

# ECE 2036 Lab 0: Getting PACE-ICE Access and Using the g++ Compiler with Vim

*Category:* Getting Started

*Assigned:* Tuesday January 7, 2020

*Due:* Sunday January 19, 2020

*(Please note that this due date is subject to change depending on pace-ice server issues)*

We suggest that you bring your computer to class and program along with your professor! To this end, we would like for you to use the PACE-ICE system as quickly as possible.

This assignment is very simple. Write a C++ program using the insertion stream operator and escape sequences that outputs the following text to your terminal screen.

```
This (") is a double quote.  
This (') is a single quote.  
This (\) is a backslash.  
This (/) is a forward slash.
```

Your PACE-ICE accounts have already been created. As a part of this assignment, we would like for you to create and run your program on coc-ice.pace.gatech.edu. Please use Appendix A to learn how to gain access to this cluster.

If you are trying to logon off campus, you will need to setup a VPN using CISCO AnyConnect Secure Mobility Client (you can access at the OIT website). Instructions are on the OIT website at Georgia Tech.

## Turn-In Instructions

Please upload your source code (i.e. the text file that contains your program) on the assignment section of Canvas. In the comment section at the beginning of your code please put the following statement:

```
//I,    your name    , have successfully accessed my pace-ice account. I am  
// able to transfer files from my pace-ice account to my local machine using an  
// ftp client. I can use either vim or nano directly on pace-ice.  
// I am ready for the next assignment on pace-ice.
```

## **CREATING AND SUBMITTING LAB0 PROGRAM ON PACE-ICE**

**Creating Source Code.** Once logged into PACE-ICE, you will need to use one of several available text editors found on the PACE-ICE cluster. Those are vi/vim, nano and emacs. Other instructors might recommend that you become familiar with vi (I, on the other hand, will likely use nano). To that end, there are many online tutorials to help you get used to vi. You could get started here:

<https://coderwall.com/p/adv71w/basic-vim-commands-for-getting-started>

**Basic Unix Commands.** Please make a directory (i.e. “folder”) called Lab0 where you keep your files. To make this directory use the following command in your home directory:

```
mkdir Lab0
```

To go into this directory from your home directory, you can use the following command:

```
cd Lab0
```

To get back to your home directory you can use the command:

```
cd
```

**Compiling Source Code.** On the PACE-ICE system we will be using the gnu g++ and gcc compiler. Use the following command to compile your source code and create an executable file called testProgram.

```
g++ testProgram.cc -o testProgram
```

To run your program at the command prompt, type in the executable file name

```
./testProgram
```

**Submitting Assignments.** You will need to submit your SOURCE code on Canvas. You will need to download the SOURCE code from PACE-ICE to your local machine, and then upload to the Canvas assignment. There are instructions in the class slides to help you do this.

The TAs in the class will compile and run your code for grading. Make sure that your code compiles correctly on PACE-ICE. If it does not you could lose up to 30-40 points off your lab!

## Appendix A

### Accessing PACE-ICE Instructions

#### ACCESSING LINUX PACE-ICE CLUSTER (SERVER)

To access the PACE-ICE cluster you need certain software on your laptop or desktop system, as described below.

#### **Windows 10 Users:**

Search on your startbar for the application called Power Shell. Once you launch this you will have a bash window that you can use to access files on your machine AND access the PACE-ICE server. Once you have a command prompt, you can use the following commands.

1. Once you're in the PowerShell, ssh into PACE-ICE by typing:

```
ssh **YourGTUsername**@ coc-ice.pace.gatech.edu
```

where \*\*YourGTUsername\*\* is replaced with your alphanumeric GT login. Ex:  
bkim334

2. When it asks if you are sure you want to connect, type in:

```
yes
```

and type in your password when prompted (Note: When typing in your password, it will not show any characters typing)

3. You are now connected to PACE-ICE. You can edit files using vim by typing in:

```
vi filename.cc          OR      nano filename.cpp
```

For a list of vim commands, use the following link:

<https://coderwall.com/p/adv7lw/basic-vim-commands-for-getting-started>

4. You are able to edit, compile, run, and submit your code from this command line.

## **Windows Users:**

### **Option 0 (Using SecureCRT)**

The Georgia Tech Office of Information Technology (OIT) maintains a web page of software that can be downloaded and installed by students and faculty. That web page is:

<http://software.oit.gatech.edu>

From that page you will need to install SecureCRT.

To access this software, you will first have to log in with your Georgia Tech user name and password, then answer a series of questions regarding export controls.

Connecting using SecureCRT should be easy.

1. Open SecureCRT, you'll be presented with the "Quick Connect" screen.
2. Choose protocol "ssh2".
3. Enter the name of the CoC machine you wish to connect to in the "HostName" box (i.e. *coc-ice.pace.gatech.edu*)
4. Type your username in the "Username" box.
5. Click "Connect".
6. A new window will open, and you'll be prompted for your password.

### **Option 1 (Using Ubuntu for Windows 10):**

Option 1 uses the Ubuntu on Windows program. This can only be downloaded if you are running Windows 10 or above. If using Windows 8 or below, use Options 2 or 3. It also requires the use of simple bash commands.

1. Install Ubuntu for Windows 10 by following the guide from the following link:

<https://msdn.microsoft.com/en-us/commandline/wsl/install-win10>

2. Once Ubuntu for Windows 10 is installed, open it and type the following into the command line:

```
ssh **YourGTUsername**@ coc-ice.pace.gatech.edu
```

where *\*\*YourGTUsername\*\** is replaced with your alphanumeric GT login. Ex: *bkim334*

3. When it asks if you are sure you want to connect, type in:

```
yes
```

and type in your password when prompted (Note: When typing in your password, it will not show any characters typing)

4. You are now connected to PACE-ICE. You can edit files using vim by typing in:

*vi filename.cc*            OR    *nano filename.cpp*

For a list of vim commands, use the following link:

<https://coderwall.com/p/adv7lw/basic-vim-commands-for-getting-started>

5. You are able to edit, compile, run, and submit your code from this command line.

#### Option 2 (Using PuTTY):

Option 2 uses a program called PuTTY to ssh into the PACE-ICE cluster. It is easier to set up, but does not allow you to access any local files from the command line. It also requires the use of simple bash commands.

1. Download and install PuTTY from the following link:

[www.putty.org](http://www.putty.org)

2. Once installed, open PuTTY and for the Host Name, type in:

*coc-ice.pace.gatech.edu*

and for the port, leave it as 22.

3. Click Open and a window will pop up asking if you trust the host. Click Yes and it will then ask you for your username and password. (Note: When typing in your password, it will not show any characters typing)

4. You are now connected to PACE-ICE. You can edit files using vim by typing in:

*vim filename.cc*            OR    *nano filename.cpp*

For a list of vim commands, use the following link:

<https://coderwall.com/p/adv7lw/basic-vim-commands-for-getting-started>

5. You are able to edit, compile, run, and submit your code from this command line.

## **MacOS Users:**

### **Option 0 (Using the Terminal to SSH into PACE-ICE):**

This option uses the built-in terminal in MacOS to ssh into PACE-ICE and use a command line text editor to edit your code.

1. Open Terminal from the Launchpad or Spotlight Search.
2. Once you are in the terminal, ssh into PACE-ICE by typing:

```
ssh **YourGTUsername**@ coc-ice.pace.gatech.edu
```

where **\*\*YourGTUsername\*\*** is replaced with your alphanumeric GT login. Ex:  
bkim334

3. When it asks if you're sure you want to connect, type in:

```
yes
```

and type in your password when prompted (Note: When typing in your password, it will not show any characters typing)

4. You are now connected to PACE-ICE. You can edit files using vim by typing in:

```
vi filename.cc            OR    nano filename.cpp
```

For a list of vim commands, use the following link:

<https://coderwall.com/p/adv71w/basic-vim-commands-for-getting-started>

5. You are able to edit, compile, run, and submit your code from this command line.

## **Linux Users:**

If you are using Linux, follow Option 0 for MacOS users.

## Appendix B

### Transferring files from PACE-ICE to your local machine

#### MacOS or Linux Users:

##### Option 1:

After you open a terminal window you can use the following command at the command prompt. I would encourage you to be in the directory on your local machine that you are transferring files to or from PACE-ICE.

**sftp** [username@coc-ice.pace.gatech.edu](mailto:username@coc-ice.pace.gatech.edu)

After you are logged into PACE-ICE, you can then use the following basic commands to transfer files.

**get filename1.cc**

This command will “get” the file (with name ‘filename1.cc’) from the server and put into your local machine.

**put filename2.cc**

This command will “put” the file (with name ‘filename2.cc’) from your local machine onto the server.

**bye**

This will end your sftp session.

You can also use the following command to manipulate the current directory on PACE-ICE.

**cd directoryName**

This will change the current directory on the server.

**ls**

This will list the current directory files on the server.

**lcd directoryName**

This will change the current directory for your local machine.

## **lls**

This will list the files in the current directory on your local machine.

### Option 2:

From your terminal while logged into to your local machine, you can use the following commands to transfer files or whole directories. You will be prompted to enter your password. Here are a few examples of the command `scp`:

To copy the file 'filename.cc' from your local machine to server (PACE-ICE), assuming you have a directory 'Lab0' on PACE-ICE in your home directory.

```
scp filename.cc username@coc-ice.pace.gatech.edu:Lab0
```

To copy a file from the server's (PACE-ICE) home directory to your local machine's current directory

```
scp username@coc-ice.pace.gatech.edu:filename.cc ./
```

To copy the entire directory 'Lab0' from your local machine to the server (PACE-ICE) Lab1 in home directory (Note that this will overwrite the existing Lab1 on your server).

```
scp -r Lab0 username@coc-ice.pace.gatech.edu:
```

To copy entire 'Lab0' directory from the server (PACE-ICE) to your local machine in current directory. (Note that this will overwrite the existing Lab1 on your local machine).

```
scp -r username@coc-ice.pace.gatech.edu:/Lab0 ./
```

### **Windows Users:**

For Window users, you can use WinSCP application to transfer files from PACE-ICE to your local machine using a simple drag and drop method. You can download the software at the following URL. Instructions are also on this website.

<https://winscp.net>