

This document provides insights into three distinct approaches for socket programming.

- I. [Using IDE's](#)
- II. [Using SCU Design Center Linux host](#)
- III. [SSH to SCU Design Center VM](#)

I. Using IDE's for development

Mac Users can use **Xcode**, Linux users can use **Eclipse**, windows users can use **Visual Studio** for socket programming. Please refer this document for further details:

<https://web.eecs.umich.edu/~sugih/courses/eecs489/common/notes/ide/> (Step by step pictures included on how to use the IDE's)

Using Oracle VirtualBox for Linux on Windows:

Download virtual box here to use Linux on windows: <https://www.virtualbox.org/>

Socket Programming: http://www.linuxhowtos.org/C_C++/socket.htm

II. How to connect to Design Center (Linux host) for windows users

Pre-requisites for remote access

1. Duo

You will need to have Duo set up. If you already have Duo set up, skip to step 2. If you do not have Duo set up yet, follow the instructions in the .

2. VPN

Connect to the VPN before you remotely access the ECC. If you do not have the VPN set up yet, refer to the VPN installation document.

Install NoMachine Enterprise Client software

1. Download the NoMachine Enterprise Client software on the computer you're connecting from
"<https://downloads.nomachine.com/>"
2. Navigate to the folder where the application is downloaded in. Right click on the executable file and click on Run as administrator.
3. On the welcome screen, click "Next."
4. Review the terms and conditions, accept the license agreement, and click "Next."

5. Choose the preferred installation location for the application. Installation might take a moment to complete.
6. Restart your machine to complete the installation.

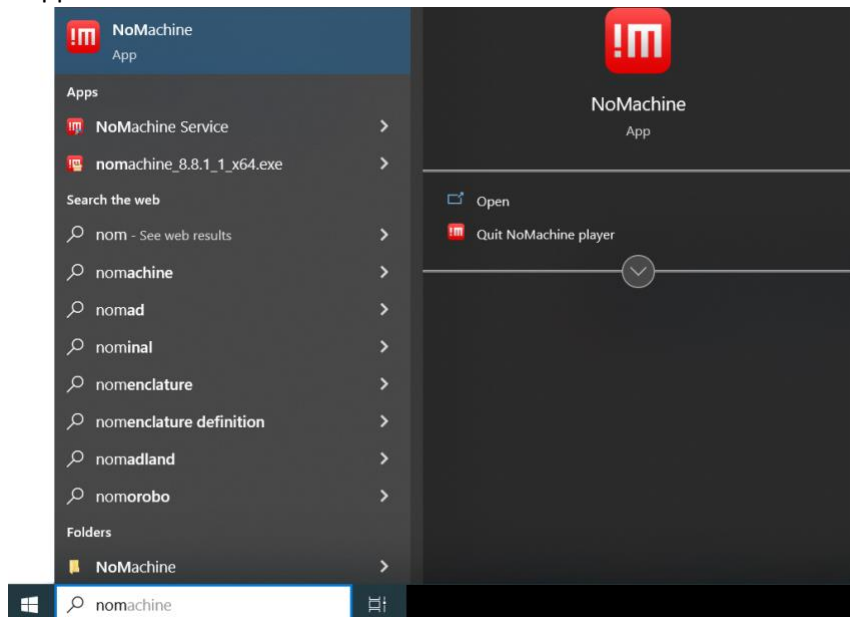
Download Linux NX for NoMachine

1. To download the connection file open "<https://quota.engr.scu.edu/nx/ECC-NX-Linux.nxs>" in browser.
2. Sign in with your SCU username (SCU Gmail without the @scu.edu), then enter your SCU password to access and download this file
3. Save the file somewhere easy to remember (like your Desktop or Documents folder)
4. Navigate to the folder where the application is downloaded in. Double-click on the ECC-NX-Linux.nxs file you saved
5. On your first connection, you will be prompted to trust the key of the NX server

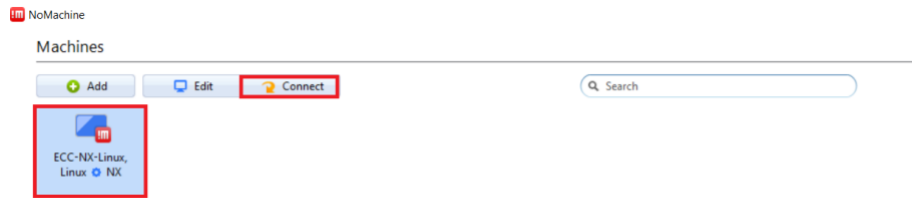
This opens **NoMachine Enterprise Client**, follow the "[Connecting to NoMachine](#)" steps to access the Linux client.

Connecting to NoMachine

1. Open NoMachine application

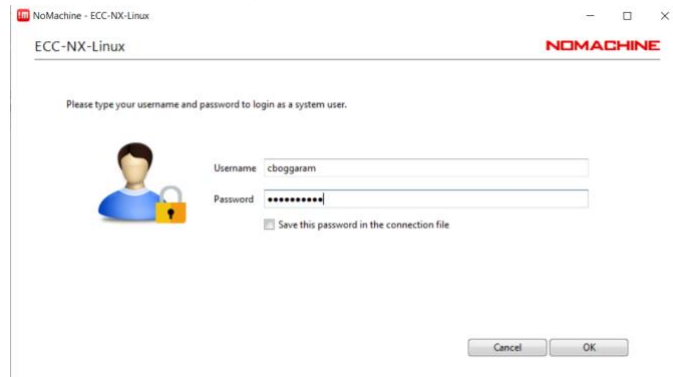


2. Click on "ECC-NX-Linux, Linux NX" as shown below and click on Connect



The first time you connect, you might receive an alert. Click "Ok" to proceed.

3. Enter your credentials (SCU ID and Password), and then click "Ok."



4. Click on "Create new virtual desktop" and configure all the required settings.
5. On your first connection, NX will display up to three help screens overlaid on top of the Linux desktop, click OK on each to move on
6. When the desktop is displayed, it may be smaller or larger than desired, simply resize the NX window to the size you want and wait for the Linux desktop to resize itself to match.

In case the display remains too small or is cut off:

- i. Move your mouse to the upper-right corner of the NX window (where the Linux date/time display is located by default).
- ii. An animation resembling a page folding down will appear. Click on it.
- iii. Choose "Display.", Click "Resize remote screen" to frame it (the "Fit to window" option will become inactive).
- iv. Click "Done" twice.

7. The Linux desktop should now auto-size itself to fit in your NX window.

NOTE: Before finalizing the process, it's a good idea to create a test folder. Close the connection, and then repeat the steps to reconnect. This will help verify if the test folder is visible upon reconnection. If the folder isn't visible, it's recommended to keep a backup copy of your data in the SCU cloud, either on Google Drive or OneDrive. It's always a best practice to have duplicate copies of your data stored in these drives.

III. SSH to Virtual Machine

Pre-requisites for remote access

1. Duo

You will need to have Duo set up. If you already have Duo set up, skip to step 2. If you do not have Duo set up yet, follow the instructions in the .

2. [VPN](#)

Connect to the VPN before you remotely access the ECC. If you do not have the VPN set up yet, refer to the VPN installation document.

Client-side Preparation

Depending on the operating system used on the computer you're connecting from, you may or may not need to install an SSH client first.

Windows 10: Built-in client. Simply use the ssh command from a PowerShell or CMD terminal. (Or download and use PuTTY as described below)

Windows 7 and earlier: No client provided. Download the PuTTY Windows Installer Package

macOS: Built-in client. Simply use the ssh command from a Terminal window.

To access the terminal on macOS, open "Applications" in finder, open the "Utilities" folder, run the "Terminal" application.

Linux: Built-in client. Simply run the ssh command from a terminal.

Connecting to VM through Command-line

Command-line ssh:

```
$ ssh <username>@linux.dc.engr.scu.edu
```

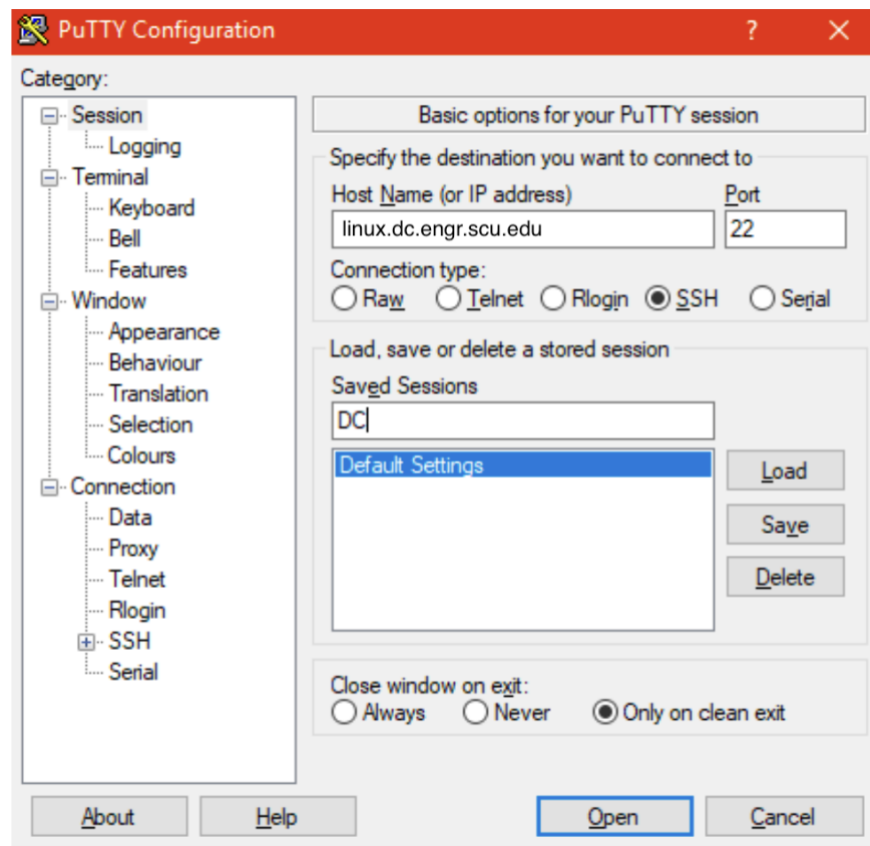
```
<username>@linux.dc.engr.scu.edu's password: <password>
```

NOTE: For <username> you must enter your SCU username (SCU Gmail, without the @scu.edu portion, in all lowercase)

When typing your SCU password, nothing will be echoed to show you're typing, but your keypresses are being registered.

Connecting to VM through PuTTY

1. Download Putty: <https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>
2. Enter Host name: “linux.dc.engr.scu.edu” (without the quotes as shown in image below)
3. Port: 22
4. Connection type: SSH
5. Save the connection for further use: Enter a name in saved sessions and click on save.
6. Use Design Center system credentials to login.
First time users should first login at Design Center, before remotely accessing DC hosts. For more information approach Design Center Help Desk at Heafey.



NOTE: The first time you connect to a host, you will be asked to accept that host's key. Once you do, any future connections to the same host will verify the saved key against the key offered by the host. The point here is to protect you from someone intercepting your connection. If you ever get a warning saying that the host key has changed, do not connect. Instead, contact us and let us know what happened.

Installation and configuration of VPN

1. To download and install the Cisco Secure Client VPN software, open "<https://vpn.scu.edu>" in browser.
2. Enter your SCU username and password, then click "Login."
3. Approve the Duo notification on your mobile device. Refer to the DUO screenshot for guidance.
4. To download the software, click on the "Download" button.
5. Navigate to the folder where the application is downloaded in. Double-click the downloaded file or right-click it and select "Install."

NOTE: You will need administrative access to complete the installation on your computer. If you do not have administrative access, please contact the Technology Help Desk at (408) 554-5700. Please provide your computer name or asset tag number when you call.

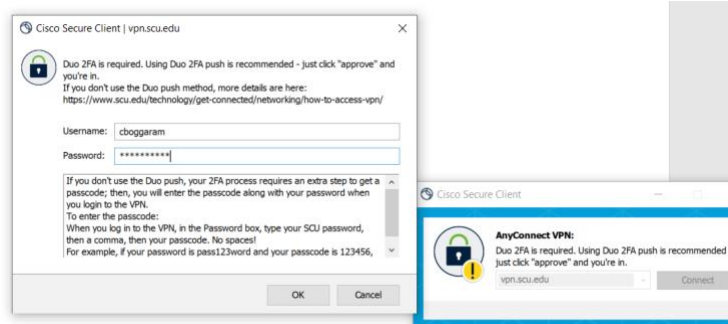
6. On the welcome screen, click "Next."
7. Review the terms and conditions, accept the license agreement, and click "Next."
8. Make sure you have administrative privileges on the machine where you're installing the application. Click "Install."

The installation process might take some time. Confirm the installation prompt by clicking "Yes."

9. Click on Finish to complete the installation.

Connecting to VPN

1. Launch the Cisco Secure Client application.
2. Type "vpn.scu.edu" into the "Connect" box and click on Connect.
3. Provide your SCU username and password.



4. Complete the 2FA (Two-Factor Authentication) procedure in the DUO application.
5. Once approved, your VPN connection will be successfully established.

On a Windows machine, to verify the connection, follow these steps:

1. Click on the upward arrow icon on the taskbar to access the hidden icons.
2. Hover your mouse pointer over the Cisco Secure Client icon.
3. If the connection is established successfully, you should see the status as "Connected."

