

## Guide to Harvey Lab Computer Accounts.

You have been issued an account that may be valid in more than one domain. There are currently three account domains and you have access to several machines in each. The domains are called **Fulton** (servers and workstations running IRIX), **Cobb** (servers and workstations running LINUX) and **DeKalb** (workstations running MacOS X and servers running MacOS X Server). All machines are in the biology.gatech.edu subnet.

Accounts must not be shared or passed on to other people; accounts that are misused in this and other ways will be deleted.

### The Fulton Domain

The machines in this domain include an eight-processor server (Wart) which can only be accessed remotely and graphical workstations (four each in CE312 and CE314) that should not be accessed remotely.

### Passwords

Choose a good password and change it regularly. A simple way to generate a good password is to take the initial letters from a phrase or sentence that is well known to you, and substitute some of the letters with evocative numbers and special characters. You may use the same password in all domains if it is good and the password had never been exposed.

You must use a secure shell for remote connections so that network traffic is encrypted. Your new password will not be transmitted in the clear unless you elect to use an email client to collect messages from our email server. Therefore, do not use our email server if you want to keep your password secure.

### Account Setup

Make sure you have been assigned to the proper group (see below). Your account will be terminated on its expiration date; this is the only warning you will get. Check the expiration date before you start to use an account. If there is insufficient time remaining on it, ask for a newer account. Groups 700 and 800 accounts cannot be renewed. All group 900 accounts expire on December 31 each and every year; a request for renewal will be granted if the account had been used in the past year.

- Initial setup

There are three things you need to do before using your account. The first is to change the initial password. Change your Fulton password at any workstation. Use `yppasswd`, the usual `passwd` command will not work. The change will be propagated to the other Fulton machines automatically, usually within 15 minutes.

```
yppasswd
Changing NIS password for yourusername on wart.biology.gatech.edu.
Old password:
New password:
```

You may also need to edit your account settings. To see the current settings for your account, type:

```
ypmatch yourusername passwd
```

You must make sure that your account has your full name (accounts without a proper full name are assumed to be unclaimed and are targeted for recycling) and you would probably want to change your shell. For example:

```
ypphpass -f "Your Full Name" -s /bin/tcsh
```

Finally, you need to modify your shell resource files (`~/.login` and `~/.cshrc`). Depending on your needs, you may have to comment out some features and remove the comments from other features. The original files (`/etc/stdlogin` and `/etc/stdcshrc`) are available on Wart (but not on the other machines) in case you mess up your copies. The changes that you make to these files will take effect at your next login.

- [SGI desktop settings](#)

Settings for your SGI desktop are saved in several resource files. You can elect to have different settings for each workstation but this takes up disk space and you will have to customize each workstation separately. It is much more convenient to have only one set of resource files and share the settings with all the workstations. You then have only to adjust one desktop. Here is how to accomplish this:

- Login to the first workstation and the first set of resource files will be created for you.
- Go to a different workstation and elect to make symbolic links to the resource files for the first workstation (instead of separate files). Also, elect to make this the default action.

Now, when you log into a new workstation, the symbolic links will be created for you without further prompting.

## Remote Operation

Normally, you would work directly at a SGI workstation. There are times when you would use a personal workstation to login remotely to a server. The most common situation is likely to be a MacOS X client connected to a SGI Origin (Wart) host. You can run some graphical programs from the server with the graphics displaying on your own workstation. Please always connect to Wart and not to any of the SGI workstations. There is really no point in a remote login to a SGI workstation because the files that you see there are the same files that you would see on Wart, and you incur an extra layer of file transfers because your files are physically on Wart. To reenforce this point, the Secure Shell program (`ssh`, see below) is not fully enabled on the workstations. You cannot use a secure channel for X11 graphical display forcing all such communications out in the open. However, there is a role for `ssh`: if a workstation console is not functioning, login remotely and kill the errant process (`Xsgi`). You can also use the DAT drive with a remote login.

With one exception, you would have no need to make a remote connection from a SGI workstation to Wart. You would if you are doing code development and you have to use a compiler. The compilers are installed only on Wart.

## Secure Shell (SSH)

- [Remote terminal sessions](#)

Telnet and `rlogin` are programs for logging into a remote machine and FTP is a program for file transfers. These programs exchange data, including passwords, in the clear. It is a simple matter to monitor network traffic to see your password and your data. The OpenSSH client (`ssh`) is intended to be a more secure replacement for telnet and `rlogin`. Similarly, `sftp` is a more secure replacement for `ftp`. These programs encrypt data including your password so that a network intruder will have to capture and decode your data: something that is still difficult to do. X11 connections can be forwarded over the secure channel. Telnet, `rlogin` and `ftp` have been turned off on all the SGI workstations and server. You must use `ssh` and `sftp` to connect to these machines.

- [Making an initial SSH connection](#)

To login using SSH, for example to a local machine (in the `biology.gatech.edu` network) named Wart using an account name `yourusername`, type:

```
ssh yourusername@wart
The authenticity of host 'wart (130.207.66.239)' can't be established.
```

```
RSA key fingerprint is 55:05:dc:82:df:57:12:bd:98:ce:34:4d:ff:b4:28:17.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added 'wart,130.207.66.239' (RSA) to the list of known hosts.  
yourusername@wart's password:
```

Notice that you get a warning message. This appears only when you connect to a machine that your workstation has never connected to before. However, once you have accepted the initial connection, you should not see the warning again in subsequent connections. If you do see the warning then you may be a victim of a “man-in-the-middle” attack. Another machine has successfully taken the place of Wart; you should not continue with the connection.

- [Subsequent SSH connections](#)

In a subsequent connection to the same machine, you should not see the warning message:

```
ssh yourusername@wart  
yourusername@wart's password:  
Last login: Tue Jun 10 06:56:43 2003 from dull.biology.gatech.edu
```

Do take note of the last login reported and be suspicious of any irregularities.

- [Setting up X11 sessions](#)

You will need an X11 server program. Whether you are using SSH or a less secure program you must provide permission on your own machine for a connection from the remote machine. For example, if the remote machine is Wart, you have to give Wart permission to display on your workstation:

```
xhost +wart
```

Only then should you start a terminal session on Wart. You would also need to specify that you want to forward the X11 connection, this is the `-X` option:

```
ssh -X yourusername@wart
```

You can combine the two commands on one line

```
xhost +wart; ssh -X yourusername@wart
```

You can leave out the `-X` option if you enable X11 forwarding in your SSH configuration file. See the section “SSH settings” below.

When you are finished with the X11 session, you should revoke the permission immediately which you can do by quitting the X11 application or you can use the `xhost` command:

```
xhost -wart
```

- [SSH settings](#)

Settings are saved in files in a hidden subdirectory of your home directory: `~/.ssh/`. The settings for `ssh` can be made in a file named `config`. Copy the system wide settings file which is called `ssh_config` (do not confuse it with `sshd_config`). This file can be found in various places depending on your operating system: `/etc/ssh/`, `/etc/openssh/` or directly on `/etc/`. Copy the file to your `~/.ssh/` directory and edit your copy. A useful change is to uncomment the `ForwardX11` keyword and change its value to `yes`. You can then invoke `ssh` without specifying the `-X` option.

- [Secure File Transfer Program \(SFTP\)](#)

Sftp is very nearly identical to ftp. To connect, type:

```
sftp yourusername@wart
```

Once you are authenticated, you can use **cd** to move to a location on the remote machine, **lcd** to do the same thing on your workstation, **get** to download a file, **put** to upload a file and **bye** to logout. A graphical sftp client called Fugu is available for MacOS X. If you have a DeKalb account, you can mount the SGI disk directly on your desktop; there is no need to use sftp or Fugu.

- [Using SSH on an alien machine or at a remote location](#)

When you are on an alien machine, you would not be able to configure SSH, nor would you want to. If you are outside the biology domain, you will also have to type the full names of machines. Thus, in our example:

```
xhost +wart.biology.gatech.edu  
ssh -X yourusername@wart.biology.gatech.edu
```

- [Authentication without passwords](#)

It is possible to set up SSH so that you can login to a remote machine without entering the password. Generate a pair of keys and copy the public key to the remote machine and keep the private key secure on your own machine. Authentication is based on your ability to decrypt a large random number; which is possible only if you have installed the correct key on the remote machine and you have the proper private key. This is quite safe as long as you can ensure that your private key is never stolen, which can happen if you leave your terminal session unattended and the key file unprotected. For additional protection you can specify a password when you create your keys so that a password is needed in order to open the key. You still have to enter a password to login but the password is confined to your own machine. It is never passed over the network not even in an encrypted form.

If you use this form of authentication you can invoke programs on the remote system directly. The command is likely to be long but you can put it in a script and install the script as a menu item in your X11 server program. You can run the remote program simply by pulling down a menu and selecting the appropriate item.

- [Remote mail access and security](#)

If you use IMAP or POP to collect mail from Wart you may be transmitting your password in the clear when you authenticate with the server. You can avoid doing so by not using Wart for email. You should be using the Institute and School servers for email anyway.

## Resource Files

The resource files are updated every now and then. Compare the contents of the system templates and the corresponding files in your own directory. You might want to adopt the changes.

System	Personal
wart:/etc/stdlogin	~/.login
wart:/etc/stdcshrc	~/.cshrc

The templates add a directory named “bin” in your home directory (~/.bin/) to your command path. You can create this directory and place your programs there.

## Groups

You are assigned to at least one account group:

Number	Name	Characteristics
<b>500</b>	<b>library</b>	Administrative users. There is no disk quota and these accounts never expire.
<b>600</b>	<b>harvey</b>	Permanent and resident members of the Harvey lab. Accounts expire when the status of the user changes. Members of this group also belong to the <b>biology</b> group.
<b>700</b>	<b>biology</b>	Prospective (such as rotation) students and non-research or nonresident members of the Harvey lab. Accounts for rotation students are valid for a maximum of 9 months. Members also belong to the <b>harvey</b> group.
<b>800</b>	<b>class</b>	Members of a class taught on SGI workstations. Accounts expire two weeks after the last class or exam.
<b>900</b>	<b>gatech</b>	All other users. Accounts always expire on the last day of the year and must be renewed during the month of December or earlier. Dormant accounts cannot be renewed.

## Disk Quotas

Your account is subject to three limits on disk usage. When you exceed the *soft limit* you can continue to add files but only up to your *hard limit* and only within a *time limit*. Within that period you should bring your usage below the soft limit. The current limits are based on the assumption that most users will not exceed their soft limit and that only a small number of users will make use of their hard limit. When a hard disk is filled to capacity, every user of the disk will not be able to write to the disk even if their usage is way below the soft limit. Note that files are not removed automatically; you have to remove them yourself and until you do so you may be blocking other users from saving their work.

Group(s)	Disk	Soft Limit	Hard Limit	Time Limit
600	/SGI	25 GB	50 GB	1 month
700, 800		5 GB	10 GB	
900		1 GB	2 GB	

You will be told that you have exceeded a limit only if you happen to be working on Wart. On the SGI workstations you will only experience mysterious failures. You should be aware of the amount of disk space you are using. To get an estimate, type:

```
du -sk ~
```

The total size of your files will be reported in kilobytes.

## Setting up Email

Do not address mail to anybody on the Fuel workstations. Always send mail to Wart. You may send mail from Wart or from any workstation. Always use the address in the form "user@wart" instead of just "user". You must make sure your correspondent has made the decision to use the Wart mail server. You can set up Netscape Mail to send mail and to read your messages. Alternatively, you can set up Mail.app on your MacOS X system to collect messages, but, you will be sending your password in clear text.

## The DeKalb Domain

The machines in this domain include two dual-processor servers (Quince and Rumour) which can only be accessed remotely, one public MacOS X workstation (in CE312) and 10 personal MacOS X workstations. Quince is equipped with a 2.2TB disk array that hosts the network home directory for all DeKalb users. You would access the same home directory when you log into any of the workstations in the DeKalb domain, but only one network login is allowed at any one time. Rumour houses the web server. When you log into a workstation or when you connect to the private areas of the web server you will have to authenticate with Quince.

### Account setup

The first two tasks should be done first and in the order listed below. The remaining tasks can be done in any order after the first two are finished.

- [Transfer from old account](#)

See the supplementary instructions.

- [Change password](#)

Change your MacOS X password at any network login. From the Apple menu (extreme top left corner of the screen), select System Preferences... and from the bottom row of icons (System) select Accounts. Your account should be the first one listed.

- [Link to other domains](#)

If you have been granted access to the Fulton domain, create a link to your home directory in that domain. From the Finder's Go menu, select "Connect to Server..." and in the Address field enter: **quince.biology.gatech.edu**. In the login dialog, enter your login name and password and press the Options button. Elect to save the password in your Keychain. There is no point in selecting the SSH option because the **SGI** and **LNX** directories are out in the open elsewhere on the network. (A secure connection is also much slower.) Leave the other options unchanged. Once you have logged in, select the **SGI** volume. Open the network volume and look for your home directory in the Fulton domain inside your group folder. Drag the icon of your SGI home directory to the sidebar of a Finder window.

If you have been granted access to the Cobb domain, repeat the process for the **LNX** volume. When you are done, your sidebar will contain up to three folders that have the same name and two of them have the same icon. Unfortunately, you cannot do much to distinguish the two network folders, except to put them in widely separated positions on the sidebar. You can also install shortcuts to subfolders instead of the home folders. Another option is to install one folder in the sidebar and the other in the Dock.

- [Setup for UNIX](#)

The local UNIX environment offers many programs ported from LINUX and UNIX by the people at the Fink project and DarwinPorts (only a few are installed) and other, noncommercial, software including MODELLER and NAMD. If you want to use these programs, make a copy of the shell resource file. Open a terminal and type:

```
cp ~/curator/Shared/Resources/DOT-cshrc ~/.cshrc
```

This replaces any file named `.cshrc` in your home directory with a copy from the `Shared/Resources` folder of `curator`. If you already have a `.cshrc` file, you may want to add only the changes in `DOT-cshrc` to your copy. You can prepare for future updates by adopting the network-wide `.cshrc` and putting your settings in `~/mycshrc`.

Apple is switching from the IBM PowerPC processors to the Intel Core processors. In addition to completely different microarchitectures these processors also order binary data in opposite order. Intel-based Macintoshes can run executable binaries that are compiled for the PowerPC architecture. This is accomplished by emulation so it is relatively slow. On the other hand, the PowerPC-based Macintoshes cannot run executable binaries that are compiled for the Intel architecture. Most new programs are delivered as Universal binaries, they contain instructions for both architecture and they run at native speed on either type of machines.

If you use the XCode compilers, you can generate Universal binaries on either type of machine.

If you use YUP you should be aware that the binary data files cannot be shared between the Intel Core and PowerPC machines. There are separate installations of YUP for the two types of machines. Your shell will select the proper package for your machine type.

Your copy of `.cshrc` assumes the following:

1. You will place your Universal executable binaries in `~/Applications/.bin/`, PowerPC binary executables in `~/Applications/.bin/PPC/` and Intel Core binary executables in `~/Applications/.bin/X86/`. Note that none of these directories exist in a clean system. You have to create them.
2. If you are developing your own Python packages, you will place them in `~/Library/Python/site-packages/PPC/` and `~/Library/Python/site-packages/X86/` for PowerPC and Intel Core respectively. Note that the shell initialization file will select `~/Library/Python/site-packages/` if it exists but only if you do not have the processor-specific subdirectories.
3. The network-wide and processor-specific directory `~curator/Shared/lib/(X86|PPC)/python/` is searched last when looking for a Python package. You can install your own copy of the YUP package to override the system-wide copy.

- **Drop Folders**

If you will be sending files to other users of the domain, you can install aliases of their drop folders. Navigate (see below) to the target user's home directory. Open his or her Public directory. Hold down the Option and Apple keys (they are side-by-side) and drag the icon of the Drop Box to the desktop. Rename the alias that is created to include the owner's name.

## Restrictions

At any one time, you are allowed only one network login. You have to logout of one machine before you can log into another. A network login is distinct from an AppleShare login in which you mount a volume from the file server on a local or another network login. There is virtually no limit on the number of such mounts. (The server does have a limit of 1000 logins and mounts.)

Please logout if you are not returning the next day; particularly on Friday nights. This provides an opportunity to perform maintenance tasks on the server without having to check first to see if any user is actually writing to the disk. The server software is very recent (although the BSD base has a long and stable history) and many revisions are expected until it matures.

Do not telnet or ssh to the servers. It is not very interesting and your local machine offers many more command line programs anyway.

Most MacOS X workstations allow logins only to members of Groups 600 and 700. The machine in CE312 offers unrestricted access.

## Disk quotas

All users are equal but some users are more equal than others.

Group	Parent Folder of Home	Disk Quota
600	quince.biology.gatech.edu/Harvey/	100 GB
700	quince.biology.gatech.edu/Biology/	10 GB
800	quince.biology.gatech.edu/Class/	5 GB
900	quince.biology.gatech.edu/GaTech/	10 GB

This is a hard limit and there is no grace period; when you reach your quota, you will no longer be allowed to save files. To check your disk usage, type the command: `df -h`. Check the quantities listed (gigabytes) for the volume mounted under `.../DeKalb/yourgroupname`. Note: disk quotas are suspended for the moment.

## Privacy

The normal permission settings allow read-only access to your home directory at the “Group” and “Others” level. However, the standard folders directly below the home (Documents, Desktop, Music, etc) are not accessible to anyone but yourself. Permissions are inherited from the parent folder. If you add files or folders directly under your home folder, these will be visible to the entire world. Quince allows guest logins so “Others” include anyone in the world with a network connection and an AppleShare client. It is best to use the default permissions and to keep files only in `~/Documents` and `~/Desktop` (you may create subfolders in these folders). However, this means that your files are not accessible to anyone else.

If you want to change permissions, use the Finder to do it (in the File Inspector). Do not use the command line to change permissions. There are subtle differences between OS X permissions and BSD (UNIX) permissions.

There are two folders in every home folder that are accessible to the world. “Sites” holds your web pages but are not served; do not use this folder but leave it as it is. The other public folder is “Public”. You may put files here for the rest of the world. Inside “Public” is “Drop Folder” which allows write-only permission to “Others” (and “Group”).

You can give a file away by dragging it into somebody’s drop box. You are actually giving away the file because you will no longer have it and the owner of the file will be changed to the recipient. If you want to retain the original file and give away a copy, Option-drag the file into the box. You will not be able to see the result. Always inform the recipient that you have deposited a file.

The owner of the drop box can open it of course and see its content. You should only accept a file if you have been told about it; delete files of unknown provenance immediately. Don’t use the drop box for storage. A file that has the same name as an existing file or folder in the drop box cannot be added to it.

## Navigation

There are several ways of navigating to the various areas of your home directory. The following is not an exhaustive list.

From the Finder Go menu, there are items you can select, to bring you to the root level of the local hard disk (Computer), to your Home folder and to the Applications and Utilities folders. The “Go To Folder...” item is useful. Select it and type a path and the folder will open. The path may be for a folder that is normally hidden, such as one that is used by UNIX. For example, `/private/var`. Enter `~somebody` to open the home folder of “somebody”, or just `~` to open your own home folder.

When you click on the Finder item in the Dock, any open Finder window will come to the front. If there is no open window, one is opened for you. You can install items in the Dock to open your Home folder or any other folder. This works differently from the Finder Go menu. The items in the Dock are accessible from any application whereas the Finder Go menu is accessible only when the Finder is the foreground application. You can navigate a file hierarchy by holding down the Control key and clicking on a folder item in the Dock.

The sidebar in a Finder window offers more navigation control. (If the sidebar is hidden, turn it on by clicking on the button in the upper right corner.) You can drag folders, network volumes or disks to the sidebar. Once installed, you can drop files into a folder icon, provided you have the necessary permission. You can install sidebar shortcuts to all your favorite places. The sidebar becomes a flat index to your folder hierarchy. If you had placed an icon for your Fulton or Cobb home directory in the sidebar and saved your password in the Keychain, you can easily access the directory now. The initial connection may take a couple of seconds but once established, access is seamless.

If you turn on column view, you can clearly see the absolute path to any visible folder. Just follow the path leftward towards the parent. If you use the icon or list view, you can move up the path by holding down the Apple key and clicking on the window title. A pull down menu appears; stop at any parent folder.

### Remote access

You can access your folder on the file server as a home directory (network login) only if (1) your computer has a high speed link to the server and (2) your computer has been enrolled into the DeKalb directory domain. Broadband speed is not sufficient for network logins and you would not want to enroll your home computer in a remote domain anyway.

However, you can access your home directory as an ordinary network folder (AppleShare) over a dial-up modem. Using your home computer and from the Finder's Go menu, select "Connect to Server..." and enter in the Address field: **quince.biology.gatech.edu**. In the Login dialog, press the Options button and make sure that you are not saving the password in the Keychain. Select your group folder then open your home folder. Notice that the icons are not decorated as they would be if the server is accessed as a network home directory. Be sure to dismount the network volume as soon as you are done.

### Resource Files

The resource files are updated every now and then. Compare the contents of the system templates and the corresponding files in your own directory. You might want to adopt the changes. These files must be formatted for UNIX. If you use a Macintosh editor, take particular care not to convert them to the Macintosh format.

System	Personal
~/curator/Shared/Resources/DOT-cshrc	~/cshrc

The templates add a directory named "bin" in your home directory (~/bin/) to your command path. You can create this folder and place your programs there.

### Restricted areas of the web server

When you try to access restricted areas of the web server (there are only two, and only one that is readily accessible), you will be challenged for a login name and password. These will be sent to the server securely. Use your DeKalb user name and password. If you use Safari, you can save the password to your Keychain and the

authentication dialog will disappear in subsequent accesses.

## Updating web pages

You can update web pages if you have been granted authoring privilege for those pages. You will be using SFTP to transfer new and revised pages to the server. Use Fugu which adds a graphical interface to the SFTP command. In addition, you can bookmark your folder and save your password to your Keychain.

## Setting up Email

You should use the email systems operated by the Institute and the School. An email account is available to users with User IDs less than 750, and only on request. The server will offer only incoming mail. You will have to arrange with other servers for outgoing mail. See below. All the account setup is done in two tabs: substitute your own information in the highlighted areas and set the other fields to the values shown below. You must select IMAP only (POP is not available). Make sure you select the secure authentication scheme shown below.

The image displays two screenshots of an email account configuration window. The left window shows the 'Account Information' tab with the following fields: Account Type (IMAP), Description (Rumour), Email Address (postmaster@rumour.biology.gatec), Full Name (Postmaster and Webmaster), Incoming Mail Server (rumour.biology.gatech.edu), User Name (postmaster), Password (masked with dots), and Outgoing Mail Server (smtp.mail.gatech.edu:rt106). The right window shows the 'Advanced' tab with the following options: 'Enable this account' (checked), 'Include when automatically checking for new mail' (checked), 'Compact mailboxes automatically' (checked), Account Directory (~/.Library/Mail), 'Keep copies of messages for offline viewing' (All messages and their attachments), 'IMAP Path Prefix' (empty), Port (143), 'Use SSL' (unchecked), and Authentication (MD5 Challenge-Response).

## The Cobb Domain

This domain is served by Snare, a SGI Altix 350 server equipped with six Itanium processors and a 1TB RAID. Snare can only be reached by a remote login. At this time, there is only one other computer in this domain: a HP xw8000 workstation (in CE312) equipped with two Xeon processors.

Please follow the setup instructions for the Fulton domain and adapt them to this domain; you will only have to make some small adjustments. The rest of this section covers things that are done differently for this domain.

## Password Change

Use `yppasswd` on any machine in the Cobb domain to change your password. (The usual `passwd` command will appear to work but it will only waste your time.) The change will be propagated to the other machines in the domain almost immediately.

### **yppasswd**

Changing NIS account information for yourusername on snare.biology.gatech.edu.  
Please enter old password:  
Please enter new password:  
Please retype new password:

You may also need to edit your account parameters in the Cobb domain. To see the current settings for your account, type:

```
yptest yourusername passwd
```

If the full name recorded for your account contains the word “Unassigned”, you must change it to your full name (accounts without a proper full name are assumed to be unclaimed and are targeted for recycling). Type:

### **ypchfn**

Changing NIS account information for yourusername on snare.biology.gatech.edu.  
Please enter password:

Changing full name for yourusername on snare.biology.gatech.edu.  
To accept the default, simply press return. To enter an empty field, type the word "none".  
Name [Unassigned]: **Your Full Name**  
Location []:  
Office Phone []:  
Home Phone []:

The GECOS information has been changed on snare.biology.gatech.edu.

The command `yppasswd` is equivalent to `yppasswd -l` and `ypchfn` is equivalent to `yppasswd -f`.

You cannot change your shell. It is always the Bourne-Again Shell (bash).

## Resource Files

The resource files are updated every now and then. Compare the contents of the system templates and the corresponding files in your own directory. You might want to adopt the changes.

System	Personal
snare:/etc/skel/*	~/.*

When a user account is created, all the files in the template directory are copied to the new home directory.

The templates add a directory named “bin” in your home directory (~bin/) to your command path. You can create this folder and place your programs there.

## Disk Quotas

The main users are granted a *soft limit* that is one quarter of the disk capacity and a *hard limit* that is one half of the disk capacity. Obviously, the disk is overallocated.

Group(s)	Disk	Soft Limit	Hard Limit	Time Limit
600	/LNX	250 GB	500 GB	1 month
700, 800, 900		10 GB	20 GB	

You will be told that you have exceeded a limit only if you happen to be working on Snare. There is no system-wide backup. You have to protect your own data.

## Itanium and Xeon

Snare, the main server is equipped with 64-bit Itanium processors. The only other machine in the Cobb domain is Shadow which is equipped with 32-bit Xeon processors. Both are LINUX machines. You can run programs compiled for the Xeon processor on an Itanium processor but it will run much slower than if the program is compiled specifically for the Itanium processor. A program compiled for the Itanium will not run on a Xeon processor. This presents a dilemma to people who have their own programs. These would be installed in the directory `~/bin` but which processor should the programs be compiled for? One solution would be to have both versions and to name the Itanium version with a variant tag for example “-64”. For example, a program compiled for the Xeon might be called `prog1` and the version compiled for the Itanium is called `prog1-64`. `prog1` will run fine on either processor but on the Itanium one would run `prog1-64` to get the best performance.

Note that the `/usr/local/` hierarchy, where shared programs are installed, are different file systems on the two types of machines. The two versions of the hierarchy may contain many programs in common but the programs are compiled specifically for the appropriate processors.

There are two compilers each for C/C++ and FORTRAN. These are the GNU and Intel compilers. The GNU compilers are the product of a collaborative, open source effort. Intel is the manufacturer of the Itanium processor. Therefore, one would expect the Intel compilers to produce better programs. You should use them whenever you can. The GNU compilers can be used if a program fails to compile with the Intel compilers and you do not have the time or inclination to revise the source files to conform to the Intel compilers.

## Miscellaneous

### Firewall

The computers in the lab. are protected by a firewall. The following are the servers and services that are accessible outside the Cherry Emerson building:

Server	Services
Wart	Secure Shell (SSH) and Secure File Transfer (SFTP)
Snare	SSH and SFTP
Snout	SSH and SFTP (by arrangement)
Rumour	HyperText Transport Protocol (HTTP) and HTTPS (Secure HTTP)
Quince	Apple Filing Protocol (AFP) usually known as AppleShare

Snout is accessible only by prior arrangement and for one week at a time.

## The LNXI Cluster

The Cluster contains a master node and 60 slave nodes. Each node has 1GB of memory and two 2.67GHz Xeon processors. Every node is connected to a private 100 Mbps Ethernet network and the master node has an additional network connection to the public network. The operating system is LINUX.

Users must have a Cobb domain account and a separate account for the cluster. User home directories reside on the /LNX file system which is hosted by Snare.

The cluster has several limitations. There is only one application available, the molecular dynamics program NAMD. There is a batch queuing system (PBS) but it is in conflict with NAMD. NAMD can be started without too much effort even without a queuing system. It will be much more difficult to schedule many single processor jobs without a queuing system. Users must work closely with each other so that the nodes can be used to their maximum potential.

The master node is normally disconnected from the public network. All access has to be through a gateway machine. To connect, first login to either Wart or Snare. Then type:

```
ssh yourusername@x-lnxi
```

and login. The address "x-lnxi" is a private one and is only recognized by Wart and Snare. Since the cluster is isolated from the public network, you have to go through a gateway machine even if you are connecting from a lab machine.

## Working across Domains

- File Sharing

The computers in the Fulton and Cobb domains cross mount their home directories. The computers in the DeKalb domain can mount the home directories from the Fulton and Cobb domains.

Exporter: Host:/Volume Capacity and Type	Importer: Domain and Mount Point		
	Fulton	Cobb	DeKalb
Wart:/SGI 275 GB RAID 0	/SGI	/SGI	/Volumes/SGI
Snare:/LNX 1 TB RAID 5	/LNX	/LNX	/Volumes/LNX
Quince:DeKalb 2 TB RAID 50			/private/.../group

In addition, the computers in the Fulton domain share two file systems in which applications are installed. The computers in the Cobb domain share the /usr/local file system.

In all three domains, the environment variables SGIHOME and LNXHOME are defined to contain the path to your home directories in the Fulton and Cobb domains respectively. These variables can be used in scripts to construct the path to your work folders. Also defined are aliases sgihome and lnxhome that will take you to these places. In the DeKalb domain, an additional variable MACHOME and alias machome is defined; "home" in this domain is defined as the Documents folder inside the home folder instead of the home folder itself.

- Shell Differences

Users of the Fulton domain may choose their shell but should use one of the C-shells (csh and tcsh) if they plan on running Insight-II. Users of the Cobb domain are assigned a Bourne-Shell (bash) and they cannot switch to another shell. Users in the DeKalb domain are assigned tcsh and they also cannot change their shell. (The default shell for MacOS X 10.3 has been changed to bash, but for now new users will continue to be assigned tcsh.)

The two families of shells are similar enough that users can switch between the two comfortably. The user has to watch out for only a few differences in syntax.

One is in file redirection; bash offers more options than the C-shell. For example, one can redirect the standard output to a file (say "results") by adding ">results" to the command, or redirect both the standard output and error to the file by adding ">&results". This works in both shells but a more complex construction is required to redirect only the standard error in the C-shell.

The other area where the user is likely to encounter syntax differences is in defining environment variables. Usually we would define environment variables in the login or a job script. For example, define the variable "VAR" to have a value "value". The C-shell syntax is "setenv VAR value". The Bourne-Shell syntax is "set VAR=value; export VAR" or "export VAR=value". (In both shells "set VAR=value" defines a shell variable.)

## Local User Account

You can ask for a local user account if you want to run simulations on your personal workstation. This is worthwhile only if you have a machine that is fast enough and it has at least two processors or cores.

MacOS X 10.4 has a well-deserved reputation for stability and we have encountered only a few instances of outright crashes. You will be switching between your simulations running in an isolated environment under your local account, and your regular work running under your network account. The following are suggestions on how to keep your workstation running smoothly so that your calculations are not interrupted prematurely.

- Avoid crash-prone programs, Usually, crashing programs do not harm the operating system. You will have to judge whether an application that keeps crashing is more important than your simulation. Force quit crashing programs quickly before they can do any real harm.
- Recognize network stalls. There are many instances when the machine appears to stall but it is only waiting for a network resource. Do not be in a hurry to reboot (and lose your calculations). Network processes are usually set to time-out after two minutes but be prepared to wait for as long as an hour.
- The login screen can crash, while the machine may continue to function normally. Since, there is no way to get into the machine, it is as good as dead.
- Brand-new users may also crash at login (this should clear out after three or four logins). Once again, the machine is running normally except for the screen. Other users should recognize the danger and should ask the owner for permission for each and every use of the machine.
- Be aware that your machine is tied to the server (QUINCE). If there is a break in the network or if the server is down, the following will apply:
  - Network logins may not be useable. Your work may be saved to a cache. In theory, your data is retrieved once the server can be contacted. Best thing to do is to take a break until the server is online.
  - Logins will stall until the server can be reached. This is true even for local accounts.
  - Logouts will also stall. The login screen will not appear until the server can be reached.
  - As long as you stay in your local account, you can continue to work. The best course of action is to do the minimum until the server is running again.
- Your local account uses the Bourne-again shell (bash), while the regular account uses the TENEX C-shell (tcsh). The two accounts are not related. You can mount your network volume from within the local account. The converse is not possible.
- Set up an isolated environment for your simulations. Use the network to transfer files, before and after the simulation. Dismount network resources before you start the calculation. If you logout in the middle of a simulation, your calculations will be terminated. However, you can switch out to the login screen or to your network account, without hurting your calculations.
- In your network account, turn on the Activity Monitor and select the floating CPU window. Set this to open automatically on login. This provides a handy visual indicator of the progress of your simulations as you work in your regular account.
- Please configure your calculations so that they run for no longer than a month at a time. Please logout of the local account when you are not running any simulations. This is so that your machine can be updated. Although, I can tell if the machine is idle, I cannot tell if you have unsaved data. Security updates are issued about every other month.
- Connect to QUINCE, mount the Harvey volume, open the *curator/Shared/Resources/* folder and copy *DOT-bashrc* as *~/.bashrc*; you have to use the command line to do this. This installs a minimal shell resource file for the following:
- You need to install a local copy of YUP of course. The latest distribution (*YUP060731*, available from *~curator@snare*), can be installed without script customization, provided you have installed the minimal bash resource file. Expand the distribution file, run the default *Prepare* script then the *INSTALLYUP* script. It is that simple!
- Use *Yup.avf* to convert AtomVector files from binary on a source platform to text. Transfer the text file to the destination platform and use *Yup.avf* again, to convert the text file to binary.

The sleep function on your machine will be turned off; it will no longer go to sleep even if it is idle. This will reduce

the life span of the machine. Your machine is also equipped with a battery which will protect against brownouts but not prolonged blackouts.