Name

grotty − *groff* output driver for typewriter-like (terminal) devices

Synopsis

grotty [**−dfho**] [**−i**|**−r**] [**−F** *dir*] [*file* . . .]

grotty −c [**−bBdfhouU**] [**−F** *dir*] [*file* . . .]

grotty −−help

grotty −v
grotty −−version

Description

The GNU *roff* TTY ("Teletype") output driver translates the output of *troff* (1) into a form suitable for type-writer-like devices, including terminal emulators. Normally, *grotty* is invoked by *groff* (1) when the latter is given one of the "**−T ascii**", "**−T latin1**", **−Tlatin1**, or "**−T utf8**" options on systems using ISO character encoding standards, or with "**−T cp1047**" or "**−T utf8**" on EBCDIC-based hosts. (In this installation, **ps** is the default output device.) Use *groff* 's **−P** option to pass any options shown above to *grotty*. If no *file* arguments are given, or if *file* is "−", *grotty* reads the standard input stream. Output is written to the standard output stream.

By default, *grotty* emits SGR escape sequences (from ISO 6429, popularly called "ANSI escapes") to change text attributes (bold, italic, underline, reverse video ["negative image"] and colors). Devices supporting the appropriate sequences can view *roff* documents using eight different background and foreground colors. Following ISO 6429, the following colors are defined in *tty.tmac*: black, white, red, green, blue, yellow, magenta, and cyan. Unrecognized colors are mapped to the default color, which is dependent on the settings of the terminal. OSC 8 hyperlinks are produced for these devices.

In keeping with long-standing practice and the rarity of terminals (and emulators) that support oblique or italic fonts, italicized text is represented with underlining by default—but see the **−i** option below.

SGR and OSC support in pagers

When paging *grotty*'s output with *less*(1), the latter program must be instructed to pass SGR and OSC sequences through to the device; its **−R** option is one way to achieve this (*less* version 566 or later is required for OSC 8 support). Consequently, programs like *man*(1) that page *roff* documents with *less* must call it with an appropriate option.

Legacy output format

The **−c** option tells *grotty* to use an output format compatible with paper terminals, like the Teletype machines for which *roff* and *nroff* were first developed but which are no longer in wide use. SGR escape sequences are not emitted; bold, italic, and underlining character attributes are thus not manipulated. Instead, *grotty* overstrikes, representing a bold character *c* with the sequence "*c* BACKSPACE *c*", an italic character *c* with the sequence "_ BACKSPACE *c*", and bold italics with "_ BACKSPACE *c* BACKSPACE *c*". This rendering is inherently ambiguous when the character *c* is itself the underscore.

The legacy output format can be rendered on a video terminal (or emulator) by piping *grotty*'s output through *ul*(1), which may render bold italics as reverse video. Some implementations of *more*(1) are also able to display these sequences; you may wish to experiment with that command's **−b** option. *less* renders legacy bold and italics without requiring options. In contrast to the terminal output drivers of some other *roff* implementations, *grotty* never outputs reverse line feeds. There is therefore no need to filter its output through *col*(1).

Device control commands

grotty understands one device control function produced by the *roff* **\X** escape sequence in a document.

\X'tty: link [*uri* [*key*=*value*] . . .]**'**

Embed a hyperlink using the OSC 8 terminal escape sequence. Specifying *uri* starts hyperlinked text, and omitting it ends the hyperlink. When *uri* is present, any number of additional key/value pairs can be specified; their interpretation is the responsibility of the pager or terminal. Spaces or tabs cannot appear literally in *uri*, *key*, or *value*; they must be represented in an alternate form.

Device description files

If the *DESC* file for the character encoding contains the "**unicode**" directive, *grotty* emits Unicode characters in UTF-8 encoding. Otherwise, it emits characters in a single-byte encoding depending on the data in the font description files. See *groff_font*(5).

A font description file may contain a directive "**internalname** *n*" where *n* is a decimal integer. If the 01 bit in *n* is set, then the font is treated as an italic font; if the 02 bit is set, then it is treated as a bold font.

Typefaces

grotty supports the standard four styles: **R** (roman), **I** (*italic*), **B** (**bold**), and **BI** (***bold-italic***). Because the output driver operates in *nroff* mode, attempts to set or change the font family or type size are ignored.

Options

−−help displays a usage message, while **−v** and **−−version** show version information; all exit afterward.

−b   Suppress the use of overstriking for bold characters in legacy output format.

−B   Use only overstriking for bold-italic characters in legacy output format.

−c   Use *grotty*'s legacy output format (see subsection "Legacy output format" above). SGR and OSC escape sequences are not emitted.

−d   Ignore all **\D** drawing escape sequences in the input. By default, *grotty* renders **\D'l** . . .**'** escape sequences that have at least one zero argument (and so are either horizontal or vertical) using Unicode box drawing characters (for the **utf8** device) or the **−**, **|**, and **+** characters (for all other devices). *grotty* handles **\D'p** . . .**'** escape sequences that consist entirely of horizontal and vertical lines similarly.

−f   Emit a form feed at the end of each page having no output on its last line.

−F *dir* Prepend directory dir*/dev*name to the search path for font and device description files; *name* describes the output device's character encoding, one of **ascii**, **latin1**, **utf8**, or **cp1047**.

−h   Use literal horizontal tab characters in the output. Tabs are assumed to be set every 8 columns.

−i   Render oblique-styled fonts (**I** and **BI**) with the SGR attribute for italic text rather than underlined text. Many terminals don't support this attribute; however, *xterm*(1), since patch #314 (2014-12-28), does. Ignored if **−c** is also specified.

−o   Suppress overstriking (other than for bold and/or underlined characters when the legacy output format is in use).

−r   Render oblique-styled fonts (**I** and **BI**) with the SGR attribute for reverse video text rather than underlined text. Ignored if **−c** or **−i** is also specified.

−u   Suppress the use of underlining for italic characters in legacy output format.

−U   Use only underlining for bold-italic characters in legacy output format.

Environment

GROFF_FONT_PATH

A list of directories in which to seek the selected output device's directory of device and font description files. See *troff*(1) and *groff_font*(5).

GROFF_NO_SGR

If set, *grotty*'s legacy output format is used just as if the **−c** option were specified; see subsection "Legacy output format" above.

Files

/usr/local/share/groff/1.23.0/font/devascii/DESC

describes the **ascii** output device.

*/usr/local/share/groff/1.23.0/font/devascii/*F

describes the font known as *F* on device **ascii**.

/usr/local/share/groff/1.23.0/font/devcp1047/DESC
> describes the **cp1047** output device.

*/usr/local/share/groff/1.23.0/font/devcp1047/*F
> describes the font known as *F* on device **cp1047**.

/usr/local/share/groff/1.23.0/font/devlatin1/DESC
> describes the **latin1** output device.

*/usr/local/share/groff/1.23.0/font/devlatin1/*F
> describes the font known as *F* on device **latin1**.

/usr/local/share/groff/1.23.0/font/devutf8/DESC
> describes the **utf8** output device.

*/usr/local/share/groff/1.23.0/font/devutf8/*F
> describes the font known as *F* on device **utf8**.

/usr/local/share/groff/1.23.0/tmac/tty.tmac
> defines macros for use with the **ascii**, **cp1047**, **latin1**, and **utf8** output devices. It is automatically loaded by *troffrc* when any of those output devices is selected.

/usr/local/share/groff/1.23.0/tmac/tty−char.tmac
> defines fallback characters for use with *grotty*. See *nroff* (1).

Limitations

grotty is intended only for simple documents.

- There is no support for fractional horizontal or vertical motions.

- *roff* **\D** escape sequences producing anything other than horizontal and vertical lines are not supported.

- Characters above the first line (that is, with a vertical drawing position of 0) cannot be rendered.

- Color handling differs from other output drivers. The *groff* requests and escape sequences that set the stroke and fill colors instead set the foreground and background character cell colors, respectively.

Examples

The following *groff* document exercises several features for which output device support varies: (1) bold style; (2) italic (underline) style; (3) bold-italic style; (4) character composition by overstriking ("coöperate"); (5) foreground color; (6) background color; and (7) horizontal and vertical line-drawing.

```
You might see \f[B]bold\f[] and \f[I]italic\f[].
Some people see \f[BI]both\f[].
If the output device does (not) co\z\[ad]operate,
you might see \m[red]red\m[].
Black on cyan can have a \M[cyan]\m[black]prominent\m[]\M[]
\D'l 1i 0'\D'l 0 2i'\D'l 1i 0' look.
.\" If in nroff mode, end page now.
.if n .pl \n[nl]u
```

Given the foregoing input, compare and contrast the output of the following.

```
$ groff −T ascii file
$ groff −T utf8 −P −i file
$ groff −T utf8 −P −c file | ul
```

See also

"Control Functions for Coded Character Sets" (ECMA-48) 5th edition, Ecma International, June 1991. A gratis version of ISO 6429, this document includes a normative description of SGR escape sequences. Available at ⟨http://www.ecma−international.org/publications/files/ECMA−ST/Ecma−048.pdf⟩.

"Hyperlinks in Terminal Emulators" ⟨https://gist.github.com/egmontkob/eb114294efbcd5ad b1944c9f3cb5feda⟩, Egmont Koblinger.

groff (1), *troff* (1), *groff_out*(5), *groff_font*(5), *groff_char*(7), *ul*(1), *more*(1), *less*(1), *man*(1)