

3

3.1

FreeBSD

. FreeBSD 가

..

- FreeBSD “가 ” 가
- 가
- FreeBSD
- FreeBSD
- 가
- , 가
- 가
- 가
- 가
- FreeBSD 가
- 가

3.2 가 &

FreeBSD

FreeBSD
FreeBSD

3.2.1

FreeBSD

```
Additional ABI support:
Local package initialization:
Additional TCP options:

Fri Sep 20 13:01:06 EEST 2002

FreeBSD/i386 (pc3.example.org) (ttyv0)

login:
```

가

FreeBSD/i386 (pc3.example.org) (ttyv0)

. x86

"FreeBSD"

(

가

) pc3.example.org

-- ttyv0

login:

FreeBSD

3.2.2 FreeBSD

FreeBSD

가
FreeBSD ()
“ ”
“ ”) 가 FreeBSD 가
가

FreeBSD 가 가

login:

john 가 john
Enter "password" 가 :

login: john

Password:

john Enter !
가

FreeBSD 가

MOTD(/etc/motd) (#, \$ %)
FreeBSD

```

Password:
Last login: Sun Sep 12 19:12:15 from 211.112.127.83
Copyright (c) 1980, 1983, 1986, 1988, 1990, 1991, 1993, 1994
    The Regents of the University of California. All rights reserved.

Last login: Fri Sep 10 21:08:31 2004 from 210.90.81.126
Copyright (c) 1980, 1983, 1986, 1988, 1990, 1991, 1993, 1994
    The Regents of the University of California. All rights reserved.

FreeBSD 4.10-RELEASE (GENERIC) #0: Tue May 25 22:47:12 GMT 2004

Welcome to FreeBSD!

Before seeking technical support, please use the following resources:

o Security advisories and updated errata information for all releases are
  at http://www.FreeBSD.org/releases/ - always consult the ERRATA section
  for your release first as it's updated frequently.

o The Handbook and FAQ documents are at http://www.FreeBSD.org/ and,
  along with the mailing lists, can be searched by going to
  http://www.FreeBSD.org/search/. If the doc distribution has
  been installed, they're also available formatted in /usr/share/doc.

If you still have a question or problem, please take the output of
`uname -a`, along with any relevant error messages, and email it
as a question to the questions@FreeBSD.org mailing list. If you are
unfamiliar with FreeBSD's directory layout, please refer to the hier(7)
man page. If you are not familiar with man pages, type `man man`.

You may also use /stand/sysinstall to re-enter the installation and
configuration utility. Edit /etc/motd to change this login announcement.
You have new mail.
%
    
```

3.2.3

```

FreeBSD
FreeBSD
가 . "가
"
가 FreeBSD 가
가 가 FreeBSD 가
FreeBSD 가 FreeBSD Alt-F1, Alt-
    
```

F2 Alt-F8

가

Note:

FreeBSD

syscons(4), atkbd(4), vidcontrol(1) kbdcontrol(1)

가 "가 " FreeBSD 가
. 가
가

3.2.4 /etc/ttys

FreeBSD 8 가
가 . 가
/etc/tty

FreeBSD 가 /etc/ttys
(#) 가
가 9 가 FreeBSD 가
8 가 ttysv 가

```
#
# $FreeBSD: src/etc/etc.i386/ttys,v 1.8.2.1 2003/11/14 12:59:51 simokawa Exp $
#   @(#)ttys      5.1 (Berkeley) 4/17/89
#
# This file specifies various information about terminals on the system.
# It is used by several different programs.  Common entries for the
# various columns include:
#
# name      The name of the terminal device.
#
# getty     The program to start running on the terminal.  Typically a
#           getty program, as the name implies.  Other common entries
#           include none, when no getty is needed, and xdm, to start the
#           X Window System.
#
# type      The initial terminal type for this port.  For hardwired
#           terminal lines, this will contain the type of terminal used.
#           For virtual consoles, the correct type is cons25.  Other
#           common values include network for network connections on
#           pseudo-terminals, dialup for incoming modem ports, and unknown
#           when the terminal type cannot be predetermined.
#
# status    Must be on or off.  If on, init will run the getty program on
#           the specified port.  If the word "secure" appears, this tty
#           allows root login.
#
# name      getty                type      status      comments
#
# If console is marked "insecure", then init will ask for the root password
# when going to single-user mode.
console none                    unknown off secure
#
ttyv0  "/usr/libexec/getty Pc"   cons25  on  secure
# Virtual terminals
ttyv1  "/usr/libexec/getty Pc"   cons25  on  secure
ttyv2  "/usr/libexec/getty Pc"   cons25  on  secure
ttyv3  "/usr/libexec/getty Pc"   cons25  on  secure
ttyv4  "/usr/libexec/getty Pc"   cons25  on  secure
ttyv5  "/usr/libexec/getty Pc"   cons25  on  secure
ttyv6  "/usr/libexec/getty Pc"   cons25  on  secure
ttyv7  "/usr/libexec/getty Pc"   cons25  on  secure
ttyv8  "/usr/X11R6/bin/xdm -nodaemon" xterm  off  secure
```

가

ttys(5)

3.2.5

“ ” 가? 12.6.2
 FreeBSD 가
 가 /etc/ttys
 . console :

```
# name  getty                type  status  comments
#
# If console is marked "insecure", then init will ask for the root password
# when going to single-user mode.
console none                unknown of secure
```

Note: *console* *secure* *insecure*
FreeBSD 가 root

insecure . root
가 FreeBSD

3.3

BSD FreeBSD 가
FreeBSD
CPU
가
가
가
8 가 3

| | | |
|---|-------------------------------|-------|
| 0 | No read, no write, no execute | - - - |
| 1 | No read, no write, execute | - - x |
| 2 | No read, write, no execute | - w - |
| 3 | No read, write, execute | - wx |
| 4 | Read, no write, no execute | r - - |

| | | |
|---|-------------------------|-----|
| 5 | Read, no write, execute | r-x |
| 6 | Read, write, no execute | rw- |
| 7 | Read, write, execute | rwX |

```

ls -l /
ls(1)

```

```

% ls -l
total 530
-rw-r--r-- 1 root wheel 512 Sep 5 12:31 myfile
-rw-r--r-- 1 root wheel 512 Sep 5 12:31 otherfile
-rw-r--r-- 1 root wheel 7680 Sep 5 12:31 email.txt
...

```

```

ls -l
:
-rw-r--r--
( ) , (character)
pseudo-file
3 rw- r--
dash(-)
가
644 3
?
FreeBSD
/dev
가
가
(

```

).

가

가 setuid sticky

chmod(1)

3.3.1

가

8

()

() ()

| | | |
|-----|---|-------------|
| | | |
| () | U | |
| () | G | |
| () | O | |
| () | A | (“ ”) |
| () | + | 가 |
| () | - | |
| () | = | |
| () | R | |
| () | W | |
| () | X | |
| () | t | Sticky bit |
| () | s | Set UID GID |

chmod(1)

FILE

% chmod go= FILE

(,)

FILE

가 .

% `chmod go-w, a+w FILE`

3.4

FreeBSD

. 가

root "/"

root

가

가 root

/usr, /var, /mnt /cdrom

/etc/fstab

. /etc/fstab

. /etc/fstab

noauto

가

rc(8)

. /etc/fstab

가

fstab(5)

/etc/fstab

```
# See the fstab(5) manual page for important information on automatic mounts
# of network filesystems before modifying this file.
#
# Device          Mountpoint      FStype  Options      Dump    Pass#
/dev/ad0s1b      none            swap    sw           0       0
/dev/ad0s1a      /               ufs     rw           1       1
#/dev/ad0s1h     /home           ufs     rw           2       2
/dev/ad0s1h     /home           ufs     rw,userquota 1       2
/dev/ad0s1e     /tmp            ufs     rw           2       2
/dev/ad0s1g     /usr            ufs     rw           2       2
/dev/ad0s1f     /var            ufs     rw           2       2
/dev/acd0c       /cdrom          cd9660  ro,noauto    0       0
proc             /proc           procfs  rw           0       0
```

hier(7)

가

| | |
|-----------------|--|
| / | root |
| /bin/ | |
| /boot/ | 가 |
| /boot/defaults/ | . loader.conf(5) |
| /dev/ | . intro(4) |
| /etc/ | |
| /etc/defaults/ | . rc(8) |
| /etc/mail/ | sendmail(8) |
| /etc/namedb/ | named . named(8) |
| /etc/periodic/ | cron(8) , , . periodic(8) |
| /etc/ppp/ | ppp . ppp(8) |
| /mnt/ | 가 |
| /proc/ | . procfs(5) mount_procfs(8) |
| /root/ | root |
| /sbin/ | |
| /stand/ | Standalone |
| /tmp/ | . mfs(8) (/tmp). |
| /usr/ | |
| /usr/bin/ | |
| /usr/include/ | C include |
| /usr/lib/ | |
| /usr/libdata/ | |
| /usr/libexec/ | & (). 가 FreeBSD |
| /usr/local/ | /usr/local /usr 가 hier(7) . /usr/local/share 가 /usr/local man share/doc/port |
| /usr/obj/ | usr/src |
| /usr/ports | FreeBSD (). |
| /usr/sbin/ | & (가) |

| | |
|-------------|--------------|
| /usr/share/ | |
| /usr/src/ | BSD |
| /usr/X11R6/ | 가 X11R6 (). |
| /var/ | |
| /var/log/ | |
| /var/mail/ | |
| /var/spool/ | |
| /var/tmp/ | |
| /var/yp | NIS |

3.5

FreeBSD 가 가 .
readme.txt README.TXT . FreeBSD

(.txt)

| | | |
|---|-------|-------|
| : | *.doc | *.exe |
|---|-------|-------|

(/)

foo 가 . readme.txt 가 bar
foo/bar/readme.txt .

root

가 . root

DOS

MacOS : .

FreeBSD .

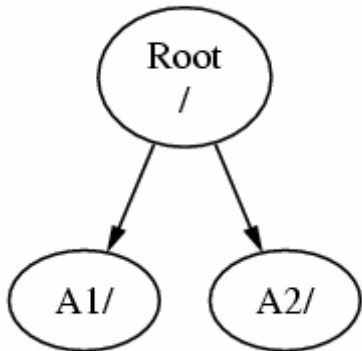
FreeBSD .

c:/foo/bar/readme.txt

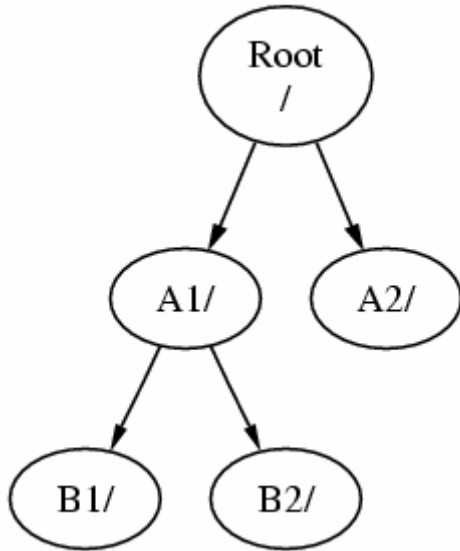
FreeBSD 가 root root root . root root .

A, B, C 3 가 가 A1
A2(B1, B2 C1, C2) root
가 .

A root ls
A1 A2 .

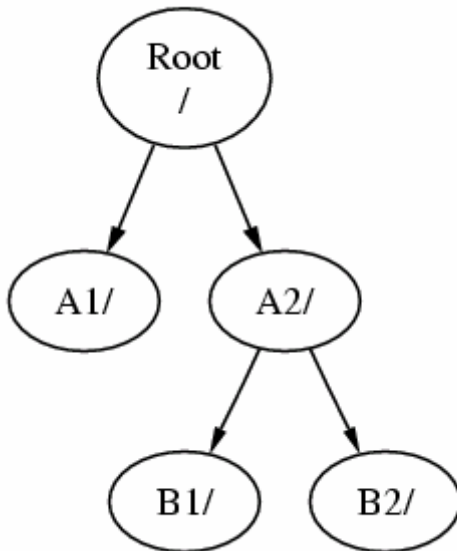


A1 가 . B root A1 B
B 가 .



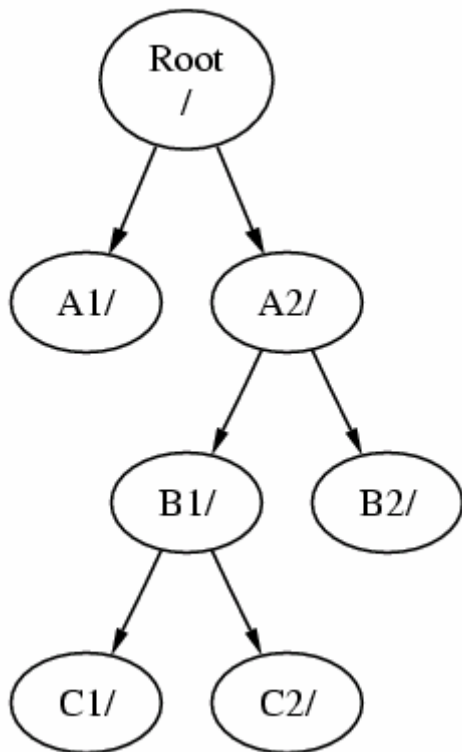
$B1$ $B2$ 가 $/A1/B1$ $/A1/B2$ 가
 $/A1$ B 가 A

 B 가 $A2$

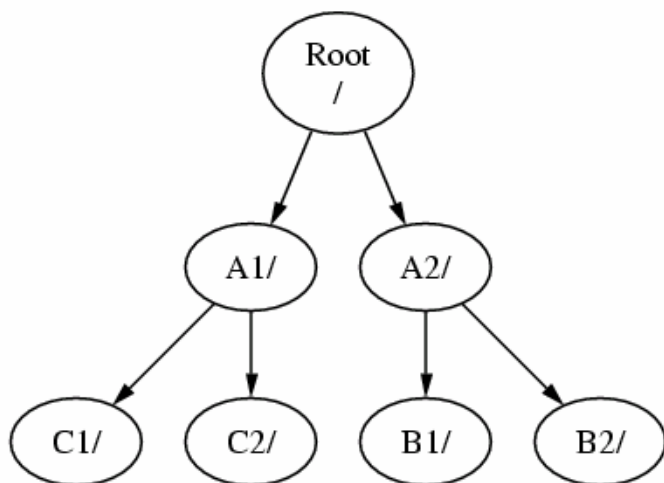


$/A2/B1$ $/A2/B2$ 가

C B B1



C A A1



DOS

join

. FreeBSD

가

가

root

- 가

root

. /home

가

nosuid

suid/guid

```

suid/guid : root
/etc/passwd root
Setuid 가 root 가
setuid
root 가 Setgid
setuid
-r-sr-xr-x 2 root wheel 32888 May 26 06:30 /usr/bin/passwd
    
```

- FreeBSD

가

가

가

- FreeBSD

가

가

- 가 . FreeBSD

: FreeBSD 4.4 growfs(8)
가

FreeBSD
가 a h

FreeBSD 가 FreeBSD 가
FreeBSD 가
FreeBSD 가

| | |
|---|---------------------------|
| | |
| a | root 가 |
| b | 가 |
| c | 가 C () |
| d | d d d sysinstall |

가 FreeBSD 가 (slice)
FreeBSD 가 FreeBSD 가
1 4
s 1 "da0s1"
SCSI 4

5 "ad0s5" IDE

a h 가

"da0a" da "ad1s3e"

IDE

가 0

3-1

FreeBSD 가

s + + 3-1

3-2

FreeBSD , FreeBSD

()

3-1.

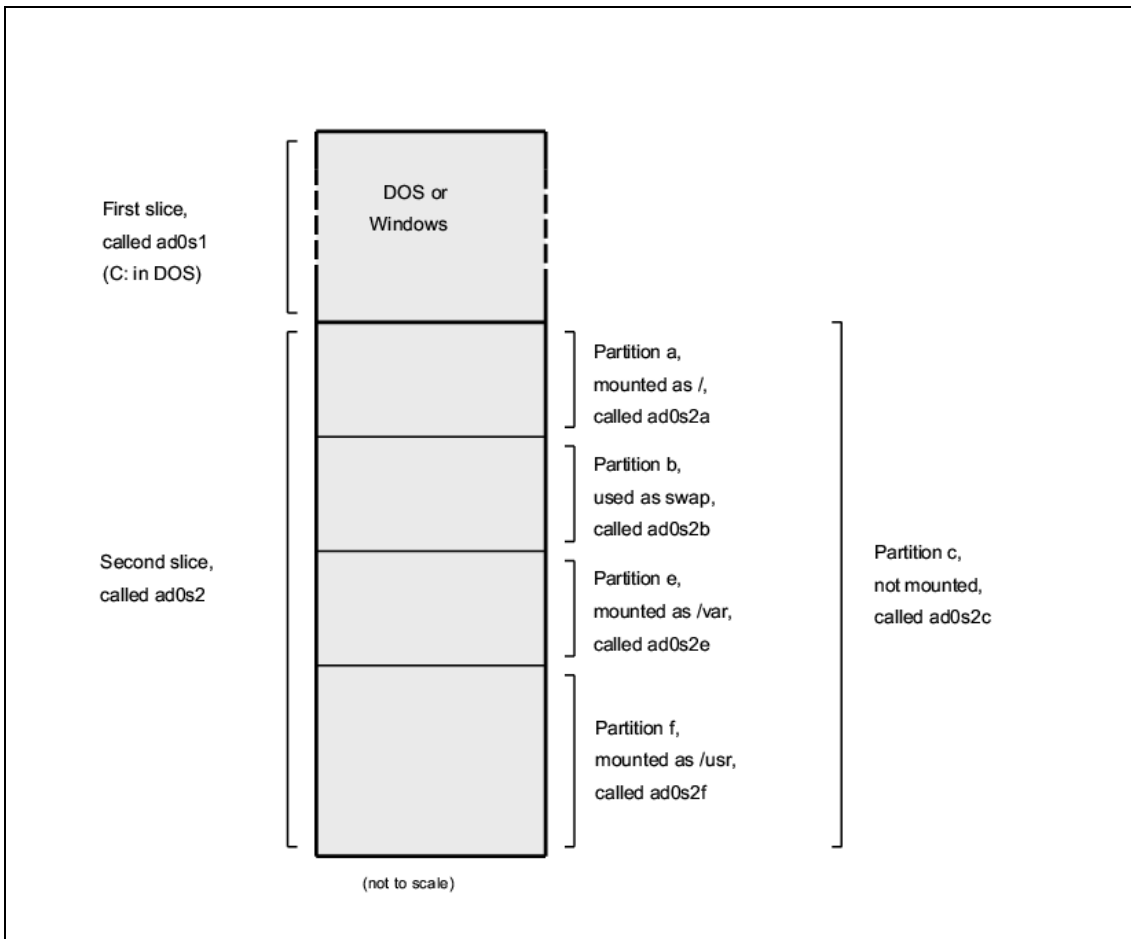
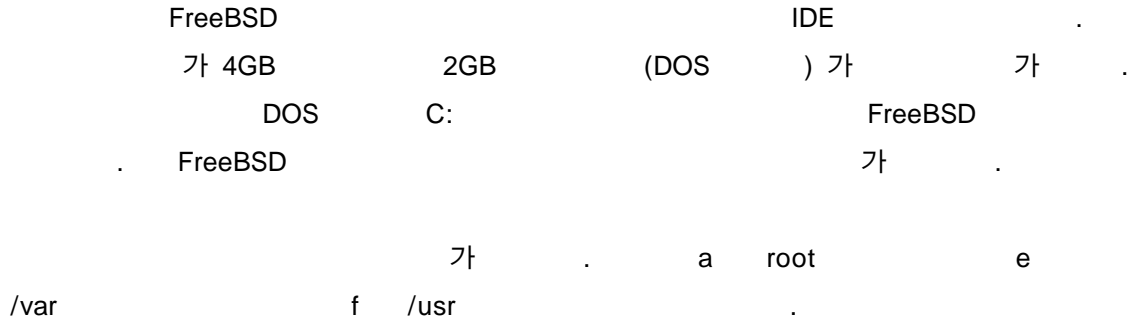
| | |
|-----|-------------------------|
| | |
| Ad | ATAPI (IDE) disk |
| Da | SCSI direct access disk |
| Acd | ATAPI(IDE) CDROM |
| Cd | SCSI CDROM |
| Fd | Floppy disk |

3-1.

| | | | | |
|--------|-----|-------|------|-----|
| | | | | |
| ad0s1a | IDE | (ad0) | (s1) | (a) |

| | | | | |
|--------|------|-------|------|-----|
| da1s2e | SCSI | (da1) | (s2) | (e) |
|--------|------|-------|------|-----|

3-2.



3.6

```

/usr/local      /      root      /dev, /usr
가      가
.
가      가      . /var      log/, spool/
. root
/      /var
.
가      CDROM
.

```

3.6.1 fstab

```

/etc/fstab (noauto)
)

```

```

# See the fstab(5) manual page for important information on automatic mounts
# of network filesystems before modifying this file.
#
# Device      Mountpoint  FStype  Options      Dump  Pass#
/dev/amrd0s1b none        swap    sw           0     0
/dev/amrd0s1a /           ufs     rw           1     1
/dev/amrd0s1h /home       ufs     rw           2     2
/dev/amrd0s1e /tmp        ufs     rw           2     2
/dev/amrd0s1g /usr        ufs     rw           2     2
/dev/amrd0s1f /var        ufs     rw           2     2
/dev/acd0c    /cdrom      cd9660  ro,noauto    0     0
proc         /proc       procfs  rw           0     0

```

```

/etc/fstab      가      :
device /mount-point  fstype  options  dumpfreq  passno
device
(      ). 16.2
mount-point
(      ).

```

```

fstype
    mount(8) . FreeBSD ufs .

options
    rw ro
    .
    noauto . mount(8)

dumpfreq
    가 dump(8)가
    0 .

passno
    . 가
    passno 0 . root (
    ) passno 1 passno
    1 passno 가
    fsck(8) 가
    
```

3.6.2. mount

```

mount(8)
    가

# mount device mountpoint

mount(8)
    .

-a
    /etc/fstab . "noauto"
    
```

-t

-d

-v

mount(8)

-f

()

-r

rdonly

-o

-t fstype

-a

"ufs"

-u

-V

-w

-o

(,)

nodev

noexec

nosuid

setuid setgid

3.6.3 umount

umount(8)

-a -A 가

-f

-v 가 *-f*

가

가

-a -A -t

-A root

3.5

FreeBSD

가

process ID PID

가

가

가

가

가 . 가 Init . init
PID 1 . Init FreeBSD 가

ps(1) top(1) . ps(1)
PID

top(1)

가

ps(1)

```
% ps
  PID TT  STAT      TIME COMMAND
   298 p0  Ss      0:01.10 tcsh
   7078 p0  S        2:40.88 xemacs mdoc.xsl (xemacs-21.1.14)
  37393 p0  I        0:03.11 xemacs freebsd.dsl (xemacs-21.1.14)
  48630 p0  S        2:50.89 /usr/local/lib/netscape-linux/navigator-linux-4.77.bi
  48730 p0  IW       0:00.00 (dns helper) (navigator-linux-)
  72210 p0  R+       0:00.00 ps
    390 p1  Is      0:01.14 tcsh
   7059 p2  Is+     1:36.18 /usr/local/bin/mutt -y
   6688 p3  I#s     0:00.00 tcsh
  10735 p4  I#s     0:00.00 tcsh
  20256 p5  I#s     0:00.00 tcsh
    262 v0  I#s     0:00.00 -tcsh (tcsh)
    270 v0  I#+     0:00.00 /bin/sh /usr/X11R6/bin/startx -- -bpp 16
    280 v0  I#+     0:00.00 xinit /home/nik/.xinitrc -- -bpp 16
    284 v0  IW      0:00.00 /bin/sh /home/nik/.xinitrc
    285 v0  S       0:38.45 /usr/X11R6/bin/sawfish
```

ps(1)

. PID

ID . PID 1 99999

. TT tty

STAT . TIME CPU

CPU 가

가

가 . COMMAND

ps(1)

가

auxww

u

. x

ww ps(1)가

top(1)

```
% top
last pid: 72257; load averages: 0.13, 0.09, 0.03 up 0+13:38:33 22:39:10
47 processes: 1 running, 46 sleeping
CPU states: 12.6% user, 0.0% nice, 7.8% system, 0.0% interrupt, 79.7% idle
Mem: 36M Active, 5256K Inact, 13M Wired, 6312K Cache, 15M Buf, 408K Free
Swap: 256M Total, 38M Used, 217M Free, 15% Inuse

  PID USERNAME PRI NICE  SIZE  RES STATE   TIME  #CPU  CPU COMMAND
 72257 nik      28   0 1960K 1044K RUN     0:00 14.86% 1.42% top
 7078 nik       2   0 15280K 10960K select 2:54 0.88% 0.88% xemacs-21.1.14
 281 nik       2   0 18636K 7112K select 5:36 0.73% 0.73% XF86_SVGA
 296 nik       2   0 3240K 1644K select 0:12 0.05% 0.05% xterm
48630 nik       2   0 29816K 9148K select 3:18 0.00% 0.00% navigator-linu
 175 root       2   0 924K 252K select 1:41 0.00% 0.00% syslogd
 7059 nik       2   0 7260K 4644K poll   1:38 0.00% 0.00% mutt
...
```

(5) PID,
()
()
가 (47),
CPU

ps(1) 가 PID,
, CPU top(1)
가

Netscape 가 30MB
9MB

top(1) 2 s

3.8 ,
가
가

가

BSD 가

3 가 가

"d"가 가 BIND
named), Apache

httpd , lpd

maild sendmail

가

() 가
가 가 가

kill(1) kill(2)

root

FreeBSD

가

FreeBSD

Segmentation Violation (SIGSEGV)

alarm(3)

(*SIGALRM*)

SIGTERM SIGKILL

SIGTERM

SIGTERM

SIGKILL

가 " 가

" . *SIGKILL* FreeBSD

```

: 가 가 가
가 ( 가 )
" "

```

SIGHUP, SIGUSR1 SIGUSR2

가

가 . 가

. httpd

SIGHUP

httpd

SIGHUP

[]

```

inetd(8) . inetd(8)
/etc/inetd.conf SIGHUP inetd(8)
ID . ps(1) grep(1)
grep(1)
inetd(8) root ps(1) ax

% ps -ax | grep inetd
198 ?? IWs 0:00.00 inetd -wW

inetd(8) PID 198 . grep inetd
ps(1)

```

```
kill(1) . inetd(8) root su(1)
root 가 .

% su
Password:
# /bin/kill -s HUP 198

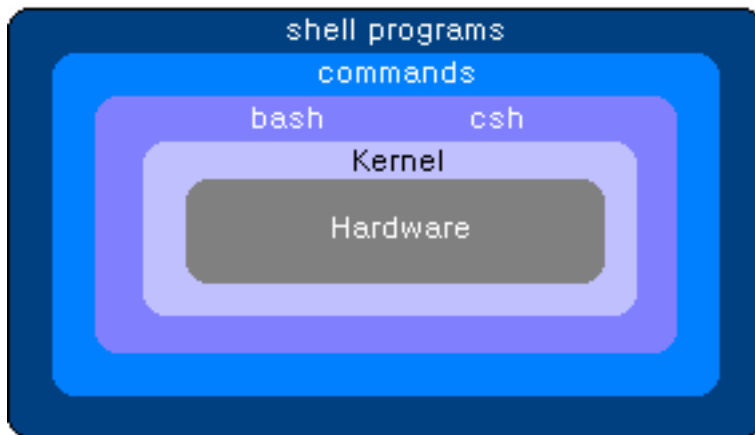
kill(1)
"kill: PID: Operation not
permitted" . PID
PID
"kill: PID: No such process"
```

```
/bin/kill 가? kill
/bin/kill
/bin/kill
TERM KILL
: ID
1 init(8) . /bin/kill -s KILL 1
Return kill(1)
```

3.9

FreeBSD

```
가 . zsh bash FreeBSD sh C- tcsh
FreeBSD
```



```

가? . C          tcsh  C
.
bash .
가 .
가 .
가 Tab
가 . foobar  foo.bar
가 . foo.bar          rm fo
[Tab].[Tab]
rm foo[BEEP].bar
[BEEP] . foobar  foo.bar  fo          foo
.. Tab
가

```

| | |
|------|--|
| | |
| USER | |

| | |
|----------|------------|
| PATH | (:) |
| DISPLAY | 가 x11 |
| SHELL | |
| TERM | . |
| TERMCAP | |
| OSTYPE | . FreeBSD. |
| MACHTYPE | CPU |
| EDITOR | 가 |
| PAGER | 가 |
| MANPATH | (:) |

```

        .          tcsh  csh  C
setenv          . sh  bash
export          .          csh  tcsh  EDITOR
/usr/local/bin/emacs

```

% **setenv EDITOR /usr/local/bin/emacs**

% **export EDITOR="/usr/local/bin/emacs"**

```

        $
$TERM echo          echo $TERM  $TERM
        .
        *
        .          echo *          ls
        *          echo
        .
        ( )
echo $TERM          . echo  $TERM  $TERM

```

3.9.1

```
가 chsh . chsh EDITOR
; vi . "Shell:"
```

```
chsh -s ;
bash
```

% **chsh -s /usr/local/bin/bash**

chsh

```
#Changing user database information for kidp.
Shell: /bin/csh
Full Name: User &
Office Location:
Office Phone:
Home Phone:
Other information:
```

Note: /etc/shells

/etc/shells

/etc/shells

bash bash 가 /usr/local/bin/

echo "/usr/local/bin/bash" >> /etc/shells

chsh

3.10

FreeBSD

가 가 (easy) (editor) ee
 . ee ee filename . filename
 /etc/rc.conf ee /etc/rc.conf

ee

```

^[] (escape) menu ^y search prompt ^k delete line ^p prev li ^g prev page
^o ascii code ^x search ^l undelete line ^n next li ^v next page
^u end of file ^a begin of line ^w delete word ^b back 1 char
^t begin of file ^e end of line ^r restore word ^f forward 1 char
^c command ^d delete char ^j undelete char ^z next word
: 1 C: 1 =====
# -- sysinstall generated deltas -- # Sat Sep 11 02:44:14 2004
# Created: Sat Sep 11 02:44:14 2004
# Enable network daemons for user convenience.
# Please make all changes to this file, not to /etc/defaults/rc.conf.
# This file now contains just the overrides from /etc/defaults/rc.conf.
    
```

^ Ctrl ^e Ctrl+e 가 . ee
 가 Esc

```

main menu
a) leave editor
b) help
c) file operations
d) redraw screen
e) settings
f) search
g) miscellaneous
press Esc to cancel
    
```

FreeBSD vi emacs
 vim FreeBSD
 vim emacs

3.11

. FreeBSD 가 .

/var/run/dmesg.boot

acd0

IDE CDROM

kbd0

/dev

3.11.1

가 가

3.11.1.1 MAKEDEV

*DEVFS*가 (5.0 FreeBSD .)
MAKEDEV(8)

cd /dev

sh MAKEDEV ad1

IDE

3.11.1.2 DEVFS ()

DEVFS

DEVFS

devfs(5)

DEVFS FreeBSD 5.0

3.12

FreeBSD 가 ELF
3 가

- out(5)

가 (magic number)
a.out(5))
. 3 :
.text .data .bss

- COFF

SVR3
.text, .data .bss 가

- elf(5)

32-bit 64-bit 가 COFF
가 : ELF ABI 가 가
가 SYSV ()
3 ABI : SVR4, Solaris, SCO)

FreeBSD ABI , ELF branding
brandelf(1)

FreeBSD “ ” a.out(5) 3.X 가
BSD . 가

FreeBSD ELF ()

FreeBSD ELF 가

ELF 가
jump-table

a.out 가 . ELF

" "

. FreeBSD

Sun SunOS 가 .

가?

. a.out (PDP-11)

68k VAXen

a.out .

CPU core 가 .

가(RISC) a.out

a.out

. COFF, ECOFF

ELF 가 .

가 ()

. VM

. a.out .

가 init 가

. 가

. a.out

a.out

. ELF

ELF

a.out ELF .

()

. FreeBSD 가 가 가

GNU ,

가 .

FreeBSD FreeBSD 가 가

as ld 가 GNU (binutils) ,

ELF, C++ 가 ELF

```
FreeBSD 가 . ELF a.out
      . ELF
      . ELF a.out
      . 가 가 init
가 가 . 가 . a.out
GENERIC (legacy) a.out
```

3.13

3.13.1

FreeBSD

```
가 . man . man .
```

% man command

```
command . ls :
```

% man ls

:

- 1.
- 2.
3. C
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

가

chmod chmod()
man

% man 1 chmod

chmod

chmod(1) chmod

chmod(2)

? -k

% man -k mail

apropos "mail" 가

/usr/bin

:

% cd /usr/bin

% man -f *

:

% cd /usr/bin

% whatis *

3.13.2 GNU Info

FreeBSD

(FSF)

가 . info emacs emacs info
info

info(1) :

% info

h . ? .