



Information Services

Introduction to UNIX

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Introduction to UNIX

This service course is intended to demonstrate the rudimental of UNIX and give you a flavour of what is available, so by the end of the session you should have gained enough knowledge to manipulate files and issue simple commands.

An operating system is a means of communicating with a computer; on a VAX the operating system is VMS, on a PC it is DOS, and on a Alpha it is UNIX. UNIX is one of the most popular operating systems in the World, it runs on more platforms than any other, it is not tied down to any architecture and it has a rich assortment of utilities and commands.

UNIX is available on so many platforms there is no need to learn a new operating system each time you change hardware vendor, it is far cheaper than any other operating system, and it is slowly standardising itself. The problem many new users discover is the fact it was designed by computer specialists for computer specialists, and consequently the syntax of the commands are very user unfriendly. But X Windows has conquered this problem.

Tips to remember:

- + UNIX is case sensitive
- + Case sensitivity also applies to passwords
- + Only ONE version of a file is saved
- + To logout of the system use ctrl-d or type 'logout'
- + An interrupt can be issued with ctrl-c
- + Many programs will terminate with a ctrl-d

Connection via a PC

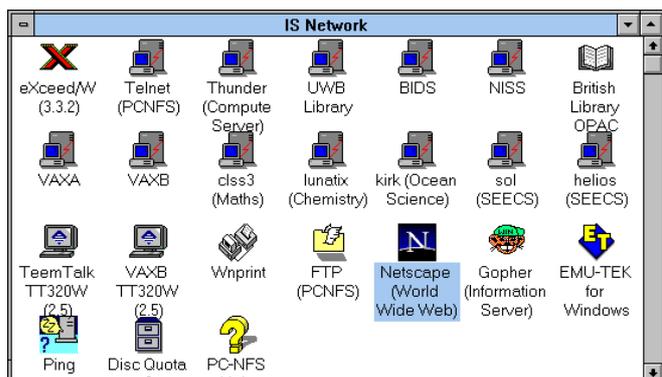
To access a UNIX host from a PC in one of the computer rooms a connection must be made to it from either DOS or Winows, this is done by means of a program called *telnet*. We shall be using a UNIX host called *thunder*.

Thunder is the name given to the newest and fastest machine the University possesses. It is a Digital 2100 Server Model A500MP and was purchased to provide the UNIX based compute server. The configuration is a three processor system with 384Mb of main memory and 10 Gbytes of disk. The operating system is Digital's OSF/1 unix.

Here is an example of a telnet call:

{NFS} M:\>telnet thunder OR

Note: if you need to use graphics or would like a multi-windows environment then you can use *eXceed/W* rather than *telnet*



Below is what you should see when you login to *thunder*.

```
{NFS} M:\>telnet thunder

OSF/1 (thunder) (ttyp8)

login: iss133
Password:
Last login: Tue Oct 11 09:45:22 from simone

DEC OSF/1 [EXT] V3.2 (Rev. 214); Mon Apr 24 16:15:57 BST 1995
DEC OSF/1 V3.2 Worksystem Software (Rev. 214)

                Welcome to Thunder!

-----
|   If you have any problems using this system or software on this system   |
|   please send E-mail to:                                                  |
|               helpdesk                                                    |
|                                                                              |
|   explaining in sufficient detail what you require help with.            |
|                                                                              |
|-----|

Good Morning! There are currently 6 user(s) running 30 programs.

thunder:/homedir/iss133>_
```

Logout

To exit the system use:

```
thunder:/homedir/iss133> exit
```

Password

yppasswd will change a user's password, by first prompting the user for the old password followed by the new password which is then typed in again for verification. The password can be of any length but must be greater than six characters, and the characters can be any letter/digit/punctuation mark or escape sequence.

```
thunder:/homedir/iss133> yppasswd iss033
Old NIS Password: <bangorpass>
New Password: <banana23>
Verification: <banana23>

NIS Passwd changed on class1
```

Note: you should not allow any other person to login as you, if you think your account has been compromised then please change your password.

The Editor

Unlike DOS where file names cannot use certain characters and a file has a concept of prefix and suffix, UNIX has no restrictions on characters or on the form of the file name, as the example below illustrates:

```
the.line.is.a.valid.filename.in.UNIX
```

Note: Directories **don't** have to have an extension of dir.

There is an editor available on **thunder** that is identical to the editor on the VAX, it is called **edt**, and has the same functionality as **edt** on the VAX. A file is created by the following command (note the `-nodisplay` command line option):

```
thunder:/homedir/iss133> edt -nodisplay new_file
```

Remember that a word processor is just a glorified editor, so editors you find on a multi-user machines are simplified word processors.

To exit **edt** press: **ctrl-Z**
 then type **exit**

at the asterix (*) prompt.

Listing Files

The command **'ls'** is used to list files, on its own it provides a brief listing which only includes the file name, but **ls** can take many options:

```
thunder:/homedir/iss133> ls -l                                long listing
-rw-rw-rw-  1 iss033  is      14683 Sep 25 16:58 autumn95.wp6
drwxrws---  2 iss033  is       2048 Aug 23 15:07 bin
-rw-r--r--  1 iss033  is      3970 Sep 29 09:40 country-codes
drwxrwsrwx  2 iss033  is       512 Apr 28 10:39 cpm

thunder:/homedir/iss133> ls -t                                displays the files in chronological order
-rw-r--r--  1 iss033  is      3970 Sep 29 09:40 country-codes
-rw-r--r--  1 iss033  is     72475 Sep 28 09:52 reg.ps
-rw-rw-rw-  1 iss033  is     14683 Sep 25 16:58 autumn95.wp6

thunder:/homedir/iss133> ls -lat                                does all of the above
-rw--w--w-  1 iss033  is      2445 Oct  2 09:17 .Xauthority
-rw-r--r--  1 iss033  is      8863 Oct  2 08:58 .pinerc
drwxr-sr-x  3 iss033  is      1024 Sep 29 15:19 win
-rw-rw-rw-  1 iss033  is     14668 Sep 29 15:18 htmlref.wp6

thunder:/homedir/iss133> ls -a                                displays hidden files
```

```
thunder:/homedir/iss133> ls -l data.dat    long listing of the file data.dat
-rw-rw-rw-  1 iss033  is                1106 Aug 24 17:14 data.dat
thunder:/homedir/iss133> ls -la .login    login listing of the hidden file .login
```

Viewing Files

To display the contents of a file on the screen the command:

```
thunder:/homedir/iss133> more file
```

is used, where the following key strokes have a special meaning:

<space>	forward a page
b	back a page
<return>	forward a line at a time
/	search for a word
q	quit

Copying Files

The command **cp** is used to make a duplication of a file, the only difference being its name:

```
thunder:/homedir/iss133> cp original new
thunder:/homedir/iss133> cp document.wp new_document.wp
```

Deletion of Files

To remove a file use the remove command:

```
thunder:/homedir/iss133> rm file_name
thunder:/homedir/iss133> rm new_document.wp
```

Renaming of Files

Renaming of files is accomplished with the move command:

```
thunder:/homedir/iss133> mv file new_file
thunder:/homedir/iss133> mv old_letter.wp new_letter.wp
```

Help

The UNIX manual can be accessed from the command line by the command **man**. **man** displays information from the reference manuals which are complete manual pages that you select by title.

```
thunder:/homedir/iss133> man cp          help on copy
thunder:/homedir/iss133> man joe        displays the man page on joe
thunder:/homedir/iss133> man lpr       man page on local printing (lpr)
```

Printing

The print command used on a UNIX host, is **lpr** followed by a **-P**<printer name>

```
thunder:/homedir/iss133> lpr -Plg01 file
```

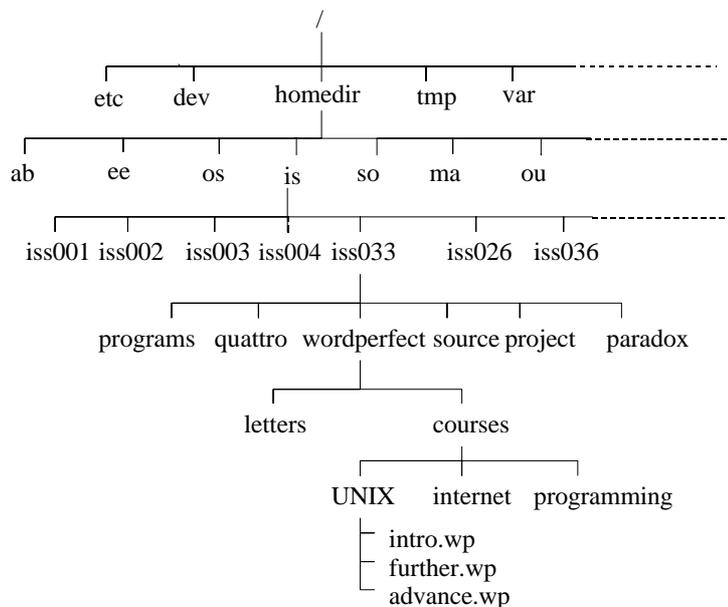
omitting the **-P** (**capital P**) will cause the file to be printed on the default printer, the flag **-P** indicates a specific printer. The printers that are available are (See APPENDIX B, for full list):

clmps1	monochrome postscript
clcps1	colour postscript, 30p/sheet
lg01	80 column dot matrix print

File Store Structure

Unlike a personal computer where a sole user owns all the files on the machine, a multi-user machine such as a UNIX host will have many users, thus there needs to be some sort of file organisation as to segregate the different users. This is done by directories or folders, a diagrammatic representation is displayed below:

File Store Structure



As can be seen from the diagram on the previous page, every user has a portion of the filestore devoted to them. The way the filestore is divided is by the use of directories. The file store can be compared to a filing cabinet, you would not put all your documents in the one folder, and consequently you would not put all files into the one directory. Files are seen as documents, and directories can be thought of as folders. When you login into the system it automatically places you in your home directory.

Manipulating Directories/Folders

To create a folder the following command is used:

```
thunder:/homedir/iss133> mkdir directory_name
```

Directories can be used to arrange work into different folders for example, spreadsheet, word processing, databases, programming:

```
thunder:/homedir/iss133> mkdir wordperfect
thunder:/homedir/iss133> mkdir quattro
thunder:/homedir/iss133> mkdir programming
thunder:/homedir/iss133> mkdir paradox
```

To navigate around the directory hierarchy you can use cd:

```
thunder:/homedir/iss133> cd wordperfect          (change directory to wordperfect)
thunder:/homedir/iss133> mkdir personal courses (make dir personal and courses)
thunder:/homedir/iss133> cd personal            (change dir. to personal)
thunder:/homedir/iss133> cd ..                  (change directory to wordperfect, ie parent)
thunder:/homedir/iss133> cd ..                  (go up one level again, ie the home dir)
```

to find out where you are in the hierarchy the command present working directory can be used:

```
thunder:/homedir/iss133> pwd
```

to return to your login directory (your home directory) type:

```
thunder:/homedir/iss133> cd                      or
thunder:/homedir/iss133> cd ~
```

to remove a directory use:

```
thunder:/homedir/iss133> rmdir directory_name
thunder:/homedir/iss133> rmdir wordperfect      [Note: The dir. must be empty!]
```

I/O Redirection

Normally any input will come from the keyboard and any output will be displayed on the screen, this can be modified by using input/output redirection. This is accomplished by utilising the following metacharacters:

>	direct the output to a file
>>	append the output to a file
<	direct the input from a file

For example,

```
thunder:/homedir/iss133> ls -l >> filelist      Appends the directory listing to "filelist"
thunder:/homedir/iss133> sort < filelist        Sort the file to alphabetic order
thunder:/homedir/iss133> cat file1 file2 > allfiles  Directs file1/2 to allfiles
thunder:/homedir/iss133> who > loggedin         Lists loggedin users in file "loggedin"
```

Pipes

A pipe is a means of connecting the output of one command to the input of another, there are two advantage in doing this; first, there is no temporary file space required, and secondly output can start coming out of a pipeline before the input has fully completed. Here are a few examples of pipes:

thunder:/homedir/iss133> <code>ls -l more</code>	Page the output from the <code>ls</code> command
thunder:/homedir/iss133> <code>ls wc -l</code>	Count the number of files in a dir
thunder:/homedir/iss133> <code>who wc -l</code>	Count the number of user logged in
thunder:/homedir/iss133> <code>ls -l grep file</code>	Search for a particular file in a dir
thunder:/homedir/iss133> <code>man cp lpr</code>	print the man page on cp

Electronic Mail

Electronic mail: is a method of sending messages to different users via the computer, it is the most popular form of inter-computer communication, probably because it is far quicker and cheaper than normal postal mail and consequently far easier to exchange information. It is even quicker than the FAX and much cheaper. Most default utilities on UNIX are very difficult to learn and master, and the mailer is no exception, which is why most users use *pine* as opposed to mail.

Addressing Schemes: just like any person has a home address, there is an equivalent home address for each computer user. Each user has a unique username which identifies them in the Bangor domain, and the domain Bangor is part of the academic domain, which is a member of the United Kingdom, so my address becomes:

iss033@bangor.ac.uk

Any user in the world can be identified by their unique user address, and consequently electronic mail can be addressed to them. In general the form of the address is as follows:

machine	-	the machine name (for example, thunder)
bangor	-	town or organisation
ac	-	type of organisation (company, government, academic, military)
uk	-	country

All countries follow this addressing convention, where the country is the last part of the address, apart from the US where it denotes the type of organisation - com, edu, mil or gov.

Pine:

A program that offers users the ability to read and write mail is called a mailer, the one we recommend is *pine* because of its ease of use. To run *pine*, enter *pine* on the command line. The screen that will be presented is the main menu of *pine* from here you can send and read mail, each screen that is presented will reserve the **bottom two lines for on-line help**. To send a message

you must first compose it, before sending it. To read a mail item go into *folder list* and *INBOX*, use the arrow keys to navigate through the index.

Main Menu Level

On entering *pine* this is the screen that will be presented to the user, and from here all functions can be accessed.

```
PINE 3.90      MAIN MENU                               Folder: INBOX  13 Messages

?      HELP          -  Get help using Pine
C      COMPOSE MESSAGE -  Compose and send a message
I      FOLDER INDEX  -  View messages in current folder
L      FOLDER LIST   -  Select a folder to view
A      ADDRESS BOOK  -  Update address book
S      SETUP         -  Configure or update Pine
Q      QUIT          -  Exit the Pine program

Copyright 1989-1994. PINE is a trademark of the University of Washington.

? Help          P PrevCmd          R RelNotes
O OTHER CMDS L [ListFldrs] N NextCmd      K KBLock
```

Message Compose Screen - Sending A Message

To send a message to a user you must select the compose feature from the top level, which will result in the following screen.

```

PINE 3.90      COMPOSE MESSAGE                               Folder: INBOX  13 Messages
To           : iss033
Cc           :
Attchmnt:
Subject     :
----- Message Text -----

Hello,

this is where the message is type in by the user.

Bye,

Sim

^G Get Help  ^X Send      ^R Read File ^Y Prev Pg  ^K Cut Text  ^O Postpone
^C Cancel    ^J Justify   ^W Where is ^V Next Pg  ^U UnCut Text^T To Spell

```

There are a number of fields to note in this screen:

to: this is where the destination address is entered. Below are a few examples of addresses:

```

to: iss033, abu147, phil@manweb.co.uk
to: simone@bangor.ac.uk
to: osp123@sos.bangor.ac.uk
to: rosa@durham.ac.uk
to: marco@plaza.aarnet.edu.au

```

cc: the *cc* filed is used to send a copy of a message to a number of other people, for example:

```

cc: iss033, iss008
cc: phil@manweb.co.uk, roy@norweb.co.uk

```

Attachment: at this point you can include any file, even a WordPerfect file, for example

```

Attchmnt:  counsel.wp
Attchmnt:  spread.wbl, letter.wp

```

Subject: here is where the subject of the mail item is entered

```

Subject:  Minutes of Meeting 10/12/94
Subject:  Construction Work

```

the message: below the *Message Text* line is where the users enters their message. Since this part is based on the *pico* editor, then any function that is available to *pico* is available to the *Message Text*. To insert an ordinary text file (ASCII) into the *Message Text* then press ctrl-R and enter the file name.

Folder list - Reading a New Mail Message

On entering *pine* it will notify the user of any new mail messages they may have. All new message are stored in the *INBOX*, which can be accessed from the FOLDER LIST option in the main menu.

```
PINE 3.90      FOLDER LIST                               Folder: INBOX  8
Messages

INBOX          sent-mail          saved-messages    courses
received       sent              sentmail          wastebasket

? Help          M Main Menu    P PrevFldr      - PrevPage      D Delete      R Rename
O OTHER CMDS V [ViewFldr] N NextFldr  Spc NextPage   A Add
```

To access any mail folder from the folder index then highlight the folder, with the arrow keys, and press return, this will display an index of that particular folder.

Folder Index Screen

From this screen all message can be accessed

```
PINE 3.90      FOLDER INDEX                               Folder: INBOX  Message 13 of 13

+  1  Jul 21 T.E.Preece              (500) mosaic and images
   2  Jul 25 Mr. D.Roberts           (3,567) dir/date and dir *.dir
+  3  Sep 12 pine390-DocServer@ (22,347) Pine info you requested (last changed
   4  Sep 15 BITNET list server    (4,940) You are now subscribed to the ROADMAP
   5  Sep 15 BITNET list server    (899) Output of your job "iss033"
+  6  Sep 16 Mr T. Crummey          (985) Re: login
+  7  Sep 19 Mr. C.S.Wilding        (1,135) newsmet
+  8  Sep 21 Ifor G. Jones          (752) Re: HotMetal
+  9  Sep 23 Mr T. Crummey          (1,325) Re: e-mail and file store problems
  10  Sep 25 Jones, E               (2,266) RE: hello
+  11 Sep 27 Brian Kelly            (1,516) Re: forms and www
  12 Sep 27 Patick Douglas Cri     (8,087) ROADMAP TRAFFIC REPORT - SEPTEMBER 25
+  13 Sep 28 psp022@uk.ac.bango    (1,684) what a lot of gauls !

? Help          M Main Menu    P PrevMsg      - PrevPage      D Delete      R Reply
O OTHER CMDS V [ViewMsg] N NextMsg      Spc NextPage   U Undelete     F Forward
```

Use the arrow keys to go up and down the index and enter to view a mail item. Other useful keys are:

- d** mark a mail item for deletion
- f** forward the mail item to another user

```

r      reply to the author of the received message
i      returns to the index - lists all mail items in the mailbox
y      prints the item on a pre-specified printer
s      extracts and saves a message in a named file
t      take address and place in address book

```

Address Book Screen

Very often it is more convenient and more memorable to assign a nick name or alias to an address of a user name, this can be done with the address book. Occasionally the same message needs to be sent to a number of different user names, this is either achieved by entering each user name at the *to* prompt of the compose message, or a far better way, is to create a distribution list. Below is the address book screen with aliases and a distribution list called friends.

```

PINE 3.90      ADDRESS BOOK                      Folder: INBOX  Message 13 of 13

pwd      R.P.Wood, Mr.                          iss026@clss1.bangor.ac.uk
sims     simy                                    iss033
max      York, Max                              iss032

freinds   Friends                               DISTRIBUTION LIST:
                                                iss033
                                                iss033@vaxa
                                                iss133

[Now in addressbook .addressbook]
? Help      M MainMenu    P PrevEntry    - PrevPage    D Delete      S CreateList
O OTHER CMDS E [Edit]    N NextEntry   Spc NextPage   A Add         Z AddToList

```

Useful Internet Commands

Finger: a simple way to establish if an e-mail has arrived at its destination is to use *finger*, this command will display the number of unread e-mail messages, and the contents of their *.plan* file. The format of the command is:

```

thunder:/homedir/iss133> finger user@address
thunder:/homedir/iss133> finger carol@sol.cs.ruu.nl
thunder:/homedir/iss133> finger iss033@vaxa.bangor
thunder:/homedir/iss133> finger @vaxa
thunder:/homedir/iss133> finger buckmr@rpi.edu

```

Who's Who at Bangor

Often a username is known but not the real name, or visa versa, therefore a useful command to know is **whos** which will either give details about the surname or the username:

```

thunder:/homedir/iss133> whos string
thunder:/homedir/iss133> whos barbaresi
Username          | Real Name
-----|-----

```

```

iss033          | S.L.Barbaresi
thunder:/homedir/iss133> whos jones abs
Username        | Real Name
-----|-----
abs028          | Dr. D.R.Jones
abs048          | S.J.Jones
abs047          | J.W.Williams-Jones
thunder:/homedir/iss133> whos os

```

Talk

talk can be used to talk to people on any machine in any part of the world assuming they are connected to the world wide network called the internet. To exit talk use **ctrl-d**

```

thunder:/homedir/iss133> talk iss033
thunder:/homedir/iss133> talk iss033@kirk
thunder:/homedir/iss133> talk harry@pluto.madrid.ac.es

```

File transfer from a remote machine

The method used for transferring files from remote machines to local machines is **ftp**, for this to work both machines must be able to run **ftp** (ie, must be talking TCP/IP). To access a file on another machine you must first have its Internet address.

If the file you are transferring is a binary file, such as a WordPerfect document then you must issue the **binary** command at the **ftp** prompt before you "**get**" the file.

Additional commands that are available from the ftp prompt are:

get	-	transfers a file from the remote machine to the local machine
put	-	transfers a file from the local machine to the remote machine
mget	-	receives multiple files
mput	-	sends multiple files
help	-	displays help information
status	-	displays technical information about the connection

```

thunder:/homedir/iss133> ftp vaxa
Connected to vaxa.
220 vaxa FTP Server (Version 3.2) Ready.
Name (vaxa:iss033): iss033
331 Username ISS033 requires a Password.
Password: password
230 User logged in.
Remote system type is VMS.
ftp> cd mtb
250 CWD command succesful.

```

```

ftp> dir
200 PORT command successful.
150 Opening data connection for (147.143.2.10,1796)

Directory DISK$IS:[ISS033.MTB]

BLOOD.MTW;2      1/4    1-JUL-1992      [ISS033]  (RWE,RWED,,)
COMMANDS.MTB;6  1/4    5-OCT-1992      [ISS033]  (RWED,RWED,RE,E)
DATA.DAT;1       1/4    28-MAY-1992     [ISS033]  (RWE,RWED,,)

Total of 3 files.

226 LIST Directory transfer complete.
ftp> get data.dat
200 PORT command successful.
150 Opening data connection for data.dat (147.143.2.10,1798)
226 Transfer complete.
43 bytes received in 0.036 seconds (1.2 Kbytes/s)
ftp> quit
221 Goodbye.
thunder:/homedir/iss133>

```

Configuring Your UNIX Session

There are two important files which defines your Unix environment. They are:called:

.login

and

.cshrc

These two files are obeyed every time you login to the system and many packages (e.g. UNIRAS) assume that these files are correctly set up. These are just ASCII text files which you can edit yourself but *be careful* since an incorrectly laid out *.login* or *.cshrc* can stop you from working! You will notice lines starting with *alias* which is a way of using your favourite command names, e.g.

```
alias type 'cat \!*
```

In your *.cshrc* file will let you use *type* to display a file.

Often, when using eXceed/W, you need to check an environment variable called DISPLAY. You can check it with the command:

```
echo $DISPLAY
```

and define it with the command:

```
setenv DISPLAY nescafe:0
```

(*nescafe* is one of the Pentium PCs in G2)

Other Topics:

grep -- search file(s) for given strings
sort -- flexible sorting command
find -- multi-purpose file-lookup program
script -- record your commands in a file

APPENDIX A - Booklets Available at Computer Lab. Reception

JANET and JIPS - Worldwide Computer Networks

An Introduction to the UNIX Operating System

An Introduction to pine - the UNIX mailer

APPENDIX B - Printers available on the UNIX service

The following printers are available from any UNIX host

Name	Format	Pages/ Side	Double Sided	Colour	Cost	Width
clmps1	PostScript	1	No	No	10p	A4
clmps2	PostScript	1	Yes	No	15p	A4
clmps4	PostScript	2	Yes	No	15p	A4
clman1	ASCII	1	No	No	10p	A4
clman2	ASCII	1	Yes	No	15p	A4
clman4	ASCII	2	Yes	No	15p	A4
almps1	PostScript	1	No	No	10p	A4
clcps1	PostScript	1	No	Yes	30p	A4
clcps2	PostScript	1	No	Yes	20p	A4
clmp1	ASCII	1	No	No	none	80 col
clfx1	ASCII	1	No	No	none	80 col
cllp	ASCII	1	No	No	none	132 col
lj250	sixel	1	No	Yes	20p	A4
clhp	HP Plotter	1	No	Yes	10p	A4/A3

APPENDIX C - Books

Title: Mastering SunOS

Authors: Brent Heslop and David Angell

Publisher: Sybex

Edition: 1990

ISBN: 0-89588-683

Comment: A good, comprehensive hand-on text to SunOS and OpenWindows ...

Title: UNIX Shell Programming

Authors: Stephen Kochan and Patrick Wood

Publisher: Hayden

Edition: 1990

ISBN: 0-672-48448-X

Comment: A classic on using and programming Bourne Shell (and Korn Shell) ...

Title: The Waite Group's UNIX Communications

Authors: Bart Anderson, Brian Costales & Harry Henderson

Publisher: Sams

Edition: 2nd ed. 1991

ISBN: 0-672-22773-8

Comment: A really excellent book on e-mail (Mail, elm), netnews (rn, nn) and UUCP ...

Title: The UNIX Programming Environment

Authors: Brian Kernighan and Rob Pike

Publisher: Prentice-Hall

Edition: 1984

ISBN: 0-13-937681-X

Title: The Whole Internet - User's Guide & Catalog

Author: Ed Krol

Publisher: O'Reilly

Edition: Second 1994

ISBN: 1-56592-025-2

Comment: Definitely a MUST for any new and not-so-new Internet users

Title: Advanced Programming in The UNIX Environment

Author: Richard Stevens

Publisher: Addison-Wesley

Edition: 1992

ISBN: 0-201-56317-7

Comment: Highly Recommended for programmers

Title: A Directory of Electronic Mail Addressing & Networks

Author: Donnalyn Frey & Rick Adams

ISBN: 1-56592-031-7

Title: UNIX in a Nutshell: Desktop Quick Reference for SV & Solaris 2.0

Author: Daniel Gilly & the staff

Publisher: O'Reilly & Associates

Edition: 2nd Edition June 1992 ISBN: 1-56592-001-5

Comment: "...the most comprehensive quickref on the market, a must for any UNIX user..."

Title: UNIX Power Tools

Author: Jerry Peek , Mike Loukides , Tim O'Reilly, & others

Publisher: Bantam ISBN

Edition: 1st

ISBN: 0-553-35402-7

Comment: ideal for UNIX users who hunger for technical--yet accessible--information.

UNIX Practical

1. Connection + connect to a UNIX host - thunder
2. Passwords + set your password
3. The editor + create a file with the **edt** editor (Hint: `edt -nodisplay report.txt`)
4. Directory + use `ls` in its various forms to list the directory
5. Type + look at the file with **more**
6. Files + copy the file a few times (Hint: `cp report.txt report.save`)
(Hint: `cp report.txt report.new`)
+ delete one of the copies (Hint: `rm report.save`)
+ rename a file (Hint: `mv report.new 1995-annual-report.txt`)
7. Printing + print the newly created file with `lp` (Hint: `lp 1995-annual-report.txt`)
8. Quota + How much quota have you?
9. Help + Use the on-line manual to obtain help on intro
10. Mail + issue the pine command for mail and send a message
+ read a new mail message
+ create a mail alias
+ create a signature file: (Hint: `edt -nodisplay .signature`)

APPENDIX D - UNIX Quick Reference Card

UNIX	Description	Example
cc program.c	the C compiler	cc anova.c
mkdir directory	make a new directory	mkdir documents
rm file	delete a file	rm project.wp
rm -i file	confirm before deleting	rm -i project.wp
lprm -Pqueue job	del a print job off queue	lprm -Pclmpsa 123
diff file1 file2	check the diff. between 2 files	diff first second
ls	directory listing	ls
ls -R	a recursive directory listing	ls -R
ls -l file or directory	a long directory listing	ls -l
ls -lg file or directory	list directory by owner and group	ls -lg
ls -g file or directory	list directory by file size	ls -s
du -s file or dir	list size of each directory	du -s
joe file	call the editor	joe project.txt
f77 program.f	the fortran compiler	f77 anova.f
man command	on-line manual pages	man cp
pine	electronic mail	pine
talk user@machine	talk with another user	talk iss033@thunderr
lpr file	print a file	lpr
lpr -Pqueue file	print a file to queue	lpr -Pclfx1 report.wp

UNIX	Description	Example
lpr -#number file	print <i>n</i> copies of the file	lpr -#2 report.wp
lprm job_number	delete a print job	lprm 123
mv source dest.	rename a file	mv report report.old
mv -i source dest.	confirm the renaming of a file	mv -i rep rep.new
grep string file	search a file for a string	grep Barbaresi log
mesg y or n	only display certain messages	mesg y
cd directory	change directory	cd documents
rlogin machine	login to another host	rlogin thunder
yppasswd	change a user's password	yppasswd
chmod perm. file	change a file's protection	chmod +x runner
pwd	show the present working dir	pwd
ps	show user's processes	ps
ps -l	long listing of user's process	ps -l
lpq -Pqueue_name	show selected printer queue	lpq -Pclfx1
ps -aux	show all processes	ps -aux
who	display all logged users	who
kill -9 pid	terminate a selected process	kill -9
at time file	submit a job to the batch	at 0200 account
more file	display the contents of a file	more report.wp