<directory_name>`
 - You can create multiple directories at the same time, just keep adding the paths of the new directories
- `cp -r <source1> <source2> <source3> ... <destination>`
 - Copies the directories `<source1> <source2> <source3>` to `<destination>`
 - The "-r" flag is needed to recursively copy all of the contents inside the source directories
 - You can copy multiple directories but the last path will always be the destination
- `rm -r <source1> <source2> <source3> ...`
 - Removes the directories `<source1> <source2> <source3>`
 - The "-r" flag is needed to recursively remove all the content inside the directories
 - You can delete multiple directories at the same time
- `mv <source> <destination>`
 - Moves the directory `<source>` to `<destination>`
 - Can also be used to rename the `<source>` directory

Linux Mini Tutorial - Files

- `touch <filename.extension>`
 - Creates a file of any extension
- `cp <source1> <source2> <source3> ... <destination>`
 - Copies multiple files to a single destination
- `rm <source1> <source2> <source3> ...`
 - Removes multiple files
- `mv <source> <destination>`
 - Moves files from the <source> to the <destination>
 - Can be used to renamed the <source> file
- `cat <filename>`
 - Displays the contents of a file
- `source <filename>`
 - Runs the contents of a file
- `vim <filename>`
 - Text editor to edit files

Linux Mini Tutorial - Vim

- Press `"i"` to enter "insert mode" where you can write and delete text in your file.
 - - A "-- INSERT --" message will appear.
 - - Use ESC to exit insert mode.
- `/<term>`
 - - Highlights all the instances of `<term>` inside the file.
 - - Use `"N"` to go to the next instance and `"SHIFT + N"` to return to the previous instance.
- `u`
 - - Undoes work you have done on the file.
- `:set number`
 - - Displays the line numbers at the left of the file.
- `:w`
 - - Saves the file.
- `:q`
 - - Quits and exists VIM.
 - - Only works if the file has been saved.
 - - Use `":q!"` to quit and avoid saving changes.
- On `cs`h files:
 - `echo "text"` displays text when sourcing

How to run Cadence and 45nmGPDK

- In your home directory, create a new folder (e.g., ELEC401), then run the terminal by right clicking on the screen.
 - Run this script: `source /CMC/scripts/kit.gpdk45_OA.csh`
 - A message like this will show up:
`virtuoso -log /ubc/ece/home/sm/grads/bjafari/CDSlogs/53282 &`
 - Copy/paste and run it to launch the cadence.
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- These are basic cadence tutorials. Do an inverter simulation by yourself. If you have any problem, we will discuss in the next TA class session.

https://www.youtube.com/watch?v=u0WgSMa1hrc&list=PLK2eyR1C9gjr7j-YoL_-JwJmjU6INZGTO&index=1

https://www.youtube.com/watch?v=IGcHR1I17ok&list=PLK2eyR1C9gjr7j-YoL_-JwJmjU6INZGTO&index=2