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Red Hat Enterprise Linux Release 9.2 Manual Pages on 'tcsetattr.3p' command

$ man tcsetattr.3p

TCSETATTR(3P) POSIX Programmer's Manual TCSETATTR(3P)

PROLOG

This manual page is part of the POSIX Programmer's Manual. The Linux implementation of this interface may differ (consult the corresponding Linux manual page for details of Linux behavior), or the interface may not be implemented on Linux.

NAME

tcsetattr ? set the parameters associated with the terminal

SYNOPSIS

```
#include <termios.h>
int tcsetattr(int fildes, int optional_actions,
    const struct termios *termios_p);
```

DESCRIPTION

The tcsetattr() function shall set the parameters associated with the terminal referred to by the open file descriptor fildes (an open file descriptor associated with a terminal) from the termios structure ref? erenced by termios_p as follows:

* If optional_actions is TCSANOW, the change shall occur immediately.
* If optional_actions is TCSADRAIN, the change shall occur after all output written to fildes is transmitted. This function should be used when changing parameters that affect output.
* If optional_actions is TCSAFLUSH, the change shall occur after all output written to fildes is transmitted, and all input so far re?

ceived but not read shall be discarded before the change is made.

If the output baud rate stored in the termios structure pointed to by termios_p is the zero baud rate, B0, the modem control lines shall no longer be asserted. Normally, this shall disconnect the line.

If the input baud rate stored in the termios structure pointed to by termios_p is 0, the input baud rate given to the hardware is the same as the output baud rate stored in the termios structure.

The tcsetattr() function shall return successfully if it was able to perform any of the requested actions, even if some of the requested ac? tions could not be performed. It shall set all the attributes that the implementation supports as requested and leave all the attributes not supported by the implementation unchanged. If no part of the request can be honored, it shall return -1 and set errno to [EINVAL]. If the input and output baud rates differ and are a combination that is not supported, neither baud rate shall be changed. A subsequent call to tcgetattr() shall return the actual state of the terminal device (re? flecting both the changes made and not made in the previous tcsetattr() call). The tcsetattr() function shall not change the values found in the termios structure under any circumstances.

The effect of tcsetattr() is undefined if the value of the termios structure pointed to by termios_p was not derived from the result of a call to tcgetattr() on fildes; an application should modify only fields and flags defined by this volume of POSIX.1?2017 between the call to tcgetattr() and tcsetattr(), leaving all other fields and flags unmodi? fied.

No actions defined by this volume of POSIX.1?2017, other than a call to tcsetattr(), a close of the last file descriptor in the system associ? ated with this terminal device, or an open of the first file descriptor in the system associated with this terminal device (using the O_TTY_INIT flag if it is non-zero and the device is not a pseudo-termi? nal), shall cause any of the terminal attributes defined by this volume of POSIX.1?2017 to change.

If tcsetattr() is called from a process which is a member of a back?

ground process group on a fildes associated with its controlling termi?
nal:

* If the calling thread is blocking SIGTTOU signals or the process is ignoring SIGTTOU signals, the operation completes normally and no signal is sent.
* Otherwise, a SIGTTOU signal shall be sent to the process group.

RETURN VALUE

Upon successful completion, 0 shall be returned. Otherwise, -1 shall be returned and errno set to indicate the error.

ERRORS

The tcsetattr() function shall fail if:

EBADF The fildes argument is not a valid file descriptor.

EINTR A signal interrupted tcsetattr().

EINVAL The optional_actions argument is not a supported value, or an attempt was made to change an attribute represented in the termios structure to an unsupported value.

EIO The process group of the writing process is orphaned, the call? ing thread is not blocking SIGTTOU, and the process is not ig? noring SIGTTOU.

ENOTTY The file associated with fildes is not a terminal.

The following sections are informative.

EXAMPLES

None.

APPLICATION USAGE

If trying to change baud rates, applications should call tcsetattr() then call tcgetattr() in order to determine what baud rates were actu? ally selected.

In general, there are two reasons for an application to change the pa? rameters associated with a terminal device:

1. The device already has working parameter settings but the applica? tion needs a different behavior, such as non-canonical mode instead of canonical mode. The application sets (or clears) only a few flags or c_cc[] values. Typically, the terminal device in this case

is either the controlling terminal for the process or a pseudo-ter?
minal.

2. The device is a modem or similar piece of equipment connected by a serial line, and it was not open before the application opened it.
In this case, the application needs to initialize all of the param?
eter settings ``from scratch''. However, since the termios struc?
ture may include both standard and non-standard parameters, the ap?
plication cannot just initialize the whole structure in an arbi?
trary way (e.g., using memset()) as this may cause some of the non-standard parameters to be set incorrectly, resulting in non-con?
forming behavior of the terminal device. Conversely, the applica?
tion cannot just set the standard parameters, assuming that the non-standard parameters will already have suitable values, as the device might previously have been used with non-conforming parame?
ter settings (and some implementations retain the settings from one use to the next). The solution is to open the terminal device using the O_TTY_INIT flag to initialize the terminal device to have con?
forming parameter settings, obtain those settings using tcge?
tattr(), and then set all of the standard parameters to the desired settings.

RATIONALE

The tcsetattr() function can be interrupted in the following situa?
tions:

* It is interrupted while waiting for output to drain.
* It is called from a process in a background process group and SIGT?
TOU is caught.

See also the RATIONALE section in tcgetattr().

FUTURE DIRECTIONS

Using an input baud rate of 0 to set the input rate equal to the output rate may not necessarily be supported in a future version of this vol?
ume of POSIX.1?2017.

SEE ALSO

cfgetispeed(), tcgetattr()

The Base Definitions volume of POSIX.1?2017, Chapter 11, General Termi?
nal Interface, <termios.h>

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