Connecting Remotely to the Statistical Computing Facility

1 Introduction

In order to access the SCF from a remote (non-SCF) computer, you must have a program which uses the secure shell (SSH) protocol to communicate with other computers. An SSH program alone will not allow you to run programs which open windows to display images or provide a nicer user interface, for example graphics windows from R, or the SAS display manager. For these purposes, you need an X Windows server (sometimes known as X11) either running natively on your computer, or via an X Windows emulator.

Depending on your operating system, one or both of these programs may already be installed on your computer. The next section will explain how to obtain the necessary programs if they are not already available, followed by an explanation of the commands necessary to connect to the SCF and run the programs you need. Finally, information on transfering files from the SCF to your local computer is presented.

If you don't have a broadband connection, you may find that the response when using X Windows remotely may be too slow to be useful; even with a broadband connection, some programs may seem nonresponsive at times. With patience, you should be able work remotely with few problems.

2 Usernames and Hostnames

In the examples that follow, the username you should provide is the login name for your SCF account. Running the sitehosts command will provide you with a list of computers to which you can remotely login. Remember that outside the Berkeley domain, you must add ".berkeley.edu" to the end of the hostname in order to connect.

3 Software

3.1 Linux

Linux natively runs the X Windows system, and most Linux systems have the ssh program available to securely connect to remote systems.

3.2 Mac OS X

The ssh command is available through the Terminal application (available in /Applications/Utilities /Terminal.app). Versions of the operating system from Panther on provide an installation package for X11 on the Developer Disk (X11User.pkg).

3.3 Microsoft Windows

To connect to the SCF remotely, you can use a free program called putty. You can download it from http://www.chiark.greenend.org.uk/ sgtatham/putty/download.html. This will allow you to run programs remotely, but it will not allow you to use the display manager, or to view graphics. To do this, you need an X Windows emulator. If you have a CalNet ID, you can download Exceed 2008 from UC Berkeley Software Distribution. A free alternative to Exceed is the Cygwin X Windows System. There are excellent instructions for installing this software at Cygwin/X. Basically, you first download a program called setup.exe, which makes it possible to install a wide variety of software;

you need choose only four packages: `xorg-server`, `xorg-scripts`, `inetutils` and `openssh` (Clicking on the `View` button in the `setup.exe` window until it displays "`Full`" makes it easier to find the packages you need). Once everything is installed there should be a Cygwin icon on your desktop. Double click on the Cygwin icon and type

`/usr/bin/startxwin.sh`

in the window that opens. Another window will open and you can use the ssh command as described below. (Notice when you use Cygwin, there's no need for the putty program, since Cygwin provides the ssh command.)

3.4 Commands

3.4.1 Microsoft Windows: `putty`

To use `putty` with an X Windows emulator, you need to make one change to the default settings: In the left-pane, click the `X` to the left of `SSH` under `Connections`, and click on `X11`. Check the box marked "`Enable X11 forwarding`". Once this is done, you can connect to the SCF by choosing "`Session`" in the left hand pane, filling in a valid hostname, and clicking "`Open`"

3.5 Linux and Mac: `ssh`

To connect to the SCF computers, use a command like this in the terminal:

`ssh -X s243xx@hostname`

where `s243xx` is your SCF class account, and `hostname` is one of the SCF computers. The `-X` flag allows tunneling of X11 connections so that you can view graphics from the SCF computers. Don't forget to include `.berkeley.edu` after the `hostname` if you're connecting from outside the Berkeley domain.

4 File Transfer

If you want to print SCF documents on your own (non-SCF) printer, the easiest route is to copy the files from the SCF computers to your computer and then to print them in the usual way. The best way is to use a file transfer program on your local computer, although other means are possible. Before transfering files, make sure that you can print them on the computer you're transfering them to. PostScript (`.ps`) files often cause problems. If you want to print a PostScript file, and you're not sure if your program has the necessary software, run the following command on the SCF system:

`ps2pdf filename.ps`

where `filename.ps` is the name of the file you'd like to print. You can then copy the resulting `pdf` file to your computer and view or print it with [Adobe Acrobat](#).

4.1 Linux

The command line `scp` command, described below, is probably the best way to transfer files from one computer to another. If you'd prefer a graphical client, programs like konqueror will accept the `sftp://` protocol.

4.2 Mac OS X

The command line `scp` command, described below, can be accessed through the terminal

(`/Applications/Utilities/Terminal.app`). Although the finder doesn't directly support the sftp protocol, the freeware program [Fugu](#) provides a nice graphical frontend to the sftp command. To use `Fugu`, enter your username and an appropriate hostname in the `Connect to:` field; you'll be prompted for a password when `Fugu` connects to the remote server. Your remote files will appear in `Fugu`'s right-hand pane, where they can be dragged and dropped to a location of your choice in the (local) left-hand pane.

4.3 Microsoft Windows

There are a number of free graphical sftp clients available for Windows; one nice and easy-to-use one is [WinSCP](#). If you choose the Explorer view instead of the default Norton Commander view, your SCF account will appear as a normal explorer window, allowing you to drag and drop files; simply enter your username and a suitable hostname to connect.

4.4 If All Else Fails

If you can't use the previously described methods, you can email files from the SCF system to an email account of your choice. One way is to use the command line program `pine`. To send files as attachments with pine, enter the following command in an ssh window connect to an SCF computer:

```
pine emailaddress -attach file1 -attach file2 ...
```

After hitting Return, type control-X to send the mail, and `Y` to confirm it. **Note:** There is a 5 Mb limit on attachments to emails sent through the SCF. While this should pose no problems with text files, complex graphics may be too large to send through email. Please check the size of the file you're sending (with the UNIX command `ls -l`) before reporting a problem.

4.5 The `scp` command

The syntax for the scp command is:

```
scp username@hostname:file local-directory
```

You'll be prompted for your password; after entering it and hitting Return, the file transfer will start.

To use wildcard patterns on the remote (SCF) machine, precede the wildcard character with a backslash (`\`). For example to copy all the C files from the home directory of your SCF account, to the current directory on your local computer, use a command like:

```
scp username@hostname:\*.c .
```

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