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## *Red Hat Enterprise Linux Release 9.2 Manual Pages on 'pty.7' command*

***$ man pty.7***

PTY(7) Linux Programmer's Manual PTY(7)

NAME

pty - pseudoterminal interfaces

DESCRIPTION

A pseudoterminal (sometimes abbreviated "pty") is a pair of virtual character devices that provide a bidirectional communication channel. One end of the channel is called the master; the other end is called the slave.

The slave end of the pseudoterminal provides an interface that behaves exactly like a classical terminal. A process that expects to be con? nected to a terminal, can open the slave end of a pseudoterminal and then be driven by a program that has opened the master end. Anything that is written on the master end is provided to the process on the slave end as though it was input typed on a terminal. For example, writing the interrupt character (usually control-C) to the master de? vice would cause an interrupt signal (SIGINT) to be generated for the foreground process group that is connected to the slave. Conversely, anything that is written to the slave end of the pseudoterminal can be read by the process that is connected to the master end.

Data flow between master and slave is handled asynchronously, much like data flow with a physical terminal. Data written to the slave will be available at the master promptly, but may not be available immediately. Similarly, there may be a small processing delay between a write to the

master, and the effect being visible at the slave.

Historically, two pseudoterminal APIs have evolved: BSD and System V. SUSv1 standardized a pseudoterminal API based on the System V API, and this API should be employed in all new programs that use pseudotermi? nals.

Linux provides both BSD-style and (standardized) System V-style pseu? doterminals. System V-style terminals are commonly called UNIX 98 pseudoterminals on Linux systems.

Since kernel 2.6.4, BSD-style pseudoterminals are considered depre? cated: support can be disabled when building the kernel by disabling the CONFIG_LEGACY_PTYS option. (Starting with Linux 2.6.30, that op? tion is disabled by default in the mainline kernel.) UNIX 98 pseu? doterminals should be used in new applications.

UNIX 98 pseudoterminals

An unused UNIX 98 pseudoterminal master is opened by calling posix_openpt(3). (This function opens the master clone device, /dev/ptmx; see pts(4).) After performing any program-specific initial? izations, changing the ownership and permissions of the slave device using grantpt(3), and unlocking the slave using unlockpt(3)), the cor? responding slave device can be opened by passing the name returned by ptsname(3) in a call to open(2).

The Linux kernel imposes a limit on the number of available UNIX 98 pseudoterminals. In kernels up to and including 2.6.3, this limit is configured at kernel compilation time (CONFIG_UNIX98_PTYS), and the permitted number of pseudoterminals can be up to 2048, with a default setting of 256. Since kernel 2.6.4, the limit is dynamically ad? justable via /proc/sys/kernel/pty/max, and a corresponding file, /proc/sys/kernel/pty/nr, indicates how many pseudoterminals are cur? rently in use. For further details on these two files, see proc(5).

BSD pseudoterminals

BSD-style pseudoterminals are provided as precreated pairs, with names of the form /dev/ptyXY (master) and /dev/ttyXY (slave), where X is a letter from the 16-character set [p-za-e], and Y is a letter from the

16-character set [0-9a-f]. (The precise range of letters in these two sets varies across UNIX implementations.) For example, /dev/ptyp1 and /dev/ttyp1 constitute a BSD pseudoterminal pair. A process finds an unused pseudoterminal pair by trying to open(2) each pseudoterminal master until an open succeeds. The corresponding pseudoterminal slave (substitute "tty" for "pty" in the name of the master) can then be opened.

## FILES

/dev/ptmx

UNIX 98 master clone device

/dev/pts/*

UNIX 98 slave devices

/dev/pty[p-za-e][0-9a-f]

BSD master devices

/dev/tty[p-za-e][0-9a-f]

BSD slave devices

## NOTES

Pseudoterminals are used by applications such as network login services (ssh(1), rlogin(1), telnet(1)), terminal emulators such as xterm(1), script(1), screen(1), tmux(1), unbuffer(1), and expect(1).

A description of the TIOCPKT ioctl(2), which controls packet mode oper? ation, can be found in ioctl_tty(2).

The BSD ioctl(2) operations TIOCSTOP, TIOCSTART, TIOCUCNTL, and TIOCRE? MOTE have not been implemented under Linux.

## SEE ALSO

ioctl_tty(2), select(2), setsid(2), forkpty(3), openpty(3), termios(3), pts(4), tty(4)

## COLOPHON

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