Introduction to Athena

RSI 2007 Staff

Contents

What is Athena, Anyway?

- MIT's general computing system
  (E-mail, Internet access, text editing, spreadsheets, etc.)
- Workstations
- Home directories (1 GB quota)
- Printers
- Mostly Unix and Linux machines

Athena Rules of Use

Don't violate the intended use of Athena. Full descriptions of and reasoning for the rules can be found at:

`http://web.mit.edu/olh/Welcome/rules.html`

- Don't let anyone else use your account
- Don't impersonate other individuals in communications
- Don't attempt to capture or crack passwords
- Don't destroy other people's data
- Don't use Athena for financial gain
- Don't transmit harassing materials (`stopit@mit.edu`)
- Don't eat stuff. Ever.

Athena Rules of Use — Continued, Ethics

- Don't let **anyone** know your password
- Don't violate the privacy of other users
- Don't copy or misuse copyrighted material
- Don't use Athena to harass anyone in any way
- Don't send SPAM or forward chain letters

Athena Cluster Manners

- Don't bring food or drink into the cluster
- Don't turn off power to equipment
- Don't reconfigure the hardware or software
- Don't login to multiple workstations at a time
- Don't leave your workstation unattended
- Don't be loud
- Don't be a printer hog — print only one copy of a document, split large jobs into sections

Password Security

As mentioned above, you must keep your password secure.

- Don't let **anyone** know your password
- No official person, including Athena help (or TAs), will ever need your password. Don't give it to them!
- Don't let **anyone** know your password
- Choose a password that is secure (e.g., not your name or 123456)
- Don't let **anyone** know your password, *ever*

How Do I Find a Workstation?

The easiest clusters to find are

- 2nd Floor, Simmons (Shared with MITES)
- `w20-575` (5th floor of the Student Center)
- `1-142` (1st floor of building 1)
- Rotch basement, `12-182`, Barker (Along the Infinite)
- `37-318`, `37-332` (Building 37)
- `56-129`, `66-080` (Near East Campus)
- `Quickstations` (various places, buildings 16 and 11, etc.)

To see a full map (or for cluster hopping), use `cview` or `xcluster`.

Logging In

You only need two things to log in:

- username (e.g., `jdoe`)
- password

Note: you will not see your password on the screen as you type it.

The Screen Before You

The default screen has several notable features:

- GNOME panel (the toolbar at the bottom)
- Terminal window (the big thing on the left)
- Console (upper right)
- Logout button (lower right on GNOME panel)
- Command Line / Prompt (in the xterm window, it starts with `athena%`)

The Shell

In Unix systems, the shell is the interface between the user and the computer. When you type a command into the shell at the prompt and press the "Return" key, the computer will do it. For example, you run programs from the shell by typing the name of the program. Try typing the following commands in your xterm window:

```
athena% whoami
athena% tellme combo
athena% xclock &
```

Directories

Directories are folder that contain other files and folders.

When you first log in, your shell starts out in a special directory called your home directory. Your home directory is similar to "My Documents." All of your files will be stored here.

The directory that your shell is in at any time is called the "current directory." If your forget what directory you're in, use the command `pwd` to find out where you are.

Files and their names

You can name files almost anything you want with a few restrictions:

- 255-character maximum
- No special characters (letters, numbers, hyphens, periods, and underscores are allowed)
- Spaces are allowed but try not to use them because file names with spaces require special handling on the shell.
- All names are CaSe sEnSItiVe

The Shell Seven

- `ls` - Lists the contents of the current directory
- `cd` - Change directory
- `rm` - Removes (deletes) one or more files or directories
- `mv` - Move/rename a file or directory
- `cp` - Copy a file or directory
- `mkdir` - Create a new directory
- `rmdir` - Remove a directory

Manipulating Directories

- To make a new directory:

```
athena% mkdir foo
```

- To remove an empty directory:

```
athena% rmdir foo
```

- To list the contents of the current directory:

```
athena% ls
```

Moving Within Directories

The command to change directories is `cd <directoryname>`. Simply typing `cd` will return you to your home directory.

Let's say `stewieG` has the directory `bar` in his `foo` directory.

- Within `foo`, he could type
  `athena% cd bar`

- From anywhere, he could type
  `athena% cd /mit/stewieG/foo/bar`

- `pwd` prints your current directory.

```
athena% pwd
/afs/athena.mit.edu/user/s/t/stewieG
```

Directories Redux

The location of a file or directory is specified by its path. In the path, different objects are separated by a forward slash (/).

Absolute paths start with a forward slash. Example:

`/mit/USER/foo.tex`

Relative paths do not start with a slash and specify a location relative to the current directory. Example:

If you are in `/mit/stewieG`, then `Public/foo.tex` refers to `/mit/stewieG/Public/foo.tex`.

~, ., ..

If you leave your home directory, you may need to refer to it as the starting location of a path. You can do this with a tilde.

`~/foo/bar.tex` is the same as `/mit/USER/foo/bar.tex`

Every directory contains two special directories: `.` and `..`

- `.` refers to the current directory
- `..` refers to the directory one level up.

Makin' Copies

The command to copy files is `cp`. It takes two paths as arguments. There are two main usages:

- Copying one file to a new location with a new name:

```
athena% cp foo.tex ~/bar/baz.tex
```

- Copying files in a directory to another directory:

```
athena% cp * ../foo/
```

Movin' on up. . .

The `mv` command also has two main uses:

- Moving without keeping a copy in the original location:

```
athena% mv foo.c bar/
```

- Renaming files:

```
athena% mv foo.c baz.c
```

Get It Outta Here!

- `rm` is the standard UNIX command. This permanently gets rid of the file and can't be reversed.

- Well, almost. If your file existed overnight, you can temporarily find a copy of it under the `OldFiles` subdirectory of your home directory.

Your turn

- Figure out where you are by using the `pwd` command
- List the contents of your current directory using `ls`
- List the contents of your `www` folder using `ls`
- Create a new directory called *foo* using `mkdir`
- Change your current directory to the directory *foo* using `cd`
- Create a new file called *bar.txt* using the `touch` command

Your turn, continued...

- Make a new file, *rsi.txt*, and another directory called *day1*
- List the contents of your current directory, then move the file *bar.txt* to the *day1* directory with the `mv` command
- Copy the file *rsi.txt* to the *day1* directory using `cp`
- Remove the files *rsi.txt* and *bar.txt* from the *day1* directory with `rm`
- Remove the *day1* directory
- Change your current directory back to your home directory

Public, Private, www and OldFiles

There are some special directories that every user has by default:

- `Public`: all files in the Public directory are readable by anyone. This is a good way to share data without giving someone else your password.

- `Private`: This is the opposite. Other users can't even get a directory listing of this folder; only you have access.

- `www`: Your web page goes here.

- `OldFiles`: A snapshot of your home directory from yesterday. If you accidentally delete something, look here.

What's the & for?

So why are some commands followed by ampersands (`&`)?

When you run a program without `&`, you don't get your prompt back until the program finishes. This means that if the program opens up a new shell, you can't have your prompt back until the program is finished. Now suppose you want to check email while your `xclock` is open ...

The ampersand in `xclock &` causes `xclock` to run without stealing your prompt (called "running in the background"), so other programs can be run simultaneously.

I want my prompt back!

If you accidentally run a program without the `&`, you can stop it by holding down the `[Control]` key and pressing `z`. Your shell should say "Suspended," and you will get your prompt back. Now type `bg` at the prompt to restart the stopped program in the background.

Conversely, if you need to move a backgrounded program to the foreground, say `fg` to your prompt.

To kill a program instead of suspending it, use Control-C instead of Control-Z.

Changing Your Password

You should change your password from time to time, especially if you think someone else might know it:

```
athena% passwd
```

You will first be prompted for your old password. Then you must enter your new password twice to ensure that you don't have a typo in your new password.

Your new password should be something you can remember, but that others can't easily guess. Never write down your password or give it to anyone else. Don't tell anyone your password.

Options and Arguments

Let's use the `ls` command to learn about options and arguments.

- **Options** modify the action of the program. For example, you can use `ls -a` to view all files (including normally hidden ones). `ls -l` shows a long form of the information.

- **Arguments** tell a program what it should act on. For `ls` the arguments are the names of the files or directories to list. If no argument is given, the default is the current directory. Example:

  `ls ~/Paper` shows the files in your own `Paper` directory

It Started with a "C" . . .

If you want to specify several files at once there are two kinds of "wildcards" you can use:

- `*` matches 0 or more characters. Example:

```
athena% ls P*
```

- `?` matches any one character. Example:

```
athena% ls /mit/rsi/200?
```

- These two modifiers can be used together.

I Want less!

`less` is a program that displays text files one page at a time.

```
athena% less ~/.anyone
```

- `[space]` scrolls forward one screen
- `b` goes back one screen
- Arrow keys move text forward or backward line by line
- `q` quits

One Page at a Time

`less` can be used to break up the output of other programs into neat, page-sized chunks. Try

```
ls -al | less
```

to see an example. The pipe operator, `|`, is used to send the output of the command on the left to the command on the right as input.

Printing

- `lpr` is the basic printing command and has the syntax:

  ```
  athena% lpr foo.ps
  ```

- To print PDF files, use the print dialog in Adobe Acrobat Reader. You can specify the printer in the properties dialog (`-P<printername>`)

Warning: `lpr` prints PostScript files and plain text correctly. DO NOT try to print a PDF or DVI or any binary graphics file using `lpr`. Doing so will make the printer spew mountains of garbage.

Checking Printer Status

- `lpq -P<printername>` gives you the status of a printer. It tells you whether the printer is out of paper or otherwise out of order and lists all the jobs waiting to print on it.

- `lpq` without an argument tells you your default printer and its status.

- `cview printers` lists the status of all printers in all public clusters.

Removing a Print Job

If there is a problem with a printer, you may need to print on a different printer. When you do this, be sure to remove your original job from the queue by using `lprm`.

- `lprm -Phelios 492 517` removes your print jobs on the printer `helios` with job numbers 492 and 517. (The job numbers appear in the output from `lpq`.)

- `lprm -Phelios` removes your top print job from `helios`

- `lprm all` by itself removes all your print jobs from your default printer.

Remember this command in case you accidentally `lpr` a DVI or other evil binary file.

Emacs

`emacs` is a text editor. It is not a word processor. It is a text editor. It can do just about anything, including making coffee. You can run `emacs` in two ways:

- `athena% emacs foo.tex &`

  opens the file `foo.tex` if it exists and creates `foo.tex` if it doesn't exist.

- `athena% emacs &`

Emacs: What you see

- Menu Bars
- Buttons
- White space
- Minibuffer

You can do a lot of stuff through the menus and with the buttons and your mouse, but there are a lot more commands you can access with just the keyboard, which, once you get used to, will make using emacs much faster. And, of course, you'll have to use the minibuffer whether you use the mouse or the keyboard ...

Minibuffer? But I Just Met Her!

The minibuffer is the bottom line of the emacs window. It displays commands and messages. It is a source of many helpful things, such as confirmation that your file is saved or a prompt to finish out a command.

When you are typing emacs commands, you're using the minibuffer.

Emacs Command Syntax

A brief description of our syntax:

- `C-x` means hold down the `[Control]` key and press `x`
- `C-x u` means hold down the `[Control]` key and press `x`, then release the `[Control]` key and hit `u`
- `C-x C-s` means hold down the `[Control]` key and press `x` followed by `s` before letting go of `[Control]`
- `M-x` means to hold down the `[Alt]` (also called the `[Meta]`key) and press `x`

When Bad Things Start to Happen

Many key combinations have special meanings in `emacs`, and it's easy to invoke a weird command by mistake. When this happens, don't panic: there are ways out.

If you get stuck in the minibuffer typing to a prompt you don't recognize, press `ESC` a few times. This should get you out of whatever trouble you were in (you'll see the word "Quit" in the minibuffer).

The **undo** command in `emacs` has two key sequences: `C-x u` and `C-_` (control-underscore). If you suddenly delete a bunch of your paper by mistake, using either of these commands should bring it back. You can undo several consecutive actions by using the undo command repeatedly.

Manipulating Files

- `C-x C-f` opens an existing file or creates and opens a new file. You will be prompted in the minibuffer for the name of the file to open.

- `C-x C-s` saves the file you are working on. Use this often.

- `C-x C-c` quits `emacs`.

Manipulating Text

- `C-w` Cut ("wipe")
- `M-w` Copy
- `C-y` pastes ("yanks") what was most recently cut or copied
- `C-k` cuts the line to the right of the cursor
- `M-q` reformats current paragraph

Search and Replace

- To find the next occurrence of a string in your file, press `C-s` and begin typing the string. `emacs` will search as you type. You may press return to leave the search or press `C-s` repeatedly to find the second, third, and following occurrences of the string.

- `C-r` is like `C-s` but searches backwards.

- To replace all occurrences of `foo` with `bar` in your file, go to the beginning of the file, then press `C-M-%`. Yes, thats `Ctrl-Alt-Shift-5`!! Enter `foo` and press return; then enter `bar` and press return.

Accessing your MIT email

You have several options:

- Thunderbird Email Client: `thunderbird`
- Pine email client: `pine`
- `http://webmail.mit.edu`
- Forward to another address: `chpobox -s myaddress@gmail.com`

Lockers, More Than Places To Leave Bodies

The place where the files in your account live is called a locker. Many groups also have lockers that contain programs or data that you might find useful. You can access other lockers using `add`.

Before running programs in a locker called `<lockername>`, you need to say `add <lockername>`. For example, after `add math` you can use Mathematica by saying

```
athena% mathematica &
```

Which Locker?

What if you don't know the name of the locker containing your program?

To see a partial list of programs available on Athena, including the lockers containing them, see the "What Runs Where" page at

`http://web.mit.edu/acs/www/whereruns.html`

If you know the name of the program you want, just say

```
athena% whichlocker <programname>
```

A Few Not Altogether Useful Programs

- `xsnow &`: When the Cambridge summer becomes unbearable.
- `oneko &`: A graphical cat chases your mouse cursor. Get it?
- `punt program_name`: Forcibly closes `program_name`. Use wisely, as in if you've decided that you've seen one too many turtles, you can close `Ctrl-Alt-Del` in Windows.

Running Firefox

Firefox is the web browser on Athena. To run Mozilla Firefox you have two options:

1. Click on the WWW button on the left side of the GNOME panel.

2. Type "`firefox &`" at the `athena%` prompt.

3. If met with a harrassment window about lock files, select "Delete lock file and proceed" and proceed.

Zephyr

Zephyr is an instant messaging system for Athena that is vaguely analogous to AIM and ICQ but better. It's very flexible and kills time like nothing else in this world. A few points of etiquette:

- Don't be annoying
- Don't spam large groups
- Don't send huge zephyrs (use line breaks!)
- Don't abuse the system

Personal Zephyrs

- To send someone a personal zephyr, simply type:

```
athena% zwrite username
```

- Write your message, and then type `C-d` or a period on a line by itself to send the message.

- You can write to several people at once:

```
athena% zwrite username1 username2 username3
```

- `barnowl` is a convenient way to organize Zephyrs

Is There Anybody Out There?

- The command `znol -l` will list the people who are now logged in and the machines they are on.

- If you omit the option `-l`, you will thereafter receive a zephyr notifying you each time someone logs in or out.

- You can also say `xzul &` to open a window that maintains a list of who is online. Click and hold the mouse over a username to see that person's location.

- If you are looking for one specific user, say `zlocate joeuser` instead of `znol -l`.

RSI Zephyr Classes

RSI has two zephyr classes to which you can subscribe and write.

- `rsi-talk` is a social zephyr class. Anything can be discussed here, but please remember that more than 100 people may be reading what you write. `zrsion` turns it on, `zrsioff` turns it off, `zrsi` sends a message to the class.

- `rsi-help` is a class for asking questions on any topic from math to Athena to chemistry to writing styles. Please make your queries as specific and thorough as possible; don't just say, "Help! It doesn't work!" RSI alumni from many years past will be listening to answer your questions.
  `zrsihelp` sends to this class. `zrsihelpon` turns it on, `zrsihelpoff` turns it off.

Don't Be Overwhelmed

A few more comments to make your zephyr-life happier:

- You can get rid of a bunch of zephyrs at once by holding down the `[Control]` key and clicking on the stack of zephyrs.
- To copy something from a zephyr, hold down the `[Shift]` key and highlight the text you want.
- If you accidentally do `znol` without the `-l` option and all of the logging in/logging out messages are annoying you, `znol off` will stop them.
- You can also always do `zrsioff` and `zrsihelpoff` if you want to stop getting those messages.
- If someone is bothering you and you want to stop getting messages from them, you can use `zpuntuser`. To start getting messages from them again, use `zunpuntsuer`.

Information Resources

To find articles on your research topic, check out:

1. MIT libraries(`libraries.mit.edu`): Engineering Library in Barker, Science Library in Hayden

2. Journal Article Databases: `libraries.mit.edu/vera`

   (a) Web of Science (general)

   (b) Compendex/Inspec (EECS, math, physics, general science)

   (c) SciFinder Scholar (chemistry, medical)

   (d) Medline (medical)

3. Individual journal web pages

Workstation Security

Security is an important aspect of the Athena system. The easiest way for an intruder to break into the system is by getting a password or using an unattended workstation. There is a way to secure your terminal:

- `xlock`

Logging Out

Once you're finished using your workstation, log out using the `logout` command or clicking on the logout button. If the command tells you that there are suspended jobs, bring them to the foreground using `fg` as we talked about earlier. Close them and `logout` again.

Accessing your account from off campus

Several options:

1. `ssh username@athena.dialup.mit.edu`
2. `ssh username@x.dialup.mit.edu`
3. `http://athena.dialup.mit.edu`
4. `http://webmail.mit.edu`

Laptop Configuration

We DO NOT officially support laptop use at RSI

Windows:

- Download SecureCRT and X-Win32 from MIT (`http://web.mit.edu/software`)
- Start XWin-32 and connect to `x.dialup.mit.edu` with SecureCRT

OS X:

- Install X11 from the OSX developer CD or Apple website
- `ssh -X username@x.dialup.mit.edu`

Getting Help

- Online Help has some information at `http://web.mit.edu/olh/`
- There is a good FAQ/Stock Answers site at `http://web.mit.edu/answers/`
- Reference Manual entries are available for most commands. To get more information about a command type

  ```
  athena% man <command>
  ```

- The RSI FAQ is on the RSI web page at

  `http://web.mit.edu/rsi/www/2007/help/faq`

- `zrsihelp` is also available to answer your questions. Once again, please be specific.