FreeBSD

Korea FreeBSD Users Group – http://www.kr.FreeBSD.org/

Chapter 9 :

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: 2004   8   7

: 2005   3   8

: 1.0

FreeBSD Documentation Project   FreeBSD Handbook   2004   8

7   . FreeBSD Handbook   ,

, CVS Repository

.

,   .

.   KFUG(Korea FreeBSD Users Group)

,   KFUG

.

"FreeBSD Handbook"   "FreeBSD Documentation Project"   ,   "   FreeBSD

"   "   (Young-oak Lee)"   .

KFUG   ,   .

.

9

9.1

FreeBSD

FreeBSD   ; FreeBSD
FreeBSD   MacOS
           . FreeBSD

                                          "   "   .

                                          :

- FreeBSD

-

-

-

-

-

-

-

                                          :

KFUG   ,   .

- (8)

9.2

FreeBSD **LPD**

. FreeBSD

. **LPD** LPD

LPD

LPD :

-

- ; .

- .

- (*burst*)
.

- .

- **LPD** .

-
.

- .

KFUG ,   .

(/etc/printcap)

LPD   .

9.2.1

                                                                    '
                                                                    .
                                                                    :

- LPD   ;
                                                                    .

- LPD   /
  (TeX DVI   )   .
                                                                    .

-
                                                                    .
                                                                    .

9.3

LPD   LPD
                                                                    :

- LPD
                                                                    .

-
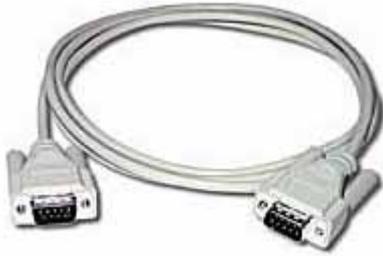   .

9.3.1

LPD   .

:

- ●

- ●   LPD   (/etc/printcap)
  .

(9.4.3.2   )   .

"   "   .   LPD
.

.

9.3.1.1

PC   .
FreeBSD   .

.

[   ]

1.
PC
:
●
.
.

KFUG   ,   .

.

[9-1.bmp]

●

. PC .

.

.

"Centronics"

.

[9-2.bmp]

● Universal Serial Bus   USB   RS232

. USB   RS232

USB

[9-3.bmp]

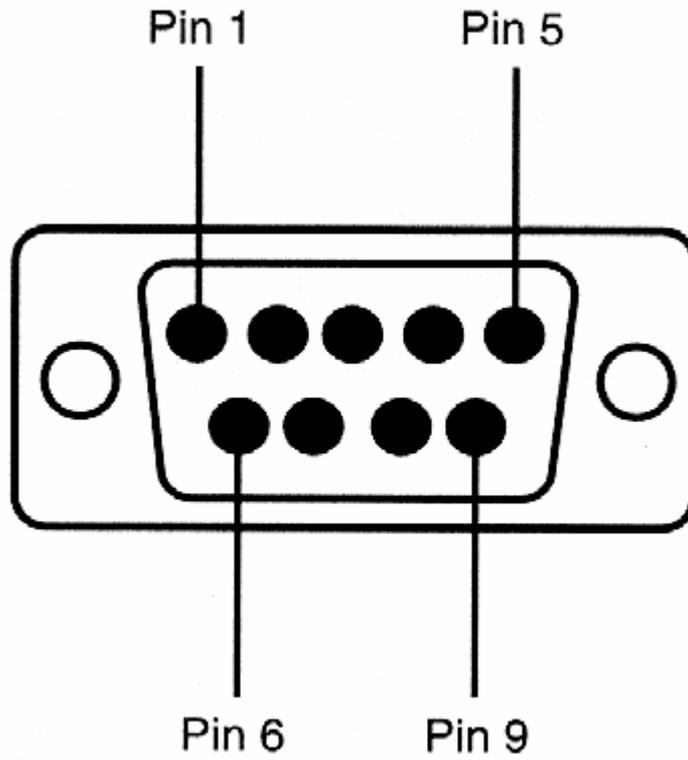(   )   USB   .
        (EPP   ECP)   FreeBSD   IEEE1284

FreeBSD   .

;

:

(   )   .

2.

Centronics

KFUG

FreeBSD

/dev/ppc0   /dev/ppc1   .   :

/dev/lpt0   .

Pin 1   Pin 13

Pin 14   Pin 25

[9-4.bm]

3.

[9-5.bmp]

"   "   .

- ●

  .   "DTE - DCE"   .

- ●

  (   )   (hood)

  (Short)   .   "DTE - DTE"   .

- ●

  .

  DIP

  .   *bps*   (bit

  (baud)   )   . 7   8   ; none, even, odd parity;   1   2

KFUG   ,   .

.

| stop | . | ; none | XON/XOFF(| "in-band" | " |
| " |) | . | | | |

9.3.1.2

FreeBSD **LPD**

.

.

```
                                                          ;
                 .


                                                          ;
                               .


                                              .
                 .



          /etc/printcap                              **LPD**          .
                 .
```

[   ]

```


                                    .
                          .
                               .




    :


# grep sio/V /var/run/dmesg.boot
```

KFUG

N   O   .

.

sio2 at port 0x3e8-0x3ef irq 5 on isa
sio2: type 16550A

:

grep ppcN /var/run/dmesg.boot

N   O   .

.

ppc0: <Parallel port> at port 0x378-0x37f irq 7 on isa0
ppc0: SMC-like chipset (ECP/EPP/PS2/NIBBLE) in COMPATIBLE mode
ppc0: FIFO with 16/16/8 bytes threshold

.

.

.

[   ]

9.3.1.3   /dev

Note: FreeBSD 5.0   *devfs*
. *devfs*   FreeBSD
.

.   /dev

.

[: /dev   ,   ]

---

1. /dev

su(1)   root   .   root   .

/dev   :

cd /dev

:

./MAKEDEV *port*

port   .   *lpt0*
                                        lpt1   ;
ttyd0   *ttyd1*   .

:

ls -l *port*

.

2.

FreeBSD   interrupt-driven   polled
                                . FreeBSD 4.X   5.X
        ppc(4)   ppbus(4)   .

● *interrupt-driven*   GENERIC   .
                                                                IRQ   .

● *polled*

---

interrupt-driven   IRQ   .

HP   (

)   .   polled   .

.

lptcontrol(8)

.

:

ppc0   .

ppc1   *ppc2*   .

- interrupt-driven   FreeBSD 4.X   *irq*   :

  device ppc0 at isa? irq *N*

  N   IRQ   .

  FreeBSD 5.X   :

  hint.ppc.0.irq="N"

  /boot/device.hints   IRQ   *N*   .
  ppc(4)   :

  device ppc

- polled   *irq*   :

  FreeBSD 4.X   :

device ppc0 at isa?

FreeBSD 5.X   /boot/device.hints
:

hint.ppc.0.irq="N"

FreeBSD 5.X   polled
.   acpi(4)
.

acpi(4)   .

,   .
.

lptcontrol(8)   :

:

lptcontrol -i -d /dev/lptN

lptN   interrupt-driven   .

:

lptcontrol -p -d /dev/lptN

lptN   polled-   .

/etc/rc.local   .
lptcontrol(8)   .

3.

lptest(1)   :   ASCII   96   96

                    (   )   .
                                                             :

%!PS
100 100 moveto 300 300 lineto stroke
310 310 moveto /Helvetica findfont 12 scalefont setfont
(Is this thing working?) show
showpage

                    Note: PCL
                              . PCL   escape

4.

            FreeBSD

                                                             :

            su(1)   root   .

- lptest(1)

:

lptest > /dev/lpt*N*

N　　O　　　　　　　　　　　　　　　.

-

:

cat > /dev/lpt*N*

RETURN　　*ENTER*

.

CONTROL+D　　　　　　　　　　　　　.

:

cat *file* > /dev/lpt*N*

file　　　　　　　　　　　　　　.

.　　　　　　　　　　　　　　　　　　　;

.

5.

FreeBSD

.

:

su(1)　　root　　　.

/etc/remote　　　　　　　　:

KFUG

```
        printer:dv=/dev/port:br#bps-rate:pa=parity
```

port   (ttyd0, ttyd1   )   , bps-rate

            parity   (even, odd, none

zero   )

19200bps

:

```
        printer:dv=/dev/ttyd2:br#19200:pa=none
```

tip(1)   :

```
    #  tip printer
```

/etc/remote   /dev/ttydN

/dev/cuaaN   .

.

● lptest(1)

:

```
    %  $lptest
```

●

.

.

.   CONTROL + D   .

:

```
    %  >file
```

file   . tip(1)

.

[   ]

9.3.1.4   : /etc/printcap

(   )

.   LPD   .

/etc/printcap   **LPD**   . **LPD**

.

printcap(5)   . /etc/printcap

.   /usr/share/misc/termcap   /etc/remote   .

cgetent(3)   .

:

(   ) /etc/printcap

;   .

sh   (   )   ;

.

sd   ;

.

/dev   *lp*   /etc/printcap

;   .

ms#

.

;   .

KFUG

lpr(1)   .

Note:

. **LPD**

                                       (   )

[: /etc/printcap   ]

1.

     (   )

/etc/printcap   *lp*   .
         . PRINTER   **LPD**
                lp   .

                             /etc/printcap   .
                       (|)
       (:)   .

                 (Diablo 630   Panasonic KX-P4455
)   /etc/printcap   :

```
#
#    /etc/printcap for host rose
#
rattan|line|diablo|lp|Diablo 630 Line Printer:


bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
```

rattan 　　 *line, diablo, lp* 　 *Diablo 630 Line Printer*

　　　 lp 　　　　　　　　　　　　　　　　　　　.

　　　 bamboo 　 *ps, PS, S, panasonic* 　 *Panasonic KX-P4455 PostScript*

v51.4 　　　　.

2.
LPD　　　　　　　　　　　　　　　　　　.

'　　　　　　　　　　　　　　　　　　　.

　.

　　　　　　　 sh 　　　　　　 /etc/printcap 　　　　. 　 *sh*

　/etc/printcap 　　　　　:

```
#
#    /etc/printcap for host rose - no header pages anywhere
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
        :sh:


bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
        :sh:
```

　　　　　　　　　　　　　　:

　　　　　TAB 　　　　　　　　.

　　　　.

3.

/var/spool

mkdir(1)   .

:

mkdir /var/spool/*printer-name*

LPD

.   *rattan*   *bamboo*
:

mkdir /var/spool/lpd
mkdir /var/spool/lpd/rattan
mkdir /var/spool/lpd/bamboo

Note:

.
,   ,   .
:

chown daemon:daemon /var/spool/lpd/rattan
chown daemon:daemon /var/spool/lpd/bamboo
chmod 770 /var/spool/lpd/rattan
chmod 770 /var/spool/lpd/bamboo

/etc/printcap   **LPD**   . *sd*
:

#
/etc/printcap for host rose - added spooling directories
#

rattan|line|diablo|lp|Diablo 630 Line Printer:

    :sh:sd=/var/spool/lpd/rattan:

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:

    :sh:sd=/var/spool/lpd/bamboo:

      .

sd   /var/spool/lpd

    .

4.

        /dev   FreeBSD   /dev

            .   **LPD**   .

                    (   )

      .

/etc/printcap   /dev   *lp*   .

        rattan   *bamboo*

        ;   /etc/printcap   :

\#

\#   /etc/printcap for host rose - identified what devices to use

\#

rattan|line|diablo|lp|Diablo 630 Line Printer:

    :sh:sd=/var/spool/lpd/rattan:

    :lp=/dev/lpt0:

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:

    :sh:sd=/var/spool/lpd/bamboo:

    :lp=/dev/ttyd5:

/etc/printcap   *lp*   **LPD**   /dev/lp

. /dev/lp   FreeBSD   .

5.

LPD

bps   ,   .

:

- /etc/printcap   ;
                                                                .

-
                                                        .

/etc/printcap   *lp*   :

br#*bps-rate*

50, 75, 110, 134, 150, 200, 300, 600, 1200, 1800,
2400, 4800, 9600, 19200, 38400, 57600   115200   *bps-rate*   .

ms#*stty-mode*

. stty(1)
            .

LPD   *lp*   *ms#*
        .   stty(1)   *parenb, parodd, cs5, cs6,*
cs7, cs8, cstopb, crtscts   *ixon*   .

bps   38400   .

−parenb　　　　　　　, *cs8*　8-bit　　, *clocal*　　　　　　　　*crtscts*

　　　　　　　:

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:

　　　:sh:sd=/var/spool/lpd/bamboo:

　　　:lp=/dev/ttyd5:ms#-parenb cs8 clocal crtscts:

6.

　　　LPD　　　　　　　　　　　　　　　　　　　　　　　　　　.
(input)　　　　　　　　　　　　　　　　　　　　　LPD
　　　.　　　　LPD
　　　　　lp　　　　　　　　　　　　　　　　　　.

　.　　　　　　　　　　　　　　　　　　　　　　　.

　　　　　　　　　　　　　　/bin/cat
　　　.　FreeBSD　　　　　　　　　　(_)
　　　　　　lpf　　　　　　　.
　　　.lpf　　　　　　　　　　　　　.

　　　　　　　　/usr/local/libexec/if-simple　　　　　.
　　　　　　:

```
#!/bin/sh
#
# if-simple - Simple text input filter for lpd
# Installed in /usr/local/libexec/if-simple
#
# Simply copies stdin to stdout.  Ignores all filter arguments.

/bin/cat && exit 0
exit 2
```

　　　　　:

　　KFUG　　　　　　　　,　　　　　　　　　　　　　.

chmod 555 /usr/local/libexec/if-simple

/etc/printcap   if   **LPD**   .

/etc/printcap   :

\#
\#   /etc/printcap for host rose - added text filter
\#
rattan|line|diablo|lp|Diablo 630 Line Printer:
          :sh:sd=/var/spool/lpd/rattan: :lp=/dev/lpt0:
          :if=/usr/local/libexec/if-simple:

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
          :sh:sd=/var/spool/lpd/bamboo:
          :lp=/dev/ttyd5:ms#-parenb cs8 clocal crtscts:
          :if=/usr/local/libexec/if-simple:

7.   LPD

lpd(8)   /etc/rc   _lpd_enable_   .   _NO_   .

/etc/rc.conf   :

          lpd_enable="YES"

                              lpd(8)   .

          # lpd

8.

          LPD   .

                              .   . LPD

                              lpr(1)   .

                                                        lpr(1)   lptest(1)

                    .

LPD   :

        # lptest 20 5 | lpr -Pprinter-name

printer-name   /etc/printcap   (   ).
                 -P   lpr(1)   .
lptest(1)   .   lpr *file*
                .

                                                    . lptest(1)
              :

!"#$%&'()*+,-./01234
"#$%&'()*+,-./012345
#$%&'()*+,-./0123456
$%&'()*+,-./01234567
%&'()*+,-./012345678

                              (   )
        lptest(1)   .   **lptest 80 60**   60   80
      .

                                                    .

9.4

                    ,   ,
                                        .

9.4.1

LPD   ,   ,

        KFUG   ,

(
)

quirks

;

FreeBSD
/usr/libexec/lpr/lpf   (

.)   . FreeBSD

:

- .

  LPD   .

  .

- LPD   .

  (
)   .

  .

  .

- .

  .

  .

  .

- typesetting

  .

  troff   lpr –t   TeX DVI   lpr - d

KFUG   ,   .

lpr - v   .

.

● 　　　　　　　　　　　　　　　　　　　　　　LPD   :

.

● lpf   lpf   .   (
　　　　　　　　　　　　　　　　　　　　　)   FreeBSD

lpf   .

lpf

.

9.4.1.1

　　　　　　　　　　　　　　　　LPD

.

LPD   .

(/etc/printcap   /dev/console   if   ).

LPD   /etc/printcap

lpr(1)   .   lpr - t   **LPD**
　　　　tf   troff   .

LPD   *if*   (:   )   .

/etc/printcap   3   :

● 　　　　　　　　　　　　LPD

.   .

LPD

.

.

:

filter-name [-c] -w*width* -l*length* -i*indent* -n *login* -h *host acct*-file

-c

lpr –l .

width

/etc/printcap 132 *pw* ( )
.

length

66 *pl* ( ) .

indent

0 lpr -i (
) ..

login

.

host

.

KFUG ,
.

acct-file

af   .

●   .

dirtoff   ditroff

ditroff   .

.

.   :

filter-name -x*pixel-width* -y*pixel-height* -n *login* -h *host acct-file*

pixel-width   *px*   (0)   *pixel-height*   *py*   (

0)   .

●   (output)   .

.

.   :

filter-name -w*width* -l*length*

-w   -l   .

exit   :

exit 0

exit 1

LPD   .

KFUG   ,   .

.

LPD .

exit 2

LPD . **LPD** .

FreeBSD /usr/libexec/lpr/lpf (feed)
width length .

LPD .
. exit
.

9.4.1.2

( )
'
.

.

. *%!* (
) .

.

.

?

lprps . lprps
.

(
) . psif
(lprps) textps

.   lprps   .

lprps   FreeBSD   (   ).
                       . lprps   lprps   psif
          . lprps   /etc/printcap
                            :

:if=/usr/local/libexec/psif:

      LPD   -   *rw*   .

                    (lprps   )
                              :

```sh
#!/bin/sh
#
#   psif - Print PostScript or plain text on a PostScript printer
#   Script version; NOT the version that comes with lprps
#   Installed in /usr/local/libexec/psif
#

IFS="" read -r first_line
first_two_chars=`expr "$first_line" : '\(..\)'`

if [ "$first_two_chars" = "%!" ]; then
    #
    #   PostScript job, print it.
    #
    echo "$first_line" && cat && printf "\004" && exit 0
    exit 2
else
    #
    #   Plain text, convert it, then print it.
    #
    ( echo "$first_line"; cat ) | /usr/local/bin/textps && printf "\004" && exit 0
    exit 2
```

fi

textps

FreeBSD   a2ps

9.4.1.3

de facto   .

Aladdin Enterprises   FreeBSD

Ghostscrpt   .

FreeBSD

:   500

.   *-sDEVICE*   gs(   )   (gs -h

.).

```
#!/bin/sh
#
#   ifhp - Print Ghostscript-simulated PostScript on a DeskJet 500
#   Installed in /usr/local/libexec/ifhp


#
#   Treat LF as CR+LF:
#
```

KFUG

```
printf "\033&k2G" || exit 2


#
#   Read first two characters of the file
#
IFS="" read -r first_line
first_two_chars=`expr "$first_line" : '\(..\)'`


if [ "$first_two_chars" = "%!" ]; then
    #
    #   It is PostScript; use Ghostscript to scan-convert and print it.
    #
    #   Note that PostScript files are actually interpreted programs,
    #   and those programs are allowed to write to stdout, which will
    #   mess up the printed output.  So, we redirect stdout to stderr
    #   and then make descriptor 3 go to stdout, and have Ghostscript
    #   write its output there.  Exercise for the clever reader:
    #   capture the stderr output from Ghostscript and mail it back to
    #   the user originating the print job.
    #
    exec 3>&1 1>&2
    /usr/local/bin/gs -dSAFER -dNOPAUSE -q -sDEVICE=djet500 \
        -sOutputFile=/dev/fd/3 - && exit 0
else
    #
    #   Plain text or HP/PCL, so just print it directly; print a form feed
    #   at the end to eject the last page.
    #
    echo "$first_line" && cat && printf "\033&l0H" &&
exit 0
fi


exit 2
```

if   LPD   :

:if=/usr/local/libexec/ifhp:

lpr plain.text   lpr whatever.ps   .

9.4.1.4

(ASCII

)   .

[   ]

---

1.   ?

TeX typesetting
.   TeX   DVI

DVI   .
:

% dvips seaweed-analysis.dvi
% lpr seaweed-analysis.ps

DVI   **LPD**   .   DVI
:

% lpr -d seaweed-analysis.dvi

-d   DVI   **LPD**   .

/etc/printcap

2.   ?

.   DVI   DVI

.   troff   troff   .

LPD   /etc/printcap   lpr
:

	/etc/printcap	lpr
cifplot	*cf*	*- c*
DVI	*df*	*- d*
plot	*gf*	*- g*
ditroff	*nf*	*- n*
FORTRAN text	*rf*	*- f*
troff	*rf*	*- f*
raster	*vf*	*- v*
plain text	*if*	none, *- p* *- l*

lpr –d   /etc/printcap   *df*
.

FORTRAN text   plot   .
.   Printerleaf
(Interleaf   )   plot
. *gf*   Printerleaf   lpr - g
Printerleaf   .

3.

FreeBSD   /usr/local   .
/usr/local/libexec   **LPD**   ;
.

/etc/printcap
.

bamboo   DVI   .

bamboo   *df*   /etc/printcap   .

```
#
#   /etc/printcap for host rose -  added df filter for bamboo
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
        :sh:sd=/var/spool/lpd/rattan:
        :lp=/dev/lpt0:
        :if=/usr/local/libexec/if-simple:

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
        :sh:sd=/var/spool/lpd/bamboo:
        :lp=/dev/ttyd5:ms#-parenb cs8 clocal crtscts:rw:
        :if=/usr/local/libexec/psif:
        :df=/usr/local/libexec/psdf:
```

DVI   /usr/local/libexec/psdf   .   :

```
#!/bin/sh
#
#   psdf -  DVI to PostScript printer filter
#   Installed in /usr/local/libexec/psdf
#
# Invoked by lpd when user runs lpr -d
#
exec /usr/local/bin/dvips -f | /usr/local/libexec/lprps "$@"
```

                                            dvips   (-*f*   )   .   LPD
                                    lprps   (
) . lprps
    .

4.

                                                                                .
                                                .   .

III-SI   (GIF   )

:


```
#!/bin/sh
#
#    hpvf - Convert GIF files into HP/PCL, then print
#    Installed in /usr/local/libexec/hpvf


PATH=/usr/X11R6/bin:$PATH; export PATH
giftopnm | ppmtopgm | pgmtopbm | pbmtolj -resolution 300
    && exit 0
    || exit 2
```


GIF   anymap   graymap, bitmap
   /PCL   .

                                        /etc/printcap   :


```
#
#    /etc/printcap for host orchid
#
teak|hp|laserjet|Hewlett Packard LaserJet 3Si:
        :lp=/dev/lpt0:sh:sd=/var/spool/lpd/teak:mx#0:
        :if=/usr/local/libexec/hpif:
        :vf=/usr/local/libexec/hpvf:
```


                                        bamboo   groff typesetting   troff

                :


```
#!/bin/sh
#
#    pstf - Convert groff's troff data into PS, then print.
#    Installed in /usr/local/libexec/pstf
#
exec grops | /usr/local/libexec/lprps "$@"
```

lprps   .

:

#!/bin/sh

#

pstf - Convert groff's troff data into PS, then print.

Installed in /usr/local/libexec/pstf

#

exec grops

                    /etc/printcap   :

:tf=/usr/local/libexec/pstf:

     FORTRAN blush   .

        FORTRAN-   .   *teak*   :

#!/bin/sh

#

hprf - FORTRAN text filter for LaserJet 3si:

Installed in /usr/local/libexec/hprf

#

printf " O33&k2G" && fpr && printf " O33&lOH" &&
 exit O
exit 2

        teak   /etc/printcap   :

:rf=/usr/local/libexec/hprf:

                                        .   *teak*   DVI
            .   /etc/printcap   DVI   :

:df=/usr/local/libexec/hpdf:

DVI   /PCL

. FreeBSD   (   )   : dvi2xx
                    .   DVI   llp,   lll
         2000   dvilj2p   .

dvilj2p   hpdf   .
                    .   .dvi   /dev/fd/O
                    .   (.dvi   ) /dev/fd/O   (   )
dvilj2O   .

                                             /tmp   .
bin   .   daemon   .   /tmp   sticky
bit   .

                    .

                              (/etc/printcap   *sd*   )
                    .   /tmp   (   )
              .

                    :


```
#!/bin/sh
#
#    hpdf - Print DVI data on HP/PCL printer
#    Installed in /usr/local/libexec/hpdf

PATH=/usr/local/bin:$PATH; export PATH


#
#    Define a function to clean up our temporary files.  These exist
#    in the current directory, which will be the spooling directory
#    for the printer.
#
cleanup() {
    rm -f hpdf$$.dvi
```

```
}

#
#   Define a function to handle fatal errors: print the given message
#   and exit 2.   Exiting with 2 tells LPD to do not try to reprint the
#   job.
#
fatal() {
    echo "$@" 1>&2
    cleanup
    exit 2
}

#
#   If user removes the job, LPD will send SIGINT, so trap SIGINT
#   (and a few other signals) to clean up after ourselves.
#
trap cleanup 1 2 15

#
#   Make sure we are not colliding with any existing files.
#
cleanup

#
#   Link the DVI input file to standard input (the file to print).
#
ln - s /dev/fd/0 hpdf$$.dvi || fatal "Cannot symlink /dev/fd/0"

#
#   Make LF = CR+LF
#
printf "  033&k2G" || fatal "Cannot initialize printer"

#
#   Convert and print.   Return value from dvilj2p does not seem to be
```

```
#    reliable, so we ignore it.
#
dvilj2p - M1 - q - e-  dfhp$$.dvi


#
#    Clean up and exit
#
cleanup
exit 0
```

5.   :

(lpr(1)

).
        .

                                    .

                              . file   .

                                                                  .

FreeBSD   apsfilter   .

                              DVI   .

9.4.1.5   (output)

LPD   :   .

                                                                  .

                                    .

- LPD   .

- LPD

        .

          KFUG   ,   .
                                    .

● LPD

.   .

    filter- name - w*width* - l*length*

    width   *pw*   *length*   *pl*   .

                                            .

                        .   (   )   ;
                                            .   byte

                            LPD

    .

                                                    escape

                                                                                            (**LPD**

).

LPD   .

    LPD   (   )

.   **LPD**   2   : ASCII 001

            ASCII 031.   2   (031, 001)   *SIGSTOP*

                    . **LPD**   *SIGCONT*

        .

                                                    LPD   **LPD**

                    .

                                                            .   .

                                        lpf   .

                                                                                            lpf

    .   lpf   .

9.4.1.6 lpf:

                KFUG   ,   .

                                                    .

FreeBSD /usr/libexec/lpr/lpf (lpr −i) ,
(lpr −l),
( ).   .

lpf   .
lpf   .

lpf   /etc/printcap   *pw* *pl*
.
.

9.4.2

.

burst   .

.   .

(
).

LPD
.
;   (9.4.2.4   ).

9.4.2.1

/etc/printcap   *sh*   ("
")   .   *sh*
.

.

KFUG   ,   .
.

PCL   :

```
#!/bin/sh
#
#   hpof - Output filter for Hewlett Packard PCL-compatible printers
#   Installed in /usr/local/libexec/hpof


printf "\033&k2G" || exit 2
exec /usr/libexec/lpr/lpf
```

of   .   .

                                   teak   /etc/printcap   ;
                              :

```
#
#   /etc/printcap for host orchid
#
teak|hp|laserjet|Hewlett Packard LaserJet 3Si:
        :lp=/dev/lpt0:sd=/var/spool/lpd/teak:mx#0:
        :if=/usr/local/libexec/hpif:
        :vf=/usr/local/libexec/hpvf:
        :of=/usr/local/libexec/hpof:
```

                          teak   .
                              lpr -h   ;   lpr(1)
                    .

              Note: LPD   (feed)   .
                                                            /etc/printcap   *ff*
                    .

9.4.2.2

                              LPD

.   (rose   kelly

outline   .):

```
k               ||        ||
k                |         |
k                |         |
k   k     eeee   |         |      y    y
k  k      e   e  |         |      y    y
k k       eeeeee |         |      y    y
kk k      e      |         |      y    y
k  k      e   e  |         |      y   yy
k   k     eeee   |||       |||     yyy y
                                       y
                                   y    y
                                   yyyy


                            ||
               t             |          i
               t             |
 oooo    u   u ttttt         |     ii     n nnn    eeee
o    o   u   u   t           |      i     nn  n    e   e
o    o   u   u   t           |      i     n    n   eeeeee
o    o   u   u   t           |      i     n    n   e
o    o   u  uu   t  t         |      i     n    n   e   e
 oooo    uuu u    tt        |||     iii     n    n    eeee




r rrr     oooo    ssss    eeee
rr   r   o    o   s    s   e   e
r        o    o    ss     eeeeee
r        o    o     ss    e
r        o    o   s    s   e   e
r         oooo    ssss    eeee


                              Job:  outline
                              Date: Sun Sep 17 11:04:58 1995
```

[9-6.bmp]

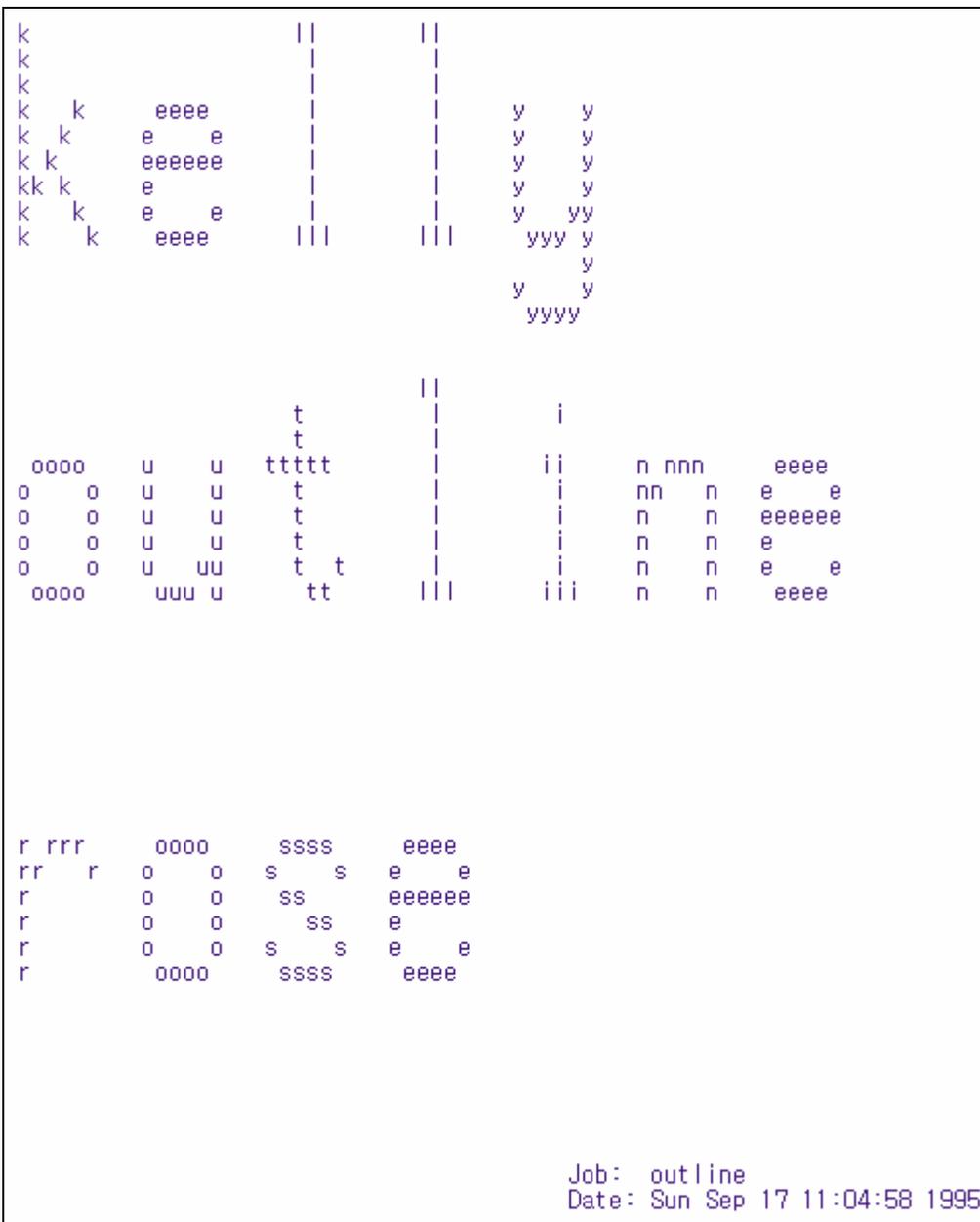**LPD**   (from feed)

(/etc/printcap   *sf*   (form feed   )

)   .

LPD   /etc/printcap   *sh*   .
:

rose:kelly   Job: outline   Date: Sun Sep 17 11:07:51 1995

            LPD   .
/etc/printcap   *hl*   (   )   .

9.4.2.3

LPD   :
            .

         ?

              .   lpr –h
     "   ”   .
               .   lpr –h
      .

         (   )
   .   lpr –h   **LPD**   *–h*
            .

            .

- **LPD**   .

- **LPD**   **LPRng**   .   **LPD**
           .

-              .

.   (

(   )   )   .

LPD   .

LPD

.

(*af*   )

.   /etc/printcap

sh   (   )   .

.

9.4.2.4

LPD

.   LPD

.

.   .

lpr -h   .

.   3   (,

)   :

```
#!/bin/sh
#
#   make- ps- header -  make a PostScript header page on stdout
#   Installed in /usr/local/libexec/make- ps- header
#


#
#   These are PostScript units (72 to the inch).   Modify for A4 or
#   whatever size paper you are using:
#
page_width=612
page_height=792
```

```
border=72


#
#   Check arguments
#
if [ $# -ne 3 ]; then
    echo "Usage: `basename $0` <user> <host> <job>" 1>&2
    exit 1
fi


#
#   Save these, mostly for readability in the PostScript, below.
#
user=$1
host=$2
job=$3
date=`date`


#
#   Send the PostScript code to stdout.
#
exec cat <<EOF
%!PS


%
%   Make sure we do not interfere with user's job that will follow
%
save


%
%   Make a thick, unpleasant border around the edge of the paper.
%
$border $border moveto
$page_width $border 2 mul sub 0 rlineto
0 $page_height $border 2 mul sub rlineto
currentscreen 3 -1 roll pop 100 3 1 roll setscreen
```

```
$border 2 mul $page_width sub 0 rlineto closepath
0.8 setgray 10 setlinewidth stroke 0 setgray


%
%   Display user's login name, nice and large and prominent
%
/Helvetica-Bold findfont 64 scalefont setfont
$page_width ($user) stringwidth pop sub 2 div $page_height 200 sub moveto
($user) show


%
%   Now show the boring particulars
%
/Helvetica findfont 14 scalefont setfont
/y 200 def
[ (Job:) (Host:) (Date:) ] {
200 y moveto show /y y 18 sub def }
forall


/Helvetica-Bold findfont 14 scalefont setfont
/y 200 def
[ ($job) ($host) ($date) ] {
        270 y moveto show /y y 18 sub def
} forall


%
% That is it
%
restore
showpage
EOF
```

DVI   :

```
#!/bin/sh
#
#   psdf - DVI to PostScript printer filter
#   Installed in /usr/local/libexec/psdf
#
#   Invoked by lpd when user runs lpr -d
#

orig_args="$@"

fail() {
    echo "$@" 1>&2
    exit 2
}

while getopts "x:y:n:h:" option; do
    case $option in
        x|y)   ;; # Ignore
        n)     login=$OPTARG ;;
        h)     host=$OPTARG ;;
        *)     echo "LPD started `basename $0` wrong." 1>&2
               exit 2
               ;;
    esac
done

[ "$login" ] || fail "No login name"
[ "$host" ] || fail "No host name"

( /usr/local/libexec/make-ps-header $login $host "DVI File"
  /usr/local/bin/dvips -f ) | eval /usr/local/libexec/lprps $orig_args
```
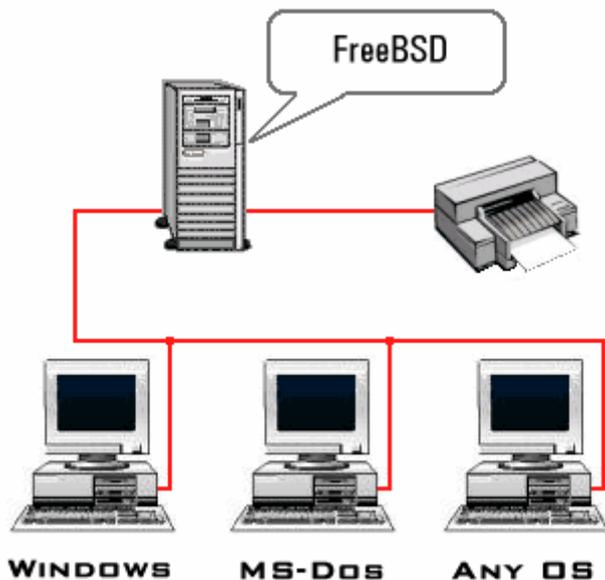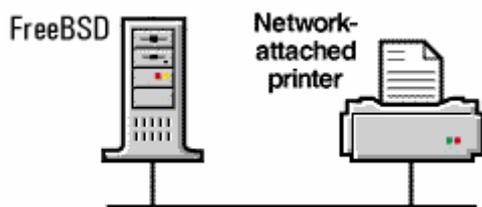
.

.   (

).

lpr "   "
(-h   ).   (
)
                    .

: LPD
                    .   lpr -h   **LPD**
                    .
LPD   .

                    psof   lprps
. psof   .

9.4.3

FreeBSD   :   .
                    :

- ●   .
                    .
                    LPD   .
                    .

KFUG   ,   .
                    .

[9-7.bmp]

●

:

[9-8.bmp]

◆ LPD

LPD

◆

.

9.4.3.1

LPD 　　　　　　　LPD　(　　　LPD　　　　　　)

．

．　　　　　　　　　　　　　　　　　　LPD

．

．　　　　　　　　　　　　　　　　　　　　．

LPD 　　　　　　　　　　　　　　　　　　　　．　　　　　　　　　　　　(

　　　　　　　) LPD

．

LPD

　　　　　　　　　　　　　　　　　　　　　．

．

> **Tip**:　　　　　　　　　　　　　　　　*text*　　　　　　　　　　　LF
> CRLF　　　　　　　　hplf　　　　　　　　　　　　．

/etc/printcap

：

．

．

lp　　　　　　　　　　　(:lp=:).

sd　　　　　　　　　　. LPD

．

rm　　　　　　　　　　　　　．

rp   .

/etc/printcap   .

                            .   rose   *bamboo*   *rattan*   .
   orchid   . orchid   (   )
/etc/printcap   *teak*   ;
   rose   :

```
#
#   /etc/printcap for host orchid - added (remote) printers on rose
#


#
#   teak is local; it is connected directly to orchid:
#
teak|hp|laserjet|Hewlett Packard LaserJet 3Si:
        :lp=/dev/lpt0:sd=/var/spool/lpd/teak:mx#0:
        :if=/usr/local/libexec/ifhp:
        :vf=/usr/local/libexec/vfhp:
        :of=/usr/local/libexec/ofhp:


#
#   rattan is connected to rose; send jobs for rattan to rose:
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
        :lp=:rm=rose:rp=rattan:sd=/var/spool/lpd/rattan:


#
#   bamboo is connected to rose as well:
#
bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
        :lp=:rm=rose:rp=bamboo:sd=/var/spool/lpd/bamboo:
```

orchid   :

mkdir -p /var/spool/lpd/rattan /var/spool/lpd/bamboo

chmod 770 /var/spool/lpd/rattan /var/spool/lpd/bamboo

chown daemon:daemon /var/spool/lpd/rattan /var/spool/lpd/bamboo

orchid   *rattan*   *bamboo*   .   orchid
                  orchid   **LPD**   DVI   /var/spool/lpd/bamboo
        .

% lpr -P bamboo -d sushi-review.dvi

        rose   *bamboo*   **LPD**
rose   .   rose   rose   DVI
                  (*bamboo*   ).

9.4.3.2

                                                                              :
                        (   )   (
)   .
                    .
        .

/etc/printcap   (
    ),   ,   ,   ,   .   TCP/IP
                                            .

            .   ;   netprint
                                    .   netprint
                                        .
                        (,   )
            (FreeBSD   ).

```perl
#!/usr/bin/perl
#
#   netprint - Text filter for printer attached to network
#   Installed in /usr/local/libexec/netprint
#
$#ARGV eq 1 || die "Usage: $0 <printer-hostname> <port-number>";

$printer_host = $ARGV[0];
$printer_port = $ARGV[1];

require 'sys/socket.ph';

($ignore, $ignore, $protocol) = getprotobyname('tcp');
($ignore, $ignore, $ignore, $ignore, $address)
    = gethostbyname($printer_host);

$sockaddr = pack('S n a4 x8', &AF_INET, $printer_port, $address);

socket(PRINTER, &PF_INET, &SOCK_STREAM, $protocol)
    || die "Can't create TCP/IP stream socket: $!";
connect(PRINTER, $sockaddr) || die "Can't contact $printer_host: $!";
while (<STDIN>) { print PRINTER; }
exit 0;
```

                                                                    Diablo 750-N
                                            .   5100   .
                        scrivener   .   :

```sh
#!/bin/sh
#
#   diablo-if-net - Text filter for Diablo printer `scrivener' listening
#   on port 5100.     Installed in /usr/local/libexec/diablo-if-net
#
exec /usr/libexec/lpr/lpf "$@" | /usr/local/libexec/netprint scrivener 5100
```

KFUG   ,   .
                                            .

9.4.4

. LPD

'

.

9.4.4.1

LPD   .   **lpr**
-#5   5   .   .

                                             /etc/printcap   *sc*   lpr(1) - #
                                           .   - #
             :

lpr: multiple copies are not allowed

             (   )
/etc/printcap   *sc*
                  .

                   .   rose   /etc/printcap   .   rattan
                                                                                  bamboo
                   sc   :

```
#
#    /etc/printcap for host rose -  restrict multiple copies on bamboo
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
        :sh:sd=/var/spool/lpd/rattan:
        :lp=/dev/lpt0:
        :if=/usr/local/libexec/if-simple:


bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
```

```
:sh:sd=/var/spool/lpd/bamboo:sc:
:lp=/dev/ttyd5:ms#-parenb cs8 clocal crtscts:rw:
:if=/usr/local/libexec/psif:
:df=/usr/local/libexec/psdf:
```

orchind   /etc/printcap   (teak

) *sc*   :

```
#
#    /etc/printcap for host orchid - no multiple copies for local
#    printer teak or remote printer bamboo
teak|hp|laserjet|Hewlett Packard LaserJet 3Si:
        :lp=/dev/lpt0:sd=/var/spool/lpd/teak:mx#0:sc:
        :if=/usr/local/libexec/ifhp:
        :vf=/usr/local/libexec/vfhp:
        :of=/usr/local/libexec/ofhp:


rattan|line|diablo|lp|Diablo 630 Line Printer:
        :lp=:rm=rose:rp=rattan:sd=/var/spool/lpd/rattan:


bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
        :lp=:rm=rose:rp=bamboo:sd=/var/spool/lpd/bamboo:sc:
```

sc   **lpr -#**   lpr(1)

:

% lpr forsale.sign forsale.sign forsale.sign forsale.sign forsale.sign

(   )   .

9.4.4.2

/etc/printcap   *rg*

.   *rg*

.

(root   )   : "lpr: Not a
member of the restricted group"   .

sc   (   )   (
)   *rg*
      .

                                        rattan   *artists*   *bamboo*
                        .   rose   /etc/printcap   :

```
#
#    /etc/printcap for host rose - restricted group for bamboo
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
        :sh:sd=/var/spool/lpd/rattan:
        :lp=/dev/lpt0:
        :if=/usr/local/libexec/if-simple:


bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
        :sh:sd=/var/spool/lpd/bamboo:sc:rg=artists:
        :lp=/dev/ttyd5:ms#-parenb cs8 clocal crtscts:rw:
        :if=/usr/local/libexec/psif:
        :df=/usr/local/libexec/psdf:
```

      /etc/printcap   (orchid)   .   orchid
bamboo   .   .

            Note: .

9.4.4.3

                        .

                        .

LPD   *mx*   .   1024

BUFSIZ   .   0   *mx*

                              1000   .

        Note: .

LPD   .

              .   .   .

                        rattan   *bamboo*   .

                                        5 MB   .

                                    :

```
#
#     /etc/printcap for host rose
#


#
#     No limit on job size:
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
          :sh:mx#0:sd=/var/spool/lpd/rattan:
          :lp=/dev/lpt0:
          :if=/usr/local/libexec/if-simple:


#
#     Limit of five megabytes:
#
bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
          :sh:sd=/var/spool/lpd/bamboo:sc:rg=artists:mx#5000:
          :lp=/dev/ttyd5:ms#-parenb cs8 clocal crtscts:rw:
          :if=/usr/local/libexec/psif:
          :df=/usr/local/libexec/psdf:
```

                              .

.   /etc/printcap   *mx*

.   .

;

.

9.4.4.4

LPD   :

LPD   /etc/hosts.equiv

/etc/hosts.lpd   . **LPD**

LPD   .

:   .
/etc/hosts.equiv   ruserok(3)   rsh(1)   rcp(1)

.

rose   /etc/hosts.lpd   :

```
orchid
violet
madrigal.fishbaum.de
```

rose   orchid   violet   madrigal.fishbaum.de
.   rose   **LPD**   .

.   minfree   .

minfree

bamboo minfree

/etc/printcap ; *bamboo* :

```
bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
        :sh:sd=/var/spool/lpd/bamboo:sc:rg=artists:mx#5000:
        :lp=/dev/ttyd5:ms#-parenb cs8 clocal crtscts:rw:mx#5000:
        :if=/usr/local/libexec/psif:
        :df=/usr/local/libexec/psdf:
```

sd . **LPD**

3 MB (6144) :

```
# echo 6144 > /var/spool/lpd/bamboo/minfree
```

/etc/printcap *rs*

. *rs*

LPD . **LPD**

.

.

.

/usr/bin/false

"token" .

9.4.5

LPD

(   )   (   )   .

:

●

●

"   "

LPD   :   (   )

:

9.4.5.1

FreeBSD   . "lpf:
          "

pac(8)   .

LPD

          .

      . /etc/printcap   *af*

                                        .

LPD   (*pw*   *pl*   ) lpf   . lpf

                    .
      .   :

2.00 rose:andy
3.00 rose:kelly
3.00 orchid:mary
5.00 orchid:mary
2.00 orchid:zhang

lpf

                    lpf   .

                              /etc/printcap   *af=acct*   .
                              acct   .

                                        pac(8)   .
                              pac   .

                    :

Login	pages/feet	runs	price
orchid:kelly	5.00	1	$ 0.10
orchid:mary	31.00	3	$ 0.62
orchid:zhang	9.00	1	$ 0.18
rose:andy	2.00	1	$ 0.04
rose:kelly	177.00	104	$ 3.54
rose:mary	87.00	32	$ 1.74
rose:root	26.00	12	$ 0.52

total		337.00	154	$	6.74

pac(8)   :

- Pprinter

     printer   .   /etc/printcap   *af*
                 .

- c

                                                      .

- m

                                        .   alpha   smith
            gamma   smith   .
            .

- pprice

     /etc/printcap   *pc*   *price*
                 2   (   )   .   *price*   .

- r

- s

          KFUG   ,   .
                                        .

name...

names .

pac(8)

. (
) pac -m :

Login	pages/feet	runs	price
andy	2.00	1	$ 0.04
kelly	182.00	105	$ 3.64
mary	118.00	35	$ 2.36
root	26.00	12	$ 0.52
zhang	9.00	1	$ 0.18
total	337.00	154	$ 6.74

pac(8) /etc/printcap (200 2)
pc .

. −*p* pac(8) . −*p*
. 1 50

.

pac -pl.50

.

pac −s

_sum . . pac(8)

.

9.4.5.2 ?

.

:

.

.

lpf   (lpf:)   .

lpf   .

?

DVI   DVI   dvilj   dvips

.

.

.

.

?

.

.

.   .

.

.

9.5

FreeBSD   .

:

lpr(1)

.

lpq(1)

.

lprm(1)

.

LPD

lpc(8)   .

lpr(1), lprm(1)   lpq(1) 3   /etc/printcap

／   - P printer- name   .

. −P   PRINTER

.   PRINTER

lp   .

PRINTER   PRINTER

lp   .

9.5.1

:

```
% lpr filename …
```

.   lpr(1)

.   :

```
% lpr /etc/host.conf /etc/hosts.equiv
```

:

```
% lpr - P printer-name filename …
```

rattan   :

```
% ls - l | lpr - P rattan
```

lpr(1)   lpr   ls –l

.

lpr(1)   ,   ,

.   .

9.5.2

lpr(1)   ,   LPD   "   "

.

.   .

lpq(1)   .   −*P*   .
bamboo   .

```
% lpq - P bamboo
```

lpq   :

```
bamboo is ready and printing
Rank    Owner    Job  Files                              Total Size
active kelly    9    /etc/host.conf, /etc/hosts.equiv   88 bytes
2nd     kelly    10   (standard input)                   1635 bytes
3rd     mary     11   …                                  78519 bytes
```

bamboo   3   .   kelly

9   .   .

.

.

9   ;   lpr(1)

.   (active   "Rank"   )

.   lpr(1)

.   mary   ;   .

lpq(1)   3   (.)

.

lpq(1)   :   (

LPD   )

lpq(1)   –/   .   lpq -l

:

```
waiting for bamboo to become ready (offline ?)
kelly: 1st                [job 009rose]
        /etc/host.conf                73 bytes
        /etc/hosts.equiv              15 bytes


kelly: 2nd                [job 010rose]
        (standard input)              1635 bytes


mary: 3rd                        [job 011rose]
        /home/orchid/mary/research/venus/alpha- regio/mapping 78519 bytes
```

9.5.3.

lprm(1)   .

lprm(1)   .

lpq(1)   .

:

% **lprm job-number**

−P   .   *bamboo*
10   :

% **lprm - P bamboo 10**

lprm(1)   :

lprm -

(   )   .

lprm *user*

user   (   )   .
;   .

lprm

−   lprm(1)
.

.

—P   .

rattan   :

% lprm - P rattan -

Note: lprm(1)

.

:

% lpr - P rattan myfile
% rlogin orchid
% lpq - P rattan
Rank   Owner   Job   Files   Total Size
active seeyan   12   …   49123 bytes
2nd   kelly   13   myfile   12 bytes
% lprm - P rattan 13
rose: Permission denied
% logout
% lprm - P rattan 13
dfA013rose dequeued
cfA013rose dequeued

9.5.4

lpr(1)   ,   ,
.   .

9.5.4.1

lpr(1)   .

pr(1)   .

KFUG   ,   .
.

DVI   (TeX typesetting   ) fish-report.dvi
bamboo   :

            % lpr -P bamboo -d fish-report.dvi

                                                DVI   ditroff
    .   .

        Note: -p   −T
                        .   −d   DVI   .
                                    .

- *c*

        cifplot   .

- *d*

        DVI   .

- *f*

        FORTRAN   .

- *g*

        plot   .

- *i number*

        number   ; *number*   8

.

Note: *- i*

- l

.

- n

ditroff(troff) .

- P

pr(1) . pr(1)
.

- T title

pr(1) *title* . *−p*
.

- t

troff .

- v

raster .

:   ls(1)
:

```
% zcat /usr/share/man/man1/ls.1.gz | troff - t - man | lpr - t
```

zcat(1)   ls(1)   GNU troff
                    lpr   (**LPD**   )
troff(1)   . $-t$ lpr(1)   GNU troff
                                                              .

9.5.4.2

                  lpr(1)   **LPD**   :

- # copies

                                                                        .
                                                                            .
                                          .

                            parser.c   parser.h   3   :

```
% lpr - # 3 parser.c parser.h
```

- m

                                                        .   **LPD**
                              .
                                .

  - s

KFUG   ,   .
                                  .

．

．   (
)

． LPD

．

： LPD

．

Note: LPD
                                          -*s*

．

-*r*

                                          -*s*   ．

!

9.5.4.3

lpr(1)   ．

．

．

-C *text*

text   ．

．

-J *text*

text   ．

KFUG   ，   ．

．

stdin   .

- h

                                        .

            Note: .

                                  .

9.5.5

                                                        . lpc(8)
          . lpc(8)   :

*   /

*   /

*   .

                              :   .

                                                                    .

                              (root   )   .
          .

      .

          lpc(8)   root   .
                                        lpc(8)   .

          lpc(8)   .   *printer-
name*   . *printer-name*   *all*   /etc/printcap
            .

abort *printer-name*

.

.

clean *printer-name*

.

LPD

.   .

disable *printer-name*

.

.   (root)   .

: root

.   enable
.

down *printer-name message*

.   disable   stop   . *message*

lpq(1)   lpc status   .

enable *printer-name*

.

.

KFUG   ,   .
.

help *command-name*

command-name   . *command-name*
                         .

restart *printer-name*

                              . LPD
                    stop   down   .
        restart   abort   start   .

start *printer-name*

                   .   .

stop *printer-name*

                   .   .
                                   .

topq *printer-name job-or-username*

        printer-name   *job*   *username*
           .   *printer-name*   *all*   .

up *printer-name*

                    ; down   . start   enable   .

lpc(8)   .   lpc(8)

exit, quit 　　　　　　　　　　　　　　　　　　　　　　　　　　.

9.6

　　　　　　　　　　　　　　FreeBSD　　LPD
　.　　　　　　　　　　　　　　　　　　　　: "
　(　　　FreeBSD　　　　　　)?"

LPRng

"LPR:　　　　" 　　　　　**LPRng** 　　　　PLP　　　　　　　.
Patrick Piwell 　Justin Mason 　(PLP　　　　　　　) **LPRng** 　　　　　　　　.
LPRng 　　　　　　http://www.lprng.org 　.

CUPS

Common UNIX Printing System **CUPS**
　　　　　　.
　　　　Easy Software Products 　　　　　　.

CUPS 　　　　　　　　　　　　　　　Internet Printing Protocol
(IPP) 　　　. Line Printer Daemon(LPD) Server Message Block (SMB)
AppSocket (a.k.a JetDirect) 　　　　　　　　　. CUPS

PostScript Printer Description (PPD) 　　　　　　.

CUPS 　　　　http://www.cups.org/

9.7

lptest(1)

.

.

. PRINT
REMAINING   FORM FEED   .

.   FORM FEED   (
)   .

.

.

/usr/local/libexec/if- simple

:

```
#!/bin/sh
#
# if- simple -  Simple text input filter for lpd
# Installed in /usr/local/libexec/if- simple
#
# Simply copies stdin to stdout.    Ignores all filter arguments.
# Writes a form feed character (  f) after printing job.


/bin/cat && printf "  f" && exit 0
exit 2
```

"   "

:

```
!"# $% &' ()*+,- ./01234
            "# $% &' ()*+,- ./012345
                # $% &' ()*+,- ./0123456
```

                        KFUG   ,   .

.

: ASCII   10,   (LF).   MS-DOS, OS/2

ASCII   10   ASCII   13   (carriage return

CR).   MS-DOS   .

FreeBSD   .

.

.

FreeBSD   :

Printer received CR   Printer prints CR
Printer received LF   Printer prints CR + LF

:

- ●   .

.

    Note: FreeBSD
    CR   LF   .

.

- ●   FreeBSD   LF
    CR+LF   .   /etc/printcap   *ms#*
                                onlcr   .

- ● *escape code*   LF
    .   escape   .
    escape

    .

PCL escape

.   LF   LF   CR   ;

;

.   .

```
#!/bin/sh
#
# hpif - Simple text input filter for lpd for HP-PCL based printers
# Installed in /usr/local/libexec/hpif
#
# Simply copies stdin to stdout.   Ignores all filter arguments.
# Tells printer to treat LF as CR+LF.   Ejects the page when done.


printf "\033&k2G" && cat && printf "\033&l0H" && exit 0
exit 2
```

orchid   /etc/printcap   .   *teak*

3Si

.   :

```
#
#    /etc/printcap for host orchid
#
teak|hp|laserjet|Hewlett Packard LaserJet 3Si:
          :lp=/dev/lpt0:sh:sd=/var/spool/lpd/teak:mx#0:
          :if=/usr/local/libexec/hpif:
```

.

.

.

. FreeBSD

LF   CR

.

KFUG   ,   .

.

LF   CR

:

Printer receives	Printer prints
CR	CR
LF	CR + LF

.

.

.

(

).   :

● XON/XOFF   *ms#*   *ixon*
  FreeBSD   .

● (carrier)   *ms#*   *crtscts*
  .

.

.

.

. *br*

bps   *ms#*   ;
/etc/printcap   .

.

KFUG   ,   .
.

FreeBSD   .

/etc/printcap   (*lf*)

.   *rattan*   *lf*   :

```
rattan|line|diablo|lp|Diablo 630 Line Printer:
        :sh:sd=/var/spool/lpd/rattan:
        :lp=/dev/lpt0:
        :if=/usr/local/libexec/if-simple:
        :lf=/var/log/rattan.log
```

.   (

/var/log/rattan.log)   .   .

lf   **LPD**   /dev/console   .

KFUG   ,   .
                              .