

# Princeton University

## COS 217: Introduction to Programming Systems

### A Minimal COS 217 Computing Environment

#### **1. Subscribing to the COS217 Account in Piazza**

*One time only...*

- 1.1. Use a Web browser to visit the page <http://www.piazza.com>.
- 1.2. Click on the "Enroll Now" button.
- 1.3. In the resulting "Step 1: Select Your School" Web page, type your Princeton e-mail address, and click on the "Continue" button
- 1.4. In the resulting "Step 2: Join Your Classes at Princeton University" Web page, type "COS 217" and press the Enter key. Then select the "Join as a student" radio button. Near the bottom of the same page fill in the "Confirm your e-mail address" text box. Click on the "Enroll me" button.
- 1.5. Check your Princeton.edu email; you should see a message whose subject is "Welcome to Piazza! You have been enrolled in COS 217 as a student." Open that e-mail, and click on the link that it contains.
- 1.6. In the resulting "Setup Your Account" Web page, click on the "Use the email I have on file" check box. Enter your full name. Please use your real full name; it's much easier to respond to a person we know from our class list than to "xSnookie1746x". Enter a password of your choice, and confirmation of that password. Read the "Terms of Use" and check the check box indicating that you have done so. Click on the "Continue" button.

*Then, throughout the semester, to communicate with the class ...*

- 1.7. Post questions and comments (that comply with the course communication policies) to Piazza via the <http://www.piazza.com/class#cos217> website. Posts will be available to all other subscribers and will be archived and searchable from within Piazza. Remember to check Piazza often, especially while working on assignments and preparing for exams.

#### **2. Activating Your University Computing Account**

*One time only...*

- 2.1. Use a Web browser to visit the page <http://helpdesk.princeton.edu/kb/display.plx?ID=9973>
- 2.2. Perform the five steps listed in the "Next, you must activate your University Computing Account..." section of the page to set your security profile.
- 2.3. In the "After you have activated your account" section of the page, click on the "Enable your Unix account" link.
- 2.4. In the resulting "Unix: How do I enable/change the default Unix shell on my account?" page, click on the "Enable Unix Account" link.
- 2.5. In the resulting dialog box, type your user id and password, and click the "OK" button.

2.6. In the resulting "Update your Unix account" page:

Select the "Enable my Unix account" radio button.  
Click on the "Enable my Account" button.

### **3. Making Bash Your Login Shell**

*One time only, continued from the previous section...*

3.1. In the "Update your Unix account" page:

Under the "Advanced settings" heading, select the "/bin/bash – GNU Bash (/bin/bash)" radio button.  
Click on the "Submit Change" button.  
Wait about 5 minutes for the change to take effect.

### **4. Conducting a Hats Terminal Session**

- *Hats is a cluster of two computers, fez and fedora, that is administered by OIT. Both use Princeton's central file system.*
- *The first time you login to hats, you will be using an impoverished computing environment. Only after you configure the Bash shell (see the "Configuring the Bash Shell" section of this document) will your environment be reasonable.*
- *The local computer communicates with hats via any terminal emulation program that can use the SSH (secure shell) protocol. Two such programs are PuTTY<sup>1</sup> (for MS Windows) and Terminal (for Mac OS X).*

*Repeatedly throughout the semester as required...*

4.1. Option 1: Use a computer running Microsoft Windows.

(Lab computer only) Log into the computer.

In the "Welcome to an OIT Cluster Mac" box, click on the "Windows" icon.  
Type the Control-Alt-Delete key combination.  
In the "Username" text field type your user id.  
In the "Password" text box type your password.  
Click on the right arrow button.

(Your computer only) Install PuTTY.

*If you're using your own computer running Microsoft Windows and did not purchase your computer through Princeton in recent years, then you may need to download and install PuTTY. To do that:*

Use a web browser to visit the page <http://www.putty.org/>.  
Click on the "You can download PuTTY here" anchor.  
In the resulting page, click on the "putty.exe" anchor.  
In the "File Downloading" dialog box, click on the "Save" button.  
In the "Save As" dialog box, choose some appropriate location in your local file system.  
Then launch PuTTY by double-clicking on the putty.exe file via Windows Explorer.

(Lab computer only) Launch PuTTY.

From the "Start | All Programs | PuTTY" menu, click on PuTTY.

(Your computer only) Launch PuTTY.

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<sup>1</sup> See <http://helpdesk.princeton.edu/kb/display.plx?ID=4104> for information on PuTTY.

Using Windows Explorer, double-click on the putty.exe file.

Log into hats.

In PuTTY:

Click on the "Window | Colours" Category, and make sure the "Use system colours" checkbox is checked.

Click on the "Session" Category.

In the "Host Name (or IP address)" text box, type "hats.princeton.edu".

Make sure that the "Port" text box contains "22".

Make sure the "Connection type" radio button panel is set to "SSH".

Make sure the "Close window on exit" radio button panel is set to "Only on clean exit".

Click on the "Open" button.

In the resulting PuTTY window:

In response to the "login as:" prompt, type your user id followed by the Enter key.

In response to the "password:" prompt, type your password followed by the Enter key. (The password will not echo as you type.)

Confirm that the PuTTY window displays a Unix shell prompt.

Use hats via PuTTY as desired.

Log out of hats.

In PuTTY, issue the "logout" (or "exit") command to disconnect the client from hats. (PuTTY will exit automatically.)

(Lab computer only) Log out of the computer.

Type the Control-Alt-Delete key combination.

Click on the "Log Off" button.

#### 4.2. Option 2: Use a computer running Mac OS X.

(Lab computer only) Log into the computer.

In the "Welcome to an OIT Cluster Mac" box, click on the "Mac OS X" icon.

In the Mac OS X window, type your user id and password, and click on the "Log In" button.

(Be patient if a reconfiguration occurs.)

(Lab computer only) Open a Terminal window.

Click on the Terminal application's icon. The icon is a monitor with a cursor. It appears in the dock at the bottom of the screen.

(Your computer only) Open a Terminal window.

Click on the Terminal application's icon. The icon is a monitor with a cursor. You can find the Terminal application's icon in "Applications | Utilities".

Log into hats.

In the Terminal window:

Issue the command "ssh *youruserid*@hats.princeton.edu".

If an SSH-related message appears, type "yes".

Type your password, followed by the Enter key. (The password will not echo as you type.)

Use hats via the Terminal window as desired.

Log out of hats.

In the Terminal window:

Issue the "exit" or "logout" command.

Close the Terminal window.

In the Terminal window:

Issue the "exit" or "logout" command.

(Lab computer only) Log out of the Mac OS X computer.

On the menu, choose "AppleSymbol | Log Out".

Click on the "Log Out" button in the dialog box.

## **5. Configuring the Bash Shell**

*One time only...*

5.1. Log into hats.

5.2. Issue the command "printenv SHELL", and confirm that the output is "/bin/bash". If that is not the case, then redo the steps in the "Making Bash your Login Shell" section of this document.

5.3. Issue these commands to copy reasonable bash startup files to your home directory:

```
cd
cp /u/cos217/.bash_profile .
cp /u/cos217/.bashrc .
```

Note the period at the end of each "cp" command. The period specifies the "working directory" (alias the "current directory") as the destination of the file copy operation. Also note the space immediately preceding each of those periods.

5.4. Suggestion: Use the "cat" command to examine the contents of the .bashrc and .bash\_profile files:

```
cat .bashrc
cat .bash_profile
```

5.5. Log out of hats. The changes will take effect the next time you log in.

## **6. Configuring the Emacs Editor**

*One time only...*

6.1. In a hats terminal session, issue these commands to copy a reasonable Emacs configuration file to your home directory:

```
cd
cp /u/cos217/.emacs .
```

Again, note the period at the end of the "cp" command, and the space immediately preceding it.

6.2. Suggestion: Use the "cat" command to examine the contents of the .emacs file:

```
cat .emacs
```

## **7. Configuring the Splint Source Code Checker**

*One time only...*

7.1. In a hats terminal session, issue these commands to copy a reasonable Splint configuration file to your home directory:

```
cd
cp /u/cos217/.splintrc .
```

Again, note the period at the end of the "cp" command, and the space immediately preceding it.

7.2. Suggestion: Use the "cat" command to examine the contents of the .splintrc file:

```
cat .splintrc
```

## **8. Printing a Hats File Directly to a Princeton Network Printer**

*Repeatedly throughout the semester as required...*

8.1. In a hats terminal session, issue one of these commands:

```
lpr filename (for ordinary printing)
enscript -2rhC -E filename (for formatted printing of code)
```

8.2. On the Print Release Station (that is, the computer located near the printer):

Type your user id and password, and click on the "Logon" button.  
In the list box, select a file from your print queue.  
Click the "Print" button.  
Click the "Log Off" button.

## **9. Printing a Hats File From Your Computer**

*Repeatedly throughout the semester as required...*

9.1. Option 1: Use a mapped drive.

- *Mapping a drive of your computer to Princeton's central file system allows you to access files in Princeton's central file system just as if they were in your computer's file system.*
- *Computers purchased through Princeton are configured such that a drive is mapped to Princeton's central file system. On a computer running Microsoft Windows, the H drive is mapped to Princeton's central file system; on a computer running Mac OS X, the mapped drive appears on the desktop.*
- *The "mapped drive" approach works on-campus. However when off-campus, you'll need to use VPN (virtual private network)<sup>2</sup> for the "mapped drive" approach to work; or use the FileZilla approach described below instead of the "mapped drive" approach.*

If your computer runs Microsoft Windows, perform the instructions on this web page: <http://helpdesk.princeton.edu/kb/display.plx?id=9347> to map a drive to Princeton's central file system.

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<sup>2</sup> See <http://www.princeton.edu/vpn> for information on VPN,  
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If your computer runs Mac OS X, perform the instructions on this web page: <http://helpdesk.princeton.edu/kb/display.plx?ID=9268> to map a drive to Princeton's central file system.

Print the file as you would any other local file.

## 9.2. Option 2: Use FileZilla

- *The FileZilla application uses SFTP (the secure file transfer protocol) to copy files between Princeton's central file system and your computer's file system.*
- *The FileZilla approach works either on-campus or off-campus. It requires only Internet connectivity.*

Download FileZilla from <http://filezilla-project.org/> and install it.

Launch the FileZilla application.

In the FileZilla application:

- In the "Host" text field type "hats.princeton.edu".
- In the "Username" text field type your user id.
- In the "Password" text field type your password.
- In the "Port" text field type "22".
- Click on the "Quickconnect" button.

In the FileZilla application:

- Click in the left-side pane to navigate through your computer's file system.
- Click in the right-side pane to navigate through Princeton's central file system.
- Drag-and-drop the desired file from the right pane to the left pane, thus copying the file from Princeton's central file system to your computer's file system.

Print the file as you would any other local file.

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