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XENIX™ Operating System Version 3.0

Release Summary

1. PRODUCT OVERVIEW

XENIX Version 3.0 is a significantly enhanced version of the Bell Labs UNIX System III Operating System. It is derived from the Bell source distribution, with modifications and enhancements to tailor the system to the microcomputer environment.

XENIX Version 3.0 represents a signifcant step forward, both in the quality and functionality of the software, and in the documentation.

The product is provided as three packages, and the documentation is structured to reflect this. All the manuals are produced in 8.5 x 5 inch "downsize" format.

1.1 Software

XENIX Version 3.0 will be provided as three packages. The *Timesharing System* contains the XENIX System kernel, plus a large number of standard utilities. This package is sufficient to provide an effective multi-user environment.

The *Software Development System* contains compilers, the linker, and a number of other utilities useful for program development. It also contains the C libraries, and include files.

The *Text Processing System* contains the text formatters and macro packages, and a number of other useful utilities.

The *Timesharing System* is required to use either of the other two packages, but the two add on packages are independent of each other, both in documentation and software.

1.2 Documentation

A detailed description of the documentation is given later. Each of the three packages comes with its own independent set of documentation. The two add on packages also contain reference manual insert pages, so that the reference manual in the *Timesharing System* can be upgraded easily.

Online documents and manual pages are no longer provided. Documentation is provided in Laser Printer output. In special cases the documents and the mm macros will be provided. Significant modification may be required to adapt the documents to other laser printers.

2. NEW FEATURES

Shared Data

A new system call will be added to allow user processes to share data areas. This will be implemented on all systems, regardless of the memory management model. However on some systems the performance will be better than on others.

Fixed Stack Analysis Utilities

A set of utility programs will allow analysis of C programs to determine stack size requirements. This is useful when developing software for fixed stack machines (eg unmapped 8086, 286, and some M68000 systems).

Inter-Machine Mailer

The mailer has been completely replaced with a significantly enhanced product. The new mailer has a user interface based on the Berkeley mail program, and is integrated with a new communications package to send mail between local machines over serial lines. Using this users can network several machines together reliably. This package replaces *uucp* for local machine communications.

The new communication package also allows remote command execution, and inter-machine file transfer.

System Administration Utilities

A number of utility programs have been added to the XENIX System to make system administration easier. For example adding and deleting user accounts can now be done with a single command.

Visual Shell

The visual shell will be provided in the *Timesharing System*. This shell runs under both the XENIX System and under MS/DOS, and provides an closely similar user interface in both cases. It is a menu driven command interpreter which makes full use of the screen to display status and environment information to the user. It has a built-in help facility, and users can add new applications to the menu. The command interface is modeled after the Microsoft Multi-Tools, and therefore easy to learn by non technical users.

MS/DOS File Access Utilities

Several utilities will be provided in XENIX Version 3.0 to allow MS-DOS files and directories to be read and written. This will be especially useful for machines which can operate both MS-DOS and the XENIX System. Access to IBM DOS 1.1 and 2.0 format diskettes will be supported.

Secure Boot Sequence

The standard boot sequence under XENIX Version 3.0 prevents entering single user mode without knowing the super user password. This closes a significant security hole.

Password Administration

The system can now be set up to enforce password ageing on a per-user basis. In addition a new command, *pwadmin* is provided for making changes to the password file.

Source Code Control System

The "SCCS" package is provided with the *Software Development* System. This consists of the following new commands: *admin, cdc, comb, delta, help, prs, rmdel, sccsdiff,* and *unget.*

Memorandum Macro Package

The memorandum macros, and the new *mm* command are provided with the *Text Processing* System. These are a significant functional improvement over the *ms* macros in XENIX Version 2.3.

System Calls

XENIX Version 3.0 contains all the XENIX Version 2.3 system calls, plus all those in AT&T's System III product. In addition the following are new:

Shared Data

As mentioned above a call will be provided to allow unrelated processes to share data.

chsize A system call to truncate files to a given length.

nap A new system call to allow a process to sleep for very short periods of time. This is useful for interactive, screen oriented packages.

lock A new system call to allow processes to lock themselves in physical memory to guarantee a greater share of machine resources.

Language Tools

The initial XENIX Version 3.0 release will contain a new compiler with the UNIX System III language extensions. This compiler will support large text and large data on XENIX-286. It will also support individual data items >64k.

The assembler provided with 286 systems does not support generation of 286 specific instructions, but can be made to do so using one of the macroprocessors provided with the Software Development Package.

Xenix 286 includes an 80287 compatible floating point emulator or support for the 80287 floating point hardware.

3. COMPATIBILITY

Systems previously supplied as Version 2.3 will continue to support execution of old binaries. A compile time option will allow compilation of Version 2.3 sources also. Thus all XENIX Version 2.3 binaries and source code are usable under XENIX Version 3.0 without modification.

There are a few exceptions to the above. Any utilities which make use of detailed internal knowledge of the kernel or file system format will need modification. It is not expected there will be any of these outside the standard the XENIX System utilities.

XENIX Version 2.3 file systems can be used with systems. The *fsck* program should be used on the file system before use with a system.

4. HARDWARE REQUIREMENTS

The absolute minimum hardware requirements for XENIX Version 3.0 are as follows:

- 512k bytes of main memory.
- 10M bytes of hard disk storage.
- One backup device (mag tape or floppy disk).

This minimum hardware is sufficient to support the full XENIX Version 3.0 system and run all the utilities.

It is important to note that the exact amount of memory required on a given system depends on usage patterns and the specific application packages added. Thus the above system is sufficient for a small number of users using the standard Xenix utilities, but might not be enough to support a large number of users, or a large and sophisticated application package. These figures are minimums.

It is possible that a single user system running just the Time-Sharing package with simple and small applications could run with slightly less disk and memory. However not all the Time-sharing utilities will run with reasonable performance in a system with less main memory. In particular using the inter-machine mail system is equivalent to running multi-user since mail can arrive asynchronously. Use of this facility definitely requires a 512k system, as does any other Time-Sharing system with any background processing.

No system without a hard disk will be able to run XENIX Version 3.0.

5. DETAILED SUMMARY

The next few sections list in detail the specific system calls, library routines, and utility commands available under , broken down by individual packages.

Commands marked '+' are new in XENIX Version 3.0.

5.1 TIMESHARING SYSTEM

The Timesharing System contains the the XENIX System kernel, and the following commands:

acctcom+ - search and print accounting files
accton - turn system accounting on/off
asktime - sets system date and time
assign - assign a device to a user
at - execute commands at a later time
atq+ - examine 'at' job queue
atrm+ - remove an 'at' job
awk - pattern scanning and processing language
banner+ - print large letters
basename - strip filename affixes
bc - arbitrary-precision arithmetic language
bdiff+ - diff very large files
bfs+ - big file scanner
cal - print calendar
calendar - reminder service
cat - catenate and print
cd - change working directory
chgrp - change group
chmod - change mode
chown - change owner
chroot+ - change process root directory
cmp - compare two files
comm - select/reject lines common to two sorted files
copy - copy groups of files
cp - copy
cpio+ - copy file archives in and out
cron - background clock daemon
crypt - encode/decode
csplit+ - context file split
cu - call the XENIX System
date - print and set the date
deassign - desasign a device
dc - desk calculator
dd - convert and copy a file
devnm+ - device name
df - disk free
diff - differential file comparator
diff3 - 3-way differential file comparison
dircmp+ - directory comparison
dirname+ - deliver portion of pathname
disable - turn terminal usage off
dtype+ - print disk type (xenix, msdos, tar, etc)
du - summarize disk usage
dump - incremental file system dump
dumpdir - print the names of files on a dump tape

echo - echo arguments
ed - text editor
egrep - search a file for a pattern
enable - turns terminal usage on
env+ - set/print command environment
ex - line editor (Version 2.13)
expr - evaluate arguments as an expression
false - provide truth values
fgrep - search a file for a pattern
file - determine file type
find - find files
finger - user information lookup program
fsck - file system consistency check and repair
getopt+ - parse command options
grep - search a file for a pattern
grpcheck+ - group file checker
haltsys - shut system down
hd+ - give hex dump of a file
head - give first few lines of a stream
id+ - print user and group id's/names
join - relational database operator
kill - terminate a process
l - detailed file list
lc - formated file list
ld - loader
learn - runs a tutorial
line+ - read one line
ln - make a link
logname+ - get login name
look - find lines in a sorted list
lpr - line printer spooler
ls - list contents of directory
mail - send or receive mail among users
mesg - permit or deny messages
mkdir - make a directory
mkfs - construct a file system
mknod - build special file
mkuser+ - add a new user account
more - file perusal filter for crt viewing
mount - mount file system
mv - move or rename files and directories
ncheck - generate names from i-numbers
netutil+ - administer mail network
newgrp - log in to a new group
nice - run a command at low priority
nl+ - line numbering filter
nohup - run background process after user logs off
od - octal dump
pack+ - compress files
passwd - change login password
pcat+ - look at packed files
pr - print file
ps - process status
pstat - print system facts

pwadmin+	- administer the password file
pwcheck+	- password file checker
pwd	- working directory name
quot	- summarize file system ownership
random	- random number generator
rcp+	- copy files between machines
remote+	- execute a command on another machine
restor	- incremental file system restore
rm	- remove (unlink) files
rmail	- sends mail amoung users
rmdir	- remove (unlink) directories
rmuser+	- delete a user account
rsh+	- restricted shell
sddate	- print and set dump dates
sdiff+	- side-by-side difference
sed	- stream editor
setmnt+	- establish mount table
settime	- change file access and modification dates
sh	- shell
shutdown	- shuts down system
sleep	- suspend execution for an interval
sort	- sort or merge files
split	- split a file into pieces
stty	- set terminal options
su	- substitute user id temporarily
sum	- sum and count blocks in a file
sync	- update the super block
sysadmin+	- generic interface to backup/restore mechanism
tail	- deliver the last part of a file
tar	- tape archiver
tee	- pipe fitting
test	- condition command
touch	- modify file access times
tr	- translate characters
true	- return true value
tset	- set terminal type
tty	- get terminal name
umask	- set default file creation mask
umount	- dismount file system
uname+	- print system name
uniq	- report repeated lines in a file
units	- conversion program
unpack+	- unpack packed files
vi	- screen editor (Version 2.13)
vsh	- visual shell
wait	- wait for background jobs to finish
wall	- write to all users
wc	- word count
what	- identify file
who	- who is on the system
whodo+	- who is doing what
write	- write to another user
xargs+	- construct arg list and exec command
yes	- write "yes" to output

Notes:

— The *learn* command contains lessons on the following subjects:

  — Files and the the XENIX System file system. The two lessons are called *files* and *morefiles*.

  — *Macros*. This lesson describes the use of the *ms* macro package.

  — *C*. This provides an introduction to the C language.

  — *Editor*. This describes the the XENIX System line editor *ed*.

  Note that all lessons are provided with the the XENIX System Timesharing System, even though some refer to programs present in the Text Processing and Software Development Packages. Also note that the *ms* macro package is the one described, not *mm*.

5.2 TEXT PROCESSING SYSTEM

The *Text Processing System* contains several text formatting programs, and three macro packages for document preparation.

5.2.1 COMMANDS

col	- filter reverse line feeds
cut+	- cut out selected fields of lines
cw+	- prepare constant width troff text
cwcheck+	- check CW macro text
deroff	- remove nroff, troff, tbl and eqn constructs
diction+	- comment on writing style
diffmk+	- mark differences between files
eqn	- typeset mathematics
eqncheck	- typeset mathematics
hyphen+	- find hyphenated words
mm+	- memorandum macros
mmcheck+	- check mm source
mmt+	- mm for troff
neqn	- typeset mathematics
nroff	- text formatting and typesetting
paste+	- merge lines of files
prep	- prepare text for statistical processing
ptx	- permuted index
soelim+	- expands nroff .so statements
spell	- find spelling errors
style+	- comment on writing style
tbl	- format tables for nroff or troff
troff	- text formatting and typesetting

5.2.2 MACRO PACKAGES The macro packages supported under XENIX Version 3.0 are:

mm The *Memorandum* macros are the standard method for producing formatted documents under XENIX Version 3.0. These macros are documented and presented as the standard XENIX System macro package.

ms The *Manuscript* macros are those provided with XENIX Version 2.3. They are less powerful and less easy to use than the *Memorandum* macros, but since many existing documents are in this format the macros are provided so these documents can still be processed. These macros are not documented, and not intended for the production of new documents.

man The *Manual* macros are used for formatting online manual pages. Although online manual pages are not provided for the standard XENIX System software, additional applications may include documentation in this format, so these macros are provided. These macros are supplied purely for processing foreign documentation, and are not documented.

5.3 SOFTWARE DEVELOPMENT SYSTEM

The *SOFTWARE DEVELOPMENT SYSTEM* contains commands, library routines, and interfaces to the kernel.

5.3.1 SYSTEM CALLS

access	- determine accessibility of a file
acct	- enable or disable process accounting
alarm	- set a process's alarm clock
sbrk	- change data segment space allocation
chdir	- change working directory
chmod	- change mode of file
chown	- change owner and group of file
chroot	- change root directory
chsize+	- change file size
close	- close a file descriptor
creat	- create a new file or rewrite an existing one
creatsem	- create an instance of a binary semaphore
dup	- duplicate an open file descriptor
dup2	- duplicate an open file descriptor
execl	- execute a file
exit	- terminate process
fcntl	- file control
fork	- create a new process
fstat	- get file status
ftime	- get system time
getpid	- get process id
getpgrp	- get process group
getppid	- get parent process id
getuid	- get real user id
geteuid	- get effective user id
getgid	- get group id
getegid	- get effective group id
ioctl	- control device
kill	- send a signal to a process or group of processes
link	- link to a file
lock+	- lock a process in memory
locking	- lock or unlock a file region for reading or writing
lseek	- move read/write file pointer
mknod	- make a file
mount	- mount a file structure
nap+	- sleep for a short time
nice	- change priority of a process
open	- open a file for reading or writing
opensem	- open a semaphore
pause	- suspend process until signal
pipe	- create an interprocess channel
profil	- execution time profile
ptrace	- process trace
rdchk	- check if there is data to be read
read	- read from a file
sdget+	- attact to a shared data region
sdfree+	- release a shared data region
sdgetv+	- synchronize use of shared data

sdenter+	- enter a shared data region
sdleave+	- leave a shared data region
sdwaitv+	- synchronize use of shared data
setpgrp	- set process group id
setuid	- set user id
setgid	- set group id
shutdn	- flush block I/O and halt system
signal	- specify what to do on receipt of a signal
sigsem	- signal a process waiting on a semaphore
stat	- get file status
stime	- set time
sync	- update super block
time	- get time
times	- get process and child process times
ulimit	- get and set user limits
umask	- set and get file creation mask
umount	- unmount a file system
uname	- get name of current the XENIX System system
unlink	- remove a directory entry
ustat	- get file system statistics
utime	- set file access and modification times
wait	- wait for child process to stop or terminate
waitsem	- wait on a semaphore
write	- write on a file

5.3.2 LIBRARY ROUTINES

The following libraries are provided as standard with XENIX Version 3.0. On 8086/88 and 286 systems, versions for Small, Middle, and Large model programs will be provided (ie three of each library).

They are included at link time by specifying -l*name* to the compiler or linker, where *name* is the name listed below less the *lib* prefix. For example *-lm*, and *-ltermcap*.

libc	The standard library containing all system call interfaces, Standard I/O routines, and other general purpose services.
libm	The standard math library.
libl	Library for use with programs produced by *lex*.
liby	Library for use with programs produced by *yacc*.
libtermcap	Routines for accessing the *termcap* data base describing terminal characteristics.
libtermlib	The same as *libtermcap*.
libcurses	Screen and cursor manipulation routines.
libdbm	Data base management routines.

5.3.3 The Standard C Library - libc

_tolower	- convert to lower case
_toupper	- convert to upper case
a64l	- convert base-64 ascii to long integer
abort	- generate an IOT fault
abs	- integer absolute value
asctime	- convert time data to ascii
assert	- program verification
atof	- convert ascii string to floating number
atoi	- convert ascii string to integer
atol	- convert ascii string to long integer
bsearch	- binary search
calloc	- allocate memory
clearerr	- clear error
crypt	- DES encryption
ctermid	- generate filename for terminal
ctime	- convert time to ascii string
cuserid	- character login name of user
defopen	- open default parameter file
defread	- read default parameters
ecvt	- format conversion
encrypt	- DES encryption
endgrent	- close group file
endpwent	- close password file
fclose	- close a stream
fcvt	- format conversion
fdopen	- reopen a stream
feof	- test for eof
ferror	- test for error
fflush	- flush a stream
fgetc	- get character from stream
fgets	- get a string from a stream
fileno	- convert stream number to file descriptor

fopen	- open a stream
fprintf	- formatted output routine
fputc	- write character to stream
fputs	- write a string to a stream
fread	- buffered input
free	- free memory
freopen	- reopen a stream
frexp	- return mantissa
fscanf	- formatted input conversion
fseek	- seek within a stream
ftell	- obtain file pointer position
fwrite	- buffered output
fxlist	- get name list entries from a file
gcvt	- format conversion
getc	- get character from stream
getchar	- get character from stream
getenv	- get value for environment variable
getgrent	- get group file entry
getgrgid	- get group file entry
getgrnam	- get group file entry
getlogin	- get login name
getopt	- parse command line options
getpass	- read a password
getpw	- get name from user id
getpwent	- get password file entry
getpwnam	- get password file entry
getpwuid	- get password file entry
gets	- get a string from a stream
getw	- get word from stream
gmtime	- obtain Grenwich Mean Time information
gsignal	- software signal
isalnum	- test for alphanumeric
isalpha	- test for alphabetic character
isascii	- test for ascii character
isatty	- check for terminal
iscntrl	- test for control character
isdigit	- test for digit
isgraph	- test for printing character
islower	- test for lower case
isprint	- test for printing character
ispunct	- test for punctuation
isspace	- test for space
isupper	- test for upper case
isxdigit	- test for hex digit
l3tol	- convert 3 byte integer to long
l64a	- convert long integer to base 64 ascii
ldexp	- a useful function
localtime	- obtain local time information
logname	- get login name of user
longjmp	- nonlocal goto
lsearch	- linear search and update
ltol3	- convert long to 3 byte integer
malloc	- allocate memory
mktemp	- make a temporary file

modf - return fractional part
monitor - prepare execution profile
nlist - get entries from name list
pclose - close pipe to process
perror - print system error messages
popen - initiate I/O to/from a process
printf - formatted output routine
putc - write character to stream
putchar - write character to stream
putpwent - write password file entry
puts - write a string to a stream
putw - write word to stream
qsort - quick sort routine
rand - random number generator
realloc - reallocate memory
regcmp - regular expression compile
regex - regular expression execute
rewind - seek to zero
scanf - formatted input conversion
setbuf - assign buffering to a stream
setgrent - rewind group file pointer
setjmp - nonlocal goto
setkey - DES encryption
setpwent - rewind password file pointer
sleep - suspend execution for an interval
sprintf - formatted output routine
srand - seed random number generator
sscanf - formatted input conversion
ssignal - software signal
strcat - concatenate strings
strchr - find character in string
strcmp - compare strings
strcpy - copy strings
strcspn - find length of substring
strlen - get string length
strncat - concatenate strings
strncmp - compare strings
strncpy - copy strings
strpbrk - find string in string
strrchr - find character in string
strspn - find length of substring
strtok - find token within string
swab - swap bytes
system - execute a shell command
tmpfile - create a temporary file
tmpnam - create a temporary file name
toascii - convert to ascii
tolower - convert to lower case
toupper - convert to upper case
ttyname - find name of terminal
tzset - set external time variables
ungetc - push character back onto stream
xlist - get name list entries from a file

5.3.4 The Standard Math Library - libm

acos	- arc cosine function
asin	- arc sin function
atan	- arc tangent function
atan2	- arc tangent function
cabs	- euclidean distance
ceil	- ceiling value
cos	- cosine function
cosh	- hyperbolic cosine
exp	- exponentiation
fabs	- returns |x|
floor	- absolute value
fmod	- a useful function
gamma	- log gamma function
hypot	- sqrt(x*x + y*y)
j0	- bessel function
j1	- bessel function
jn	- bessel function
log	- natural logarithm
log10	- log base 10
pow	- power function
sin	- sin function
sinh	- hyperbolic sine
sqrt	- square root function
tan	- tangent function
tanh	- hyperbolic tangent
y0	- bessel function
y1	- bessel function
yn	- bessel function

5.3.5 The Default Lex Library - libl

main	- lex program entry
yyless	- lex routine
yywrap	- lex routine

5.3.6 The Default Yacc Library - liby

main	- yacc program entry
yyerror	- yacc error handler

5.3.7 The Terminal Capabilities Library - libtermcap

tgetent	- get terminal capability entry
tgetflag	- test for presence of capability
tgetnum	- get numeric value of capability
tgetstr	- get string value of capability
tgoto	- get cursor addressing string
tputs	- decode padding information

5.3.8 The Screen Manipulation Library - libcurses

curses	- many screen cursor manipulation routines

5.3.9 The Data Base Management Library - libdbm

dbminit	- open data base
delete	- delete key in data base
fetch	- access key in data base
firstkey	- get first key in data base
nextkey	- get next key in data base
store	- store key in data base

5.3.10 COMMANDS

adb	- debugger
admin+	- create and administer sccs files
ar	- archive and library maintainer
as	- assembler
cb	- C program beautifier
cc	- C compiler
cdc+	- change delta commentary
comb+	- combine sccs deltas
cref+	- make cross ref listing
csh	- a shell (command interpreter) with C-like syntax
ctags	- create a tags file
delta+	- make sccs delta (change)
get+	- get version of sccs file
gets	- get a string from standard input
help+	- ask for help
hdr+	- print binary file header information
lex	- generator of lexical analysis programs
lint	- a C program verifier
lorder	- find ordering relation for an object library
m4	- macro processor
make	- maintain software
mkstr	- create an error message file
nm	- print name list
prof	- display profile data
prs+	- print an sccs file
ranlib	- convert archives to random libraries
ratfor	- rational Fortran dialect
regcmp+	- regular expression compile
rmdel+	- remove sccs delta from file
sact+	- print sccs file editing activity
sccsdiff+	- compare two versions of sccs file
size	- size of an object file
spline	- interpolate smooth curve
stackuse	- determine stack requirements for "C" programs.
strings	- find the printable strings in binary file
strip	- remove symbols and relocation bits
time	- time a command
tsort	- topological sort
unget+	- undo get of sccs file
uucp	- unix to unix copy
uulog	- unix to unix copy
uux	- unix to unix command execution
val	- validate SCCS file

xref+	- cross reference for C programs
xstr	- extract strings from C programs
yacc	- yet another compiler-compiler

5.4 MS-DOS Commands

The following commands are available on all versions of the XENIX System, but will not necessarily be appropriate on some, and so may not be provided.

doscat	- 'cat' a file on an MS-DOS floppy disk
doscp	- copy files to/from MS-DOS floppy disks
dosdir	- list directory of MS-DOS floppy disk
dosls	- list directory of MS-DOS floppy disk
dosmkdir	- create an MS-DOS directory on an MS-DOS disk
dosrm	- delete an MS-DOS file
dosrmdir	- delete an MS-DOS directory

5.5 UNSUPPORTED COMMANDS

Some of the UNIX code provided to Microsoft is in an undocumented form which makes it impossible to provide as complete support as we would otherwise wish. In addition some software produces output for certain devices (eg graphics plotters and typesetters) to which Microsoft does not have access. It is not possible for us to verify the operation of this UNIX code.

6. DOCUMENTATION

This section provides an overview of XENIX Version 3.0 documentation, describing the components of a full the XENIX System documentation set and how this set can be divided to correspond to individually marketed packages. Preliminary outlines are given for each manual.

6.1 Overall Organization

Listed below are the documents comprising the complete the XENIX System Version 3.0 documentation set.

Installation Guide

Operations Guide

User's Guide

Reference Manual

Programmer's Guide

Programmer's Reference Manual

Text Processing Guide

These document manuals divided between the three the XENIX System product packages as follows:

1. The XENIX System Timesharing System
   - Installation
   - Operations
   - User's Guide
   - Reference
2. The XENIX System Text Processing System
   - Text Processing Guide
3. The XENIX System Software Development System
   - Programmer's Guide
   - Programmer's Reference

The Timesharing System is a prerequisite to the other two packages.

6.2 Outlines

Below are outlines for the volumes being written and their approximate page counts:

XENIX Installation Guide (15 pages)

XENIX Operations Guide (90 pages)

Chapter 1. Introduction
Chapter 2. Starting and Stopping the System
Chapter 3. Preparing XENIX for Users
Chapter 4. Using File Systems
Chapter 5. Maintaining File Systems
Chapter 6. Backing Up File Systems
Chapter 7. Using Peripheral Devices
Chapter 8. Solving System Problems
Chapter 9. Building A Micnet Network

Appendix A. XENIX Device Files
Appendix B. XENIX Directories

XENIX User's Guide (300 pages)

Chapter 1. Introduction
Chapter 2. Demonstration
Chapter 3. Basic Concepts
Chapter 4. Tasks
Chapter 5. Vi: A Screen Editor
Chapter 6. Mail
Chapter 7. The Shell
Chapter 8. BC: A Calculator

Appendix A. Ed

XENIX Programmer's Guide (260 pages)

Chapter 1. Introduction
Chapter 2. CC: A Compiler
Chapter 3. Lint: A C Program Checker
Chapter 4. Make: A Program Maintainer
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