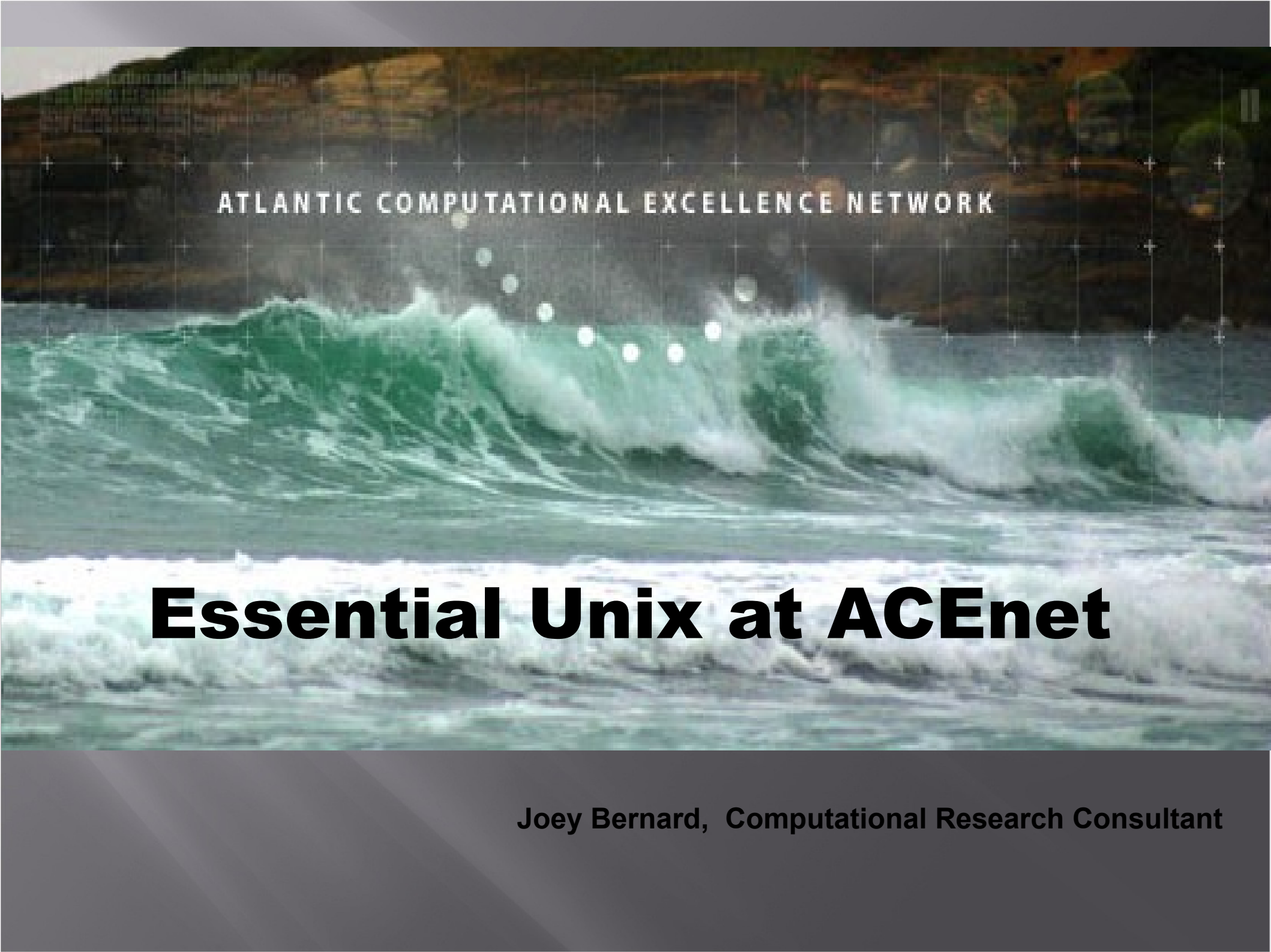




ATLANTIC COMPUTATIONAL EXCELLENCE NETWORK

Essential Unix at ACEnet

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Outline

- How to connect
 - ssh
 - sftp
- Basic Unix or Linux
 - commands
 - files and directories
 - environment variables

...not necessarily in that order

Getting connected

- `ssh` *Secure SHell*
 - provided with Mac OS X and Linux
 - `ssh -Y username@somehost.ace-net.ca`
 - Windows users need PuTTY or Cygwin
 - <http://www.chiark.greenend.org.uk/~sgtatham/putty/download>
 - <http://www.cygwin.com>

PuTTY Configuration



Category:

- [-] Session
 - Logging
- [-] Terminal
 - Keyboard
 - Bell
 - Features
- [-] Window
 - Appearance
 - Behaviour
 - Translation
 - Selection
 - Colours
- [-] Connection
 - Data
 - Proxy
 - Telnet
 - Rlogin
 - [+] SSH**
 - Serial

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address) Port

Connection type:

☐ Raw ☐ Telnet ☐ Rlogin **☒ SSH** ☐ Serial

Load, save or delete a stored session

Saved Sessions

Default Settings

fundy
mahone
mahone2
placentia
placentia2

Close window on exit:

☐ Always ☐ Never **☒ Only on clean exit**

mahone2.ace-net.ca - PuTTY

login as: rdickson

rdickson@mahone2.ace-net.ca's password:

Last login: Tue Feb 19 13:34:02 2008 from rdickson.ucis.dal.ca

Important: Queuing Changes

Beginning Monday, February 25 the queuing system on all ACEnet clusters will require you to specify an estimate of the time your job will take to complete. This can be done with the "-l h_rt=hh:mm:ss" flag to qsub.

Further information at:

http://wiki.ace-net.ca/index.php/New_queue_policies

rdickson@mahone2:clhead2 ~ > █

Looking Around

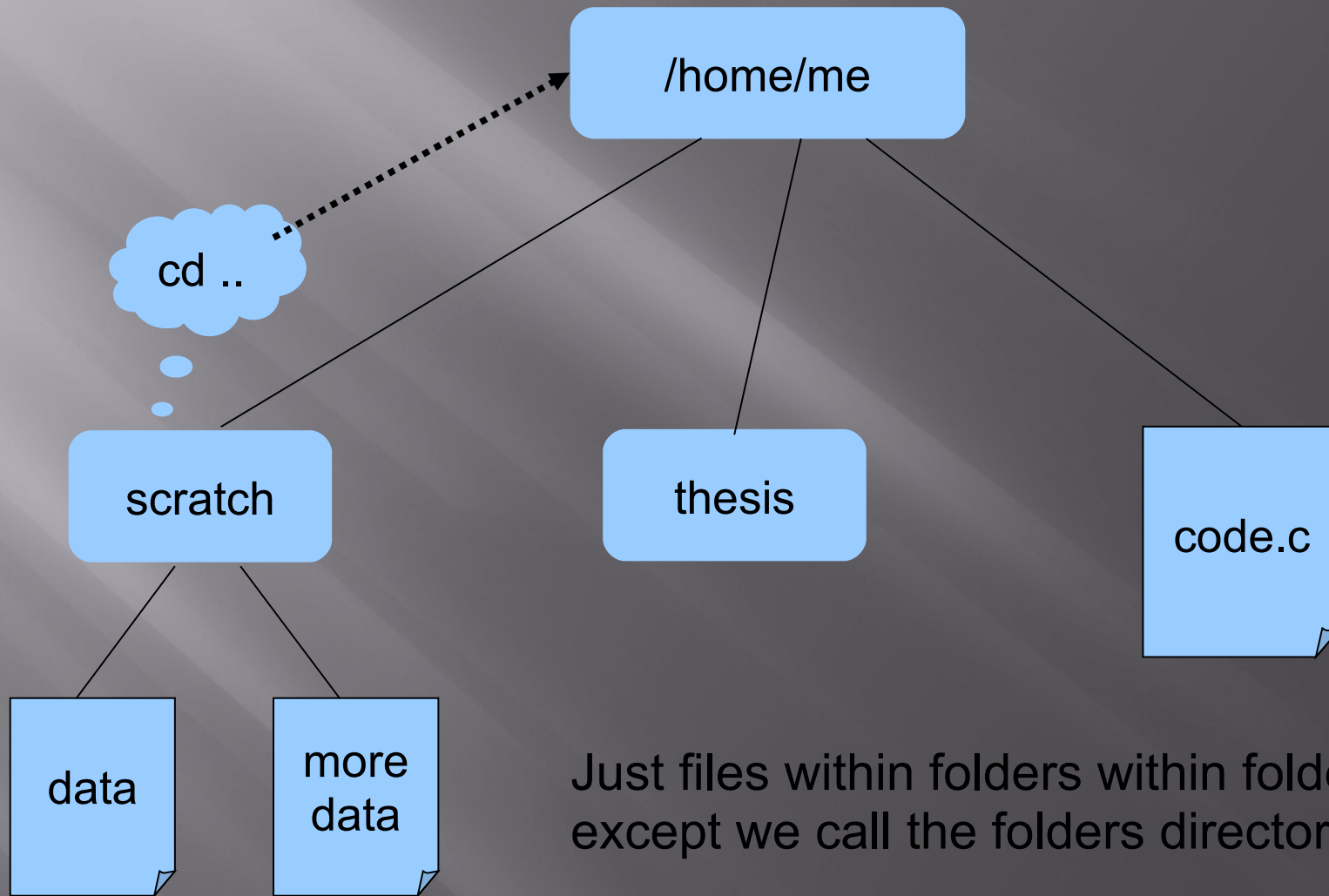
- pwd
 - “print working directory”
 - where am I?
- ls
 - “list”
 - what files are here? what subdirectories?

Getting around

- `mkdir newdir`
 - “make directory”
- `cd directory`
 - “change directory”
- `cd ..`
 - “..” means “parent directory” or “one level up”
 - “.” means “right here”
 - “~” means “my home directory”

Directories grow on trees

Ok, upside down trees...



Just files within folders within folders,
except we call the folders directories.

Create your (empty) directory

```
▣ > mkdir workshop
▣ > cd workshop
▣ > ls
▣ > pwd
▣ /home/userid/workshop
▣ >
```

Moving stuff around

- `mv` *from to*
 - “move”, also “rename”
- `cp` *from to*
 - “copy”
- `rm` *file*
 - “remove”
 - Careful --- There's no recycle bin!
- `rmdir` *directory*

Paths, directories, abbreviations

- directory separator is “/”
- /home/jsmith/code/test is an *absolute path*
 - begins with “/”
- code/test is a *relative path*
 - no “/” at the beginning
 - same thing if pwd is /home/jsmith
- *
 - “wildcard”

Get some files

```
▣ > pwd
▣ /home/userid/workshop
▣ > cp /home/rdickson/demo/C/* .
▣ > ls
▣ function.c  hello.c  input  int1.c
▣ int2.c      int3.c  int4.c  Makefile
▣ >
```

What's inside?

- *more file*
- *less file*
 - scroll through file, one screen at a time
 - Spacebar to continue, q to quit, ctrl-B to back up
- Editors
 - *vim file*
 - *emacs file*
 - or use your computer and transfer with sftp

The Vim logo, featuring the word "vim" in a stylized, lowercase, yellow font with a 3D effect, set against a dark gray background.A screenshot of a PuTTY terminal window titled "mahone2.ace-net.ca - PuTTY". The terminal has a black background with green and red text. The code displayed is:

```
#include <stdio.h>  
  
main()  
{  
    printf ("Hello World!\n");  
}  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~
```

The status bar at the bottom right shows "1, 1" and "All". On the far right edge, there are standard window control buttons (minimize, maximize, close) and a vertical scrollbar.

File Permissions

Sometimes you need to edit the permissions of a file. The permissions of a file dictate who can execute, read and write to a file.

If you do **ls -l** you might see something like the following:

```
-rwxr-xr-x  1 staveley TechTeam      271 Jul 12  2007 Makefile
```

Diagram illustrating the breakdown of the permissions string **-rwxr-xr-x** into three groups of three permissions each:

- First group of 3: what you (owner) can do --- read, write, execute?** (Permissions: **rw****x**)
- Second group of 3: What group members can do** (Permissions: **xr****-**)
- Third group of 3: What everyone else can do** (Permissions: **xr****-**)

Labels for the **ls -l** output:

- Directory (y / n): **-**
- Permissions: **rw****xr****-****xr****-****x**
- Owner (User): **1**
- Owner (Group): **staveley**
- Date Last Modified: **TechTeam**

- To see a directory listing you must have *execute* permission
- To change permissions, use **chmod**
 - **chmod +x file** to turn on execute permission for you
 - **chmod o-r file** to turn off read permission for others

What happens if I ...?

- which *program*
 - shows absolute path of *program*
- echo \$PATH
 - what directories are searched for executables?
 - \$PATH is an *environment variable*
- setenv or set
 - “set environment”
 - shows or sets variables

Miscellany

More information can be found out about the system you are working on with the following commands:

du - disk usage - how much disk space is being used by the current directory

du -h - “human readable”

df - how much disk space is available

ps - show the programs that you are running

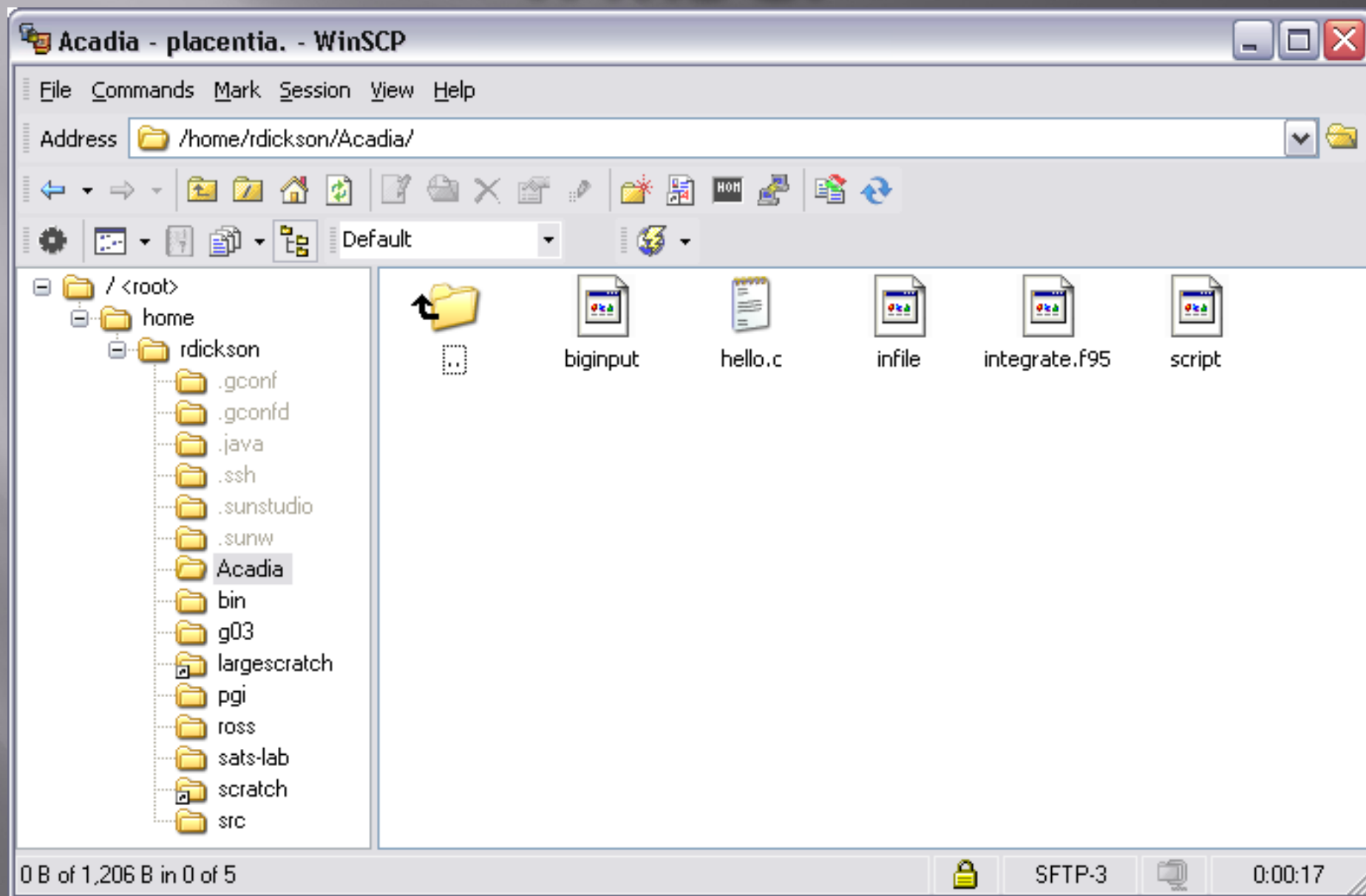
top - shows information about processor and memory usage of the machine you're on

date - displays the current date and time (machine clock)

Data from the outside world or from one cluster to another

- `sftp` *Secure File Transfer Protocol*
 - provided with Mac OS X and Linux
 - `sftp username@somehost.ace-net.ca`
 - Easiest way to move data between clusters
 - MS Windows? Use WinSCP or Cygwin
 - <http://winscp.net/eng/index.php>
 - <http://www.cygwin.com>

WinSCP



sftp commands

- `ls`
 - List files already *there*
- `put filename`
 - Copy file from *here* to *there*
 - Can use wildcards: “put *” copies everything
- `get filename`
- `cd directory`
 - Change directory *there*
- `lcd directory`
 - “Local cd”, change directory *here*

Where to go for help

- `man command`
 - “manual”
- `man -k keyword`
 - searches online manual pages
- Online Linux tutorials
 - Google “Unix command line tutorial”

Where else to go for help

- ACEnet User Wiki
 - <http://wiki.ace-net.ca/>
- User support line
 - email: support@ace-net.ca

 brasdor.ace-net.ca - PuTTY



login as: rdickson

Using keyboard-interactive authentication.

Password:

Last login: Fri Jun 8 12:14:12 2007 from n2.pub.hpcv1.qu

Sun Microsystems Inc. SunOS 5.10 Generic January 2005

rdickson@brasdor: ~ > 