



**GEORGETOWN UNIVERSITY**

**AITS GUIDE TO  
UNIX COMPUTING**  
*GUSUN - RESEARCH*

ACADEMIC AND INFORMATION  
TECHNOLOGY SERVICES  
A DIVISION OF  
UNIVERSITY INFORMATION SERVICES

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# INTRODUCTION

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**AITS Mission (draft)** The mission of Academic and Information Technology Services is to provide quality services that support, empower and unite the Georgetown University community in their use of information technology in order to encourage, facilitate, and enhance teaching, research, learning, outreach, and administrative services.

**UNIX Computing at Georgetown** Academic and Information Technology Services currently owns and operates a number of UNIX-based microcomputers for use by the Georgetown community including GUSUN and RESEARCH. This guide is geared towards GUSUN, but all commands will work on the other AITS-operated UNIX machines.

## GUSUN AND RESEARCH

---

GUSUN is a Sun Microsystems SPARC Server running the Solaris UNIX operating system. GUSUN functions mainly as an email system for students, faculty, and staff, but it also features a wide variety of other programs for accessing the Internet including the Pine email reader, the Lynx web browser, IRC chat, GOPHER, and Usenet news. GUSUN also functions as Georgetown's primary web server ([www.georgetown.edu](http://www.georgetown.edu)).

RESEARCH is a Sun Microsystems Ultra Enterprise 4000 server with two 250 Megahertz processors and 512 megabytes of RAM. The system also includes 40 gigabytes of research disk storage via a Sun Storage Array Model 210. RESEARCH replaced the GUVAX research system in July 1998. Use of RESEARCH is restricted to students, faculty, and staff who need to have access to analytical, research, and development tools such as SAS, SPSS, GAUSSIAN and FORTRAN.

**Obtaining GUSUN and RESEARCH Accounts** GUSUN accounts for new Main Campus and Medical Center students are created automatically at the beginning of the academic year. Accounts become active on the first day of classes. Main Campus faculty and staff may apply for accounts either in person at the AITS ServiceDesk in Reiss 238 or online at <http://www.georgetown.edu/uis/services>. The online application page should be used for new account requests only. Problems with existing accounts should be reported to the AITS HelpDesk at 687-6096.

Medical Center students may go to the Dahlgren Library to pick up their GUSUN usernames and passwords. Medical Center staff and faculty who want a GUSUN account should go to Dahlgren Library to fill out an application form.

Main Campus faculty and staff who need access to the software on the RESEARCH system can fill out an application form at the AITS ServiceDesk in Reiss 238 or via the online application at <http://www.georgetown.edu/uis/services>. Students may also apply for RESEARCH accounts by bringing a letter signed by a faculty sponsor explaining why they need a RESEARCH account to Reiss 238 and filling out an account application form.


## ABOUT THIS MANUAL

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This manual is intended to provide GUSUN users with a basic introduction to the UNIX operating system and its applications here at Georgetown. All GUSUN account holders should have a fundamental working knowledge of UNIX, the GUSUN operating system, and an understanding of the Internet utilities available on this system.

### How to Use This Manual

In the procedures outlined in this manual, the following fonts are used to distinguish between system and user commands:

<code>typewriter style</code>	Indicates system prompts or responses
<i>italics</i>	Indicates commands you should type or a URL (website) address
<b><i>bold italics</i></b>	Indicates a variable specified by the user
<b>bold</b>	Indicates a topic or concept discussed
	Indicates important information or notes

The `gusun%` prompt that appears at the beginning of command lines is the GUSUN command prompt. When `gusun%` is displayed on the screen it indicates that the operating system is waiting for you to enter a command. (You do not need to re-type this.)

You must press the *Enter* or *Return* key after entering commands at the `gusun%` prompt.

## GEORGETOWN UNIVERSITY COMPUTER SYSTEMS ACCEPTABLE USE POLICY

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This section contains policies for acceptable computer use at Georgetown University. These regulations apply to all computer systems supported by Georgetown University including, but not limited to, public computing facilities, electronic mail accounts, and network accounts. Additional copies of these policies may be obtained at the Academic and Information Technology Services office in Reiss 238 or on-line at <http://www.georgetown.edu/technology/use/>. They can also be found in the Student Handbook.

This policy is designed to guide students, faculty, and staff in the acceptable use of computer and information systems and networks provided by Georgetown University. More importantly, it is meant as an application of the principles of respect and

reverence for every person that are at the core of Georgetown's Catholic, Jesuit identity.

## **Guiding Principles**

The Georgetown University community is encouraged to make innovative and creative use of information technologies in support of education and research. Access to information representing a multitude of views on current and historical issues should be allowed for the interest, information and enlightenment of the Georgetown University community. Consistent with other University policies, this policy is intended to respect the rights and obligations of academic freedom. The University recognizes that the purpose of copyright is to protect the rights of the creators of intellectual property and to prevent the unauthorized use or sale of works available in the private sector. Also consistent with other University policies, an individual's right of access to computer materials should not be denied or abridged because of race, creed, color, age, national origin, gender, sexual orientation, or disability.

The University cannot protect individuals against the existence or receipt of material that may be offensive to them. As such, those who make use of electronic communications are warned that they may come across or be recipients of material they find offensive. Those who use e-mail and/or make information about themselves available on the Internet should be forewarned that the University cannot protect them from invasions of privacy and other possible dangers that could result from the individual's distribution of personal information.

Georgetown University computing and network resources are to be used only for University-related research, instruction, learning, enrichment, dissemination of scholarly information, and administrative activities. The computing and network facilities of the University are limited and should be used wisely and carefully with consideration for the needs of others. Computers and network systems offer powerful tools for communications among members of the community and of communities outside the University. When used appropriately, these tools can enhance dialog and communications. When used unlawfully or inappropriately, however, these tools can infringe on the beliefs or rights of others.

## **Responsibilities**

The following examples, though not covering every situation, specify some of the responsibilities that accompany computer use at Georgetown and/or on networks to which Georgetown is connected.

1. Users may not attempt to modify the University system or network facilities or attempt to crash systems. They should not tamper with any software protections or restrictions placed on computer applications or files.
2. Users may use only their own computer accounts. Users may not supply false or misleading data nor improperly obtain another's password in order to gain access to computers or network systems, data or information.

The negligence or naivete of another user in revealing an account name or password is not considered authorized use. Convenience of file or printer sharing is not sufficient reason for sharing a computer account. Users should not attempt to subvert the restrictions associated with their computer accounts.

3. Users are responsible for all use of their computer account(s). They should make appropriate use of the system and network-provided protection features and take precautions against others obtaining access to their computer resources. Individual password security is the responsibility of each user.

4. Users may not encroach on others' use of computer resources. Such activities would include, but are not limited to, tying up computer resources for excessive game playing or other trivial applications; sending harassing messages; sending frivolous or excessive messages, including chain letters, junk mail, and other types of broadcast messages, either locally or over the Internet; using excessive amounts of storage; intentionally introducing any computer viruses, worms, Trojan Horses, or other rogue programs to Georgetown University hardware or software; physically damaging systems; or running grossly inefficient programs when efficient ones are available.

5. Users are responsible for making use of software and electronic materials in accordance with copyright and licensing restrictions and applicable university policies. Georgetown University equipment and software may not be used to violate copyright or the terms of any license agreement. No one may inspect, modify, distribute, or copy proprietary data, directories, programs, files, disks or other software without proper authorization.

6. Users must remember that information distributed through the University's computing and networking facilities is a form of publishing, and some of the same standards apply. For example, anything generated at GU that is available on the Internet represents GU and not just an individual. Even with disclaimers, the University is represented by its students, faculty and staff, and appropriate language, behavior and style are warranted.

## **Administration and Implementation**

The University encourages all members of its community to use electronic communications in a manner that is respectful to others. While respecting users' confidentiality and privacy, the University reserves the right to examine all computer files. The University takes this step to enforce its policies regarding harassment and the safety of individuals; to prevent the posting of proprietary software or electronic copies of electronic texts or images in disregard of copyright restrictions or contractual obligations; to safeguard the integrity of computers, networks, and data either at the University or elsewhere; and to protect the University against seriously damaging consequences. The University may restrict the use of its computers and network systems for electronic communications when faced with evidence of violation of University policies, or federal or local laws. The University reserves the right to limit access to its networks through University-owned or other computers,

and to remove or limit access to material posted on University-owned computers.

All users are expected to conduct themselves consistent with these responsibilities and all other applicable University policies. Abuse of computing privileges will subject the user to disciplinary action, as established by the applicable operating policies and procedures of the University. Abuse of networks or computers at other sites through the use of Georgetown University resources will be treated as an abuse of computing privileges at the University. When appropriate, temporary restrictive actions will be taken by system or network administrators pending further disciplinary action; the loss of computing privileges may result.

The University and users recognize that all members of the University community are bound by relating to electronic media. It should be understood that this policy does not preclude enforcement under the laws and regulations of the United States of America or the District of Columbia.

# CHAPTER I: Connecting to GUSUN

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Users can log onto GUSUN from all AITS lab machines, remotely via modem, or via the campus network.

## FROM AITS LAB MACHINES

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### From IBM-Compatible Computers

To log onto GUSUN from AITS IBM-compatible computers, perform the following steps:

1. Choose **Internet Utilities** from the Windows 95 desktop.
2. Select **GUSUN**.
3. Once the connection has successfully been made, the GUSUN log-in screen will be displayed. At the `login :` prompt, type your designated username.

The UNIX operating system considers upper and lower-case letters to be different. This means that when you type in commands, you usually need to type them in lower case. Be sure that the Caps Lock on your keyboard is turned off before you try to connect to GUSUN.

4. At the `Password :` prompt, type your password and then press *Enter*.

The password is not displayed when typed.

If the username or password entered is incorrect the message `login incorrect` is displayed. If you have forgotten your password, you must come by the AITS ServiceDesk in Reiss 238 to fill out a Password Reset Form.

The `gusun%` prompt appears once the connection has been established.

### From Macintosh Computers

To log onto GUSUN from AITS Macintosh computers, perform the following steps:

1. Go to the **At Ease Items Menu**.
2. Click on the **GUSUN** icon.

3. Once the connection has successfully been made, the GUSUN log-in screen will be displayed. At the `login:` prompt, type your designated username.

The UNIX operating system considers upper and lower-case letters to be different. This means that when you type in commands, you usually need to type them in lower case. Be sure that the caps lock on your keyboard is turned off before you try to connect to GUSUN.

4. At the `Password:` prompt, type your password and then press *Enter*.

The password is not displayed when typed.

If the username or password entered is incorrect, the message `login incorrect` is displayed. If you have forgotten your password, you must come by the AITS office in Reiss 238 to fill out a Password Reset Form.

The `gusun%` prompt appears once the connection has been established.

## VIA MODEM

---

Users may access their GUSUN accounts from remote sites via modem. To obtain direct access via modem you must have the following:

1. A current GUSUN account
2. A personal computer configured with a Hayes-compatible modem
3. A communications package set up as follows:
  - 28,800 baud (or less)
  - 8 data bits
  - 1 stop bit
  - No parity
  - Flow control set to xon/xoff
4. The package must be able to emulate a VT100 (or better) terminal.

AITs supports Hyperterminal for Windows 95, Terminal for Windows 3.1, and Kermit for the Macintosh. Hyperterminal and Terminal are free with the Windows operating system. Kermit is available for downloading from all AITS lab machines and the AITS web site (<http://www.georgetown.edu/acs/downloads>).

Modem access is available 24 hours a day by dialing:

(202) 687-0720	(up to 28,800 baud)
(202) 687-0730	(up to 28,800 baud)

Dialing either of these numbers connects you to a modem pool; there are over 50 modems in this pool which provide access to GUSUN.


To establish a connection to GUSUN using a modem, perform the following procedures:

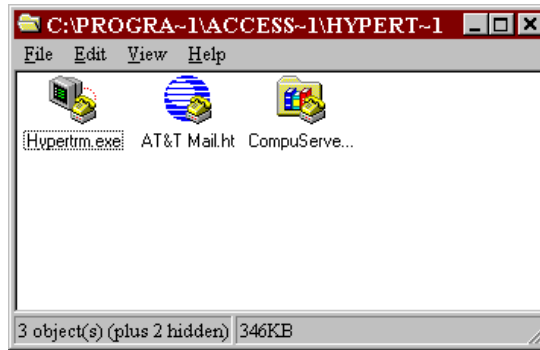
1. Using a Hayes-compatible modem, dial **(202) 687-0720** or **(202) 687-0730**.
2. At the connect prompt, you may need to press *Enter*. A menu will appear.
3. Choose *1 (one)* for GUSUN.
4. Once connected to GUSUN, you will be prompted for your username and password. If you are logging on for the first time, you will be prompted to change your password.

## USING HYPERTERMINAL WITH WINDOWS '95

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Accessing your GUSUN account has never been easier than it is with Windows '95. The remote terminal server is configured for optimal compatibility with your Windows '95 dial-in capabilities and will allow you to access all offered services with a minimum of configuration changes. The steps are as follows:

1. The first time you try to dial in to one of our servers you will have to go through an initial setup procedure. Once this is completed, if you save your work, you will never have to go through it again. To begin the setup procedure, click once on the  button in Windows '95 and then select **Programs**. Once inside of Programs, select **Accessories** and from Accessories choose the **HyperTerminal** folder.
2. After you click on the **HyperTerminal** folder you will get a window that looks like the figure at the top of the following page. Double click on the **hypertrm** icon and you will begin the setup procedure.



3. After you double-click on the **Hypertrm** icon, HyperTerminal will start. You will see the setup screen shown below.



4. Once you have the Connection Description Window on your screen, type in a short and easy-to-remember name for your terminal session. Choose an icon from one of those pictured and then click on the **OK** button.
5. You now need to modify the dialing properties to meet your specific needs. These needs vary from person to person and from telephone system to system but may include any combination of the following:

<b>Special Setting</b>	<b>Required Code</b>
Call Waiting from Bell Atlantic	*70,
Call Waiting from Hoyanet	113,
Calling the modem pool from off-campus	9,
Calling Long Distance	1202,

**Please note the commas in the listed examples. These are necessary and cause the telephone dialer to pause for 3 seconds. If the pause is not long enough for your system, you may need to insert additional commas.**

6. Once you have configured the telephone number click on the **Dial** button. If your modem is connected (and the volume is turned up) you will hear a dial tone. Once you are connected you will see a menu. Type **I** for GUSUN. If you do not receive the menu or if you get a garbled screen, please call the AITS HelpDesk at(202) 687-4949 and we will be happy to help you examine your advanced settings. Remember these settings should be set to their defaults.

In the future you will be able to click on the icon you set up in the first step of this project instead of reconfiguring the session each time you try to dial in. You may also simply start **HyperTerminal** and then choose **Open** from the File option in the settings bar (shown above). You will receive a listing of all the different **HyperTerminal** sessions you have created, usually one for each telephone number you dial, and you can choose the **HyperTerminal** session you wish to run.

## **PASSWORDS AND SECURITY**

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Maintaining the integrity of Georgetown's computer systems must involve everyone from system administrators to individual users. It is important to keep your account secure in order to prevent unauthorized users from accessing confidential data or damaging the GUSUN and RESEARCH systems themselves. As the owner of an account, you will be held responsible for any activity violating the Georgetown University Computer Systems Acceptable Use Policy use of it, authorized or not. For this reason it is imperative that you take simple yet important steps to guarantee that only you use your account.

One of the most important yet easiest steps you can take to insure the security of your account is choosing a good password. Passwords must be at least six characters long and contain at least one number and two letters. A good password should be easy for you to remember but hard for others to guess. Whole words and nicknames are poor choices for passwords as are obvious dates such as birthdays or anniversaries. Please choose your password carefully since a poor password presents a security risk to the system.

Changing your password on a regular basis is another easy way to maintain the security of your account. Perform the following procedure to change your password:

1. Log onto GUSUN
2. At the gusun% prompt, type *passwd*
3. When prompted, type in your old password. Passwords will not echo to the screen, i.e., they are not displayed when typed.
4. At the New Password: prompt, type in the new password.
5. At the Re-enter new password: prompt, retype your new password.

The display will return to the gusun% prompt.

Note that you must know your old password in order to change it. If you have forgotten your password, you must come by Reiss 238 with your Georgetown ID to fill out a Password Reset Form. Passwords are your responsibility and are not kept on file by AITS.

Individual accounts may not be shared with others. Account sharing compromises the confidentiality of your password. It is a violation of the Acceptable Use Policy to share access information about your account with others, to obtain access information about accounts other than your own, or to use any accounts other than those you own. Convenience, negligence, and naivete are not acceptable reasons for account sharing. If you suspect that someone has gained access to your account, please change your password and contact the AITS HelpDesk immediately at (202)687-6096.

Another simple step you can take to help the security effort is to keep your account free of any files or programs that could damage or compromise the system. As part of our effort to keep them secure, AITS periodically runs security sweeps in order to detect files or processes that threaten the security of Georgetown's computer systems. Possession or execution of such files or programs is a violation of acceptable use.

## LOGGING OFF

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To disconnect from the GUSUN system, you must first exit any program you are running, such as Pine. At the gusun% prompt, simply type *logout* to end your GUSUN session.

# CHAPTER 2: UNIX Basics

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## The UNIX Operating System

The UNIX operating system is divided into two main parts, the **kernel** and the **shell**. The kernel can be thought of as the internal processor that takes your instructions and acts upon them. The shell is the part of the operating system that sends your instructions to this processor. The shell is essentially a program like any other and is the part of the operating system that prints the `gusun%` prompt.

As the UNIX operating system developed, several different versions of shells also developed. The default shell on GUSUN is called “myshell,” which is a version of the standard c-shell (csh) customized for Georgetown. For more information on changing your shell and customizing your account, please see [Chapter 5: Advanced UNIX Commands](#).

## Naming Conventions

Information stored in your GUSUN account is stored in files, much like paper files in a file cabinet. These files can be created, deleted, moved, copied and even stored in directories and sub-directories. The first thing you need to know about a file is its name. UNIX offers a very flexible file-naming system. Filenames can be up to 256 characters long, and can use letters, digits, periods, hyphens, and under-scores. UNIX does, however, recognize differences in upper and lowercase letters, so it is important to remember that **FILE**, **File** and **file** would all be viewed as different files.

You should not use any of the following characters in filenames, as the system reserves these characters for special meaning:

`/ ! @ # $ ^ & * ( ) + ' " \ ?`

## WORKING WITH COMMANDS

---

The UNIX operating system also offers a very flexible system for working with commands. Almost every command you can use on GUSUN allows the use of special “flags” in conjunction with the commands. These flags allow the user to specify certain options to tailor the actions of the commands. UNIX commands are usually made up of a single word (the command), followed by a dash and a combination of letters and then any file(s) upon which the command acts.

### Example:

```
gusun% rm -i oldfile
```

In this example, the UNIX command **rm** is used to delete a file. The **-i** flag tells GUSUN that you would like the system to warn you before actually deleting the file. *oldfile* is the name of the file to be acted upon (deleted).

## WORKING WITH FILES

---

### Listing Files

To get a listing of your files, use the **ls** command. This is a request to the system to “list the contents of a directory.” If you do not specify a directory, you get a list of files in the directory in which you are currently working.

To display more detailed information about the files in the directory, there are a number of options available for use with the **ls** command. For example, the **-l** flag will give you a longer description of your files including size and creation date.

Many UNIX system files are stored in your account in order to save your preferences for your shell and various programs. These files typically begin with a period. If you simply list your files with **ls**, you will not see these “hidden” files. But the command **ls -a** will give you a complete list of all of your files, including hidden files.

UNIX allows you to combine flags to further tailor your commands, so using **ls -al** will give you a complete listing of your files, including all system and hidden files.

#### Example:

```
gusun% ls -al
total 9
drwx----- 3 smithm      512      Aug 17 11:28 .
drwxr-xr-x  3296 root      62464   Aug 23 15:54 ..
-rw-----  1 smithm       40      Aug 17 01:28 .addressbook
-rw-----  1 smithm     3124   Aug 17 01:28 .cshrc
-rw-----  1 smithm      575   Aug 17 01:28 .login
-rw-----  1 smithm     4338   Aug 17 11:28 .pine-debug1
-rw-----  1 smithm     8803   Aug 17 11:28 .pinerc
-rw-----  1 smithm      144   Aug 17 01:28 .profile
drwxrwxrwx  2 smithm      512   Aug 17 11:28 mail
```

### Wildcards

When you issue a command in UNIX, you may want to apply that command to more than one file. UNIX provides a wildcard character to help you do so. The **\*** (asterisk) character can be used to take the place of any set of characters. For example, if you would like to list all the files in your account which begin with the letter **m**, you could use the **ls** command with the **\*** wildcard:

#### Example:

```
gusun% ls m*
mbox      meeting5_8  meeting6_26  meeting7_10
meeting5_22  meeting6_12  meeting6_5
```

## Viewing Text Files

To view the contents of a text file, use the **more** command. This command will display the file you specify, one screen at a time. At the bottom of each screen, it will display the percentage of the file you have already seen and prompt you to press the spacebar to continue to the next screen.

### Example:

```
gusun% more longfile
```

This command would display a file named *longfile* one page at a time. To scroll forward one line at a time, press Enter. To stop viewing before the entire file has been shown, press *Control-C*.

The **more** command can also be used in conjunction with other UNIX commands. For example, if your directory listing using the **ls** command scrolls down the screen too fast for you to read it, you could use the **more** command to show the listing one page at a time:

```
gusun% ls | more
```

| is the UNIX "pipe" symbol, or vertical bar, on your keyboard (the output of the command on the left of the pipe symbol is sent to the command on the right). The pipe symbol can be used with many UNIX commands to direct command output.

## Moving Files

To move a file from one place in the file system to another, use the **mv** command. For example, to move a file called *myfile* from your current directory to the *english* directory beneath your home directory, you would issue the following command:

```
gusun% mv myfile english/myfile
```

The **mv** command allows you to change the name of the file in the move. If you wanted to move the file called *myfile* to the *english* directory, but rename it *yourfile*, you would type:

```
gusun% mv myfile english/yourfile
```

## Renaming Files

As seen earlier, the **mv** command moves files around in the file system. In the process of moving a file or a directory, **mv** can also rename the file. The process of renaming a file is a side effect of the move function. If you would like to rename a file, simply move it to another filename:

```
gusun% mv oldfile newfile
```

## Copying Files

To copy a file to another file or directory without deleting the original, use the **cp** command. For example, to copy the contents of the file *read.me* into *read.this*, type:

```
gusun% cp read.me read.this
```

Both *read.me* and *read.this* will now exist, and their contents will be identical.

## Removing Files

The **rm** command deletes (“removes”) files from a directory. For example, to remove the file *read.this*, you would type:

```
gusun% rm read.this
```

Warning: Use the **rm** command with extreme caution! Once a file is deleted, it is very difficult, if not impossible to get it back. You may want to use the **-i** flag when using **rm**. **rm -i** will ask you if you really want to delete the file, thus lessening the risk of accidentally deleting an important file.

# WORKING WITH DIRECTORIES

---

Each user’s account contains at least one file directory, your **root** or **home** directory. Your home directory is a folder that holds all of the files and programs that you create on GUSUN, including all sub-directories. Your home directory has the same name as your username.

When you first log in, your current directory will be your home directory. You can, and usually should, make other directories in which to store various files. All files and directories that you create will be stored in your home directory. For all accounts on GUSUN, users' home directories are located at `/home2/username` or `/home3/username`. Usernames A - L are located at `/home2/username` and M - Z are located at `/home3/username`.

For example, if your username is `smithm`, your home directory would be: `/home3/smithm`.

To determine which directory you are currently in, use the **pwd** command. Typing this at the `gusun%` prompt will show you your current working directory.

## Creating Directories

The **mkdir** command creates (or “makes”) directories. To create a sub-directory within your home directory, simply specify the name of the directory you would like to create:

```
gusun% mkdir Reports
```

This would create a directory beneath your current directory named `Reports`.

## Changing Directories

Once you have created a new directory you may want to move into that directory to work with files. To change the current directory (the “working” directory), use the **cd** (“change directory”) command plus the name (or pathname) of the directory you wish to work in.

The command:

```
gusun% cd Reports
```

would move you into a directory called **Reports** located in your home directory. The full pathname of this directory would be:

```
/home3/smithm/Reports
```

## Removing Directories

To delete an empty directory use the **rm** command.

```
gusun% rm Reports
```

would remove the **Reports** directory within your home directory if the directory is empty. To delete a directory and all its contents, use the **rm** command with the **-r** flag:

```
gusun% rm -r english
```

## Pathnames

You can use the **~** (tilde) symbol as shorthand for your home directory. For example, **/home3/smithm/Reports** is the same as **~/Reports**. You can use this shorthand whenever you issue a command including your home directory.

## Other Directory Commands

To back up one level in the directory structure, type `gusun% cd ..`.

To get back to your root or home directory type `gusun% cd`

To move to a directory that is not a sub-directory of the current working directory, use the full pathname, the one that begins with a forward slash. For example, to look around in the `/usr` directory, you can type `gusun% cd /usr`.

## DISK SPACE USAGE

---

Your GUSUN account is allocated a specific amount of disk space for file and directory storage. This disk space is limited to 4MB. In addition, the directory where your mail is kept (`/var/mail`) is limited to 3MB. You need to closely monitor the space in your `/var/mail` directory. In general, you can maintain 75 to 100 average-sized e-mail messages without exceeding the quota.

If you exceed your quota in either your home directory or your `/var/mail` directory, you are given a 7-day grace period to bring your disk usage back under quota. If you continue to be over quota after 7 days, your account will be frozen and you

will not be able to send or receive e-mail or perform other tasks. If this happens, you will need to contact the AITS HelpDesk for further assistance in cleaning out your account. The AITS Helpdesk can be reached at (202) 687-6096, or at [helpdesk@gusun.georgetown.edu](mailto:helpdesk@gusun.georgetown.edu).

In order to use the system resources responsibly and to prevent your account from freezing, you can check on your disk space usage at any time with the **quota -v** command. This command will display your current usage, your allotted disk space, and the amount of time left in the grace period (if you are exceeding your quota).

There is another utility available on GUSUN that will help you keep track of your disk space usage. To run this program, simply type *disk* at the `gusun%` prompt. This utility will display all files in your account, sorted from smallest to largest. The number on the left side of the screen is the size of the file, measured in blocks. The right side of your screen shows the complete file name, including the sub-directory. The sum total of all your files will be displayed at the end of the program.

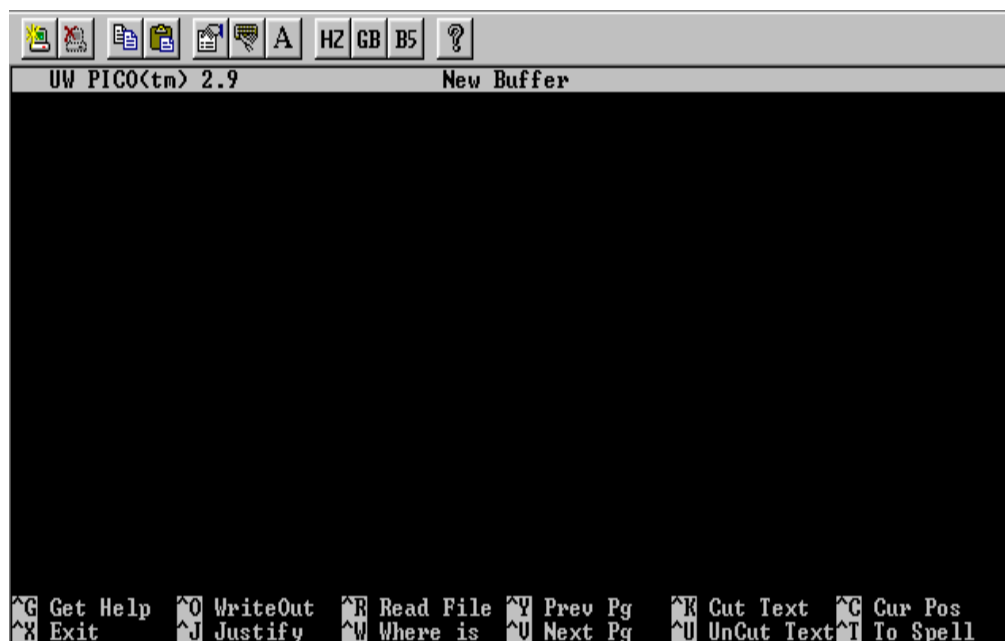
# CHAPTER 3: Text Editors

## TEXT EDITING

The GUSUN system provides users with a variety of text manipulation programs for word processing, sending e-mail, and even creating program code. This chapter outlines two of the most popular text editing packages offered on GUSUN.

## THE PICO EDITOR

Pico is a user-friendly text editor created by the makers of GUSUN's Pine Mail Reader program. The layout for this program is very similar to that of the Pine program, and uses many of the same commands.



The status line at the top of the display shows Pico's version, the current file being edited, and whether or not there are outstanding changes that have not been saved. The third line from the bottom is used to report informational messages and for additional command input. The bottom two lines list the available editing commands.

Each character typed is automatically inserted into the buffer at the current cursor position. Editing commands and cursor movements (besides arrow keys) are entered by typing special control-key sequences.

You will notice that some of the options at the bottom of the screen appear as two characters, for example "**^G**" for Get Help. The "**^**" refers to the control key. On some keyboards this key is labeled "**Control**," on others it is labeled "**Ctrl**." In either case "**^G**" implies that you press down the control key, keep it depressed, and then press the key that follows, in this case "**G**." The control key functions like the shift key, meaning that by itself it does nothing, but when pressed in conjunction with another character it does have an effect.

## Creating a File

To begin editing, you should type the command **pico**, followed by the name of the document you wish to create. For example, to edit a file named *newfile*, you would type:

```
gusun% pico newfile
```

The message [New File] at the bottom of the screen indicates that you are editing a brand new document.

## Editing Files

To begin, just start typing. Pico offers word-wrap capabilities usually found in programs such as WordPerfect. At the end of the line, Pico will automatically wrap the word around to the next line if it is too long, thus eliminating the need to press **<Return>** at the end of each line. The **<Delete>** key will erase characters that you have just typed and the **<Return>** key will start a new line.

## Moving Around

In addition to using the arrow keys to navigate through the text, Pico offers some other features that allow you to move around large sections of text:

- ^F** move forward a character
- ^B** move backward a character
- ^P** move to the previous line
- ^N** move to the next line
- ^A** move to the beginning of the current line
- ^E** move to the end of the current line
- ^V** move forward a page of text
- ^Y** move backward a page of text

## Searching and Browsing

To search for occurrences of text in the document, execute the following command:

- ^W** Search for text, neglecting case

## Selecting, Cutting and Pasting Text

The following commands will allow you to cut and paste text:

- ^^** (**Control-carrot**) Mark cursor position as beginning of selected text.  
(Note: Using this command when mark is already set unselects text.)
- ^K** Cut selected text (displayed in inverse characters).  
(Note: Selected text is to the left of the cursor. The character under the cursor is not selected.)

**^U** Uncut (paste), inserting last cut text at the current cursor position.

**^I** Insert a tab at the current cursor position.

**^J** Format (justify) the current paragraph.

## Justifying Paragraphs

Paragraph justification (**^J**) takes place in the paragraph that contains the cursor, or if the cursor is between lines, in the paragraph immediately below. Paragraphs are delimited by blank lines, or by lines beginning with a space or tab.

Unjustification can be done immediately after justification using the **^U** key combination.

## Retrieving and Saving Files

The following commands allow you to retrieve and save files:

**^R** Insert an external file at the current cursor position.

**^O** Output the current buffer to a file, saving it.

## Spell checker

The spell checker examines all words in the text. It then offers each misspelled word for correction while simultaneously highlighting it in the text. Spell checking can be canceled at any time.

**^T** To invoke the spell checker

## More Help

Pico offers an on-line help utility to provide you with a quick reference guide for available commands. To access this utility, use the following command.

**^G** Online Help

## Exiting Pico

To save your file and exit the Pico program, use **^X**. Pico will then ask you if you want to save changes and what you would like to name the file. For example, to save a file named *newfile*, after typing **^X**, you will see:

```
Save modifier buffer (ANSWERING "No" WILL DESTROY CHANGES)?
```

If you type **Y** and press Enter, you will see:

```
File Name to write: newfile
```

Again if you type **Y** and press Enter, your file will be saved and you will exit Pico.

# THE VI EDITOR

---

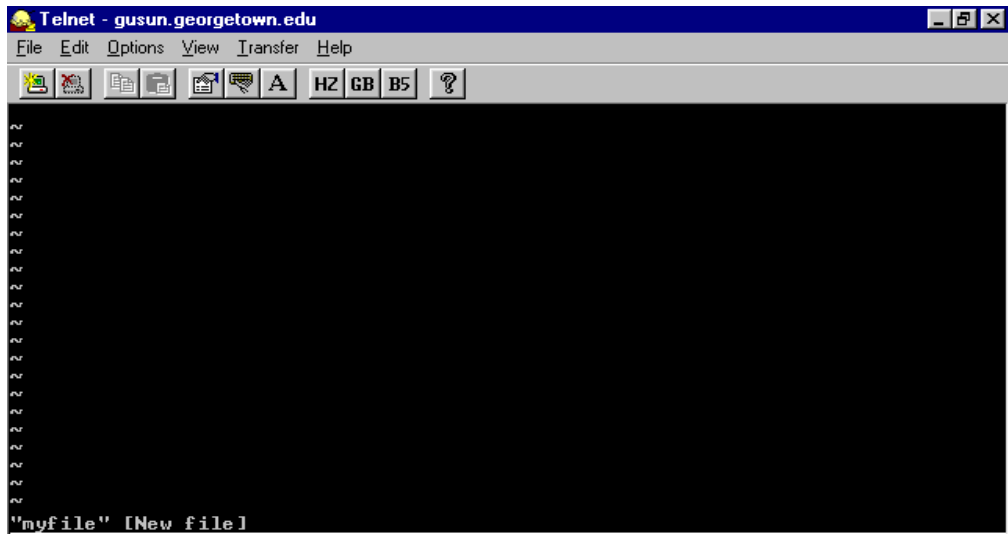
**VI** is an editor available on GUSUN that is useful for writing programs, papers, and letters. Though VI is not considered to be “user-friendly,” if used correctly, it is a very powerful editing tool. Though there are other editors available on the GUSUN (e.g., Pico), it is a good idea to have a working knowledge of VI, as it is available on all UNIX systems.

## Creating a File

To begin editing, type the command `vi` followed by the name of the document you wish to edit or create. For example, to edit a file named *myfile*, type:

```
gusun% vi myfile
```

A tilde (~) in the left column of the screen indicates that you are looking at the end of the file.



## Overview of VI

There are three different “**modes**” in **VI**. Each mode is used for a different type of editing task; in different modes, the same character typed at the terminal may have different meanings.

**Command mode** can be thought of as the “master mode.” It is the mode that you will be in when you first enter **VI**. Tasks in command mode include moving around the text, deleting, copying, cutting, and pasting. In addition, you can get to the other modes from command mode, and you may return to command mode from the other modes as well.

Note that when you are in command mode you will not see the actual letters of the commands that you type ‘echoed’ on the screen, but you will see the effects of those commands.

**Insert mode** is used to add new text to the file and delete the text you just typed. The simplest way to get into insert mode is by typing *i* when you are in command mode. To get back to command mode, press the key labelled **<Esc>** or **<escape>**.

**Colon mode** is used for tasks such as saving your file, jumping between files, or exiting VI. You can get to colon mode from command mode by pressing the *colon* (**:**) key. To return to command mode at any time, press the **<escape>** key. In addition, commands given to the editor while you are in colon mode should be followed by a **<Return>**.

The following lists contain commands or instructions for doing basic editing tasks in **VI**.

## Inserting Text

As mentioned above, enter new text in **insert mode**. Use the following to get into insert mode and add some text:

- 1) Type **i** to get into insert mode. (You will not see "i" echoed on the screen.)
- 2) Type in your text. You may use the **<Delete>** key to erase characters that you have typed and the **<Return>** key to start a new line of text.

## Moving Around

Moving around in your file is done in **command mode**. To get back to command mode from insert mode, press **<Esc>**. If you are ever unsure about which mode you are in or what command you are using, just press the **<Esc>** key several times. This gets you back to command mode and cancels any commands.

The following commands are used in command mode to change the position of the cursor in the file:

<b>&lt;space&gt;</b>	move one character forward
<b>&lt;Return&gt;</b>	move down one line
<b>&lt; - &gt;</b> (the "hyphen" key)	move up one line

An alternative system for moving around within command mode which works in some other applications and therefore may be more familiar to some users, involves the following commands:

<b>h</b>	move one character back
<b>j</b>	move down one line
<b>k</b>	move up one line
<b>l</b>	move one character forward

## Changing Text

Here are some commands for deleting and adding text (notice the distinctions between upper and lower case):

<b>x</b>	delete a character
<b>dw</b>	delete the next word to the right of the cursor
<b>D</b>	delete the rest of the line to the right of the cursor
<b>dd</b>	delete the entire line
<b>p</b>	put the line back
<b>u</b>	undo the last thing done. An additional "u" undoes the undo

Most commands in command mode can be preceded with an **argument** - a number indicating the number of characters or lines to be affected, or the number of times the command should be performed. For example, **3dd** deletes the next three lines.

## Searching

The following commands used in command mode will move your cursor to the first occurrence of a given word or phrase. The command is echoed at the bottom of the screen and should be followed by **<Return>**, as in colon mode.

<b>/<i>aword</i></b>	To search for <b><i>aword</i></b> in the file below the cursor
<b>?<i>aword</i></b>	To search for <b><i>aword</i></b> in the file above the cursor

## Cutting, Copying and Pasting

Cutting or copying and then pasting text in VI is done using buffers, or storage spaces. The command **dd**, for example, sends the line that your cursor is on into a buffer, while **p** puts the line back into your file.

To move text from the screen to a buffer, use the following commands in command mode:

<b>ny</b>	copy ("yank") the current line and the following <b>n</b> lines into the buffer. <b>n</b> should be a number. For example, <b>3y</b> copies the current line and the next three lines.
<b>ndd</b>	delete (cut) the current line and put the following <b>n</b> lines into the buffer.

To move text from the buffer to the screen (paste), move the cursor to the position where the text should go and type **p**. You can paste text as many times as you wish.

## Saving and Exiting

Saving and exiting is done in **colon mode**. Colon mode is used by pressing the

*colon* (:) key in command mode and then typing the appropriate command, followed by <Return>.

Commands in colon mode show up at the bottom of screen, and they may be corrected as they are typed with the <Delete> key. These are the basic colon mode commands for saving and exiting:

<b>:w</b>	save the file (save it on the computer)
<b>:q</b>	quit from the file (if you have not made any changes)
<b>:wq</b>	save and quit (this is usually the most convenient command)
<b>:q!</b>	quit without saving

# CHAPTER 4: The Internet

---

## THE INTERNET

The Internet is a global electronic resource connecting millions of computers around the world. The Internet began as an experiment over twenty years ago by the U.S. Department of Defense. It now comprises educational, military, government, and commercial networks which together provide electronic mail, file transfer, and remote login capabilities to computers worldwide.

Vast amounts of information, software, literature, and other resources are available on the Internet. GUSUN provides a number of utilities that allow users to obtain these kinds of information from remote computers, communicate interactively over the network, and even log onto remote computers to retrieve files or issue commands.

## ELECTRONIC MAIL

---

**Electronic Mail (e-mail)** is the primary (though not only) means of communicating with other users over the Internet. Though there are many programs available for e-mail, the two that are offered and supported for GUSUN are Pine and Netscape Mail. The Pine e-mail software was developed at the University of Washington and is one of the most popular UNIX-based e-mail packages being used today. Pine uses a text-based interface and resides on the GUSUN system. Netscape Mail is bundled together with the Netscape Communicator suite of Internet applications. It uses a graphical interface and runs on your local machine under the Windows 95 and MacOS platforms.

### E-mail Addresses

All GUSUN users at Georgetown have an Internet e-mail address. This means that you can mail to and receive mail from other people connected to the Internet. As a GUSUN user, the format for your e-mail address would be:

*username@gusun.georgetown.edu*

For example, if your username is **smithm**, your full Internet e-mail address would be:

*smithm@gusun.georgetown.edu*

### Netscape Mail

Netscape Mail is a graphical alternative to the text-based interface of Pine. It is tied to the Netscape Navigator web browser, allowing you to move seamlessly between working on e-mail and surfing the Internet. Web addresses that are sent to you over e-mail can be browsed easily from inside the message itself. Netscape's graphical interface also allows you to work with your email in a windowed environment.

## Choosing POP or IMAP

Netscape can read your GUSUN e-mail in two ways, using the Post Office Protocol (POP) or the Internet Mail Access Protocol (IMAP).

Each protocol has its own advantages and drawbacks, so choosing the correct one is important.

POP works with e-mail messages by taking them off of your e-mail server and placing them on your local computer. You may choose whether or not the messages are removed from GUSUN after a copy has been placed on your local computer. Folders can be created within Netscape to organize your messages. The main advantage of POP is that it allows you to keep your GUSUN account clear of a large number of messages which can slow down the Pine reader. This is especially useful if you receive large amounts of e-mail. POP has two main disadvantages. First, once a message is downloaded to a computer and removed from GUSUN, you can only access it from that particular computer. If you typically read your e-mail account from many different machines, in computer labs for example, this presents a problem. Second, you can only access and work with messages in your Inbox. Any folders you have previously created to organize your mail through Pine are inaccessible.

IMAP addresses the drawbacks of POP by working with your messages on the mail server. First, IMAP allows you to access and organize your e-mail from multiple machines because Netscape doesn't need to copy a message to the local machine to read it. Second, access is not limited to your Inbox. Other folders can be created and managed on GUSUN through the Netscape interface. However, because IMAP does not remove messages from your mail server by default, your account can accumulate a very large number of messages and be slowed down. Overall, though, IMAP is more flexible than POP, making it easier to access and work with your GUSUN e-mail.

The following are instructions for configuring Netscape Mail (version 4.05).

1. From the **Edit** menu, select **Preferences**. Click on the plus (+) sign next to **Mail & Groups** to see the various settings panels.
2. Select **Identity**. Fill in the fields **Your name** and **Email address** with the name you want to appear in your messages and your GUSUN email address. The other fields are optional.
3. Select **Mail Server**. In the **mail server user name** field, type your GUSUN user name. In the **Outgoing mail (SMTP) server** field, type *gusun.georgetown.edu*. Do the same in the **Incoming mail server** field.

You can only use *gusun.georgetown.edu* as your outgoing mail server if you are using Netscape on-campus. If you are accessing your mail using an outside service provider (AOL, Erols, Bell Atlantic, etc.), contact their support service for the proper SMTP server name.

4. Under **Mail Server Type**, select either **POP** or **IMAP**.
5. Select **OK** to close the Preferences window.

## The Pine Mail Reader

To start the Pine Mail Reader, type *pine* at the `gusun%` prompt and press **Return**. The **Pine Main Menu** will appear. (Please see the screen below.)

The top line of the Menu shows the version of Pine, the current menu, the current folder and the number of messages in that folder. This line remains at the top of the screen while you are in Pine, providing you with a reminder of your current working folder or menu.

At the bottom of the screen is a list of available commands. Since the screen is not large enough to display all available commands, you can press **O** to see the rest.

```

Telnet - gusun.georgetown.edu
File Edit Options View Transfer Help
[Pine Icons] A HZ GB B5 ?
PINE 3.96 MAIN MENU Folder: INBOX 6 Messages
? HELP - Get help using Pine
C COMPOSE MESSAGE - Compose and send/post a message
I FOLDER INDEX - View messages in current folder
L FOLDER LIST - Select a folder OR news group to view
A ADDRESS BOOK - Update address book
S SETUP - Configure or update Pine
Q QUIT - Exit the Pine program

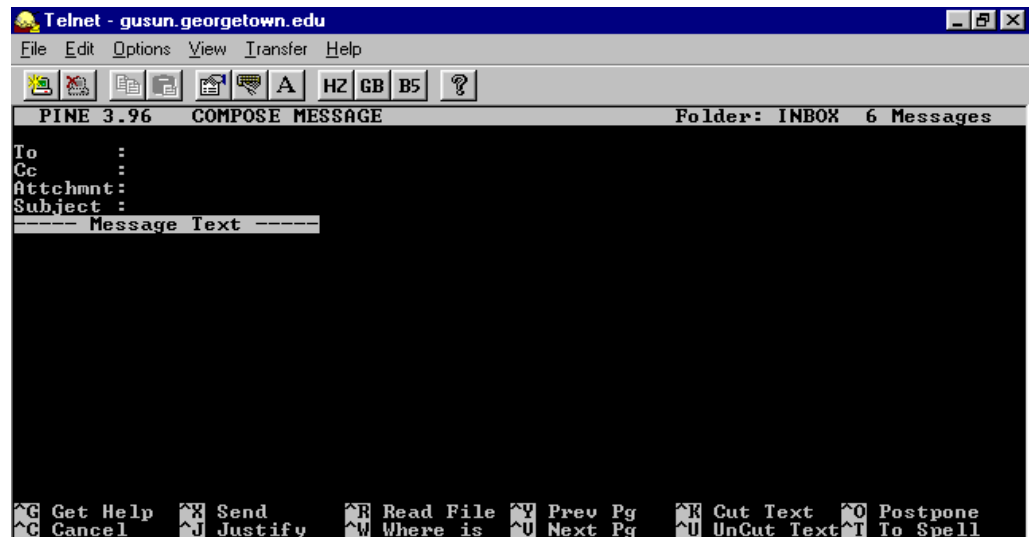
Copyright 1989-1997. PINE is a trademark of the University of Washington.
[Folder "INBOX" opened with 6 messages]
? Help [P] PreviCmd [R] RelNotes
0 OTHER CMDS [I] [ListFldrs] [N] NextCmd [K] KBlock
  
```

You will notice that when in Pine, some of the options at the bottom of the screen appear as two characters, for example, **^G** for get help. The “**^**” refers to the control key. On some keyboards this key is labeled “**Control**,” on others it is labeled “**Ctrl**.” In either case, “**^G**” implies you press down the control key, keep it depressed, and then press the key that follows, in this case **G**. The control key functions like the shift key, meaning that by itself it does nothing, but when pressed in conjunction with another character, it does have an effect.

Unlike the UNIX shell, Pine does not distinguish between upper- and lower-case letters, so pressing C and c will give you the same results.

## Sending E-mail

To send an e-mail message, use the compose option from the Pine Main Menu. Pressing the letter **C** will invoke this option.



Enter the full Internet address (i.e., *username@node.domain*) of the recipient in the **To:** field and press Enter. If you would like to send a copy of the letter to another person, enter the address in the **Cc:** field. You can specify more than one recipient with a comma between the addresses.

If you are sending mail to another user on GUSUN, you only need to enter their username. Pine will insert the rest of the address automatically.

## Blind Copies

It is also possible to send “Blind Copies” of the message. Recipients of the original message and recipients of Ccs are not informed to whom blind copies are sent. To send blind copies of a message, first press **Ctrl-R**, then type in the full Internet address(es) in the **Bcc:** field.

## Attachments

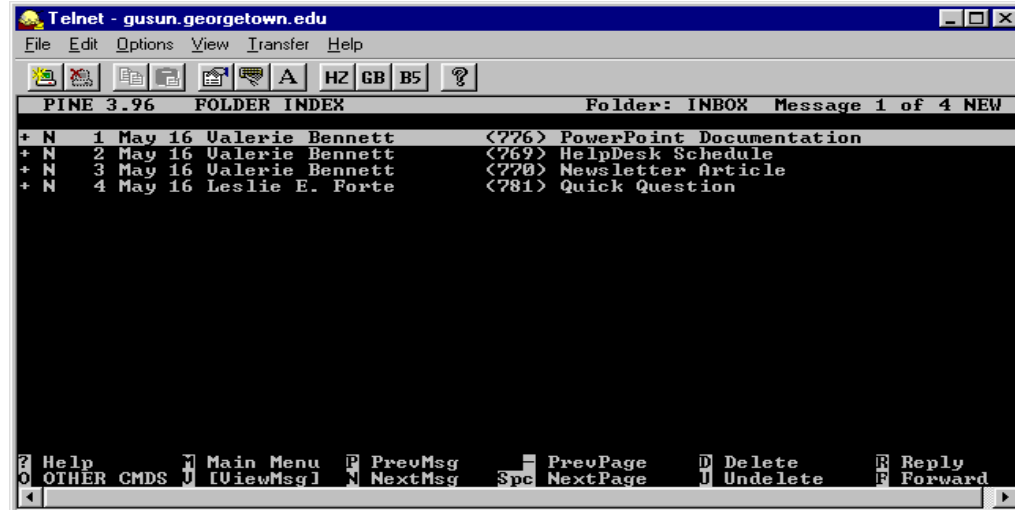
To attach a file to your e-mail message, enter the name of the file in the **Attchmnt:** field. (The file must first be in your home directory on GUSUN.)

Finally, enter a brief header for your letter in the **Subject:** field. Once you have done this, you can use the Tab key or Enter key to enter the message text section. Here you may begin typing your message.

Once your e-mail letter is complete, you can send it by pressing **Ctrl-X**.

## Receiving E-mail

When Pine starts, it automatically checks to see if you have any new e-mail messages. This e-mail is stored in your INBOX and remains there until you delete it or move it to another folder. To see the mail in your INBOX, choose **I** from the Main Menu. A new screen will appear and you will see a list of all of your e-mail messages.



Select the message you would like to read by using the arrow keys to highlight the message, and then press **Return** or **V**. The message will be displayed and you will then be able to reply to, forward, save or delete the message.

## Replying to E-mail

To **reply (R)** to an e-mail message, be certain that you are reading it or that it is highlighted on the screen. Then simply press the letter **R**. A prompt will appear at the bottom of the screen, asking if you would like to include the original message. After choosing yes or no, you can continue to compose a response just like you would compose a letter. Press **Ctrl-X** to send the reply.

If you are replying to a message sent to several recipients, you may receive the following prompts to which you can answer yes or no:

Use "Reply to:" address instead of "From:" address:

Reply to all recipients:

## Forwarding Messages

To **forward (F)** a message to another person, press **F**. A screen similar to the Compose Message screen will appear. From here you can type in the full address of the person to whom you would like to forward the message. Press **Ctrl-X** to send the forwarded message.

## Deleting Messages

Once you have read a message in your INBOX it is a good idea to delete it or move it to another folder. To **delete (D)** a message, press **D** while reading the message.

## Saving Messages

To **save (S)** a message to a folder within Pine, simply press *S* while looking at a message. You will be prompted to enter a folder name. To create a folder, enter the name of the folder you would like created. This creates the new folder and stores your message in that folder. To view a **list (L)** of your folders, press *L* at the Main Menu.

In order to keep your disk space usage below your allotted quota, you may want to save some of your e-mail to a disk. The following are instructions on how to save messages using the IBM-compatible computers in the student labs.

1. Once you are in **Pine** and reading the message that you would like to save, press *E* for **Export**. Pine will ask you to provide a file name. The message will be saved as a text file in your gusun account. (By typing *ls* at the `gusun%` prompt, you can view all your files.)
2. In order to save messages to a disk, you will need to use **FTP**. FTP is located on the Windows 95 desktop under **Internet Utilities**. Double click on the FTP icon. (More information on FTP can be found on page 39 of this manual.)
3. Where the screen says Remote Host Name type *gusun*. Then enter your user name and password in the appropriate boxes. Make certain that the Remote Operating System box is displaying UNIX.
4. Now you will see two windows. The top one will display the `c:\temp` directory and the bottom one will display the contents of your GUSUN main directory.
5. In the top window, click on the words `c:\temp`. A window will appear asking for a new pathname. Type *a:* to access the disk drive. The window will now display the contents of your disk.
6. Make certain that you are in your home directory. You should see the file(s) that you want to transfer in the bottom window. To select a different directory on your GUSUN account, simply click on the directory name in the window.
7. To move files between your disk and GUSUN account, move the pointer to the file that you want to move. Press and hold down the mouse button. While holding down the button, move the highlighted file from one window to the other. Release the mouse button and the file will be copied.

## Address Book

The **address book** utility in the Pine Mail Reader provides a very useful system for keeping track of e-mail addresses. To access the **address book**, press *A* at the Main Menu. You will see the Address Book menu screen which will allow you to add new names and addresses to your list, edit existing entries, give your friends nicknames, create mailing lists, and delete entries.

The following commands are available for working with addresses:

- A** Adds a new entry to your Address Book.
- V** Edits or views an existing entry. Use the arrow keys to move to the entry you want to change, then press **E**.
- A** Creates or adds a new mailing list.
- T** Adds names to an existing mailing list. Use the arrow keys to move to the list you wish to edit, then press **T**.

Pressing **T** while reading a mail message will allow you to add the sender's address to your address book directly. This helps you add entries to your addressbook without having to remember long e-mail addresses.

- D** Deletes the highlighted entry from your address book (or from your mailing list).

Once you have an entry in your address book for a person, you can type their assigned nickname in the **To** : field while composing a letter and Pine will automatically insert that person's full e-mail address for you.

### More Commands

The Pine Mail reader also provides many other utilities for working with electronic mail. To obtain a list of all available commands from a particular menu, press **?** to access the **Pine Mail Help**. Here you will find information on customizing your Pine setup and using advanced e-mail commands.

### Exiting Pine

To exit or **quit** Pine, press **Q**.

### Forwarding E-mail

If you are going to be using another e-mail account instead of your GUSUN account, you may want to set up your account to forward all mail received at GUSUN to your other account.

1. At the `gusun%` prompt, type ***pico .forward***. (A space is required between *pico* and *.forward*.) This places you in the Pico text editor.
2. Type in the full Internet address of the account where the mail will be forwarded.

**Example:** *elvisp@graceland.memphis.com*

3. Press *Ctrl-X* to save the file, and press *Return* to accept the filename of *.forward*. Your mail will now be forwarded from GUSUN to another account.

(See [Chapter 3 : Text Editors](#) for more information on creating and editing files on GUSUN.) To stop forwarding your mail at any time, simply type *rm .forward* at the `gusun%` prompt and press *Y* for yes.

## TELNET

---

**Telnet** is a utility that allows users to log onto other computers (i.e., hosts) on the Internet. It allows users to connect to a wide variety of computers and operating systems. In order to use a remote host, however, you must have appropriate authorization and be familiar with the host's operating system. With the proper authorization, once you are logged on, you can use the remote host's commands and files, just as if you were logged on to a terminal hard-wired to that machine.

For many list servers and file servers on the Internet, you do not need to have special authorization as these machines usually allow users to login as "anonymous" in order to retrieve publicly available files and programs. Anonymous IDs, however, are usually restricted to retrieving files and information only.

To initiate a Telnet session and connect to a remote host, log onto GUSUN. Then enter *telnet* followed by the name of the host to which you want to connect:

```
gusun% telnet research.georgetown.edu
```

Once a connection has been successfully made, you will usually receive a `login:` prompt. Enter a valid login username at the `login:` prompt and press *Return*. If the remote system supports anonymous logins, you can type *anonymous* at the `login:` prompt. After you have logged in you will usually be prompted for a password. When you login as anonymous, most hosts require that you use your actual e-mail address for your password.

If you have logged on anonymously, you may be restricted to certain functions and files. If you are unfamiliar with the remote host, or if you are an anonymous user, you can often type *Help* for a list of valid commands. You can also usually type *directory* or *ls* to display the current directory.

To end a Telnet session, you usually type *logout* at the `$` or `%` prompt. If neither of these work, you will have to use the `ctrl-]` combination to get back to the Telnet program. You will see a `telnet>` prompt. To exit Telnet completely, type *quit*.

**File Transfer Protocol (FTP)** is a powerful application used for transferring files from one computer to another. You can use FTP to transfer files and programs between any two computers connected to the Internet that support TCP/IP, a computer networking protocol. FTP does not require that you know the remote host's operating system in order to transfer files. However, you must have either have a valid account on the remote host, or the remote host must provide for anonymous FTP. You can use FTP to transfer files in either direction between the remote and local hosts.

To initiate an FTP connection, log onto GUSUN. At the `gusun%` prompt, enter *ftp* followed by the name of the remote host with which you would like to connect.

```
gusun% ftp info.umd.edu
```

will connect you to an FTP server at the University of Maryland. Once the connection has been successfully made, a message similar to the following will appear:

```
Connected to info.umd.edu.  
220 info.umd.edu FTP server (Version wu-2.4(82) Mon Apr  
24 10:40:42 EDT 1995) ready.  
Name (info.umd.edu:smithm):
```

At the `login:` prompt, enter a valid user i.d. or *anonymous* if the remote host allows for anonymous login. You will then be prompted for a password. If you are logging on anonymously, the remote host will usually request that you enter your e-mail address from your local host as your password. Enter the password and press **Return**.

Once you have successfully connected to the remote system, you will see an `ftp>` prompt. You can retrieve files from or send files to the remote host from this prompt. Note that you must know the pathname of the file to be retrieved from the remote host, or of the directory where you want to place a file on the remote host. To see a list of available files and directories when connected to a remote host, type *dir*. You can use the *cd* command to navigate through the file structure of the remote host and find out where files are located.

Before you can send or receive files, you must tell the program what type of files are being transferred. If you are transferring graphics, sounds, or program files such as WordPerfect or QuattroPro files, you will need to set the transfer type to binary:

```
ftp> binary
```

If you are transferring straight text files, set the transfer type to ASCII:

```
ftp> ASCII
```

Once you have set the file transfer type, use the **get** and **put** commands to transfer your file. To transfer a copy of the file *myfile.txt* from the remote host to your GUSUN home directory, you would type:

```
ftp> get myfile.txt
```

To transfer a copy of the file *yourfile.txt* from your GUSUN home directory to the remote site, you would type:

```
ftp> put yourfile.txt
```

The default for the file transfer gives the new file the same name as it has on the remote host. If you would like to rename the file in its new location, simply specify the new name after the old file name:

```
ftp> get myfile.txt hisfile.txt
```

To transfer more than one file at a time, use **mget** and **mput** followed by the filenames.

On-line help is usually available in FTP by typing **help** while connected to a remote host.

To disconnect from the remote host and exit FTP, type *quit* or *bye* at the ftp> prompt.

## FILE COMPRESSION

---

Many of the files stored on remote Internet computers have been compressed to save disk space on the remote system. Once you transfer these files to GUSUN, you will need to decompress them before you can use them. Files that have been compressed usually have an extension to the filename indicating what sort of compression utility you will need to use to decompress the files. Files with a **.tar** extension, for example, are UNIX tape archives and need to be decompressed using the UNIX **tar** command. The following is a list of common compression extensions, their associated decompression tools and the syntax for decompressing files with these extensions:

<b>.tar</b>	UNIX tape archive	<i>tar xvf filename</i>
<b>.gz</b>	GNU zipped file	<i>gunzip filename</i>
<b>Z</b>	UNIX compressed file	<i>uncompress filename</i>

In general, decompressing files is a simple procedure. Type the decompression command followed by the full name of the file, including its extension.

```
gusun% gunzip program.gz
```

The decompression program should then create the expanded file, without the extension, in your account. Note, however, that most decompression programs will also keep the original compressed file in your account. In order to conserve disk space, you should either delete or download the compressed file to disk after you have decompressed it.

Many Internet computers store files and programs on UNIX systems that are intended for use on IBM-compatible or Macintosh computers. Files with the extensions **.zip** or **.sit** cannot be decompressed on GUSUN and need to be downloaded from GUSUN before they can be used. The **.zip** extension usually indicates that you need a DOS-based decompression utility (e.g., PKUNZIP) to decompress the file. A **.sit** extension requires a Macintosh decompression utility (e.g., Unstuffit). These decompression utilities are available on all AITS lab computers.

## FILE ENCODING

---

From time to time, you may need to encode or decode documents. Some mail readers cannot process files which are in binary format (e.g., WordPerfect) rather than in straight text format. In order to send such documents via e-mail, the mail reader converts them to ASCII (text).

Pine will automatically encode attachments. You do not have to encode binary files before sending them in Pine.

### Uuencoding

If you are sending a document that needs to be encoded, once you have the file in your GUSUN home directory, you can encode it. You will need to supply the name of the file to encode, the name of the file to be created and the name of the third file to be created when the person receiving the file decodes it. For example, to encode a file called *paper.wpd*, you would issue the following command:

```
gusun% uuencode paper < paper.wpd > paper.uuu
```

This would create a text file in your home directory called *paper.uuu*. You may then send this file via e-mail. When the person receiving the file **uudecodes** it, the **uudecode** program will create a binary file called *paper* from the *paper.uuu* text file. Please see the section entitled **Pine Mail Reader** for more information about sending files via e-mail. It is a good idea to inform the recipient of the file that you have encoded it and how they can decode the file for use.

### Uudecoding

Alternatively, you may receive a **uuencoded** file which you would like to download and use. If you received the file through e-mail, you will need to first save the message as a file in your home directory. Read the message in Pine. Then use the **E**

command to export the file and give it a name.

To **uudecode** the file, type the following at the `gusun%` prompt:

```
gusun% uudecode < filename
```

The uudecode program will automatically strip out the headers of the document and decode the file. The new uudecoded file will then be in your home directory for you to download and use.

Further information about using the uudecode and uuencode commands on GUSUN can be obtained by typing **man uuencode** or **man uudecode** at the `gusun%` prompt.

## FINGER

---

The **Finger** command is used to obtain information about users and user addresses on GUSUN or other computers on the Internet. To list information about a particular user on the GUSUN system, use the following format:

```
gusun% finger username
```

For example, to learn more about the person with the username **smithm**, type:

```
gusun% finger smithm
```

You can get a list of all users currently logged on, along with relevant information, by typing:

```
gusun% finger (without specifying a username)
```

You can also use **Finger** to find out information about a user on a remote computer on the Internet. Use the following format for information on users on remote hosts:

```
gusun% finger username@host.domain
```

Use *finger @host.domain* for a list of all users currently logged onto the remote host.

Note that for security reasons, users on systems outside of GUSUN cannot finger users on GUSUN.

# TALK

---

The **TALK** utility is used to communicate interactively with other users on the Internet. To initiate a talk session with another user, type *talk* followed by the full Internet address of the person with whom you want to communicate:

```
gusun% talk username@host.domain
```

If you wish to **TALK** with another user on the same computer, you need only enter their username. For example, to communicate with another user on GUSUN, with the username **smithm**, enter the following:

```
gusun% talk smithm
```

When you initiate a **TALK** session, the other user will receive the following message:

```
Message from TalkDaemon@<recipient's node>. . .  
talk:connection requested by <sender>@<sender's node>  
talk:respond with: talk <sender>@<sender's node>
```

where **<recipient's node>** is the node of the person to whom the message was sent, and **<sender>@<sender's node>** is the complete Internet address of the person who initiated the session.

To respond to the **TALK** message, the recipient must enter the command:

```
gusun% talk sender@sender's node
```

Once the recipient has responded, two windows will appear on each user's screen. One window is for messages from the initiator, the other is for messages from the recipient. Users can type simultaneously. Their outputs will appear in separate windows on each screen.

To exit **TALK**, press *Ctrl-C*. The screen will return to the `gusun%` prompt.

TALK is installed on GUSUN for the convenience of the user community, but it is not an AITS-supported package. Please note that use of TALK is restricted by the Acceptable Use Policy.

## IRC

---

**IRC (Internet Relay Chat)** is a multi-user, multichannel chatting network. It is a means of communication that allows people from all around the world to join in real-time conversations and “chat” with each other over the Internet. This program is similar to the program **TALK**, but it allows many users to communicate at the same time. Topics of discussion on **IRC** are varied and often address current issues around the world. Most **IRC** conversations take place in English, but other languages can be found on the **IRC** channels.

To access **IRC** from GUSUN, type *irc* at the `gusun%` prompt.

IRC is installed on GUSUN for the convenience of the user community, but it is not an AITS-supported package. Please note that use of IRC is restricted by the Acceptable Use Policy.

Users wishing to learn more about this program should use the on-line help utility. To access this, first start **IRC**. Once you are in **IRC**, typing */HELP* will provide you with more information about this program.

## LYNX

---

**Lynx** is an Internet utility used to access the World Wide Web (WWW) in a text-based format. The World Wide Web is an Internet resource providing access to electronic text, graphics, and multimedia. The Web allows users to access various files and sites (Web pages) around the world. **Lynx** allows you to access hypertext markup language (HTML) documents containing links to files residing on the local system, as well as files residing on remote systems running Gopher, HTTP, and FTP servers.

To access a location on the World Wide Web, you must first know the address of the location. World Wide Web locations are referred to as **URLs (Universal Resource Locators)**. URLs provide Web browsers with the information they need to successfully connect to the remote web site.

**A sample URL:** *http://www.georgetown.edu/*

The “http” is the protocol section of the URL. This identifies the type of protocol used on the remote server providing the file. Http is the most common protocol on the World Wide Web. Other recognized protocols on the Web include FTP, Gopher and Telnet.

To start **Lynx**, type *lynx* at the `gusun%` prompt. When you open **Lynx** from GUSUN, you will see the AITS home page.

Once you are in **Lynx**, you can jump to and from various places on the Internet, using "hyperlinks." Hyperlinks are pointers to files that reside on the local server or at another site. Bold text indicates a hyperlink. Text that is highlighted indicates the current selection. To move between selections, use the down-arrow key until you reach the desired link. To see the next page of a document, press the spacebar. Once you have reached the desired link, press **Return** to jump to that file.

The following is a list of commands that may be used to navigate through the World Wide Web using **Lynx**:

<b>Down arrow</b>	Highlight next topic
<b>Up arrow</b>	Highlight previous topic
<b>Right arrow</b>	Jump to highlighted topic
<b>Return</b>	Jump to highlighted topic
<b>Left arrow</b>	Return to previous topic
<b>+</b> (or <b>space</b> )	Scroll down to next page
<b>-</b> (or <b>b</b> )	Scroll up to previous page
<b>d</b>	Download selected file
<b>a</b>	Add the current link to your bookmark file
<b>c</b>	Send a comment to the document owner
<b>d</b>	Download the current link
<b>g</b>	Go to a user-specified URL or file
<b>m</b>	Return to main screen
<b>p</b>	Print to a file, mail, printer, or other
<b>q</b>	Quit (Capital 'Q' for quick quit)
<b>/</b>	Search for a string within the current document
<b>v</b>	View your bookmark file

**Lynx** provides an excellent **on-line help** utility to assist users in navigating through the World Wide Web. To access this help feature, simply press ? (question mark).

To exit **Lynx**, use the **Quit (q)** command. You will be asked if you really wish to exit. Answering **y** will exit the program and answering **n** will return you to the program. To quit without the verification, simply press **Q**.

## USENET/NN

---

**Usenet** is a global network providing an electronic service called netnews. **Usenet** is essentially an enormous bulletin board with articles and contributions organized into relevant categories called "newsgroups." Altogether there are over 11,000 newsgroups on a wide variety of topics. Usenet groups are similar to electronic journals and discussion groups: anyone can join and participate in the dialogue. The advantage of **Usenet**, however, is that you do not get bombarded with excess

sive electronic mail. Instead, all Usenet articles or messages are stored in a central location where users can view them at their leisure. Most Usenet newsgroups are open to the public.

To participate in the newsgroups, users must have access to a Usenet reader. The supported newsreader on GUSUN is called **nn**.

## Newsgroups

Usenet newsgroups generally fall into eight categories. These categories indicate the types of discussions included in the newsgroups. The following prefixes to newsgroup titles indicate content of the categories:

<b>alt</b>	anything from the ridiculous to the sublime
<b>comp</b>	computer-related topics
<b>edu</b>	education related
<b>misc</b>	miscellaneous topics
<b>news</b>	news network maintenance and software
<b>rec</b>	hobbies and recreational activities
<b>sci</b>	scientific research and applications
<b>soc</b>	social issues and world cultures
<b>talk</b>	discussion and debate

## Reading USENET News Through nn

Newsgroups emanating from Georgetown University have the prefix “**gtu**” and are only open to the Georgetown community.

To start **nn** and access Usenet, type *nn* at the `gusun%` prompt.

If you wish to read articles only in a particular newsgroup, specify the name of the group when starting **nn**:

```
gusun% nn gtu.18thc.novel
```

Upon entering **nn**, you will be taken to the last newsgroup in which you had been working. To move from one newsgroup to another, press *Shift-g* (note that **nn** commands are case sensitive). At the prompt, type the name of the group whose postings you wish to review, for example, *gtu.www*.

## Selecting Articles

The **nn** newsreader will show you the authors and subjects of the unread articles in the newsgroups. Follow-up articles are indicated with *>>*. There are five different formats which provide information about the unread articles. You can toggle through them by pressing the *double quote* (“).

To select items you would like to read, type the article ID (a letter from a to z) as shown in the list of newsgroup items. You can select a range of articles by specifying the first and last with a dash between them, e.g., *a-s* selects articles *a,b,c,d,e...s*.

In addition, you can select articles on an entire thread with a common subject. For example, you can select all articles that have the same subject as item *j* by typing *j\**.

Use the spacebar to scroll through the list of articles. The line along the bottom of the screen displays the time, the name of the newsgroup you are browsing, how many more selected articles you have to read, how to get help (?), and the percentage of articles you have already searched.

At the end of the list of articles, the bottom line reads "**Bot.**" Press the spacebar again to start reading the articles. While some newsgroups are fairly small, others contain thousands of articles, which can take considerable time to scroll through. To start reading your selected articles and then return to the list, press **Z**. To get a complete listing of all available newsgroups once you are in **nn**, press **Y**.

You will often find newsgroups cluttered with articles of little interest to you. You can use a "kill" file to eliminate articles you do not want to read. Kill files can weed out articles on a particular subject. To kill an article and all articles with the same subject, press **K** while reading an article. You will receive the following prompt:

```
AUTO (K)ill or (S)elect (CR => Kill subject 30 days)
```

If you press **Return**, this article and all articles on the same subject will not appear on your newsgroup reading list for the next 30 days.

## Saving Articles

You can save a copy of any of the articles that you read or you can forward a copy of them to a friend. To save an item you are reading, press **s**.

If you press **Return**, the newsreader will save the article in a file in your home directory.

If you have never before saved an article from this newsgroup, **nn** will ask you if you would like a directory or directories created in which to store your file. Answering **y** for "yes" will create those directories and save the article for later use. If you have already saved some articles from that newsgroup, answering yes will append the new articles onto the other articles.

## Mailing Articles

To mail an article to someone else, use the **m** command while you are reading the article. **nn** will ask if you want to include a message, and then will prompt you for the address of the person to whom you would like to send the article. You will see a text editor in which you can type a message. When you are finished, close the file as you normally would to exit a text editor (*Esc*, *Shift+Z* in **VI**, *Ctrl+X* in **Pico**). For more information on text editors, see [Chapter 3: Text Editors](#).

**IMPORTANT:** The default editor on GUSUN is **VI**, and it is not very user-friendly. If you would like to make your default editor **Pico** (the editor that is used in the **PINE** mailer), type the following command at the `gusun%` prompt:  
*EDITOR pico.*

## Posting

Once you have had experience browsing Usenet with **nn**, you may want to post an article yourself. Type **:post** to post an article. Then type in the name of the desired target group, the subject, any keywords, a summary, and the distribution of the article.

## Exiting nn

To quit **nn**, use the **Q** command.

## Reading USENET News Through Pine

The Pine Mail reader also offers a user friendly interface for reading USENET News. Pine treats USENET News very similarly to electronic mail. A newsgroup can be viewed as a folder of messages just like your e-mail INBOX. Within this folder, each article is listed, and can be read, as if it were an ordinary e-mail message. If you are familiar with reading and sending e-mail via Pine, you will be able to read and post to newsgroups easily.

## Setting up Pine to Read News

To read news through Pine, you will first need to configure Pine to display newsgroups. The first step will be to tell Pine the name of your news server:

1. From the **Pine Main Menu**, press **S** for Setup.
2. When prompted to choose a task, press **C** for Configure.
3. Use the **TAB** key to go to the line that reads `nntp-server`.
4. Press **A** to add a value. Enter ***news.georgetown.edu*** and press **Return**.
5. Press **E** to exit the Configuration Setup.
6. **Quit (Q)** from Pine and then restart Pine.

## Getting Started

To start reading newsgroups in Pine, press **L** to view your folders at the Pine Main Menu. Pine stores newsgroup articles in folders just like ones you create to store your e-mail. To read a newsgroup, you will need to go to the section of folders that contains the newsgroups. Use the **TAB** key to go to and highlight the line that says `Select Here to See Expanded List under News-Collection`, and press **Return**.

## Reading News

Reading articles in a newsgroup with Pine is very similar to reading messages in a mail folder. To select a newsgroup, use the **TAB** key or the arrow keys to move to the desired newsgroup. To read messages, simply press **V** to view the index of all messages in the newsgroup. You can also specify the name of a newsgroup you would like to open by pressing **G**. When prompted, enter the name of the newsgroup you would like to read.

Once you are in the folder index, use the **TAB** or arrow keys to move through the list. To read a highlighted message, press **V**. To return to the index of messages, press **I**. To return to the list of newsgroups, press **L**.

Articles in the newsgroup list can be read, saved to other folders, and forwarded exactly as if they were ordinary e-mail messages.

## Replying to or Posting News

To post a reply or "follow-up" to an article, first locate and open the appropriate newsgroup. Next, select the article to which you wish to reply. Press **R** to use the reply command, just as if you were replying to e-mail. You will first be asked if you would like to include the original message. You will then be asked if you want to post the message to the newsgroup. Pressing **Y** will send your post to the entire newsgroup. Pressing **N** will send your message to just the originator of the post. Once you have typed your message, press **Ctrl-X** to send it.

Sometimes you may wish to start a new thread of conversation, rather than replying to one. Follow the above instructions, but use Compose (**C**) instead of Reply. Once you have typed your message, press **Ctrl-X** to send it.

## Subscribing and Unsubscribing to Newsgroups

You can customize the list of new groups that you see in your folder list. You do so by "subscribing" and "unsubscribing" to and from newsgroups. When you first use Pine as a mail reader, you will be subscribed to all available newsgroups. You can subscribe to additional newsgroups at a later date, or unsubscribe from ones you are no longer interested in.

To subscribe to a particular group, press **A** to add a group. When prompted, enter the name of the group to which you would like to subscribe. To unsubscribe from a specific group, use the **TAB** or arrow keys to go to the desired group. Once you have highlighted the group, type **D** to unsubscribe.

## MAILING LISTS

---

Another Internet utility allowing users to communicate with others with similar interests is the **mailing list utility**. A mailing list is a program that causes a single mail message to be sent to many people at once. **Listproc** and **listserv** are two popular mailing list packages. After you sign up to be on a mailing list, you will receive all the messages sent to that mailing list. Some mailing lists only receive one or two messages a day; others receive dozens.

Most mailing list programs on the Internet automatically copy messages received at the list's mailing address to everyone on the list. If you send a message to the list's address, everyone who is on the list will see your message in their mailbox. Some lists are "moderated," meaning that someone screens every message sent to the mailing list address when it is received, and decides whether or not to send it on to the people on the mailing list.

Almost every mailing list has two addresses: one specifically for subscribing and unsubscribing to the list and the other for receiving the reader-submitted messages that will be distributed to everyone on the list. To subscribe to a mailing list, you send a message to the mailing list administrator requesting to be added. (Note that you do *not* send a letter to the mailing list itself when you want to subscribe! The people reading the list do not want to know when you subscribe.)

There are many methods to subscribe and unsubscribe to a mailing list, depending

on the kind of program used by the list's administrator. You should be sure to check the instructions for subscribing carefully, since some lists require subscription information to be formatted in a particular sequence. You should also take note of how to unsubscribe, in case the mailing list is more active than you anticipated and you get inundated with too much mail.

For a list of publicly accessible mailing lists, see the following Web page: <http://www.neosoft.com/internet/paml/index.html>. For information on **Listproc** (the mailing list software used at Georgetown), visit <http://www.cren.net>. For information about creating mailing lists at Georgetown, visit <http://www.georgetown.edu/uis/services>.

# CHAPTER 5: Advanced UNIX Commands

---

UNIX offers many advanced commands that can be used to customize your GUSUN account along with special tools for file and process management. Once you have had a chance to learn the basic UNIX commands for working with files and directories, you may want to explore this powerful operating system further. This chapter contains some of the more useful commands along with information about using the GUSUN UNIX environment.

## SYSTEM PROMPTS

---

By default, the GUSUN system prompt is `gusun%`. This prompt, however, can be changed to display anything you wish, including your name or the working directory. To set your prompt, use the `set prompt` command. For example, to set your prompt to display "Greetings, Earthling>", issue the following command:

```
gusun% set prompt="Greetings, Earthling>"
```

Note, however, that this change will only affect that current login session. To make this change permanent, you will need to enter this command into a file in your home directory called `.login`. This system file contains a set of commands that are run each time you login, in order to customize your GUSUN environment. You may edit this file using a text editor like Pico or VI.

Users who move around a lot in the directory structure may find it helpful to change their prompt to always display the current working directory. To do so, add the following lines to your `.login` file:

```
alias setprompt 'set prompt="`pwd`>'"
setprompt
alias cd 'chdir `!` * && setprompt'
```

## CHANGING SHELLS

---

A couple of different shells are available on the GUSUN system, including **myshell**, **sh**, **csh**, and **tcsh**. All GUSUN accounts are created with **myshell** as the default login shell. Myshell is a derivation of the standard **csh** with a few modifications for the Georgetown University environment.

While the differences between the shells are not noticeable to most users, some shells do offer more capabilities and flexibility in terms of working with commands.

The **tcsh shell**, for example, offers users the ability to repeat commands and edit the command line. In other words, you can press the up-arrow key and the last command that you entered will be displayed on the screen (much like the MS-DOS

DOSKEY utility). This is useful if you tend to issue long and complicated commands repeatedly. Alternatively, the **bourne shell (sh)** is often used for writing shell scripts or programs. The **cs**h was written to be compatible with C programming and is probably the most widely used shell today.

Unless you plan on doing extensive scripting and processing, you will never need to change shells. If you would like to change your shell, however, you can send an e-mail message to [helpdesk@gusun.georgetown.edu](mailto:helpdesk@gusun.georgetown.edu) requesting the change. Unlike other versions of UNIX operating systems, the Solaris operating system no longer allows users to change their own shells.

## SIGNATURE FILES

---

Once you have used your account for a while and have communicated with other users on the Internet, you may begin to notice that many people have contact information or short quotations attached to each of their mail messages or newsgroup postings. These "signatures" are not typed in each time the user sends a message, but rather, they are stored in a text file called **.signature** that is automatically appended to the bottom of all transmissions.

To create your own "signature," you must create a file called **.signature** in your home directory. Place your desired text in this file, save it, and exit the text editor. The next time that you start Pine, your signature will be appended at the bottom of all your letters. To change or remove the signature at any time, simply edit or remove the **.signature** file.

Please keep in mind that Internet etiquette suggests that **.signature files** should be no longer than 4 lines. Excessive signatures waste valuable Internet bandwidth.

## PLAN AND PROJECT FILES

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You can also create a **.plan** file that other users will see when using **finger** to obtain information about you on the GUSUN system. Many users find this **.plan** file useful to display further information about themselves or to notify other users that they will be away on vacation. The **.plan** file allows you to display multiple lines of information. To enable your own **.plan** file, create a file in your home directory called **.plan** containing the information you would like to display. You then need to change the permissions on the file so that all users can read the file. To do so, issue the following commands:

1. Set your files to world access with a `chmod a - r` command (otherwise, they remain inaccessible).

2. Then issue the command which will give everyone on the system the ability to read files from your account:

```
gusun% chmod 755 ~
```

3. Next, you need to provide read access to your **.plan** file to everyone on the system, using the command line:

```
gusun% chmod 644 .plan
```

Do not issue a similar command for any of your other files unless you want to also grant read access to everyone on the system. See the section entitled File Permissions for more information on the **chmod** command.

A similar file called **.project** can also be created in your home directory using the above steps. The **.project** file is another means of providing information about yourself to other users. It allows you to display one line of information.

## ALIASES

---

GUSUN offers a "shorthand" system of entering commands in the form of **aliases**. If you often issue long commands, you can alias those commands to be one easy-to-remember word.

For example, if you often check on your disk quota with the long command `"du -a | sort -r -n -T /tmp"`, you can alias the command to be "check" by issuing the following:

```
gusun% alias check "du -a | sort -r -n -T /tmp"
```

You can then type **check** to execute the whole command string. Just as the set prompt command only changes your prompt for the duration of your session, alias commands can only be used during the current session unless you add them to your `.cshrc` file.

## SEARCHING FILES

---

The UNIX operating system offers a very powerful search utility called **grep**. This utility can search through files for certain words or strings of words and will print the output to the screen. You can use **grep** to locate a particular file in your directory based upon its content. For example, if you are in a directory called **memo**, and you want to find out which memos you wrote contain references to paycheck, you would use the following:

```
gusun% grep paycheck memo*
```

`grep` searches all of the files in the directory for files containing the word "pay-check," and displays the filenames and lines containing the reference:

```
memo_2.5.92:  paycheck distribution schedule  
meme_4.22.93:  paycheck processing
```

Use the `-i` flag to tell `grep` to ignore the case of letters.

## HISTORY

---

For each session that you are logged onto GUSUN, your shell keeps a record of the last 50 commands that you have executed. This is useful if you have typed a really long command and you cannot remember the exact syntax. To see this list, type *history* at the `gusun%` prompt.

```
gusun% history  
 1  ls  
 2  pine  
 3  irc  
 4  ftp  
 5  lynx  
 6  more  
 7  ls  
 8  date  
 9  history
```

## JOB/PROCESS CONTROL

---

Each time that you enter a command at the `gusun%` prompt and press **Return**, you are creating a job for the operating system to process. To keep track of processes, the UNIX operating system assigns each process a unique number (Process ID or PID). Usually, only the operating system needs to worry about this number. Occasionally, however, a process gets stuck or "hung" and the user needs to stop that process in order to continue working.

To get a list of the processes that you are running at any given time, use the `ps` command:

```
gusun% ps  
  
PID      TT          S        TIME    COMMAND  
16589    pts/2       S         0:01    -csh  
16620    pts/2       S         0:02    /usr/local/bin/nn  
17963    pts/3       O         0:00    ps
```

The PID column tells you the Process ID number, while the COMMAND column tells which actual commands are associated with that number. To stop or end a process, you need to "kill" it. The newsreader nn, for example, sometimes thinks you are running two copies of the program and will not let you continue until you kill one process. In the above example, the PID for the nn process is 16620. Therefore, use the following command to stop the process:

```
gusun% kill -9 16620
```

Sometimes, you may want to **suspend** a process and return to it later. For example, you may be in the middle of reading news when you receive a talk request. In order to save your place in news, you can suspend the job with the **Control-Z** command and then return to it after your talk session.

To resume suspended jobs, type *fg*. Sometimes you may have more than one suspended job. Typing *fg* will only bring the most recently stopped job to the foreground. To get a list of all your suspended jobs, issue the *jobs* command.

```
gusun% jobs
```

```
[1] - Suspended          nn
[2] + Suspended          vi text
```

The most recently suspended job is the one preceded by the plus sign (+). Each job is assigned a number. The nn job is job #1 and the vi job is job #2. Use the % followed by the job number to continue the desired job. For example, to continue processing the nn job, use the following command:

```
gusun% fg %1
```

## FILE PERMISSIONS

---

Each file created on GUSUN has certain file permissions associated with it. These permission determine who on the system has rights to read, modify, and, in the case of programs, execute the file. By default, when you create a document in your home directory, you own it and have all rights to that file. You may choose, however, to allow other users access to your home directory and your files (as in the case of **.plan** and **.project** files).

If you type *ls -la* at the `gusun%` prompt, you will get a long display of all the files in your account.

```

gusun% ls -la
total 84
drwx----- 3 smithm      512 Aug 17 11:28 .
drwxr-xr-x3300 root      62464 Aug 25 14:10 ..
-rw----- 1 smithm        40 Aug 17 01:28 .addressbook
-rw----- 1 smithm     3124 Aug 17 01:28 .cshrc
-rw----- 1 smithm      575 Aug 17 01:28 .login
-rw----- 1 smithm     8803 Aug 17 11:28 .pinerc
-rw----- 1 smithm      144 Aug 17 01:28 .profile
-rwxr-xr-x 1 smithm     1232 Aug 17 11:29 my_program
drwxrwxrwx 2 smithm      512 Aug 17 11:28 mail

```

The very first column contains information about the file permissions on each file. There are three different types of permissions associated with a file: **r (read)**, **w (write)** and **x (execute)**. In order to edit and make changes to a file, a user must have the **w (write)** permission to a file and to that directory. To execute a program or shell script, a user must have the **x (execute)** permission.

Permissions are set on three different levels: for the owner of the file, for the group to which the owner of the file belongs, and for all other users on the system. You can determine file permission based on the first ten characters on each line of the `ls -la` command. The first character tells you whether the file is a **file (-)** or a **directory (d)**. The next three characters specify the permissions granted to the owner of the file. The three characters after that specify the permissions granted to the owner's groups and finally, the last three characters specify the permissions granted to all other users. In the above example, the file `my_program` is owned by `smithm`. Since the owner permissions for that file are `rwX`, `smithm` can read, write and execute that file. The group permissions for that file are `rx`, which means that users belonging to the same group as `smithm` can read and execute, but not modify or write to that file. Since the permissions for all other users are `rx` also, all other users on the system can read and execute this file.

If you own a particular file, you may change the file permissions on that file to allow or disallow others access to that file. The **chmod** command lets you change these permissions. Though there are two methods of changing file permissions, this book will only attempt to cover one method. Further information about changing file permissions can be obtained with the **man chmod** command.

The default setting for all files created on GUSUN are **rw** for the owner of the file. You may then change those settings for group and all users. To do so, use the **chmod** command with the appropriate arguments. Following is a list of flags indicating how to modify permission:

**u** user (owner) permission  
**g** group permissions  
**o** other (all other users) permissions  
**+** add a permission  
**-** remove a permission  
**r** read permission  
**w** write permission  
**x** execute permission

Using the example from above:

```
-rwxr-xr-x 1 smithm          1232 Aug 17 11:29 my_program
```

You can change permissions of `my_program` so that the group has write permission to this file with the following command:

```
gusun% chmod g+w my_program
```

Another `ls -l` command would display the following:

```
-rwxrwxr-x 1 smithm          1232 Aug 17 11:29 my_program
```

To take away all permissions from all users, use the following:

```
gusun% chmod o-rwx my_program
```

```
gusun% ls -l my_program
```

```
-rwxrwx--- 1 smithm          1232 Aug 17 11:29 my_program
```

# CHAPTER 6: Additional Help

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## On-Line Help

Unfortunately, the on-line assistance that comes with UNIX does not offer a very user-friendly help utility. All commands available on the system are, however, outlined in a collection of text files. These files are known as **man files** because they were originally pages of the *UNIX Programmer's Manual*. Though these pages are often cryptic and include more detailed information than the typical user might need, they can be a good last resort.

If you know the name of the command you wish to learn more about, you can view its **man** pages by typing *man* and then the name of the command:

```
gusun% man commandname
```

When man pages are being presented, the system pauses after each full screen and displays *more* on the bottom line. To continue reading the file, press the space bar to continue to the next full screen.

## APROPOS

---

A program called **apropos** is also available for those who don't know the name of the needed command. The **apropos** command searches the man page headers for the provided keyword and lists all the relevant man pages.

```
gusun% apropos keyword
```

Once you know the command associated with the keyword, you can use the **man** utility to view the related man pages.

For example, if you would like to learn more about copying files, you might try doing a man search on the copy command. Since there is no copy command in Unix, no man pages will be displayed if you type *man copy*. If you type *apropos copy* however, you will see a list displaying all the commands that deal with copying files or directories. From there you can choose the one you would like more information on and use the man command for further details.

## AITS PUBLICATIONS

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Academic and Information Technology Services publishes *An AITS Survival Guide for Students* and *The AITS Faculty Guide to Computing at Georgetown*, which list the various services and resources available on the Main Campus. AITS also publishes a collection of "One-Page Wonders" for users seeking specific information on computer related subjects. These informational sheets provide additional information for the use of the GUSUN system.

To obtain a copy of any of these publications, please come to the AITS office located in the Reiss Science Building, Room 238. These publications are available free of charge and can be picked up Monday through Friday, 9:00 am to 5:00 pm. Much of this information can be found at the AITS web site at <http://www.georgetown.edu/uis/help>.

## AITS HELPDESK

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Users with specific questions regarding usage of GUSUN are welcome to contact the Academic and Information Technology Services HelpDesk for technical support. The AITS HelpDesk is open Monday through Friday, 8:30 am to 5:00 pm, at 202-687-6096. Questions may also be sent to the HelpDesk via electronic mail. Students should send inquiries and requests for help to [helpdesk@gusun.georgetown.edu](mailto:helpdesk@gusun.georgetown.edu), while faculty and staff should send mail to [help@gunet.georgetown.edu](mailto:help@gunet.georgetown.edu).

## RECOMMENDED BOOKS

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For users seeking additional information on the UNIX operating system, the following is a list of recommended reference books:

- *Open Computing Best UNIX Tips Ever*. Host, Douglas and Kenneth Rose and Rosinki, Richard, (New York: Osborne McGraw-Hill, 1994).
- *The UNIX Programming Environment*. Kernighan, Brian and Pike, Rob, (New Jersey: Prentice-Hall Books, 1984).
- *UNIX for Dummies*. Levine, John R. and Young, Margaret Levine, (Massachusetts: IDG Books, 1995).

# Need Help???

## Contact the HelpDesk!!!

Phone: (202)687-6096

E-mail: [helpdesk@gusun.georgetown.edu](mailto:helpdesk@gusun.georgetown.edu)

Web: <http://www.georgetown.edu/uis/help>

Office: 238 Reiss Science Building