libcaca

0.99.beta17

Generated by Doxygen 1.5.6

Wed Jan 5 14:39:50 2011

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1 libcaca Documentation

1.1 Introduction

libcaca is a graphics library that outputs text instead of pixels, so that it can work on older video cards or text terminals. It is not unlike the famous AAlib library. *libcaca* can use almost any virtual terminal to work, thus it should work on all Unix systems (including Mac OS X) using either the S-Lang library or the ncurses library, on DOS using the conio library, and on Windows systems using the native Win32 console, the conio library, or using S-Lang or ncurses (through Cygwin emulation). There is also a native X11 driver, and an OpenGL driver (through freeglut) that does not require a text terminal. For machines without a screen, the raw driver can be used to send the output to another machine, using for instance cacaserver.

libcaca is free software, released under the Do What The Fuck You Want To Public License. This ensures that no one, not even the *libcaca* developers, will ever have anything to say about what you do with the software. It used to be licensed under the GNU Lesser General Public License, but that was not free enough.

1.2 Developer's documentation

The complete *libcaca* programming interface is available from the following header:

- caca.h

There is language-specific documentation for the various bindings:

- Libcaca ruby bindings

Some other topics are covered by specific sections:

- A libcaca tutorial
- Migrating from libcaca 0.x to the 1.0 API

There is also information specially targeted at *libcaca* developers:

- The libcaca font format (version 1)
- The libcaca canvas format (version 1)
- Libcaca coding style

1.3 User's documentation

- Libcaca environment variables

1.4 Misc

- Libcaca news
- Libcaca authors
- Libcaca thanks

1.5 License

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2 Module Documentation

2.1 libcaca attribute definitions

Enumerations

- enum caca_color {
  CACA_BLACK = 0x00,
  CACA_BLUE = 0x01,
  CACA_GREEN = 0x02,
  CACA_CYAN = 0x03,
  CACA_RED = 0x04,
  CACA_MAGENTA = 0x05,
  CACA_BROWN = 0x06,
  CACA_LIGHTGRAY = 0x07,
  CACA_DARKGRAY = 0x08,
  CACA_LIGHTBLUE = 0x09,
  CACA_LIGHTGREEN = 0x0a,
  CACA_LIGHTCYAN = 0x0b,
  CACA_LIGHTRED = 0x0c,
  CACA_LIGHTMAGENTA = 0x0d,
  CACA_YELLOW = 0x0e,
  CACA_WHITE = 0x0f,
  CACA_DEFAULT = 0x10,
  CACA_TRANSPARENT = 0x20 }
- enum caca_style {
  CACA_BOLD = 0x01,
  CACA_ITALICS = 0x02,
  CACA_UNDERLINE = 0x04,
  CACA_BLINK = 0x08 }

2.1.1 Detailed Description

Colours and styles that can be used with caca_set_attr().

2.1.2 Enumeration Type Documentation

2.1.2.1 enum caca_color

libcaca colour keyword

Enumerator:

CACA_BLACK The colour index for black.

CACA_BLUE The colour index for blue.

CACA_GREEN The colour index for green.

CACA_CYAN The colour index for cyan.

CACA_RED The colour index for red.

CACA_MAGENTA The colour index for magenta.

CACA_BROWN The colour index for brown.

CACA_LIGHTGRAY The colour index for light gray.

CACA_DARKGRAY The colour index for dark gray.

CACA_LIGHTBLUE The colour index for blue.

CACA_LIGHTGREEN The colour index for light green.

CACA_LIGHTCYAN The colour index for light cyan.

CACA_LIGHTRED The colour index for light red.

CACA_LIGHTMAGENTA The colour index for light magenta.

CACA_YELLOW The colour index for yellow.

CACA_WHITE The colour index for white.

CACA_DEFAULT The output driver's default colour.

CACA_TRANSPARENT The transparent colour.

2.1.2.2 enum caca_style

libcaca style keyword

Enumerator:

CACA_BOLD The style mask for bold.

CACA_ITALICS The style mask for italics.

CACA_UNDERLINE The style mask for underline.

CACA_BLINK The style mask for blink.

2.2 libcaca basic functions

Functions

- __extern caca_canvas_t * caca_create_canvas (int, int)
  Initialise a libcaca *canvas.*
- __extern int caca_manage_canvas (caca_canvas_t *, int(*)(void *), void *)
  Manage a canvas.
- __extern int caca_unmanage_canvas (caca_canvas_t *, int(*)(void *), void *)
  unmanage a canvas.
- __extern int caca_set_canvas_size (caca_canvas_t *, int, int)
  Resize a canvas.
- __extern int caca_get_canvas_width (caca_canvas_t const *)
  Get the canvas width.
- __extern int caca_get_canvas_height (caca_canvas_t const *)
  Get the canvas height.
- __extern uint32_t const * caca_get_canvas_chars (caca_canvas_t const *)
  Get the canvas character array.
- __extern uint32_t const * caca_get_canvas_attrs (caca_canvas_t const *)
  Get the canvas attribute array.
- __extern int caca_free_canvas (caca_canvas_t *)
  Free a libcaca *canvas.*
- __extern int caca_rand (int, int)
  Generate a random integer within a range.
- __extern char const * caca_get_version (void)
  Return the libcaca *version.*

2.2.1 Detailed Description

These functions provide the basic *libcaca* routines for library initialisation, system information retrieval and configuration.

2.2.2 Function Documentation

2.2.2.1 __extern caca_canvas_t* caca_create_canvas (int *width*, int *height*)

Initialise internal *libcaca* structures and the backend that will be used for subsequent graphical operations. It must be the first *libcaca* function to be called in a function. caca_free_canvas() should be called at the end of the program to free all allocated resources.

Both the cursor and the canvas' handle are initialised at the top-left corner.

If an error occurs, NULL is returned and **errno** is set accordingly:

- `EINVAL` Specified width or height is invalid.
- `ENOMEM` Not enough memory for the requested canvas size.

Parameters:

width The desired canvas width

height The desired canvas height

Returns:

A libcaca canvas handle upon success, NULL if an error occurred.

References CACA_DEFAULT, caca_set_color_ansi(), and CACA_TRANSPARENT.

Referenced by caca_canvas_set_figfont(), caca_conio_movetext(), caca_create_display_with_driver(), caca_export_area_to_memory(), caca_import_area_from_file(), caca_import_area_from_memory(), and caca_set_canvas_boundaries().

2.2.2.2 __extern int caca_manage_canvas (caca_canvas_t * *cv*, int(*)(void *) *callback*, void * *p*)

Lock a canvas to prevent it from being resized. If non-NULL, the *callback* function pointer will be called upon each *caca_set_canvas_size* call and if the returned value is zero, the canvas resize request will be denied.

This function is only useful for display drivers such as the *libcaca* library.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EBUSY` The canvas is already being managed.

Parameters:

cv A libcaca canvas.

callback An optional callback function pointer.

p The argument to be passed to *callback*.

Returns:

0 in case of success, -1 if an error occurred.

Referenced by caca_create_display_with_driver().

2.2.2.3 __extern int caca_unmanage_canvas (caca_canvas_t * *cv*, int(*)(void *) *callback*, void * *p*)

unlock a canvas previously locked by caca_manage_canvas(). for safety reasons, the callback and callback data arguments must be the same as for the caca_manage_canvas() call.

this function is only useful for display drivers such as the *libcaca* library.

if an error occurs, -1 is returned and **errno** is set accordingly:

- `einval` the canvas is not managed, or the callback arguments do not match.

Parameters:

cv a libcaca canvas.

callback the *callback* argument previously passed to caca_manage_canvas().

p the *p* argument previously passed to caca_manage_canvas().

Returns:

0 in case of success, -1 if an error occurred.

Referenced by caca_create_display_with_driver(), and caca_free_display().

2.2.2.4 __extern int caca_set_canvas_size (caca_canvas_t * *cv*, int *width*, int *height*)

Set the canvas' width and height, in character cells.

The contents of the canvas are preserved to the extent of the new canvas size. Newly allocated character cells at the right and/or at the bottom of the canvas are filled with spaces.

If as a result of the resize the cursor coordinates fall outside the new canvas boundaries, they are readjusted. For instance, if the current X cursor coordinate is 11 and the requested width is 10, the new X cursor coordinate will be 10.

It is an error to try to resize the canvas if an output driver has been attached to the canvas using caca_create_display(). You need to remove the output driver using caca_free_display() before you can change the canvas size again. However, the caca output driver can cause a canvas resize through user interaction. See the caca_event() documentation for more about this.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Specified width or height is invalid.
- `EBUSY` The canvas is in use by a display driver and cannot be resized.
- `ENOMEM` Not enough memory for the requested canvas size. If this happens, the canvas handle becomes invalid and should not be used.

Parameters:

cv A libcaca canvas.

width The desired canvas width.

height The desired canvas height.

Returns:

0 in case of success, -1 if an error occurred.

Referenced by caca_canvas_set_figfont(), caca_flush_figlet(), and caca_put_figchar().

2.2.2.5 __extern int caca_get_canvas_width (caca_canvas_t const * *cv*)

Return the current canvas' width, in character cells.

This function never fails.

Parameters:

cv A libcaca canvas.

Returns:

The canvas width.

Referenced by caca_conio_clreol(), caca_conio_movetext(), and caca_get_mouse_x().

2.2.2.6 __extern int caca_get_canvas_height (caca_canvas_t const * *cv*)

Returns the current canvas' height, in character cells.

This function never fails.

Parameters:

cv A libcaca canvas.

Returns:

The canvas height.

Referenced by caca_flush_figlet(), and caca_get_mouse_y().

2.2.2.7 __extern uint32_t const* caca_get_canvas_chars (caca_canvas_t const * *cv*)

Return the current canvas' internal character array. The array elements consist in native endian 32-bit Unicode values as returned by caca_get_char().

This function is probably only useful for *libcaca* 's internal display drivers.

This function never fails.

Parameters:

cv A libcaca canvas.

Returns:

The canvas character array.

2.2.2.8 __extern uint32_t const* caca_get_canvas_attrs (caca_canvas_t const * *cv*)

Returns the current canvas' internal attribute array. The array elements consist in native endian 32-bit attribute values as returned by caca_get_attr().

This function is probably only useful for *libcaca* 's internal display drivers.

This function never fails.

Parameters:

cv A libcaca canvas.

Returns:

The canvas attribute array.

2.2.2.9 __extern int caca_free_canvas (caca_canvas_t * *cv*)

Free all resources allocated by caca_create_canvas(). The canvas pointer becomes invalid and must no longer be used unless a new call to caca_create_canvas() is made.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EBUSY` The canvas is in use by a display driver and cannot be freed.

Parameters:

cv A libcaca canvas.

Returns:

0 in case of success, -1 if an error occurred.

References caca_canvas_set_figfont().

Referenced by caca_canvas_set_figfont(), caca_create_display_with_driver(), caca_export_area_to_-memory(), caca_free_display(), caca_import_area_from_file(), and caca_import_area_from_memory().

2.2.2.10 __extern int caca_rand (int *min*, int *max*)

Generate a random integer within the given range.

This function never fails.

Parameters:

min The lower bound of the integer range.

max The upper bound of the integer range.

Returns:

A random integer comprised between `min` and `max` - 1 (inclusive).

2.2.2.11 __extern char const* caca_get_version (void)

Return a read-only string with the *libcaca* version information.

This function never fails.

Returns:

The *libcaca* version information.

2.3 libcaca canvas drawing

Defines

- #define CACA_MAGIC_FULLWIDTH 0x000ffffe

Functions

- __extern int caca_gotoxy (caca_canvas_t *, int, int)
  Set cursor position.
- __extern int caca_wherex (caca_canvas_t const *)
  Get X cursor position.
- __extern int caca_wherey (caca_canvas_t const *)
  Get Y cursor position.
- __extern int caca_put_char (caca_canvas_t *, int, int, uint32_t)
  Print an ASCII or Unicode character.
- __extern uint32_t caca_get_char (caca_canvas_t const *, int, int)
  Get the Unicode character at the given coordinates.
- __extern int caca_put_str (caca_canvas_t *, int, int, char const *)
  Print a string.
- __extern int caca_printf (caca_canvas_t *, int, int, char const *,...)
  Print a formated string.
- __extern int caca_vprintf (caca_canvas_t *, int, int, char const *, va_list)
  Print a formated string (va_list version).
- __extern int caca_clear_canvas (caca_canvas_t *)
  Clear the canvas.
- __extern int caca_set_canvas_handle (caca_canvas_t *, int, int)
  Set cursor handle.
- __extern int caca_get_canvas_handle_x (caca_canvas_t const *)
  Get X handle position.
- __extern int caca_get_canvas_handle_y (caca_canvas_t const *)
  Get Y handle position.
- __extern int caca_blit (caca_canvas_t *, int, int, caca_canvas_t const *, caca_canvas_t const *)
  Blit a canvas onto another one.
- __extern int caca_set_canvas_boundaries (caca_canvas_t *, int, int, int, int)
  Set a canvas' new boundaries.

2.3.1 Detailed Description

These functions provide low-level character printing routines and higher level graphics functions.

2.3.2 Define Documentation

2.3.2.1 #define CACA_MAGIC_FULLWIDTH 0x000ffffe

Used to indicate that the previous character was a fullwidth glyph.

Referenced by caca_blit(), caca_flip(), caca_put_attr(), caca_put_char(), and caca_rotate_180().

2.3.3 Function Documentation

2.3.3.1 __extern int caca_gotoxy (caca_canvas_t * *cv*, int *x*, int *y*)

Put the cursor at the given coordinates. Functions making use of the cursor will use the new values. Setting the cursor position outside the canvas is legal but the cursor will not be shown.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

x X cursor coordinate.

y Y cursor coordinate.

Returns:

This function always returns 0.

Referenced by caca_conio_cgets(), caca_conio_clrscr(), caca_conio_cprintf(), caca_conio_cputs(), caca_conio_gotoxy(), caca_conio_printf(), and caca_conio_putch().

2.3.3.2 __extern int caca_wherex (caca_canvas_t const * *cv*)

Retrieve the X coordinate of the cursor's position.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

Returns:

The cursor's X coordinate.

Referenced by caca_conio_cgets(), caca_conio_clreol(), caca_conio_cprintf(), caca_conio_cputs(), caca_conio_printf(), caca_conio_putch(), and caca_conio_wherex().

2.3.3.3 __extern int caca_wherey (caca_canvas_t const * *cv*)

Retrieve the Y coordinate of the cursor's position.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

Returns:

The cursor's Y coordinate.

Referenced by caca_conio_cgets(), caca_conio_clreol(), caca_conio_cprintf(), caca_conio_cputs(), caca_conio_printf(), caca_conio_putch(), and caca_conio_wherey().

2.3.3.4 __extern int caca_put_char (caca_canvas_t * *cv*, int *x*, int *y*, uint32_t *ch*)

Print an ASCII or Unicode character at the given coordinates, using the default foreground and background colour values.

If the coordinates are outside the canvas boundaries, nothing is printed. If a fullwidth Unicode character gets overwritten, its remaining visible parts are replaced with spaces. If the canvas' boundaries would split the fullwidth character in two, a space is printed instead.

The behaviour when printing non-printable characters or invalid UTF-32 characters is undefined. To print a sequence of bytes forming an UTF-8 character instead of an UTF-32 character, use the caca_put_str() function.

This function returns the width of the printed character. If it is a fullwidth character, 2 is returned. Otherwise, 1 is returned.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

x X coordinate.

y Y coordinate.

ch The character to print.

Returns:

The width of the printed character: 2 for a fullwidth character, 1 otherwise.

References caca_add_dirty_rect(), CACA_MAGIC_FULLWIDTH, and caca_utf32_is_fullwidth().

Referenced by caca_conio_cgets(), caca_conio_cputs(), caca_conio_putch(), caca_dither_bitmap(), caca_fill_box(), caca_fill_triangle(), caca_flush_figlet(), caca_put_figchar(), and caca_put_str().

2.3.3.5 __extern uint32_t caca_get_char (caca_canvas_t const * *cv*, int *x*, int *y*)

Get the ASCII or Unicode value of the character at the given coordinates. If the value is less or equal to 127 (0x7f), the character can be printed as ASCII. Otherise, it must be handled as a UTF-32 value.

If the coordinates are outside the canvas boundaries, a space (0x20) is returned.

A special exception is when CACA_MAGIC_FULLWIDTH is returned. This value is guaranteed not to be a valid Unicode character, and indicates that the character at the left of the requested one is a fullwidth character.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

x X coordinate.

y Y coordinate.

Returns:

The Unicode character at the given coordinates.

Referenced by caca_flush_figlet(), and caca_put_figchar().

2.3.3.6 __extern int caca_put_str (caca_canvas_t * *cv*, int *x*, int *y*, char const * *s*)

Print an UTF-8 string at the given coordinates, using the default foreground and background values. The coordinates may be outside the canvas boundaries (eg. a negative Y coordinate) and the string will be cropped accordingly if it is too long.

See caca_put_char() for more information on how fullwidth characters are handled when overwriting each other or at the canvas' boundaries.

This function returns the number of cells printed by the string. It is not the number of characters printed, because fullwidth characters account for two cells.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

x X coordinate.

y Y coordinate.

s The string to print.

Returns:

The number of cells printed.

References caca_put_char(), caca_utf32_is_fullwidth(), and caca_utf8_to_utf32().

Referenced by caca_vprintf().

2.3.3.7 __extern int caca_printf (caca_canvas_t * *cv*, int *x*, int *y*, char const * *format*, ...)

Format a string at the given coordinates, using the default foreground and background values. The coordinates may be outside the canvas boundaries (eg. a negative Y coordinate) and the string will be cropped accordingly if it is too long. The syntax of the format string is the same as for the C printf() function.

This function returns the number of cells printed by the string. It is not the number of characters printed, because fullwidth characters account for two cells.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

x X coordinate.

y Y coordinate.

format The format string to print.

... Arguments to the format string.

Returns:

The number of cells printed.

References caca_vprintf().

2.3.3.8 __extern int caca_vprintf (caca_canvas_t * *cv*, int *x*, int *y*, char const * *format*, va_list *args*)

Format a string at the given coordinates, using the default foreground and background values. The coordinates may be outside the canvas boundaries (eg. a negative Y coordinate) and the string will be cropped accordingly if it is too long. The syntax of the format string is the same as for the C vprintf() function.

This function returns the number of cells printed by the string. It is not the number of characters printed, because fullwidth characters account for two cells.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

x X coordinate.

y Y coordinate.

format The format string to print.

args A va_list containting the arguments to the format string.

Returns:

The number of cells printed.

References caca_put_str().

Referenced by caca_conio_cprintf(), caca_conio_printf(), and caca_printf().

2.3.3.9 __extern int caca_clear_canvas (caca_canvas_t * *cv*)

Clear the canvas using the current foreground and background colours.

This function never fails.

Parameters:

cv The canvas to clear.

Returns:

This function always returns 0.

References caca_add_dirty_rect().

Referenced by caca_conio_clrscr().

2.3.3.10 __extern int caca_set_canvas_handle (caca_canvas_t * *cv*, int *x*, int *y*)

Set the canvas' handle. Blitting functions will use the handle value to put the canvas at the proper coordinates.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

x X handle coordinate.

y Y handle coordinate.

Returns:

This function always returns 0.

Referenced by caca_put_figchar().

2.3.3.11 __extern int caca_get_canvas_handle_x (caca_canvas_t const * *cv*)

Retrieve the X coordinate of the canvas' handle.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

Returns:

The canvas' handle's X coordinate.

2.3.3.12 __extern int caca_get_canvas_handle_y (caca_canvas_t const * *cv*)

Retrieve the Y coordinate of the canvas' handle.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

Returns:

The canvas' handle's Y coordinate.

2.3.3.13 __extern int caca_blit (caca_canvas_t * *dst*, int *x*, int *y*, caca_canvas_t const * *src*, caca_canvas_t const * *mask*)

Blit a canvas onto another one at the given coordinates. An optional mask canvas can be used.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` A mask was specified but the mask size and source canvas size do not match.

Parameters:

dst The destination canvas.

x X coordinate.

y Y coordinate.

src The source canvas.

mask The mask canvas.

Returns:

0 in case of success, -1 if an error occurred.

References caca_add_dirty_rect(), and CACA_MAGIC_FULLWIDTH.

Referenced by caca_conio_movetext(), caca_export_area_to_memory(), caca_import_area_from_file(), caca_import_area_from_memory(), caca_put_figchar(), and caca_set_canvas_boundaries().

2.3.3.14 __extern int caca_set_canvas_boundaries (caca_canvas_t * *cv*, int *x*, int *y*, int *w*, int *h*)

Set new boundaries for a canvas. This function can be used to crop a canvas, to expand it or for combinations of both actions. All frames are affected by this function.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Specified width or height is invalid.
- `EBUSY` The canvas is in use by a display driver and cannot be resized.
- `ENOMEM` Not enough memory for the requested canvas size. If this happens, the canvas handle becomes invalid and should not be used.

Parameters:

cv The canvas to crop.

x X coordinate of the top-left corner.

y Y coordinate of the top-left corner.

w The width of the cropped area.

h The height of the cropped area.

Returns:

0 in case of success, -1 if an error occurred.

References caca_add_dirty_rect(), caca_blit(), caca_create_canvas(), caca_create_frame(), caca_get_frame_count(), and caca_set_frame().

2.4 libcaca dirty rectangle manipulation

Functions

- __extern int caca_disable_dirty_rect (caca_canvas_t *)
  Disable dirty rectangles.
- __extern int caca_enable_dirty_rect (caca_canvas_t *)
  Enable dirty rectangles.
- __extern int caca_get_dirty_rect_count (caca_canvas_t *)
  Get the number of dirty rectangles in the canvas.
- __extern int caca_get_dirty_rect (caca_canvas_t *, int, int *, int *, int *, int *)

Get a canvas's dirty rectangle.

- __extern int caca_add_dirty_rect (caca_canvas_t *, int, int, int, int)

  Add an area to the canvas's dirty rectangle list.

- __extern int caca_remove_dirty_rect (caca_canvas_t *, int, int, int, int)

  Remove an area from the dirty rectangle list.

- __extern int caca_clear_dirty_rect_list (caca_canvas_t *)

  Clear a canvas's dirty rectangle list.

2.4.1 Detailed Description

These functions manipulate dirty rectangles for optimised blitting.

2.4.2 Function Documentation

2.4.2.1 __extern int caca_disable_dirty_rect (caca_canvas_t * *cv*)

Disable dirty rectangle handling for all *libcaca* graphic calls. This is handy when the calling application needs to do slow operations within a known area. Just call caca_add_dirty_rect() afterwards.

This function is recursive. Dirty rectangles are only reenabled when caca_enable_dirty_rect() is called as many times.

This function never fails.

Parameters:

cv A libcaca canvas.

Returns:

This function always returns 0.

2.4.2.2 __extern int caca_enable_dirty_rect (caca_canvas_t * *cv*)

This function can only be called after caca_disable_dirty_rect() was called.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Dirty rectangles were not disabled.

Parameters:

cv A libcaca canvas.

Returns:

0 in case of success, -1 if an error occurred.

2.4.2.3 __extern int caca_get_dirty_rect_count (caca_canvas_t * *cv*)

Get the number of dirty rectangles in a canvas. Dirty rectangles are areas that contain cells that have changed since the last reset.

The dirty rectangles are used internally by display drivers to optimise rendering by avoiding to redraw the whole screen. Once the display driver has rendered the canvas, it resets the dirty rectangle list.

Dirty rectangles are guaranteed not to overlap.

This function never fails.

Parameters:

cv A libcaca canvas.

Returns:

The number of dirty rectangles in the given canvas.

2.4.2.4 __extern int caca_get_dirty_rect (caca_canvas_t * *cv*, int *r*, int * *x*, int * *y*, int * *width*, int * *height*)

Get the canvas's given dirty rectangle coordinates. The index must be within the dirty rectangle count. See caca_get_dirty_rect_count() for how to compute this count.

If an error occurs, no coordinates are written in the pointer arguments, -1 is returned and **errno** is set accordingly:

- `EINVAL` Specified rectangle index is out of bounds.

Parameters:

cv A libcaca canvas.

r The requested rectangle index.

x A pointer to an integer where the leftmost edge of the dirty rectangle will be stored.

y A pointer to an integer where the topmost edge of the dirty rectangle will be stored.

width A pointer to an integer where the width of the dirty rectangle will be stored.

height A pointer to an integer where the height of the dirty rectangle will be stored.

Returns:

0 in case of success, -1 if an error occurred.

2.4.2.5 __extern int caca_add_dirty_rect (caca_canvas_t * *cv*, int *x*, int *y*, int *width*, int *height*)

Add an invalidating zone to the canvas's dirty rectangle list. For more information about the dirty rectangles, see caca_get_dirty_rect().

This function may be useful to force refresh of a given zone of the canvas even if the dirty rectangle tracking indicates that it is unchanged. This may happen if the canvas contents were somewhat directly modified.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Specified rectangle coordinates are out of bounds.

Parameters:

cv A libcaca canvas.

x The leftmost edge of the additional dirty rectangle.

y The topmost edge of the additional dirty rectangle.

width The width of the additional dirty rectangle.

height The height of the additional dirty rectangle.

Returns:

0 in case of success, -1 if an error occurred.

Referenced by caca_blit(), caca_clear_canvas(), caca_fill_box(), caca_flip(), caca_flop(), caca_free_frame(), caca_invert(), caca_put_attr(), caca_put_char(), caca_rotate_180(), caca_rotate_left(), caca_rotate_right(), caca_set_canvas_boundaries(), caca_set_frame(), caca_stretch_left(), and caca_stretch_right().

2.4.2.6 __extern int caca_remove_dirty_rect (caca_canvas_t * *cv*, int *x*, int *y*, int *width*, int *height*)

Mark a cell area in the canvas as not dirty. For more information about the dirty rectangles, see caca_get_dirty_rect().

Values such that **xmin** > **xmax** or **ymin** > **ymax** indicate that the dirty rectangle is empty. They will be silently ignored.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Specified rectangle coordinates are out of bounds.

Parameters:

cv A libcaca canvas.

x The leftmost edge of the clean rectangle.

y The topmost edge of the clean rectangle.

width The width of the clean rectangle.

height The height of the clean rectangle.

Returns:

0 in case of success, -1 if an error occurred.

2.4.2.7 __extern int caca_clear_dirty_rect_list (caca_canvas_t * *cv*)

Empty the canvas's dirty rectangle list.

This function never fails.

Parameters:

cv A libcaca canvas.

Returns:

This function always returns 0.

Referenced by caca_refresh_display().

2.5 libcaca canvas transformation

Functions

- __extern int caca_invert (caca_canvas_t *)
  Invert a canvas' colours.
- __extern int caca_flip (caca_canvas_t *)
  Flip a canvas horizontally.
- __extern int caca_flop (caca_canvas_t *)
  Flip a canvas vertically.
- __extern int caca_rotate_180 (caca_canvas_t *)
  Rotate a canvas.
- __extern int caca_rotate_left (caca_canvas_t *)
  Rotate a canvas, 90 degrees counterclockwise.
- __extern int caca_rotate_right (caca_canvas_t *)
  Rotate a canvas, 90 degrees counterclockwise.
- __extern int caca_stretch_left (caca_canvas_t *)
  Rotate and stretch a canvas, 90 degrees counterclockwise.
- __extern int caca_stretch_right (caca_canvas_t *)
  Rotate and stretch a canvas, 90 degrees clockwise.

2.5.1 Detailed Description

These functions perform horizontal and vertical canvas flipping.

2.5.2 Function Documentation

2.5.2.1 __extern int caca_invert (caca_canvas_t * *cv*)

Invert a canvas' colours (black becomes white, red becomes cyan, etc.) without changing the characters in it.

This function never fails.

Parameters:

cv The canvas to invert.

Returns:

This function always returns 0.

References caca_add_dirty_rect().

2.5.2.2 __extern int caca_flip (caca_canvas_t * *cv*)

Flip a canvas horizontally, choosing characters that look like the mirrored version wherever possible. Some characters will stay unchanged by the process, but the operation is guaranteed to be involutive: performing it again gives back the original canvas.

This function never fails.

Parameters:

cv The canvas to flip.

Returns:

This function always returns 0.

References caca_add_dirty_rect(), and CACA_MAGIC_FULLWIDTH.

2.5.2.3 __extern int caca_flop (caca_canvas_t * *cv*)

Flip a canvas vertically, choosing characters that look like the mirrored version wherever possible. Some characters will stay unchanged by the process, but the operation is guaranteed to be involutive: performing it again gives back the original canvas.

This function never fails.

Parameters:

cv The canvas to flop.

Returns:

This function always returns 0.

References caca_add_dirty_rect().

2.5.2.4 __extern int caca_rotate_180 (caca_canvas_t * *cv*)

Apply a 180-degree transformation to a canvas, choosing characters that look like the upside-down version wherever possible. Some characters will stay unchanged by the process, but the operation is guaranteed to be involutive: performing it again gives back the original canvas.

This function never fails.

Parameters:

cv The canvas to rotate.

Returns:

This function always returns 0.

References caca_add_dirty_rect(), and CACA_MAGIC_FULLWIDTH.

2.5.2.5 __extern int caca_rotate_left (caca_canvas_t * *cv*)

Apply a 90-degree transformation to a canvas, choosing characters that look like the rotated version wherever possible. Characters cells are rotated two-by-two. Some characters will stay unchanged by the process,

some others will be replaced by close equivalents. Fullwidth characters at odd horizontal coordinates will be lost. The operation is not guaranteed to be reversible at all.

Note that the width of the canvas is divided by two and becomes the new height. Height is multiplied by two and becomes the new width. If the original width is an odd number, the division is rounded up.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EBUSY` The canvas is in use by a display driver and cannot be rotated.
- `ENOMEM` Not enough memory to allocate the new canvas size. If this happens, the previous canvas handle is still valid.

Parameters:

cv The canvas to rotate left.

Returns:

0 in case of success, -1 if an error occurred.

References caca_add_dirty_rect().

2.5.2.6 __extern int caca_rotate_right (caca_canvas_t * *cv*)

Apply a 90-degree transformation to a canvas, choosing characters that look like the rotated version wherever possible. Characters cells are rotated two-by-two. Some characters will stay unchanged by the process, some others will be replaced by close equivalents. Fullwidth characters at odd horizontal coordinates will be lost. The operation is not guaranteed to be reversible at all.

Note that the width of the canvas is divided by two and becomes the new height. Height is multiplied by two and becomes the new width. If the original width is an odd number, the division is rounded up.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EBUSY` The canvas is in use by a display driver and cannot be rotated.
- `ENOMEM` Not enough memory to allocate the new canvas size. If this happens, the previous canvas handle is still valid.

Parameters:

cv The canvas to rotate right.

Returns:

0 in case of success, -1 if an error occurred.

References caca_add_dirty_rect().

2.5.2.7 __extern int caca_stretch_left (caca_canvas_t * *cv*)

Apply a 90-degree transformation to a canvas, choosing characters that look like the rotated version wherever possible. Some characters will stay unchanged by the process, some others will be replaced by close equivalents. Fullwidth characters will be lost. The operation is not guaranteed to be reversible at all.

Note that the width and height of the canvas are swapped, causing its aspect ratio to look stretched.

If an error occurs, -1 is returned and **errno** is set accordingly:

- EBUSY The canvas is in use by a display driver and cannot be rotated.
- ENOMEM Not enough memory to allocate the new canvas size. If this happens, the previous canvas handle is still valid.

Parameters:

cv The canvas to rotate left.

Returns:

0 in case of success, -1 if an error occurred.

References caca_add_dirty_rect().

2.5.2.8 __extern int caca_stretch_right (caca_canvas_t * *cv*)

Apply a 270-degree transformation to a canvas, choosing characters that look like the rotated version wherever possible. Some characters will stay unchanged by the process, some others will be replaced by close equivalents. Fullwidth characters will be lost. The operation is not guaranteed to be reversible at all.

Note that the width and height of the canvas are swapped, causing its aspect ratio to look stretched.

If an error occurs, -1 is returned and **errno** is set accordingly:

- EBUSY The canvas is in use by a display driver and cannot be rotated.
- ENOMEM Not enough memory to allocate the new canvas size. If this happens, the previous canvas handle is still valid.

Parameters:

cv The canvas to rotate right.

Returns:

0 in case of success, -1 if an error occurred.

References caca_add_dirty_rect().

2.6 libcaca attribute conversions

Functions

- __extern uint32_t caca_get_attr (caca_canvas_t const *, int, int)

  Get the text attribute at the given coordinates.

- __extern int caca_set_attr (caca_canvas_t *, uint32_t)

  Set the default character attribute.

- __extern int caca_unset_attr (caca_canvas_t *, uint32_t)

  Unset flags in the default character attribute.

- __extern int caca_toggle_attr (caca_canvas_t *, uint32_t)

  Toggle flags in the default character attribute.

- __extern int caca_put_attr (caca_canvas_t *, int, int, uint32_t)
  Set the character attribute at the given coordinates.
- __extern int caca_set_color_ansi (caca_canvas_t *, uint8_t, uint8_t)
  Set the default colour pair for text (ANSI version).
- __extern int caca_set_color_argb (caca_canvas_t *, uint16_t, uint16_t)
  Set the default colour pair for text (truecolor version).
- __extern uint8_t caca_attr_to_ansi (uint32_t)
  Get DOS ANSI information from attribute.
- __extern uint8_t caca_attr_to_ansi_fg (uint32_t)
  Get ANSI foreground information from attribute.
- __extern uint8_t caca_attr_to_ansi_bg (uint32_t)
  Get ANSI background information from attribute.
- __extern uint16_t caca_attr_to_rgb12_fg (uint32_t)
  Get 12-bit RGB foreground information from attribute.
- __extern uint16_t caca_attr_to_rgb12_bg (uint32_t)
  Get 12-bit RGB background information from attribute.
- __extern void caca_attr_to_argb64 (uint32_t, uint8_t[8])
  Get 64-bit ARGB information from attribute.

2.6.1 Detailed Description

These functions perform conversions between attribute values.

2.6.2 Function Documentation

2.6.2.1 __extern uint32_t caca_get_attr (caca_canvas_t const * *cv*, int *x*, int *y*)

Get the internal *libcaca* attribute value of the character at the given coordinates. The attribute value has 32 significant bits, organised as follows from MSB to LSB:

- 3 bits for the background alpha
- 4 bits for the background red component
- 4 bits for the background green component
- 3 bits for the background blue component
- 3 bits for the foreground alpha
- 4 bits for the foreground red component
- 4 bits for the foreground green component

- 3 bits for the foreground blue component
- 4 bits for the bold, italics, underline and blink flags

If the coordinates are outside the canvas boundaries, the current attribute is returned.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

x X coordinate.

y Y coordinate.

Returns:

The requested attribute.

Referenced by caca_conio_textbackground(), caca_conio_textcolor(), caca_dither_bitmap(), caca_flush_figlet(), and caca_put_figchar().

2.6.2.2 __extern int caca_set_attr (caca_canvas_t * *cv*, uint32_t *attr*)

Set the default character attribute for drawing. Attributes define foreground and background colour, transparency, bold, italics and underline styles, as well as blink. String functions such as caca_printf() and graphical primitive functions such as caca_draw_line() will use this attribute.

The value of *attr* is either:

- a 32-bit integer as returned by caca_get_attr(), in which case it also contains colour information,
- a combination (bitwise OR) of style values (*CACA_UNDERLINE*, *CACA_BLINK*, *CACA_BOLD* and *CACA_ITALICS*), in which case setting the attribute does not modify the current colour information.

To retrieve the current attribute value, use caca_get_attr(-1,-1).

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

attr The requested attribute value.

Returns:

This function always returns 0.

Referenced by caca_dither_bitmap(), and caca_put_figchar().

2.6.2.3 __extern int caca_unset_attr (caca_canvas_t * *cv*, uint32_t *attr*)

Unset flags in the default character attribute for drawing. Attributes define foreground and background colour, transparency, bold, italics and underline styles, as well as blink. String functions such as caca_printf() and graphical primitive functions such as caca_draw_line() will use this attribute.

The value of *attr* is a combination (bitwise OR) of style values (*CACA_UNDERLINE*, *CACA_BLINK*, *CACA_BOLD* and *CACA_ITALICS*). Unsetting these attributes does not modify the current colour information.

To retrieve the current attribute value, use caca_get_attr(-1,-1).

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

attr The requested attribute values to unset.

Returns:

This function always returns 0.

2.6.2.4 __extern int caca_toggle_attr (caca_canvas_t * *cv*, uint32_t *attr*)

Toggle flags in the default character attribute for drawing. Attributes define foreground and background colour, transparency, bold, italics and underline styles, as well as blink. String functions such as caca_printf() and graphical primitive functions such as caca_draw_line() will use this attribute.

The value of *attr* is a combination (bitwise OR) of style values (*CACA_UNDERLINE*, *CACA_BLINK*, *CACA_BOLD* and *CACA_ITALICS*). Toggling these attributes does not modify the current colour information.

To retrieve the current attribute value, use caca_get_attr(-1,-1).

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

attr The requested attribute values to toggle.

Returns:

This function always returns 0.

2.6.2.5 __extern int caca_put_attr (caca_canvas_t * *cv*, int *x*, int *y*, uint32_t *attr*)

Set the character attribute, without changing the character's value. If the character at the given coordinates is a fullwidth character, both cells' attributes are replaced.

The value of *attr* is either:

- a 32-bit integer as returned by caca_get_attr(), in which case it also contains colour information,
- a combination (bitwise OR) of style values (*CACA_UNDERLINE*, *CACA_BLINK*, *CACA_BOLD* and *CACA_ITALICS*), in which case setting the attribute does not modify the current colour information.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

x X coordinate.

y Y coordinate.

attr The requested attribute value.

Returns:

This function always returns 0.

References caca_add_dirty_rect(), and CACA_MAGIC_FULLWIDTH.

Referenced by caca_flush_figlet(), and caca_put_figchar().

2.6.2.6 __extern int caca_set_color_ansi (caca_canvas_t * *cv*, uint8_t *fg*, uint8_t *bg*)

Set the default ANSI colour pair for text drawing. String functions such as caca_printf() and graphical primitive functions such as caca_draw_line() will use these attributes.

Color values are those defined in caca.h, such as CACA_RED or CACA_TRANSPARENT.

If an error occurs, 0 is returned and **errno** is set accordingly:

- `EINVAL` At least one of the colour values is invalid.

Parameters:

cv A handle to the libcaca canvas.

fg The requested ANSI foreground colour.

bg The requested ANSI background colour.

Returns:

0 in case of success, -1 if an error occurred.

Referenced by caca_conio_textbackground(), caca_conio_textcolor(), caca_create_canvas(), and caca_dither_bitmap().

2.6.2.7 __extern int caca_set_color_argb (caca_canvas_t * *cv*, uint16_t *fg*, uint16_t *bg*)

Set the default ARGB colour pair for text drawing. String functions such as caca_printf() and graphical primitive functions such as caca_draw_line() will use these attributes.

Colors are 16-bit ARGB values, each component being coded on 4 bits. For instance, 0xf088 is solid dark cyan (A=15 R=0 G=8 B=8), and 0x8fff is white with 50% alpha (A=8 R=15 G=15 B=15).

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

fg The requested ARGB foreground colour.

bg The requested ARGB background colour.

Returns:

This function always returns 0.

2.6.2.8 __extern uint8_t caca_attr_to_ansi (uint32_t *attr*)

Get the ANSI colour pair for a given attribute. The returned value is an 8-bit value whose higher 4 bits are the background colour and lower 4 bits are the foreground colour.

If the attribute has ARGB colours, the nearest colour is used. Special attributes such as *CACA_DEFAULT* and *CACA_TRANSPARENT* are not handled and are both replaced with *CACA_LIGHTGRAY* for the foreground colour and *CACA_BLACK* for the background colour.

This function never fails. If the attribute value is outside the expected 32-bit range, higher order bits are simply ignored.

Parameters:

attr The requested attribute value.

Returns:

The corresponding DOS ANSI value.

References CACA_BLACK, and CACA_LIGHTGRAY.

2.6.2.9 __extern uint8_t caca_attr_to_ansi_fg (uint32_t *attr*)

Get the ANSI foreground colour value for a given attribute. The returned value is either one of the *CACA_RED*, *CACA_BLACK* etc. predefined colours, or the special value *CACA_DEFAULT* meaning the media's default foreground value, or the special value *CACA_TRANSPARENT*.

If the attribute has ARGB colours, the nearest colour is returned.

This function never fails. If the attribute value is outside the expected 32-bit range, higher order bits are simply ignored.

Parameters:

attr The requested attribute value.

Returns:

The corresponding ANSI foreground value.

Referenced by caca_conio_textbackground().

2.6.2.10 __extern uint8_t caca_attr_to_ansi_bg (uint32_t *attr*)

Get the ANSI background colour value for a given attribute. The returned value is either one of the *CACA_RED*, *CACA_BLACK* etc. predefined colours, or the special value *CACA_DEFAULT* meaning the media's default background value, or the special value *CACA_TRANSPARENT*.

If the attribute has ARGB colours, the nearest colour is returned.

This function never fails. If the attribute value is outside the expected 32-bit range, higher order bits are simply ignored.

Parameters:

attr The requested attribute value.

Returns:

The corresponding ANSI background value.

Referenced by caca_conio_textcolor().

2.6.2.11 __extern uint16_t caca_attr_to_rgb12_fg (uint32_t *attr*)

Get the 12-bit foreground colour value for a given attribute. The returned value is a native-endian encoded integer with each red, green and blue values encoded on 8 bits in the following order:

- 8-11 most significant bits: red
- 4-7 most significant bits: green
- least significant bits: blue

This function never fails. If the attribute value is outside the expected 32-bit range, higher order bits are simply ignored.

Parameters:

attr The requested attribute value.

Returns:

The corresponding 12-bit RGB foreground value.

References CACA_DEFAULT, CACA_LIGHTGRAY, and CACA_TRANSPARENT.

2.6.2.12 __extern uint16_t caca_attr_to_rgb12_bg (uint32_t *attr*)

Get the 12-bit background colour value for a given attribute. The returned value is a native-endian encoded integer with each red, green and blue values encoded on 8 bits in the following order:

- 8-11 most significant bits: red
- 4-7 most significant bits: green
- least significant bits: blue

This function never fails. If the attribute value is outside the expected 32-bit range, higher order bits are simply ignored.

Parameters:

attr The requested attribute value.

Returns:

The corresponding 12-bit RGB background value.

References CACA_BLACK, CACA_DEFAULT, and CACA_TRANSPARENT.

2.6.2.13 __extern void caca_attr_to_argb64 (uint32_t *attr*, uint8_t *argb*[8])

Get the 64-bit colour and alpha values for a given attribute. The values are written as 8-bit integers in the *argb* array in the following order:

- *argb*[0]: background alpha value
- *argb*[1]: background red value
- *argb*[2]: background green value
- *argb*[3]: background blue value
- *argb*[4]: foreground alpha value
- *argb*[5]: foreground red value
- *argb*[6]: foreground green value
- *argb*[7]: foreground blue value

This function never fails. If the attribute value is outside the expected 32-bit range, higher order bits are simply ignored.

Parameters:

attr The requested attribute value.

argb An array of 8-bit integers.

References CACA_BLACK, CACA_DEFAULT, CACA_LIGHTGRAY, and CACA_TRANSPARENT.

Referenced by caca_render_canvas().

2.7 libcaca character set conversions

Functions

- __extern uint32_t caca_utf8_to_utf32 (char const *, size_t *)
  Convert a UTF-8 character to UTF-32.
- __extern size_t caca_utf32_to_utf8 (char *, uint32_t)
  Convert a UTF-32 character to UTF-8.
- __extern uint8_t caca_utf32_to_cp437 (uint32_t)
  Convert a UTF-32 character to CP437.
- __extern uint32_t caca_cp437_to_utf32 (uint8_t)
  Convert a CP437 character to UTF-32.
- __extern char caca_utf32_to_ascii (uint32_t)
  Convert a UTF-32 character to ASCII.
- __extern int caca_utf32_is_fullwidth (uint32_t)
  Tell whether a UTF-32 character is fullwidth.

2.7.1 Detailed Description

These functions perform conversions between usual character sets.

2.7.2 Function Documentation

2.7.2.1 __extern uint32_t caca_utf8_to_utf32 (char const * *s*, size_t * *bytes*)

Convert a UTF-8 character read from a string and return its value in the UTF-32 character set. If the second argument is not null, the total number of read bytes is written in it.

If a null byte was reached before the expected end of the UTF-8 sequence, this function returns zero and the number of read bytes is set to zero.

This function never fails, but its behaviour with illegal UTF-8 sequences is undefined.

Parameters:

s A string containing the UTF-8 character.

bytes A pointer to a size_t to store the number of bytes in the character, or NULL.

Returns:

The corresponding UTF-32 character, or zero if the character is incomplete.

Referenced by caca_put_str().

2.7.2.2 __extern size_t caca_utf32_to_utf8 (char * *buf*, uint32_t *ch*)

Convert a UTF-32 character read from a string and write its value in the UTF-8 character set into the given buffer.

This function never fails, but its behaviour with illegal UTF-32 characters is undefined.

Parameters:

buf A pointer to a character buffer where the UTF-8 sequence will be written.

ch The UTF-32 character.

Returns:

The number of bytes written.

2.7.2.3 __extern uint8_t caca_utf32_to_cp437 (uint32_t *ch*)

Convert a UTF-32 character read from a string and return its value in the CP437 character set, or "?" if the character has no equivalent.

This function never fails.

Parameters:

ch The UTF-32 character.

Returns:

The corresponding CP437 character, or "?" if not representable.

2.7.2.4 __extern uint32_t caca_cp437_to_utf32 (uint8_t *ch*)

Convert a CP437 character read from a string and return its value in the UTF-32 character set, or zero if the character is a CP437 control character.

This function never fails.

Parameters:

ch The CP437 character.

Returns:

The corresponding UTF-32 character, or zero if not representable.

2.7.2.5 __extern char caca_utf32_to_ascii (uint32_t *ch*)

Convert a UTF-32 character into an ASCII character. When no equivalent exists, a graphically close equivalent is sought.

This function never fails, but its behaviour with illegal UTF-32 characters is undefined.

Parameters:

ch The UTF-32 character.

Returns:

The corresponding ASCII character, or a graphically close equivalent if found, or "?" if not representable.

2.7.2.6 __extern int caca_utf32_is_fullwidth (uint32_t *ch*)

Check whether the given UTF-32 character should be printed at twice the normal width (fullwidth characters). If the character is unknown or if its status cannot be decided, it is treated as a standard-width character.

This function never fails.

Parameters:

ch The UTF-32 character.

Returns:

1 if the character is fullwidth, 0 otherwise.

Referenced by caca_put_char(), and caca_put_str().

2.8 libcaca primitives drawing

Functions

- __extern int caca_draw_line (caca_canvas_t *, int, int, int, int, uint32_t)

  Draw a line on the canvas using the given character.

- __extern int caca_draw_polyline (caca_canvas_t *, int const x[ ], int const y[ ], int, uint32_t)
  Draw a polyline.
- __extern int caca_draw_thin_line (caca_canvas_t *, int, int, int, int)
  Draw a thin line on the canvas, using ASCII art.
- __extern int caca_draw_thin_polyline (caca_canvas_t *, int const x[ ], int const y[ ], int)
  Draw an ASCII art thin polyline.
- __extern int caca_draw_circle (caca_canvas_t *, int, int, int, uint32_t)
  Draw a circle on the canvas using the given character.
- __extern int caca_draw_ellipse (caca_canvas_t *, int, int, int, int, uint32_t)
  Draw an ellipse on the canvas using the given character.
- __extern int caca_draw_thin_ellipse (caca_canvas_t *, int, int, int, int)
  Draw a thin ellipse on the canvas.
- __extern int caca_fill_ellipse (caca_canvas_t *, int, int, int, int, uint32_t)
  Fill an ellipse on the canvas using the given character.
- __extern int caca_draw_box (caca_canvas_t *, int, int, int, int, uint32_t)
  Draw a box on the canvas using the given character.
- __extern int caca_draw_thin_box (caca_canvas_t *, int, int, int, int)
  Draw a thin box on the canvas.
- __extern int caca_draw_cp437_box (caca_canvas_t *, int, int, int, int)
  Draw a box on the canvas using CP437 characters.
- __extern int caca_fill_box (caca_canvas_t *, int, int, int, int, uint32_t)
  Fill a box on the canvas using the given character.
- __extern int caca_draw_triangle (caca_canvas_t *, int, int, int, int, int, int, uint32_t)
  Draw a triangle on the canvas using the given character.
- __extern int caca_draw_thin_triangle (caca_canvas_t *, int, int, int, int, int, int)
  Draw a thin triangle on the canvas.
- __extern int caca_fill_triangle (caca_canvas_t *, int, int, int, int, int, int, uint32_t)
  Fill a triangle on the canvas using the given character.
- __extern int caca_fill_triangle_textured (caca_canvas_t *cv, int coords[6], caca_canvas_t *tex, float uv[6])
  Fill a triangle on the canvas using an arbitrary-sized texture.

2.8.1 Detailed Description

These functions provide routines for primitive drawing, such as lines, boxes, triangles and ellipses.

2.8.2 Function Documentation

2.8.2.1 __extern int caca_draw_line (caca_canvas_t * *cv*, int *x1*, int *y1*, int *x2*, int *y2*, uint32_t *ch*)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x1 X coordinate of the first point.

y1 Y coordinate of the first point.

x2 X coordinate of the second point.

y2 Y coordinate of the second point.

ch UTF-32 character to be used to draw the line.

Returns:

This function always returns 0.

Referenced by caca_draw_box(), caca_draw_triangle(), and caca_fill_ellipse().

2.8.2.2 __extern int caca_draw_polyline (caca_canvas_t * *cv*, int const *x*[ ], int const *y*[ ], int *n*, uint32_t *ch*)

Draw a polyline on the canvas using the given character and coordinate arrays. The first and last points are not connected, hence in order to draw a polygon you need to specify the starting point at the end of the list as well.

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x Array of X coordinates. Must have `n` + 1 elements.

y Array of Y coordinates. Must have `n` + 1 elements.

n Number of lines to draw.

ch UTF-32 character to be used to draw the lines.

Returns:

This function always returns 0.

2.8.2.3 __extern int caca_draw_thin_line (caca_canvas_t * *cv*, int *x1*, int *y1*, int *x2*, int *y2*)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x1 X coordinate of the first point.

y1 Y coordinate of the first point.

x2 X coordinate of the second point.

y2 Y coordinate of the second point.

Returns:

This function always returns 0.

Referenced by caca_draw_thin_triangle().

2.8.2.4 __extern int caca_draw_thin_polyline (caca_canvas_t * *cv*, int const *x*[ ], int const *y*[ ], int *n*)

Draw a thin polyline on the canvas using the given coordinate arrays and with ASCII art. The first and last points are not connected, so in order to draw a polygon you need to specify the starting point at the end of the list as well.

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x Array of X coordinates. Must have `n` + 1 elements.

y Array of Y coordinates. Must have `n` + 1 elements.

n Number of lines to draw.

Returns:

This function always returns 0.

2.8.2.5 __extern int caca_draw_circle (caca_canvas_t * *cv*, int *x*, int *y*, int *r*, uint32_t *ch*)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x Center X coordinate.

y Center Y coordinate.

r Circle radius.

ch UTF-32 character to be used to draw the circle outline.

Returns:

This function always returns 0.

2.8.2.6 __extern int caca_draw_ellipse (caca_canvas_t * *cv*, int *xo*, int *yo*, int *a*, int *b*, uint32_t *ch*)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

xo Center X coordinate.

yo Center Y coordinate.

a Ellipse X radius.

b Ellipse Y radius.

ch UTF-32 character to be used to draw the ellipse outline.

Returns:

This function always returns 0.

2.8.2.7 __extern int caca_draw_thin_ellipse (caca_canvas_t * *cv*, int *xo*, int *yo*, int *a*, int *b*)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

xo Center X coordinate.

yo Center Y coordinate.

a Ellipse X radius.

b Ellipse Y radius.

Returns:

This function always returns 0.

2.8.2.8 __extern int caca_fill_ellipse (caca_canvas_t * *cv*, int *xo*, int *yo*, int *a*, int *b*, uint32_t *ch*)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

xo Center X coordinate.

yo Center Y coordinate.

a Ellipse X radius.

b Ellipse Y radius.

ch UTF-32 character to be used to fill the ellipse.

Returns:

This function always returns 0.

References caca_draw_line().

2.8.2.9 __extern int caca_draw_box (caca_canvas_t * cv, int x, int y, int w, int h, uint32_t ch)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x X coordinate of the upper-left corner of the box.

y Y coordinate of the upper-left corner of the box.

w Width of the box.

h Height of the box.

ch UTF-32 character to be used to draw the box.

Returns:

This function always returns 0.

References caca_draw_line().

2.8.2.10 __extern int caca_draw_thin_box (caca_canvas_t * cv, int x, int y, int w, int h)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x X coordinate of the upper-left corner of the box.

y Y coordinate of the upper-left corner of the box.

w Width of the box.

h Height of the box.

Returns:

This function always returns 0.

2.8.2.11 __extern int caca_draw_cp437_box (caca_canvas_t * cv, int x, int y, int w, int h)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x X coordinate of the upper-left corner of the box.

y Y coordinate of the upper-left corner of the box.

w Width of the box.

h Height of the box.

Returns:

This function always returns 0.

2.8.2.12 __extern int caca_fill_box (caca_canvas_t * *cv*, int *x*, int *y*, int *w*, int *h*, uint32_t *ch*)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x X coordinate of the upper-left corner of the box.

y Y coordinate of the upper-left corner of the box.

w Width of the box.

h Height of the box.

ch UTF-32 character to be used to draw the box.

Returns:

This function always returns 0.

References caca_add_dirty_rect(), and caca_put_char().

Referenced by caca_conio_clreol().

2.8.2.13 __extern int caca_draw_triangle (caca_canvas_t * *cv*, int *x1*, int *y1*, int *x2*, int *y2*, int *x3*, int *y3*, uint32_t *ch*)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x1 X coordinate of the first point.

y1 Y coordinate of the first point.

x2 X coordinate of the second point.

y2 Y coordinate of the second point.

x3 X coordinate of the third point.

y3 Y coordinate of the third point.

ch UTF-32 character to be used to draw the triangle outline.

Returns:

This function always returns 0.

References caca_draw_line().

2.8.2.14 __extern int caca_draw_thin_triangle (caca_canvas_t * *cv*, int *x1*, int *y1*, int *x2*, int *y2*, int *x3*, int *y3*)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x1 X coordinate of the first point.

y1 Y coordinate of the first point.

x2 X coordinate of the second point.

y2 Y coordinate of the second point.

x3 X coordinate of the third point.

y3 Y coordinate of the third point.

Returns:

This function always returns 0.

References caca_draw_thin_line().

2.8.2.15 __extern int caca_fill_triangle (caca_canvas_t * *cv*, int *x1*, int *y1*, int *x2*, int *y2*, int *x3*, int *y3*, uint32_t *ch*)

This function never fails.

Parameters:

cv The handle to the libcaca canvas.

x1 X coordinate of the first point.

y1 Y coordinate of the first point.

x2 X coordinate of the second point.

y2 Y coordinate of the second point.

x3 X coordinate of the third point.

y3 Y coordinate of the third point.

ch UTF-32 character to be used to fill the triangle.

Returns:

This function always returns 0.

References caca_fill_triangle(), and caca_put_char().

Referenced by caca_fill_triangle().

2.8.2.16 __extern int caca_fill_triangle_textured (caca_canvas_t * *cv*, int *coords*[6], caca_canvas_t * *tex*, float *uv*[6])

This function fails if one or both the canvas are missing

Parameters:

cv The handle to the libcaca canvas.

coords The coordinates of the triangle (3{x,y})

tex The handle of the canvas texture.

uv The coordinates of the texture (3{u,v})

Returns:

This function return 0 if ok, -1 if canvas or texture are missing.

2.9 libcaca canvas frame handling

Functions

- __extern int caca_get_frame_count (caca_canvas_t const *)
  Get the number of frames in a canvas.
- __extern int caca_set_frame (caca_canvas_t *, int)
  Activate a given canvas frame.
- __extern char const * caca_get_frame_name (caca_canvas_t const *)
  Get the current frame's name.
- __extern int caca_set_frame_name (caca_canvas_t *, char const *)
  Set the current frame's name.
- __extern int caca_create_frame (caca_canvas_t *, int)
  Add a frame to a canvas.
- __extern int caca_free_frame (caca_canvas_t *, int)
  Remove a frame from a canvas.

2.9.1 Detailed Description

These functions provide high level routines for canvas frame insertion, removal, copying etc.

2.9.2 Function Documentation

2.9.2.1 __extern int caca_get_frame_count (caca_canvas_t const * *cv*)

Return the current canvas' frame count.

This function never fails.

Parameters:

cv A libcaca canvas

Returns:

The frame count

Referenced by caca_set_canvas_boundaries().

2.9.2.2 __extern int caca_set_frame (caca_canvas_t * *cv*, int *id*)

Set the active canvas frame. All subsequent drawing operations will be performed on that frame. The current painting context set by caca_set_attr() is inherited.

If the frame index is outside the canvas' frame range, nothing happens.

If an error occurs, -1 is returned and **errno** is set accordingly:

- EINVAL Requested frame is out of range.

Parameters:

cv A libcaca canvas

id The canvas frame to activate

Returns:

0 in case of success, -1 if an error occurred.

References caca_add_dirty_rect().

Referenced by caca_set_canvas_boundaries().

2.9.2.3 __extern char const* caca_get_frame_name (caca_canvas_t const * *cv*)

Return the current frame's name. The returned string is valid until the frame is deleted or caca_set_frame_name() is called to change the frame name again.

This function never fails.

Parameters:

cv A libcaca canvas.

Returns:

The current frame's name.

2.9.2.4 __extern int caca_set_frame_name (caca_canvas_t * *cv*, char const * *name*)

Set the current frame's name. Upon creation, a frame has a default name of "frame#xxxxxxxx" where xxxxxxxx is a self-incrementing hexadecimal number.

If an error occurs, -1 is returned and **errno** is set accordingly:

- ENOMEM Not enough memory to allocate new frame.

Parameters:

cv A libcaca canvas.

name The name to give to the current frame.

Returns:

0 in case of success, -1 if an error occurred.

2.9.2.5 __extern int caca_create_frame (caca_canvas_t * *cv*, int *id*)

Create a new frame within the given canvas. Its contents and attributes are copied from the currently active frame.

The frame index indicates where the frame should be inserted. Valid values range from 0 to the current canvas frame count. If the frame index is greater than or equals the current canvas frame count, the new

frame is appended at the end of the canvas. If the frame index is less than zero, the new frame is inserted at index 0.

The active frame does not change, but its index may be renumbered due to the insertion.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `ENOMEM` Not enough memory to allocate new frame.

Parameters:

cv A libcaca canvas

id The index where to insert the new frame

Returns:

0 in case of success, -1 if an error occurred.

Referenced by caca_set_canvas_boundaries().

2.9.2.6 __extern int caca_free_frame (caca_canvas_t * *cv*, int *id*)

Delete a frame from a given canvas.

The frame index indicates the frame to delete. Valid values range from 0 to the current canvas frame count minus 1. If the frame index is greater than or equals the current canvas frame count, the last frame is deleted.

If the active frame is deleted, frame 0 becomes the new active frame. Otherwise, the active frame does not change, but its index may be renumbered due to the deletion.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Requested frame is out of range, or attempt to delete the last frame of the canvas.

Parameters:

cv A libcaca canvas

id The index of the frame to delete

Returns:

0 in case of success, -1 if an error occurred.

References caca_add_dirty_rect().

2.10 libcaca bitmap dithering

Functions

- __extern caca_dither_t * caca_create_dither (int, int, int, int, uint32_t, uint32_t, uint32_t, uint32_t)

  Create an internal dither object.

- __extern int caca_set_dither_palette (caca_dither_t *, uint32_t r[ ], uint32_t g[ ], uint32_t b[ ], uint32_t a[ ])

  Set the palette of an 8bpp dither object.

- __extern int caca_set_dither_brightness (caca_dither_t *, float)
  Set the brightness of a dither object.
- __extern float caca_get_dither_brightness (caca_dither_t const *)
  Get the brightness of a dither object.
- __extern int caca_set_dither_gamma (caca_dither_t *, float)
  Set the gamma of a dither object.
- __extern float caca_get_dither_gamma (caca_dither_t const *)
  Get the gamma of a dither object.
- __extern int caca_set_dither_contrast (caca_dither_t *, float)
  Set the contrast of a dither object.
- __extern float caca_get_dither_contrast (caca_dither_t const *)
  Get the contrast of a dither object.
- __extern int caca_set_dither_antialias (caca_dither_t *, char const *)
  Set dither antialiasing.
- __extern char const *const * caca_get_dither_antialias_list (caca_dither_t const *)
  Get available antialiasing methods.
- __extern char const * caca_get_dither_antialias (caca_dither_t const *)
  Get current antialiasing method.
- __extern int caca_set_dither_color (caca_dither_t *, char const *)
  Choose colours used for dithering.
- __extern char const *const * caca_get_dither_color_list (caca_dither_t const *)
  Get available colour modes.
- __extern char const * caca_get_dither_color (caca_dither_t const *)
  Get current colour mode.
- __extern int caca_set_dither_charset (caca_dither_t *, char const *)
  Choose characters used for dithering.
- __extern char const *const * caca_get_dither_charset_list (caca_dither_t const *)
  Get available dither character sets.
- __extern char const * caca_get_dither_charset (caca_dither_t const *)
  Get current character set.
- __extern int caca_set_dither_algorithm (caca_dither_t *, char const *)
  Set dithering algorithm.
- __extern char const *const * caca_get_dither_algorithm_list (caca_dither_t const *)

Get dithering algorithms.

- __extern char const * caca_get_dither_algorithm (caca_dither_t const *)

  Get current dithering algorithm.

- __extern int caca_dither_bitmap (caca_canvas_t *, int, int, int, int, caca_dither_t const *, void const *)

  Dither a bitmap on the canvas.

- __extern int caca_free_dither (caca_dither_t *)

  Free the memory associated with a dither.

2.10.1 Detailed Description

These functions provide high level routines for dither allocation and rendering.

2.10.2 Function Documentation

2.10.2.1 __extern caca_dither_t* caca_create_dither (int *bpp*, int *w*, int *h*, int *pitch*, uint32_t *rmask*, uint32_t *gmask*, uint32_t *bmask*, uint32_t *amask*)

Create a dither structure from its coordinates (depth, width, height and pitch) and pixel mask values. If the depth is 8 bits per pixel, the mask values are ignored and the colour palette should be set using the caca_set_dither_palette() function. For depths greater than 8 bits per pixel, a zero alpha mask causes the alpha values to be ignored.

If an error occurs, NULL is returned and **errno** is set accordingly:

- `EINVAL` Requested width, height, pitch or bits per pixel value was invalid.
- `ENOMEM` Not enough memory to allocate dither structure.

Parameters:

bpp Bitmap depth in bits per pixel.

w Bitmap width in pixels.

h Bitmap height in pixels.

pitch Bitmap pitch in bytes.

rmask Bitmask for red values.

gmask Bitmask for green values.

bmask Bitmask for blue values.

amask Bitmask for alpha values.

Returns:

Dither object upon success, NULL if an error occurred.

2.10.2.2 __extern int caca_set_dither_palette (caca_dither_t * *d*, uint32_t *red*[ ], uint32_t *green*[ ], uint32_t *blue*[ ], uint32_t *alpha*[ ])

Set the palette of an 8 bits per pixel bitmap. Values should be between 0 and 4095 (0xfff).

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Dither bits per pixel value is not 8, or one of the pixel values was outside the range 0 - 4095.

Parameters:

d Dither object.

red Array of 256 red values.

green Array of 256 green values.

blue Array of 256 blue values.

alpha Array of 256 alpha values.

Returns:

0 in case of success, -1 if an error occurred.

2.10.2.3 __extern int caca_set_dither_brightness (caca_dither_t * *d*, float *brightness*)

Set the brightness of dither.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Brightness value was out of range.

Parameters:

d Dither object.

brightness brightness value.

Returns:

0 in case of success, -1 if an error occurred.

2.10.2.4 __extern float caca_get_dither_brightness (caca_dither_t const * *d*)

Get the brightness of the given dither object.

This function never fails.

Parameters:

d Dither object.

Returns:

Brightness value.

2.10.2.5 __extern int caca_set_dither_gamma (caca_dither_t * *d*, float *gamma*)

Set the gamma of the given dither object. A negative value causes colour inversion.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Gamma value was out of range.

Parameters:

d Dither object.
gamma Gamma value.

Returns:

0 in case of success, -1 if an error occurred.

2.10.2.6 __extern float caca_get_dither_gamma (caca_dither_t const * *d*)

Get the gamma of the given dither object.

This function never fails.

Parameters:

d Dither object.

Returns:

Gamma value.

2.10.2.7 __extern int caca_set_dither_contrast (caca_dither_t * *d*, float *contrast*)

Set the contrast of dither.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Contrast value was out of range.

Parameters:

d Dither object.
contrast contrast value.

Returns:

0 in case of success, -1 if an error occurred.

2.10.2.8 __extern float caca_get_dither_contrast (caca_dither_t const * *d*)

Get the contrast of the given dither object.

This function never fails.

Parameters:

d Dither object.

Returns:

Contrast value.

2.10.2.9 __extern int caca_set_dither_antialias (caca_dither_t * *d*, char const * *str*)

Tell the renderer whether to antialias the dither. Antialiasing smoothens the rendered image and avoids the commonly seen staircase effect.

- `"none"`: no antialiasing.
- `"prefilter"` or `"default"`: simple prefilter antialiasing. This is the default value.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Invalid antialiasing mode.

Parameters:

d Dither object.

str A string describing the antialiasing method that will be used for the dithering.

Returns:

0 in case of success, -1 if an error occurred.

2.10.2.10 __extern char const* const* caca_get_dither_antialias_list (caca_dither_t const * *d*)

Return a list of available antialiasing methods for a given dither. The list is a NULL-terminated array of strings, interleaving a string containing the internal value for the antialiasing method to be used with caca_set_dither_antialias(), and a string containing the natural language description for that antialiasing method.

This function never fails.

Parameters:

d Dither object.

Returns:

An array of strings.

2.10.2.11 __extern char const* caca_get_dither_antialias (caca_dither_t const * *d*)

Return the given dither's current antialiasing method.

This function never fails.

Parameters:

d Dither object.

Returns:

A static string.

2.10.2.12 __extern int caca_set_dither_color (caca_dither_t * *d*, char const * *str*)

Tell the renderer which colours should be used to render the bitmap. Valid values for `str` are:

- `"mono"`: use light gray on a black background.
- `"gray"`: use white and two shades of gray on a black background.
- `"8"`: use the 8 ANSI colours on a black background.
- `"16"`: use the 16 ANSI colours on a black background.
- `"fullgray"`: use black, white and two shades of gray for both the characters and the background.
- `"full8"`: use the 8 ANSI colours for both the characters and the background.
- `"full16"` or `"default"`: use the 16 ANSI colours for both the characters and the background. This is the default value.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Invalid colour set.

Parameters:

d Dither object.

str A string describing the colour set that will be used for the dithering.

Returns:

0 in case of success, -1 if an error occurred.

2.10.2.13 __extern char const* const* caca_get_dither_color_list (caca_dither_t const * *d*)

Return a list of available colour modes for a given dither. The list is a NULL-terminated array of strings, interleaving a string containing the internal value for the colour mode, to be used with caca_set_dither_color(), and a string containing the natural language description for that colour mode.

This function never fails.

Parameters:

d Dither object.

Returns:

An array of strings.

2.10.2.14 __extern char const* caca_get_dither_color (caca_dither_t const * *d*)

Return the given dither's current colour mode.

This function never fails.

Parameters:

d Dither object.

Returns:

A static string.

2.10.2.15 __extern int caca_set_dither_charset (caca_dither_t * *d*, char const * *str*)

Tell the renderer which characters should be used to render the dither. Valid values for `str` are:

- `"ascii"` or `"default"`: use only ASCII characters. This is the default value.
- `"shades"`: use Unicode characters "U+2591 LIGHT SHADE", "U+2592 MEDIUM SHADE" and "U+2593 DARK SHADE". These characters are also present in the CP437 codepage available on DOS and VGA.
- `"blocks"`: use Unicode quarter-cell block combinations. These characters are only found in the Unicode set.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Invalid character set.

Parameters:

d Dither object.

str A string describing the characters that need to be used for the dithering.

Returns:

0 in case of success, -1 if an error occurred.

2.10.2.16 __extern char const* const* caca_get_dither_charset_list (caca_dither_t const * *d*)

Return a list of available character sets for a given dither. The list is a NULL-terminated array of strings, interleaving a string containing the internal value for the character set, to be used with caca_set_dither_charset(), and a string containing the natural language description for that character set.

This function never fails.

Parameters:

d Dither object.

Returns:

An array of strings.

2.10.2.17 __extern char const* caca_get_dither_charset (caca_dither_t const * *d*)

Return the given dither's current character set.

This function never fails.

Parameters:

d Dither object.

Returns:

A static string.

2.10.2.18 __extern int caca_set_dither_algorithm (caca_dither_t * *d*, char const * *str*)

Tell the renderer which dithering algorithm should be used. Dithering is necessary because the picture being rendered has usually far more colours than the available palette. Valid values for `str` are:

- `"none"`: no dithering is used, the nearest matching colour is used.
- `"ordered2"`: use a 2x2 Bayer matrix for dithering.
- `"ordered4"`: use a 4x4 Bayer matrix for dithering.
- `"ordered8"`: use a 8x8 Bayer matrix for dithering.
- `"random"`: use random dithering.
- `"fstein"`: use Floyd-Steinberg dithering. This is the default value.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Unknown dithering mode.

Parameters:

d Dither object.

str A string describing the algorithm that needs to be used for the dithering.

Returns:

0 in case of success, -1 if an error occurred.

2.10.2.19 __extern char const* const* caca_get_dither_algorithm_list (caca_dither_t const * *d*)

Return a list of available dithering algorithms for a given dither. The list is a NULL-terminated array of strings, interleaving a string containing the internal value for the dithering algorithm, to be used with caca_set_dither_dithering(), and a string containing the natural language description for that algorithm.

This function never fails.

Parameters:

d Dither object.

Returns:

An array of strings.

2.10.2.20 __extern char const* caca_get_dither_algorithm (caca_dither_t const * *d*)

Return the given dither's current dithering algorithm.

This function never fails.

Parameters:

d Dither object.

Returns:

A static string.

2.10.2.21 __extern int caca_dither_bitmap (caca_canvas_t * *cv*, int *x*, int *y*, int *w*, int *h*, caca_dither_t const * *d*, void const * *pixels*)

Dither a bitmap at the given coordinates. The dither can be of any size and will be stretched to the text area.

This function never fails.

Parameters:

cv A handle to the libcaca canvas.

x X coordinate of the upper-left corner of the drawing area.

y Y coordinate of the upper-left corner of the drawing area.

w Width of the drawing area.

h Height of the drawing area.

d Dither object to be drawn.

pixels Bitmap's pixels.

Returns:

This function always returns 0.

References CACA_BLACK, caca_get_attr(), caca_put_char(), caca_set_attr(), and caca_set_color_ansi().

2.10.2.22 __extern int caca_free_dither (caca_dither_t * *d*)

Free the memory allocated by caca_create_dither().

This function never fails.

Parameters:

d Dither object.

Returns:

This function always returns 0.

2.11 libcaca font handling

Functions

- __extern caca_font_t * caca_load_font (void const *, size_t)
  Load a font from memory for future use.
- __extern char const *const * caca_get_font_list (void)
  Get available builtin fonts.
- __extern int caca_get_font_width (caca_font_t const *)
  Get a font's standard glyph width.
- __extern int caca_get_font_height (caca_font_t const *)
  Get a font's standard glyph height.

- __extern uint32_t const * caca_get_font_blocks (caca_font_t const *)
  Get a font's list of supported glyphs.
- __extern int caca_render_canvas (caca_canvas_t const *, caca_font_t const *, void *, int, int, int)
  Render the canvas onto an image buffer.
- __extern int caca_free_font (caca_font_t *)
  Free a font structure.

2.11.1 Detailed Description

These functions provide font handling routines and high quality canvas to bitmap rendering.

2.11.2 Function Documentation

2.11.2.1 __extern caca_font_t* caca_load_font (void const * *data*, size_t *size*)

This function loads a font and returns a handle to its internal structure. The handle can then be used with caca_render_canvas() for bitmap output.

Internal fonts can also be loaded: if `size` is set to 0, `data` must be a string containing the internal font name.

If `size` is non-zero, the `size` bytes of memory at address `data` are loaded as a font. This memory are must not be freed by the calling program until the font handle has been freed with caca_free_font().

If an error occurs, NULL is returned and **errno** is set accordingly:

- `ENOENT` Requested built-in font does not exist.
- `EINVAL` Invalid font data in memory area.
- `ENOMEM` Not enough memory to allocate font structure.

Parameters:

data The memory area containing the font or its name.

size The size of the memory area, or 0 if the font name is given.

Returns:

A font handle or NULL in case of error.

References caca_load_font().

Referenced by caca_load_font().

2.11.2.2 __extern char const* const* caca_get_font_list (void)

Return a list of available builtin fonts. The list is a NULL-terminated array of strings.

This function never fails.

Returns:

An array of strings.

2.11.2.3 __extern int caca_get_font_width (caca_font_t const * *f*)

Return the standard value for the current font's glyphs. Most glyphs in the font will have this width, except fullwidth characters.

This function never fails.

Parameters:

f The font, as returned by caca_load_font()

Returns:

The standard glyph width.

2.11.2.4 __extern int caca_get_font_height (caca_font_t const * *f*)

Returns the standard value for the current font's glyphs. Most glyphs in the font will have this height.

This function never fails.

Parameters:

f The font, as returned by caca_load_font()

Returns:

The standard glyph height.

2.11.2.5 __extern uint32_t const* caca_get_font_blocks (caca_font_t const * *f*)

This function returns the list of Unicode blocks supported by the given font. The list is a zero-terminated list of indices. Here is an example:

```
{
   0x0000, 0x0080,   // Basic latin: A, B, C, a, b, c
   0x0080, 0x0100,   // Latin-1 supplement: "A, 'e, ^u
   0x0530, 0x0590,   // Armenian
   0x0000, 0x0000,   // END
};
```

This function never fails.

Parameters:

f The font, as returned by caca_load_font()

Returns:

The list of Unicode blocks supported by the font.

2.11.2.6 __extern int caca_render_canvas (caca_canvas_t const * *cv*, caca_font_t const * *f*, void * *buf*, int *width*, int *height*, int *pitch*)

This function renders the given canvas on an image buffer using a specific font. The pixel format is fixed (32-bit ARGB, 8 bits for each component).

The required image width can be computed using caca_get_canvas_width() and caca_get_font_width(). The required height can be computed using caca_get_canvas_height() and caca_get_font_height().

Glyphs that do not fit in the image buffer are currently not rendered at all. They may be cropped instead in future versions.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Specified width, height or pitch is invalid.

Parameters:

cv The canvas to render

f The font, as returned by caca_load_font()

buf The image buffer

width The width (in pixels) of the image buffer

height The height (in pixels) of the image buffer

pitch The pitch (in bytes) of an image buffer line.

Returns:

0 in case of success, -1 if an error occurred.

References caca_attr_to_argb64().

2.11.2.7 __extern int caca_free_font (caca_font_t * *f*)

This function frees all data allocated by caca_load_font(). The font structure is no longer usable by other libcaca functions. Once this function has returned, the memory area that was given to caca_load_font() can be freed.

This function never fails.

Parameters:

f The font, as returned by caca_load_font()

Returns:

This function always returns 0.

2.12 libcaca FIGfont handling

Functions

- __extern int caca_canvas_set_figfont (caca_canvas_t *, char const *)
  load a figfont and attach it to a canvas
- __extern int caca_put_figchar (caca_canvas_t *, uint32_t)
  paste a character using the current figfont
- __extern int caca_flush_figlet (caca_canvas_t *)
  flush the figlet context

2.12.1 Detailed Description

These functions provide FIGlet and TOIlet font handling routines.

2.13 libcaca file IO

Functions

- __extern caca_file_t * caca_file_open (char const *, const char *)
  Open a file for reading or writing.
- __extern int caca_file_close (caca_file_t *)
  Close a file handle.
- __extern uint64_t caca_file_tell (caca_file_t *)
  Return the position in a file handle.
- __extern size_t caca_file_read (caca_file_t *, void *, size_t)
  Read data from a file handle.
- __extern size_t caca_file_write (caca_file_t *, const void *, size_t)
  Write data to a file handle.
- __extern char * caca_file_gets (caca_file_t *, char *, int)
  Read a line from a file handle.
- __extern int caca_file_eof (caca_file_t *)
  Tell whether a file handle reached end of file.

2.13.1 Detailed Description

These functions allow to read and write files in a platform-independent way.

2.13.2 Function Documentation

2.13.2.1 __extern caca_file_t* caca_file_open (char const * *path*, const char * *mode*)

Create a caca file handle for a file. If the file is zipped, it is decompressed on the fly.

If an error occurs, NULL is returned and **errno** is set accordingly:

- `ENOSTS` Function not implemented.
- `EINVAL` File not found or permission denied.

Parameters:

path The file path

mode The file open mode

Returns:

A file handle to *path*.

Referenced by caca_import_canvas_from_file().

2.13.2.2 __extern int caca_file_close (caca_file_t * *fp*)

Close and destroy the resources associated with a caca file handle.

This function is a wrapper for fclose() or, if available, gzclose().

Parameters:

fp The file handle

Returns:

The return value of fclose() or gzclose().

Referenced by caca_import_canvas_from_file().

2.13.2.3 __extern uint64_t caca_file_tell (caca_file_t * *fp*)

Return the file handle position, in bytes.

Parameters:

fp The file handle

Returns:

The current offset in the file handle.

2.13.2.4 __extern size_t caca_file_read (caca_file_t * *fp*, void * *ptr*, size_t *size*)

Read data from a file handle and copy them into the given buffer.

Parameters:

fp The file handle

ptr The destination buffer

size The number of bytes to read

Returns:

The number of bytes read

Referenced by caca_import_canvas_from_file().

2.13.2.5 __extern size_t caca_file_write (caca_file_t * *fp*, const void * *ptr*, size_t *size*)

Write the contents of the given buffer to the file handle.

Parameters:

fp The file handle

ptr The source buffer

size The number of bytes to write

Returns:

The number of bytes written

2.13.2.6 __extern char* caca_file_gets (caca_file_t * *fp*, char * *s*, int *size*)

Read one line of data from a file handle, up to one less than the given number of bytes. A trailing zero is appended to the data.

Parameters:

fp The file handle

s The destination buffer

size The maximum number of bytes to read

Returns:

The number of bytes read, including the trailing zero

2.13.2.7 __extern int caca_file_eof (caca_file_t * *fp*)

Return the end-of-file status of the file handle.

This function is a wrapper for feof() or, if available, gzeof().

Parameters:

fp The file handle

Returns:

1 if EOF was reached, 0 otherwise

Referenced by caca_import_canvas_from_file().

2.14 libcaca importers/exporters from/to various

Functions

- __extern ssize_t caca_import_canvas_from_memory (caca_canvas_t *, void const *, size_t, char const *)

  Import a memory buffer into a canvas.

- __extern ssize_t caca_import_canvas_from_file (caca_canvas_t *, char const *, char const *)

  Import a file into a canvas.

- __extern ssize_t caca_import_area_from_memory (caca_canvas_t *, int, int, void const *, size_t, char const *)

  Import a memory buffer into a canvas area.

- __extern ssize_t caca_import_area_from_file (caca_canvas_t *, int, int, char const *, char const *)

  Import a file into a canvas area.

- __extern char const *const * caca_get_import_list (void)

  Get available import formats.

- __extern void * caca_export_canvas_to_memory (caca_canvas_t const *, char const *, size_t *)

  Export a canvas into a foreign format.

- __extern void * caca_export_area_to_memory (caca_canvas_t const *, int, int, int, int, char const *, size_t *)

  Export a canvas portion into a foreign format.

- __extern char const *const * caca_get_export_list (void)

  Get available export formats.

2.14.1 Detailed Description

formats

These functions import various file formats into a new canvas, or export the current canvas to various text formats.

2.14.2 Function Documentation

2.14.2.1 __extern ssize_t caca_import_canvas_from_memory (caca_canvas_t * *cv*, void const * *data*, size_t *len*, char const * *format*)

Import a memory buffer into the given libcaca canvas's current frame. The current frame is resized accordingly and its contents are replaced with the imported data.

Valid values for `format` are:

- `""`: attempt to autodetect the file format.
- `"caca"`: import native libcaca files.
- `"text"`: import ASCII text files.
- `"ansi"`: import ANSI files.
- `"utf8"`: import UTF-8 files with ANSI colour codes.

The number of bytes read is returned. If the file format is valid, but not enough data was available, 0 is returned.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `ENOMEM` Not enough memory to allocate canvas.

- EINVAL Invalid format requested.

Parameters:

cv A libcaca canvas in which to import the file.

data A memory area containing the data to be loaded into the canvas.

len The size in bytes of the memory area.

format A string describing the input format.

Returns:

The number of bytes read, or 0 if there was not enough data, or -1 if an error occurred.

Referenced by caca_import_area_from_memory(), and caca_import_canvas_from_file().

2.14.2.2 __extern ssize_t caca_import_canvas_from_file (caca_canvas_t * *cv*, char const * *filename*, char const * *format*)

Import a file into the given libcaca canvas's current frame. The current frame is resized accordingly and its contents are replaced with the imported data.

Valid values for format are:

- "": attempt to autodetect the file format.
- "caca": import native libcaca files.
- "text": import ASCII text files.
- "ansi": import ANSI files.
- "utf8": import UTF-8 files with ANSI colour codes.

The number of bytes read is returned. If the file format is valid, but not enough data was available, 0 is returned.

If an error occurs, -1 is returned and **errno** is set accordingly:

- ENOSYS File access is not implemented on this system.
- ENOMEM Not enough memory to allocate canvas.
- EINVAL Invalid format requested. caca_import_file() may also fail and set **errno** for any of the errors specified for the routine fopen().

Parameters:

cv A libcaca canvas in which to import the file.

filename The name of the file to load.

format A string describing the input format.

Returns:

The number of bytes read, or 0 if there was not enough data, or -1 if an error occurred.

References caca_file_close(), caca_file_eof(), caca_file_open(), caca_file_read(), and caca_import_canvas_from_memory().

Referenced by caca_import_area_from_file().

2.14.2.3 __extern ssize_t caca_import_area_from_memory (caca_canvas_t * *cv*, int *x*, int *y*, void const * *data*, size_t *len*, char const * *format*)

Import a memory buffer into the given libcaca canvas's current frame, at the specified position. For more information, see caca_import_canvas_from_memory().

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Unsupported format requested or invalid coordinates.
- `ENOMEM` Not enough memory to allocate canvas.

Parameters:

cv A libcaca canvas in which to import the file.

x The leftmost coordinate of the area to import to.

y The topmost coordinate of the area to import to.

data A memory area containing the data to be loaded into the canvas.

len The size in bytes of the memory area.

format A string describing the input format.

Returns:

The number of bytes read, or 0 if there was not enough data, or -1 if an error occurred.

References caca_blit(), caca_create_canvas(), caca_free_canvas(), and caca_import_canvas_from_memory().

2.14.2.4 __extern ssize_t caca_import_area_from_file (caca_canvas_t * *cv*, int *x*, int *y*, char const * *filename*, char const * *format*)

Import a file into the given libcaca canvas's current frame, at the specified position. For more information, see caca_import_canvas_from_file().

If an error occurs, -1 is returned and **errno** is set accordingly:

- `ENOSYS` File access is not implemented on this system.
- `ENOMEM` Not enough memory to allocate canvas.
- `EINVAL` Unsupported format requested or invalid coordinates. caca_import_file() may also fail and set **errno** for any of the errors specified for the routine fopen().

Parameters:

cv A libcaca canvas in which to import the file.

x The leftmost coordinate of the area to import to.

y The topmost coordinate of the area to import to.

filename The name of the file to load.

format A string describing the input format.

Returns:

The number of bytes read, or 0 if there was not enough data, or -1 if an error occurred.

References caca_blit(), caca_create_canvas(), caca_free_canvas(), and caca_import_canvas_from_file().

2.14.2.5 __extern char const* const* caca_get_import_list (void)

Return a list of available import formats. The list is a NULL-terminated array of strings, interleaving a string containing the internal value for the import format, to be used with caca_import_canvas(), and a string containing the natural language description for that import format.

This function never fails.

Returns:

An array of strings.

2.14.2.6 __extern void* caca_export_canvas_to_memory (caca_canvas_t const * *cv*, char const * *format*, size_t * *bytes*)

This function exports a libcaca canvas into various foreign formats such as ANSI art, HTML, IRC colours, etc. The returned pointer should be passed to free() to release the allocated storage when it is no longer needed.

Valid values for `format` are:

- `"caca"`: export native libcaca files.
- `"ansi"`: export ANSI art (CP437 charset with ANSI colour codes).
- `"html"`: export an HTML page with CSS information.
- `"html3"`: export an HTML table that should be compatible with most navigators, including textmode ones.
- `"irc"`: export UTF-8 text with mIRC colour codes.
- `"ps"`: export a PostScript document.
- `"svg"`: export an SVG vector image.
- `"tga"`: export a TGA image.
- `"troff"`: export a troff source.

If an error occurs, NULL is returned and **errno** is set accordingly:

- `EINVAL` Unsupported format requested.
- `ENOMEM` Not enough memory to allocate output buffer.

Parameters:

cv A libcaca canvas

format A string describing the requested output format.

bytes A pointer to a size_t where the number of allocated bytes will be written.

Returns:

A pointer to the exported memory area, or NULL in case of error.

Referenced by caca_export_area_to_memory().

2.14.2.7 __extern void* caca_export_area_to_memory (caca_canvas_t const * *cv*, int *x*, int *y*, int *w*, int *h*, char const * *format*, size_t * *bytes*)

This function exports a portion of a *libcaca* canvas into various formats. For more information, see caca_export_canvas_to_memory().

If an error occurs, NULL is returned and **errno** is set accordingly:

- `EINVAL` Unsupported format requested or invalid coordinates.
- `ENOMEM` Not enough memory to allocate output buffer.

Parameters:

cv A libcaca canvas

x The leftmost coordinate of the area to export.

y The topmost coordinate of the area to export.

w The width of the area to export.

h The height of the area to export.

format A string describing the requested output format.

bytes A pointer to a size_t where the number of allocated bytes will be written.

Returns:

A pointer to the exported memory area, or NULL in case of error.

References caca_blit(), caca_create_canvas(), caca_export_canvas_to_memory(), and caca_free_canvas().

2.14.2.8 __extern char const* const* caca_get_export_list (void)

Return a list of available export formats. The list is a NULL-terminated array of strings, interleaving a string containing the internal value for the export format, to be used with caca_export_memory(), and a string containing the natural language description for that export format.

This function never fails.

Returns:

An array of strings.

2.15 libcaca display functions

Functions

- __extern caca_display_t * caca_create_display (caca_canvas_t *)

  Attach a caca graphical context to a caca canvas.

- __extern caca_display_t * caca_create_display_with_driver (caca_canvas_t *, char const *)

  Attach a specific caca graphical context to a caca canvas.

- __extern char const *const * caca_get_display_driver_list (void)

  Get available display drivers.

- __extern char const * caca_get_display_driver (caca_display_t *)
  Return a caca graphical context's current output driver.
- __extern int caca_set_display_driver (caca_display_t *, char const *)
  Set the output driver.
- __extern int caca_free_display (caca_display_t *)
  Detach a caca graphical context from a caca backend context.
- __extern caca_canvas_t * caca_get_canvas (caca_display_t *)
  Get the canvas attached to a caca graphical context.
- __extern int caca_refresh_display (caca_display_t *)
  Flush pending changes and redraw the screen.
- __extern int caca_set_display_time (caca_display_t *, int)
  Set the refresh delay.
- __extern int caca_get_display_time (caca_display_t const *)
  Get the display's average rendering time.
- __extern int caca_get_display_width (caca_display_t const *)
  Get the display width.
- __extern int caca_get_display_height (caca_display_t const *)
  Get the display height.
- __extern int caca_set_display_title (caca_display_t *, char const *)
  Set the display title.
- __extern int caca_set_mouse (caca_display_t *, int)
  Show or hide the mouse pointer.
- __extern int caca_set_cursor (caca_display_t *, int)
  Show or hide the cursor.

2.15.1 Detailed Description

These functions provide the basic *libcaca* routines for display initialisation, system information retrieval and configuration.

2.15.2 Function Documentation

2.15.2.1 __extern caca_display_t* caca_create_display (caca_canvas_t * *cv*)

Create a graphical context using device-dependent features (ncurses for terminals, an X11 window, a DOS command window...) that attaches to a libcaca canvas. Everything that gets drawn in the libcaca canvas can then be displayed by the libcaca driver.

If no caca canvas is provided, a new one is created. Its handle can be retrieved using caca_get_canvas() and it is automatically destroyed when caca_free_display() is called.

See also caca_create_display_with_driver().

If an error occurs, NULL is returned and **errno** is set accordingly:

- ENOMEM Not enough memory.
- ENODEV Graphical device could not be initialised.

Parameters:

cv The caca canvas or NULL to create a canvas automatically.

Returns:

The caca graphical context or NULL if an error occurred.

References caca_create_display_with_driver().

2.15.2.2 __extern caca_display_t* caca_create_display_with_driver (caca_canvas_t * *cv*, char const * *driver*)

Create a graphical context using device-dependent features (ncurses for terminals, an X11 window, a DOS command window...) that attaches to a libcaca canvas. Everything that gets drawn in the libcaca canvas can then be displayed by the libcaca driver.

If no caca canvas is provided, a new one is created. Its handle can be retrieved using caca_get_canvas() and it is automatically destroyed when caca_free_display() is called.

If no driver name is provided, *libcaca* will try to autodetect the best output driver it can.

See also caca_create_display().

If an error occurs, NULL is returned and **errno** is set accordingly:

- ENOMEM Not enough memory.
- ENODEV Graphical device could not be initialised.

Parameters:

cv The caca canvas or NULL to create a canvas automatically.

driver A string describing the desired output driver or NULL to choose the best driver automatically.

Returns:

The caca graphical context or NULL if an error occurred.

References caca_create_canvas(), caca_free_canvas(), caca_manage_canvas(), and caca_unmanage_canvas().

Referenced by caca_create_display().

2.15.2.3 __extern char const* const* caca_get_display_driver_list (void)

Return a list of available display drivers. The list is a NULL-terminated array of strings, interleaving a string containing the internal value for the display driver, and a string containing the natural language description for that driver.

This function never fails.

Returns:

An array of strings.

2.15.2.4 __extern char const* caca_get_display_driver (caca_display_t * *dp*)

Return the given display's current output driver.

This function never fails.

Parameters:

dp The caca display.

Returns:

A static string.

2.15.2.5 __extern int caca_set_display_driver (caca_display_t * *dp*, char const * *driver*)

Dynamically change the given display's output driver.

FIXME: decide what to do in case of failure

Parameters:

dp The caca display.

driver A string describing the desired output driver or NULL to choose the best driver automatically.

Returns:

0 in case of success, -1 if an error occurred.

2.15.2.6 __extern int caca_free_display (caca_display_t * *dp*)

Detach a graphical context from its caca backend and destroy it. The libcaca canvas continues to exist and other graphical contexts can be attached to it afterwards.

If the caca canvas was automatically created by caca_create_display(), it is automatically destroyed and any handle to it becomes invalid.

This function never fails.

Parameters:

dp The libcaca graphical context.

Returns:

This function always returns 0.

References caca_free_canvas(), and caca_unmanage_canvas().

2.15.2.7 __extern caca_canvas_t* caca_get_canvas (caca_display_t * *dp*)

Return a handle on the *caca_canvas_t* object that was either attached or created by caca_create_display().

This function never fails.

Parameters:

dp The libcaca graphical context.

Returns:

The libcaca canvas.

2.15.2.8 __extern int caca_refresh_display (caca_display_t * *dp*)

Flush all graphical operations and print them to the display device. Nothing will show on the screen until this function is called.

If caca_set_display_time() was called with a non-zero value, caca_refresh_display() will use that value to achieve constant framerate: if two consecutive calls to caca_refresh_display() are within a time range shorter than the value set with caca_set_display_time(), the second call will be delayed before performing the screen refresh.

This function never fails.

Parameters:

dp The libcaca display context.

Returns:

This function always returns 0.

References caca_clear_dirty_rect_list().

2.15.2.9 __extern int caca_set_display_time (caca_display_t * *dp*, int *usec*)

Set the refresh delay in microseconds. The refresh delay is used by caca_refresh_display() to achieve constant framerate. See the caca_refresh_display() documentation for more details.

If the argument is zero, constant framerate is disabled. This is the default behaviour.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `EINVAL` Refresh delay value is invalid.

Parameters:

dp The libcaca display context.

usec The refresh delay in microseconds.

Returns:

0 upon success, -1 if an error occurred.

2.15.2.10 __extern int caca_get_display_time (caca_display_t const * *dp*)

Get the average rendering time, which is the average measured time between two caca_refresh_display() calls, in microseconds. If constant framerate was activated by calling caca_set_display_time(), the average rendering time will be close to the requested delay even if the real rendering time was shorter.

This function never fails.

Parameters:

dp The libcaca display context.

Returns:

The render time in microseconds.

2.15.2.11 __extern int caca_get_display_width (caca_display_t const * *dp*)

If libcaca runs in a window, get the usable window width. This value can be used for aspect ratio calculation. If libcaca does not run in a window or if there is no way to know the font size, most drivers will assume a 6x10 font is being used. Note that the units are not necessarily pixels.

This function never fails.

Parameters:

dp The libcaca display context.

Returns:

The display width.

2.15.2.12 __extern int caca_get_display_height (caca_display_t const * *dp*)

If libcaca runs in a window, get the usable window height. This value can be used for aspect ratio calculation. If libcaca does not run in a window or if there is no way to know the font size, assume a 6x10 font is being used. Note that the units are not necessarily pixels.

This function never fails.

Parameters:

dp The libcaca display context.

Returns:

The display height.

2.15.2.13 __extern int caca_set_display_title (caca_display_t * *dp*, char const * *title*)

If libcaca runs in a window, try to change its title. This works with the ncurses, S-Lang, OpenGL, X11 and Win32 drivers.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `ENOSYS` Display driver does not support setting the window title.

Parameters:

dp The libcaca display context.

title The desired display title.

Returns:

0 upon success, -1 if an error occurred.

2.15.2.14 __extern int caca_set_mouse (caca_display_t * *dp*, int *flag*)

Show or hide the mouse pointer. This function works with the ncurses, S-Lang and X11 drivers.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `ENOSYS` Display driver does not support hiding the mouse pointer.

Parameters:

dp The libcaca display context.

flag 0 hides the pointer, 1 shows the system's default pointer (usually an arrow). Other values are reserved for future use.

Returns:

0 upon success, -1 if an error occurred.

2.15.2.15 __extern int caca_set_cursor (caca_display_t * *dp*, int *flag*)

Show or hide the cursor, for devices that support such a feature.

If an error occurs, -1 is returned and **errno** is set accordingly:

- `ENOSYS` Display driver does not support showing the cursor.

Parameters:

dp The libcaca display context.

flag 0 hides the cursor, 1 shows the system's default cursor (usually a white rectangle). Other values are reserved for future use.

Returns:

0 upon success, -1 if an error occurred.

Referenced by caca_conio__setcursortype().

2.16 libcaca event handling

Functions

- __extern int caca_get_event (caca_display_t *, int, caca_event_t *, int)

  Get the next mouse or keyboard input event.

- __extern int caca_get_mouse_x (caca_display_t const *)
  Return the X mouse coordinate.
- __extern int caca_get_mouse_y (caca_display_t const *)
  Return the Y mouse coordinate.
- __extern enum caca_event_type caca_get_event_type (caca_event_t const *)
  Return an event's type.
- __extern int caca_get_event_key_ch (caca_event_t const *)
  Return a key press or key release event's value.
- __extern uint32_t caca_get_event_key_utf32 (caca_event_t const *)
  Return a key press or key release event's Unicode value.
- __extern int caca_get_event_key_utf8 (caca_event_t const *, char *)
  Return a key press or key release event's UTF-8 value.
- __extern int caca_get_event_mouse_button (caca_event_t const *)
  Return a mouse press or mouse release event's button.
- __extern int caca_get_event_mouse_x (caca_event_t const *)
  Return a mouse motion event's X coordinate.
- __extern int caca_get_event_mouse_y (caca_event_t const *)
  Return a mouse motion event's Y coordinate.
- __extern int caca_get_event_resize_width (caca_event_t const *)
  Return a resize event's display width value.
- __extern int caca_get_event_resize_height (caca_event_t const *)
  Return a resize event's display height value.

2.16.1 Detailed Description

These functions handle user events such as keyboard input and mouse clicks.

2.16.2 Function Documentation

2.16.2.1 __extern int caca_get_event (caca_display_t * *dp*, int *event_mask*, caca_event_t * *ev*, int *timeout*)

Poll the event queue for mouse or keyboard events matching the event mask and return the first matching event. Non-matching events are discarded. If `event_mask` is zero, the function returns immediately.

The timeout value tells how long this function needs to wait for an event. A value of zero returns immediately and the function returns zero if no more events are pending in the queue. A negative value causes the function to wait indefinitely until a matching event is received.

If not null, `ev` will be filled with information about the event received. If null, the function will return but no information about the event will be sent.

This function never fails.

Parameters:

dp The libcaca graphical context.

event_mask Bitmask of requested events.

timeout A timeout value in microseconds, -1 for blocking behaviour

ev A pointer to a caca_event structure, or NULL.

Returns:

1 if a matching event was received, or 0 if the wait timeouted.

References CACA_EVENT_NONE.

Referenced by caca_conio_getch(), and caca_conio_kbhit().

2.16.2.2 __extern int caca_get_mouse_x (caca_display_t const * *dp*)

Return the X coordinate of the mouse position last time it was detected. This function is not reliable if the ncurses or S-Lang drivers are being used, because mouse position is only detected when the mouse is clicked. Other drivers such as X11 work well.

This function never fails.

Parameters:

dp The libcaca graphical context.

Returns:

The X mouse coordinate.

References caca_get_canvas_width().

2.16.2.3 __extern int caca_get_mouse_y (caca_display_t const * *dp*)

Return the Y coordinate of the mouse position last time it was detected. This function is not reliable if the ncurses or S-Lang drivers are being used, because mouse position is only detected when the mouse is clicked. Other drivers such as X11 work well.

This function never fails.

Parameters:

dp The libcaca graphical context.

Returns:

The Y mouse coordinate.

References caca_get_canvas_height().

2.16.2.4 __extern enum caca_event_type caca_get_event_type (caca_event_t const * *ev*)

Return the type of an event. This function may always be called on an event after caca_get_event() was called, and its return value indicates which other functions may be called:

- `CACA_EVENT_NONE`: no other function may be called.
- `CACA_EVENT_KEY_PRESS`, `CACA_EVENT_KEY_RELEASE`: caca_get_event_key_ch(), caca_get_event_key_utf32() and caca_get_event_key_utf8() may be called.
- `CACA_EVENT_MOUSE_PRESS`, `CACA_EVENT_MOUSE_RELEASE`: caca_get_event_mouse_button() may be called.
- `CACA_EVENT_MOUSE_MOTION`: caca_get_event_mouse_x() and caca_get_event_mouse_y() may be called.
- `CACA_EVENT_RESIZE`: caca_get_event_resize_width() and caca_get_event_resize_height() may be called.
- `CACA_EVENT_QUIT`: no other function may be called.

This function never fails.

Parameters:

ev The libcaca event.

Returns:

The event's type.

2.16.2.5 __extern int caca_get_event_key_ch (caca_event_t const * *ev*)

Return either the ASCII value for an event's key, or if the key is not an ASCII character, an appropriate *enum caca_key* value.

This function never fails, but must only be called with a valid event of type `CACA_EVENT_KEY_PRESS` or `CACA_EVENT_KEY_RELEASE`, or the results will be undefined. See caca_get_event_type() for more information.

Parameters:

ev The libcaca event.

Returns:

The key value.

Referenced by caca_conio_getch(), and caca_conio_kbhit().

2.16.2.6 __extern uint32_t caca_get_event_key_utf32 (caca_event_t const * *ev*)

Return the UTF-32/UCS-4 value for an event's key if it resolves to a printable character.

This function never fails, but must only be called with a valid event of type `CACA_EVENT_KEY_PRESS` or `CACA_EVENT_KEY_RELEASE`, or the results will be undefined. See caca_get_event_type() for more information.

Parameters:

ev The libcaca event.

Returns:

The key's Unicode value.

2.16.2.7 __extern int caca_get_event_key_utf8 (caca_event_t const * *ev*, char * *utf8*)

Write the UTF-8 value for an event's key if it resolves to a printable character. Up to 6 UTF-8 bytes and a null termination are written.

This function never fails, but must only be called with a valid event of type `CACA_EVENT_KEY_PRESS` or `CACA_EVENT_KEY_RELEASE`, or the results will be undefined. See caca_get_event_type() for more information.

Parameters:

ev The libcaca event.

utf8 A string buffer with enough bytes to hold the pressed key value in UTF-8. Though fewer bytes may be written to it, 7 bytes is the minimum safe size.

Returns:

This function always returns 0.

2.16.2.8 __extern int caca_get_event_mouse_button (caca_event_t const * *ev*)

Return the mouse button index for an event.

This function never fails, but must only be called with a valid event of type `CACA_EVENT_MOUSE_PRESS` or `CACA_EVENT_MOUSE_RELEASE`, or the results will be undefined. See caca_get_event_type() for more information.

This function returns 1 for the left mouse button, 2 for the right mouse button, and 3 for the middle mouse button.

Parameters:

ev The libcaca event.

Returns:

The event's mouse button.

2.16.2.9 __extern int caca_get_event_mouse_x (caca_event_t const * *ev*)

Return the X coordinate for a mouse motion event.

This function never fails, but must only be called with a valid event of type `CACA_EVENT_MOUSE_MOTION`, or the results will be undefined. See caca_get_event_type() for more information.

Parameters:

ev The libcaca event.

Returns:

The event's X mouse coordinate.

2.16.2.10 __extern int caca_get_event_mouse_y (caca_event_t const * *ev*)

Return the Y coordinate for a mouse motion event.

This function never fails, but must only be called with a valid event of type `CACA_EVENT_MOUSE_MOTION`, or the results will be undefined. See caca_get_event_type() for more information.

Parameters:

ev The libcaca event.

Returns:

The event's Y mouse coordinate.

2.16.2.11 __extern int caca_get_event_resize_width (caca_event_t const * *ev*)

Return the width value for a display resize event.

This function never fails, but must only be called with a valid event of type `CACA_EVENT_RESIZE`, or the results will be undefined. See caca_get_event_type() for more information.

Parameters:

ev The libcaca event.

Returns:

The event's new display width value.

2.16.2.12 __extern int caca_get_event_resize_height (caca_event_t const * *ev*)

Return the height value for a display resize event.

This function never fails, but must only be called with a valid event of type `CACA_EVENT_RESIZE`, or the results will be undefined. See caca_get_event_type() for more information.

Parameters:

ev The libcaca event.

Returns:

The event's new display height value.

2.17 libcaca DOS conio.h compatibility layer

Functions

- __extern char * caca_conio_cgets (char *str)

  DOS conio.h cgets() equivalent.

- __extern void caca_conio_clreol (void)

  DOS conio.h clreol() equivalent.

- __extern void caca_conio_clrscr (void)

DOS conio.h clrscr() equivalent.

- __extern int caca_conio_cprintf (const char *format,...)
  DOS conio.h cprintf() equivalent.
- __extern int caca_conio_cputs (const char *str)
  DOS conio.h cputs() equivalent.
- __extern int caca_conio_cscanf (char *format,...)
  DOS stdio.h cscanf() equivalent.
- __extern void caca_conio_delay (unsigned int)
  DOS dos.h delay() equivalent.
- __extern void caca_conio_delline (void)
  DOS conio.h delline() equivalent.
- __extern int caca_conio_getch (void)
  DOS conio.h getch() equivalent.
- __extern int caca_conio_getche (void)
  DOS conio.h getche() equivalent.
- __extern char * caca_conio_getpass (const char *prompt)
  DOS conio.h getpass() equivalent.
- __extern int caca_conio_gettext (int left, int top, int right, int bottom, void *destin)
  DOS conio.h gettext() equivalent.
- __extern void caca_conio_gettextinfo (struct caca_conio_text_info *r)
  DOS conio.h gettextinfo() equivalent.
- __extern void caca_conio_gotoxy (int x, int y)
  DOS conio.h gotoxy() equivalent.
- __extern void caca_conio_highvideo (void)
  DOS conio.h highvideo() equivalent.
- __extern void caca_conio_insline (void)
  DOS conio.h insline() equivalent.
- __extern int caca_conio_kbhit (void)
  DOS conio.h kbhit() equivalent.
- __extern void caca_conio_lowvideo (void)
  DOS conio.h lowvideo() equivalent.
- __extern int caca_conio_movetext (int left, int top, int right, int bottom, int destleft, int desttop)
  DOS conio.h movetext() equivalent.

- __extern void caca_conio_normvideo (void)
  DOS conio.h normvideo() equivalent.
- __extern void caca_conio_nosound (void)
  DOS dos.h nosound() equivalent.
- __extern int caca_conio_printf (const char *format,...)
  DOS stdio.h printf() equivalent.
- __extern int caca_conio_putch (int ch)
  DOS conio.h putch() equivalent.
- __extern int caca_conio_puttext (int left, int top, int right, int bottom, void *destin)
  DOS conio.h puttext() equivalent.
- __extern void caca_conio__setcursortype (int cur_t)
  DOS conio.h _setcursortype() equivalent.
- __extern void caca_conio_sleep (unsigned int)
  DOS dos.h sleep() equivalent.
- __extern void caca_conio_sound (unsigned int)
  DOS dos.h sound() equivalent.
- __extern void caca_conio_textattr (int newattr)
  DOS conio.h textattr() equivalent.
- __extern void caca_conio_textbackground (int newcolor)
  DOS conio.h textbackground() equivalent.
- __extern void caca_conio_textcolor (int newcolor)
  DOS conio.h textcolor() equivalent.
- __extern void caca_conio_textmode (int newmode)
  DOS conio.h textmode() equivalent.
- __extern int caca_conio_ungetch (int ch)
  DOS conio.h ungetch() equivalent.
- __extern int caca_conio_wherex (void)
  DOS conio.h wherex() equivalent.
- __extern int caca_conio_wherey (void)
  DOS conio.h wherey() equivalent.
- __extern void caca_conio_window (int left, int top, int right, int bottom)
  DOS conio.h window() equivalent.

2.17.1 Detailed Description

These functions implement DOS-like functions for high-level text operations.

3 Data Structure Documentation

3.1 caca_conio_text_info Struct Reference

DOS text area information.

Data Fields

- unsigned char winleft
- unsigned char wintop
- unsigned char winright
- unsigned char winbottom
- unsigned char attribute
- unsigned char normattr
- unsigned char currmode
- unsigned char screenheight
- unsigned char screenwidth
- unsigned char curx
- unsigned char cury

3.1.1 Detailed Description

This structure stores text area information for the DOS conio.h compatibility layer.

3.1.2 Field Documentation

3.1.2.1 unsigned char caca_conio_text_info::winleft

left window coordinate

3.1.2.2 unsigned char caca_conio_text_info::wintop

top window coordinate

3.1.2.3 unsigned char caca_conio_text_info::winright

right window coordinate

3.1.2.4 unsigned char caca_conio_text_info::winbottom

bottom window coordinate

3.1.2.5 unsigned char caca_conio_text_info::attribute

text attribute

3.1.2.6 unsigned char caca_conio_text_info::normattr

normal attribute

3.1.2.7 unsigned char caca_conio_text_info::currmode

current video mode: BW40, BW80, C40, C80, or C4350

3.1.2.8 unsigned char caca_conio_text_info::screenheight

text screen's height

3.1.2.9 unsigned char caca_conio_text_info::screenwidth

text screen's width

3.1.2.10 unsigned char caca_conio_text_info::curx

x-coordinate in current window

3.1.2.11 unsigned char caca_conio_text_info::cury

y-coordinate in current window

3.2 caca_event Struct Reference

Handling of user events.

Data Fields

- enum caca_event_type type
- union {
  struct {
  int **x**
  int **y**
  int **button**
  } **mouse**
  struct {
  int **w**
  int **h**
  } **resize**
  struct {
  int **ch**
  uint32_t **utf32**
  char **utf8** [8]
  } **key**
  } data

3.2.1 Detailed Description

This structure is filled by caca_get_event() when an event is received. It is an opaque structure that should only be accessed through caca_event_get_type() and similar functions. The struct members may no longer be directly accessible in future versions.

3.2.2 Field Documentation

3.2.2.1 enum caca_event_type caca_event::type

The event type.

3.2.2.2 union { ... } caca_event::data

The event information data

4 File Documentation

4.1 caca.h File Reference

The *libcaca* public header.

Data Structures

- struct caca_event
  Handling of user events.
- struct caca_conio_text_info
  DOS text area information.

Defines

- #define CACA_API_VERSION_1
- #define CACA_MAGIC_FULLWIDTH 0x000ffffe

Typedefs

- typedef struct caca_canvas caca_canvas_t
- typedef struct caca_dither caca_dither_t
- typedef struct caca_font caca_font_t
- typedef struct caca_file caca_file_t
- typedef struct caca_display caca_display_t
- typedef struct caca_event caca_event_t

Enumerations

- enum caca_color {
  CACA_BLACK = 0x00,
  CACA_BLUE = 0x01,
  CACA_GREEN = 0x02,
  CACA_CYAN = 0x03,
  CACA_RED = 0x04,
  CACA_MAGENTA = 0x05,
  CACA_BROWN = 0x06,
  CACA_LIGHTGRAY = 0x07,
  CACA_DARKGRAY = 0x08,
  CACA_LIGHTBLUE = 0x09,
  CACA_LIGHTGREEN = 0x0a,
  CACA_LIGHTCYAN = 0x0b,
  CACA_LIGHTRED = 0x0c,
  CACA_LIGHTMAGENTA = 0x0d,
  CACA_YELLOW = 0x0e,
  CACA_WHITE = 0x0f,
  CACA_DEFAULT = 0x10,
  CACA_TRANSPARENT = 0x20 }
- enum caca_style {
  CACA_BOLD = 0x01,
  CACA_ITALICS = 0x02,
  CACA_UNDERLINE = 0x04,
  CACA_BLINK = 0x08 }
- enum caca_event_type {
  CACA_EVENT_NONE = 0x0000,
  CACA_EVENT_KEY_PRESS = 0x0001,
  CACA_EVENT_KEY_RELEASE = 0x0002,
  CACA_EVENT_MOUSE_PRESS = 0x0004,
  CACA_EVENT_MOUSE_RELEASE = 0x0008,
  CACA_EVENT_MOUSE_MOTION = 0x0010,
  CACA_EVENT_RESIZE = 0x0020,
  CACA_EVENT_QUIT = 0x0040,
  CACA_EVENT_ANY = 0xffff }

  User event type enumeration.

- enum caca_key {
  CACA_KEY_UNKNOWN = 0x00,
  CACA_KEY_CTRL_A = 0x01,
  CACA_KEY_CTRL_B = 0x02,

CACA_KEY_CTRL_C = 0x03,
CACA_KEY_CTRL_D = 0x04,
CACA_KEY_CTRL_E = 0x05,
CACA_KEY_CTRL_F = 0x06,
CACA_KEY_CTRL_G = 0x07,
CACA_KEY_BACKSPACE = 0x08,
CACA_KEY_TAB = 0x09,
CACA_KEY_CTRL_J = 0x0a,
CACA_KEY_CTRL_K = 0x0b,
CACA_KEY_CTRL_L = 0x0c,
CACA_KEY_RETURN = 0x0d,
CACA_KEY_CTRL_N = 0x0e,
CACA_KEY_CTRL_O = 0x0f,
CACA_KEY_CTRL_P = 0x10,
CACA_KEY_CTRL_Q = 0x11,
CACA_KEY_CTRL_R = 0x12,
CACA_KEY_PAUSE = 0x13,
CACA_KEY_CTRL_T = 0x14,
CACA_KEY_CTRL_U = 0x15,
CACA_KEY_CTRL_V = 0x16,
CACA_KEY_CTRL_W = 0x17,
CACA_KEY_CTRL_X = 0x18,
CACA_KEY_CTRL_Y = 0x19,
CACA_KEY_CTRL_Z = 0x1a,
CACA_KEY_ESCAPE = 0x1b,
CACA_KEY_DELETE = 0x7f,
CACA_KEY_UP = 0x111,
CACA_KEY_DOWN = 0x112,
CACA_KEY_LEFT = 0x113,
CACA_KEY_RIGHT = 0x114,
CACA_KEY_INSERT = 0x115,
CACA_KEY_HOME = 0x116,
CACA_KEY_END = 0x117,
CACA_KEY_PAGEUP = 0x118,
CACA_KEY_PAGEDOWN = 0x119,
CACA_KEY_F1 = 0x11a,
CACA_KEY_F2 = 0x11b,
CACA_KEY_F3 = 0x11c,
CACA_KEY_F4 = 0x11d,
CACA_KEY_F5 = 0x11e,
CACA_KEY_F6 = 0x11f,

CACA_KEY_F7 = 0x120,
CACA_KEY_F8 = 0x121,
CACA_KEY_F9 = 0x122,
CACA_KEY_F10 = 0x123,
CACA_KEY_F11 = 0x124,
CACA_KEY_F12 = 0x125,
CACA_KEY_F13 = 0x126,
CACA_KEY_F14 = 0x127,
CACA_KEY_F15 = 0x128 }

Special key values.

- enum CACA_CONIO_COLORS {
CACA_CONIO_BLINK = 128,
CACA_CONIO_BLACK = 0,
CACA_CONIO_BLUE = 1,
CACA_CONIO_GREEN = 2,
CACA_CONIO_CYAN = 3,
CACA_CONIO_RED = 4,
CACA_CONIO_MAGENTA = 5,
CACA_CONIO_BROWN = 6,
CACA_CONIO_LIGHTGRAY = 7,
CACA_CONIO_DARKGRAY = 8,
CACA_CONIO_LIGHTBLUE = 9,
CACA_CONIO_LIGHTGREEN = 10,
CACA_CONIO_LIGHTCYAN = 11,
CACA_CONIO_LIGHTRED = 12,
CACA_CONIO_LIGHTMAGENTA = 13,
CACA_CONIO_YELLOW = 14,
CACA_CONIO_WHITE = 15 }

  DOS colours.

- enum CACA_CONIO_CURSOR {
CACA_CONIO__NOCURSOR = 0,
CACA_CONIO__SOLIDCURSOR = 1,
CACA_CONIO__NORMALCURSOR = 2 }

  DOS cursor modes.

- enum CACA_CONIO_MODE {
CACA_CONIO_LASTMODE = -1,
CACA_CONIO_BW40 = 0,
CACA_CONIO_C40 = 1,
CACA_CONIO_BW80 = 2,

CACA_CONIO_C80 = 3,
CACA_CONIO_MONO = 7,
CACA_CONIO_C4350 = 64 }
DOS video modes.

Functions

- __extern caca_canvas_t * caca_create_canvas (int, int)
  Initialise a libcaca *canvas.*
- __extern int caca_manage_canvas (caca_canvas_t *, int(*)(void *), void *)
  Manage a canvas.
- __extern int caca_unmanage_canvas (caca_canvas_t *, int(*)(void *), void *)
  unmanage a canvas.
- __extern int caca_set_canvas_size (caca_canvas_t *, int, int)
  Resize a canvas.
- __extern int caca_get_canvas_width (caca_canvas_t const *)
  Get the canvas width.
- __extern int caca_get_canvas_height (caca_canvas_t const *)
  Get the canvas height.
- __extern uint32_t const * caca_get_canvas_chars (caca_canvas_t const *)
  Get the canvas character array.
- __extern uint32_t const * caca_get_canvas_attrs (caca_canvas_t const *)
  Get the canvas attribute array.
- __extern int caca_free_canvas (caca_canvas_t *)
  Free a libcaca *canvas.*
- __extern int caca_rand (int, int)
  Generate a random integer within a range.
- __extern char const * caca_get_version (void)
  Return the libcaca *version.*
- __extern int caca_gotoxy (caca_canvas_t *, int, int)
  Set cursor position.
- __extern int caca_wherex (caca_canvas_t const *)
  Get X cursor position.
- __extern int caca_wherey (caca_canvas_t const *)
  Get Y cursor position.

- __extern int caca_put_char (caca_canvas_t *, int, int, uint32_t)
  Print an ASCII or Unicode character.
- __extern uint32_t caca_get_char (caca_canvas_t const *, int, int)
  Get the Unicode character at the given coordinates.
- __extern int caca_put_str (caca_canvas_t *, int, int, char const *)
  Print a string.
- __extern int caca_printf (caca_canvas_t *, int, int, char const *,...)
  Print a formated string.
- __extern int caca_vprintf (caca_canvas_t *, int, int, char const *, va_list)
  Print a formated string (va_list version).
- __extern int caca_clear_canvas (caca_canvas_t *)
  Clear the canvas.
- __extern int caca_set_canvas_handle (caca_canvas_t *, int, int)
  Set cursor handle.
- __extern int caca_get_canvas_handle_x (caca_canvas_t const *)
  Get X handle position.
- __extern int caca_get_canvas_handle_y (caca_canvas_t const *)
  Get Y handle position.
- __extern int caca_blit (caca_canvas_t *, int, int, caca_canvas_t const *, caca_canvas_t const *)
  Blit a canvas onto another one.
- __extern int caca_set_canvas_boundaries (caca_canvas_t *, int, int, int, int)
  Set a canvas' new boundaries.
- __extern int caca_disable_dirty_rect (caca_canvas_t *)
  Disable dirty rectangles.
- __extern int caca_enable_dirty_rect (caca_canvas_t *)
  Enable dirty rectangles.
- __extern int caca_get_dirty_rect_count (caca_canvas_t *)
  Get the number of dirty rectangles in the canvas.
- __extern int caca_get_dirty_rect (caca_canvas_t *, int, int *, int *, int *, int *)
  Get a canvas's dirty rectangle.
- __extern int caca_add_dirty_rect (caca_canvas_t *, int, int, int, int)
  Add an area to the canvas's dirty rectangle list.
- __extern int caca_remove_dirty_rect (caca_canvas_t *, int, int, int, int)

Remove an area from the dirty rectangle list.

- __extern int caca_clear_dirty_rect_list (caca_canvas_t *)
  Clear a canvas's dirty rectangle list.
- __extern int caca_invert (caca_canvas_t *)
  Invert a canvas' colours.
- __extern int caca_flip (caca_canvas_t *)
  Flip a canvas horizontally.
- __extern int caca_flop (caca_canvas_t *)
  Flip a canvas vertically.
- __extern int caca_rotate_180 (caca_canvas_t *)
  Rotate a canvas.
- __extern int caca_rotate_left (caca_canvas_t *)
  Rotate a canvas, 90 degrees counterclockwise.
- __extern int caca_rotate_right (caca_canvas_t *)
  Rotate a canvas, 90 degrees counterclockwise.
- __extern int caca_stretch_left (caca_canvas_t *)
  Rotate and stretch a canvas, 90 degrees counterclockwise.
- __extern int caca_stretch_right (caca_canvas_t *)
  Rotate and stretch a canvas, 90 degrees clockwise.
- __extern uint32_t caca_get_attr (caca_canvas_t const *, int, int)
  Get the text attribute at the given coordinates.
- __extern int caca_set_attr (caca_canvas_t *, uint32_t)
  Set the default character attribute.
- __extern int caca_unset_attr (caca_canvas_t *, uint32_t)
  Unset flags in the default character attribute.
- __extern int caca_toggle_attr (caca_canvas_t *, uint32_t)
  Toggle flags in the default character attribute.
- __extern int caca_put_attr (caca_canvas_t *, int, int, uint32_t)
  Set the character attribute at the given coordinates.
- __extern int caca_set_color_ansi (caca_canvas_t *, uint8_t, uint8_t)
  Set the default colour pair for text (ANSI version).
- __extern int caca_set_color_argb (caca_canvas_t *, uint16_t, uint16_t)
  Set the default colour pair for text (truecolor version).

- __extern uint8_t caca_attr_to_ansi (uint32_t)
  Get DOS ANSI information from attribute.
- __extern uint8_t caca_attr_to_ansi_fg (uint32_t)
  Get ANSI foreground information from attribute.
- __extern uint8_t caca_attr_to_ansi_bg (uint32_t)
  Get ANSI background information from attribute.
- __extern uint16_t caca_attr_to_rgb12_fg (uint32_t)
  Get 12-bit RGB foreground information from attribute.
- __extern uint16_t caca_attr_to_rgb12_bg (uint32_t)
  Get 12-bit RGB background information from attribute.
- __extern void caca_attr_to_argb64 (uint32_t, uint8_t[8])
  Get 64-bit ARGB information from attribute.
- __extern uint32_t caca_utf8_to_utf32 (char const *, size_t *)
  Convert a UTF-8 character to UTF-32.
- __extern size_t caca_utf32_to_utf8 (char *, uint32_t)
  Convert a UTF-32 character to UTF-8.
- __extern uint8_t caca_utf32_to_cp437 (uint32_t)
  Convert a UTF-32 character to CP437.
- __extern uint32_t caca_cp437_to_utf32 (uint8_t)
  Convert a CP437 character to UTF-32.
- __extern char caca_utf32_to_ascii (uint32_t)
  Convert a UTF-32 character to ASCII.
- __extern int caca_utf32_is_fullwidth (uint32_t)
  Tell whether a UTF-32 character is fullwidth.
- __extern int caca_draw_line (caca_canvas_t *, int, int, int, int, uint32_t)
  Draw a line on the canvas using the given character.
- __extern int caca_draw_polyline (caca_canvas_t *, int const x[ ], int const y[ ], int, uint32_t)
  Draw a polyline.
- __extern int caca_draw_thin_line (caca_canvas_t *, int, int, int, int)
  Draw a thin line on the canvas, using ASCII art.
- __extern int caca_draw_thin_polyline (caca_canvas_t *, int const x[ ], int const y[ ], int)
  Draw an ASCII art thin polyline.
- __extern int caca_draw_circle (caca_canvas_t *, int, int, int, uint32_t)
  Draw a circle on the canvas using the given character.

- __extern int caca_draw_ellipse (caca_canvas_t *, int, int, int, int, uint32_t)
  Draw an ellipse on the canvas using the given character.
- __extern int caca_draw_thin_ellipse (caca_canvas_t *, int, int, int, int)
  Draw a thin ellipse on the canvas.
- __extern int caca_fill_ellipse (caca_canvas_t *, int, int, int, int, uint32_t)
  Fill an ellipse on the canvas using the given character.
- __extern int caca_draw_box (caca_canvas_t *, int, int, int, int, uint32_t)
  Draw a box on the canvas using the given character.
- __extern int caca_draw_thin_box (caca_canvas_t *, int, int, int, int)
  Draw a thin box on the canvas.
- __extern int caca_draw_cp437_box (caca_canvas_t *, int, int, int, int)
  Draw a box on the canvas using CP437 characters.
- __extern int caca_fill_box (caca_canvas_t *, int, int, int, int, uint32_t)
  Fill a box on the canvas using the given character.
- __extern int caca_draw_triangle (caca_canvas_t *, int, int, int, int, int, int, uint32_t)
  Draw a triangle on the canvas using the given character.
- __extern int caca_draw_thin_triangle (caca_canvas_t *, int, int, int, int, int, int)
  Draw a thin triangle on the canvas.
- __extern int caca_fill_triangle (caca_canvas_t *, int, int, int, int, int, int, uint32_t)
  Fill a triangle on the canvas using the given character.
- __extern int caca_fill_triangle_textured (caca_canvas_t *cv, int coords[6], caca_canvas_t *tex, float uv[6])
  Fill a triangle on the canvas using an arbitrary-sized texture.
- __extern int caca_get_frame_count (caca_canvas_t const *)
  Get the number of frames in a canvas.
- __extern int caca_set_frame (caca_canvas_t *, int)
  Activate a given canvas frame.
- __extern char const * caca_get_frame_name (caca_canvas_t const *)
  Get the current frame's name.
- __extern int caca_set_frame_name (caca_canvas_t *, char const *)
  Set the current frame's name.
- __extern int caca_create_frame (caca_canvas_t *, int)
  Add a frame to a canvas.

- __extern int caca_free_frame (caca_canvas_t *, int)
  Remove a frame from a canvas.
- __extern caca_dither_t * caca_create_dither (int, int, int, int, uint32_t, uint32_t, uint32_t, uint32_t)
  Create an internal dither object.
- __extern int caca_set_dither_palette (caca_dither_t *, uint32_t r[ ], uint32_t g[ ], uint32_t b[ ], uint32_t a[ ])
  Set the palette of an 8bpp dither object.
- __extern int caca_set_dither_brightness (caca_dither_t *, float)
  Set the brightness of a dither object.
- __extern float caca_get_dither_brightness (caca_dither_t const *)
  Get the brightness of a dither object.
- __extern int caca_set_dither_gamma (caca_dither_t *, float)
  Set the gamma of a dither object.
- __extern float caca_get_dither_gamma (caca_dither_t const *)
  Get the gamma of a dither object.
- __extern int caca_set_dither_contrast (caca_dither_t *, float)
  Set the contrast of a dither object.
- __extern float caca_get_dither_contrast (caca_dither_t const *)
  Get the contrast of a dither object.
- __extern int caca_set_dither_antialias (caca_dither_t *, char const *)
  Set dither antialiasing.
- __extern char const *const * caca_get_dither_antialias_list (caca_dither_t const *)
  Get available antialiasing methods.
- __extern char const * caca_get_dither_antialias (caca_dither_t const *)
  Get current antialiasing method.
- __extern int caca_set_dither_color (caca_dither_t *, char const *)
  Choose colours used for dithering.
- __extern char const *const * caca_get_dither_color_list (caca_dither_t const *)
  Get available colour modes.
- __extern char const * caca_get_dither_color (caca_dither_t const *)
  Get current colour mode.
- __extern int caca_set_dither_charset (caca_dither_t *, char const *)
  Choose characters used for dithering.
- __extern char const *const * caca_get_dither_charset_list (caca_dither_t const *)

Get available dither character sets.

- __extern char const * caca_get_dither_charset (caca_dither_t const *)
  Get current character set.
- __extern int caca_set_dither_algorithm (caca_dither_t *, char const *)
  Set dithering algorithm.
- __extern char const *const * caca_get_dither_algorithm_list (caca_dither_t const *)
  Get dithering algorithms.
- __extern char const * caca_get_dither_algorithm (caca_dither_t const *)
  Get current dithering algorithm.
- __extern int caca_dither_bitmap (caca_canvas_t *, int, int, int, int, caca_dither_t const *, void const *)
  Dither a bitmap on the canvas.
- __extern int caca_free_dither (caca_dither_t *)
  Free the memory associated with a dither.
- __extern caca_font_t * caca_load_font (void const *, size_t)
  Load a font from memory for future use.
- __extern char const *const * caca_get_font_list (void)
  Get available builtin fonts.
- __extern int caca_get_font_width (caca_font_t const *)
  Get a font's standard glyph width.
- __extern int caca_get_font_height (caca_font_t const *)
  Get a font's standard glyph height.
- __extern uint32_t const * caca_get_font_blocks (caca_font_t const *)
  Get a font's list of supported glyphs.
- __extern int caca_render_canvas (caca_canvas_t const *, caca_font_t const *, void *, int, int, int)
  Render the canvas onto an image buffer.
- __extern int caca_free_font (caca_font_t *)
  Free a font structure.
- __extern int caca_canvas_set_figfont (caca_canvas_t *, char const *)
  load a figfont and attach it to a canvas
- __extern int caca_put_figchar (caca_canvas_t *, uint32_t)
  paste a character using the current figfont
- __extern int caca_flush_figlet (caca_canvas_t *)
  flush the figlet context

- __extern caca_file_t * caca_file_open (char const *, const char *)
  Open a file for reading or writing.
- __extern int caca_file_close (caca_file_t *)
  Close a file handle.
- __extern uint64_t caca_file_tell (caca_file_t *)
  Return the position in a file handle.
- __extern size_t caca_file_read (caca_file_t *, void *, size_t)
  Read data from a file handle.
- __extern size_t caca_file_write (caca_file_t *, const void *, size_t)
  Write data to a file handle.
- __extern char * caca_file_gets (caca_file_t *, char *, int)
  Read a line from a file handle.
- __extern int caca_file_eof (caca_file_t *)
  Tell whether a file handle reached end of file.
- __extern ssize_t caca_import_canvas_from_memory (caca_canvas_t *, void const *, size_t, char const *)
  Import a memory buffer into a canvas.
- __extern ssize_t caca_import_canvas_from_file (caca_canvas_t *, char const *, char const *)
  Import a file into a canvas.
- __extern ssize_t caca_import_area_from_memory (caca_canvas_t *, int, int, void const *, size_t, char const *)
  Import a memory buffer into a canvas area.
- __extern ssize_t caca_import_area_from_file (caca_canvas_t *, int, int, char const *, char const *)
  Import a file into a canvas area.
- __extern char const *const * caca_get_import_list (void)
  Get available import formats.
- __extern void * caca_export_canvas_to_memory (caca_canvas_t const *, char const *, size_t *)
  Export a canvas into a foreign format.
- __extern void * caca_export_area_to_memory (caca_canvas_t const *, int, int, int, int, char const *, size_t *)
  Export a canvas portion into a foreign format.
- __extern char const *const * caca_get_export_list (void)
  Get available export formats.
- __extern caca_display_t * caca_create_display (caca_canvas_t *)

Attach a caca graphical context to a caca canvas.

- __extern caca_display_t * caca_create_display_with_driver (caca_canvas_t *, char const *)
  Attach a specific caca graphical context to a caca canvas.
- __extern char const *const * caca_get_display_driver_list (void)
  Get available display drivers.
- __extern char const * caca_get_display_driver (caca_display_t *)
  Return a caca graphical context's current output driver.
- __extern int caca_set_display_driver (caca_display_t *, char const *)
  Set the output driver.
- __extern int caca_free_display (caca_display_t *)
  Detach a caca graphical context from a caca backend context.
- __extern caca_canvas_t * caca_get_canvas (caca_display_t *)
  Get the canvas attached to a caca graphical context.
- __extern int caca_refresh_display (caca_display_t *)
  Flush pending changes and redraw the screen.
- __extern int caca_set_display_time (caca_display_t *, int)
  Set the refresh delay.
- __extern int caca_get_display_time (caca_display_t const *)
  Get the display's average rendering time.
- __extern int caca_get_display_width (caca_display_t const *)
  Get the display width.
- __extern int caca_get_display_height (caca_display_t const *)
  Get the display height.
- __extern int caca_set_display_title (caca_display_t *, char const *)
  Set the display title.
- __extern int caca_set_mouse (caca_display_t *, int)
  Show or hide the mouse pointer.
- __extern int caca_set_cursor (caca_display_t *, int)
  Show or hide the cursor.
- __extern int caca_get_event (caca_display_t *, int, caca_event_t *, int)
  Get the next mouse or keyboard input event.
- __extern int caca_get_mouse_x (caca_display_t const *)
  Return the X mouse coordinate.

- __extern int caca_get_mouse_y (caca_display_t const *)
  Return the Y mouse coordinate.
- __extern enum caca_event_type caca_get_event_type (caca_event_t const *)
  Return an event's type.
- __extern int caca_get_event_key_ch (caca_event_t const *)
  Return a key press or key release event's value.
- __extern uint32_t caca_get_event_key_utf32 (caca_event_t const *)
  Return a key press or key release event's Unicode value.
- __extern int caca_get_event_key_utf8 (caca_event_t const *, char *)
  Return a key press or key release event's UTF-8 value.
- __extern int caca_get_event_mouse_button (caca_event_t const *)
  Return a mouse press or mouse release event's button.
- __extern int caca_get_event_mouse_x (caca_event_t const *)
  Return a mouse motion event's X coordinate.
- __extern int caca_get_event_mouse_y (caca_event_t const *)
  Return a mouse motion event's Y coordinate.
- __extern int caca_get_event_resize_width (caca_event_t const *)
  Return a resize event's display width value.
- __extern int caca_get_event_resize_height (caca_event_t const *)
  Return a resize event's display height value.
- __extern char * caca_conio_cgets (char *str)
  DOS conio.h cgets() equivalent.
- __extern void caca_conio_clreol (void)
  DOS conio.h clreol() equivalent.
- __extern void caca_conio_clrscr (void)
  DOS conio.h clrscr() equivalent.
- __extern int caca_conio_cprintf (const char *format,...)
  DOS conio.h cprintf() equivalent.
- __extern int caca_conio_cputs (const char *str)
  DOS conio.h cputs() equivalent.
- __extern int caca_conio_cscanf (char *format,...)
  DOS stdio.h cscanf() equivalent.
- __extern void caca_conio_delay (unsigned int)
  DOS dos.h delay() equivalent.

- __extern void caca_conio_delline (void)
  DOS conio.h delline() equivalent.
- __extern int caca_conio_getch (void)
  DOS conio.h getch() equivalent.
- __extern int caca_conio_getche (void)
  DOS conio.h getche() equivalent.
- __extern char * caca_conio_getpass (const char *prompt)
  DOS conio.h getpass() equivalent.
- __extern int caca_conio_gettext (int left, int top, int right, int bottom, void *destin)
  DOS conio.h gettext() equivalent.
- __extern void caca_conio_gettextinfo (struct caca_conio_text_info *r)
  DOS conio.h gettextinfo() equivalent.
- __extern void caca_conio_gotoxy (int x, int y)
  DOS conio.h gotoxy() equivalent.
- __extern void caca_conio_highvideo (void)
  DOS conio.h highvideo() equivalent.
- __extern void caca_conio_insline (void)
  DOS conio.h insline() equivalent.
- __extern int caca_conio_kbhit (void)
  DOS conio.h kbhit() equivalent.
- __extern void caca_conio_lowvideo (void)
  DOS conio.h lowvideo() equivalent.
- __extern int caca_conio_movetext (int left, int top, int right, int bottom, int destleft, int desttop)
  DOS conio.h movetext() equivalent.
- __extern void caca_conio_normvideo (void)
  DOS conio.h normvideo() equivalent.
- __extern void caca_conio_nosound (void)
  DOS dos.h nosound() equivalent.
- __extern int caca_conio_printf (const char *format,...)
  DOS stdio.h printf() equivalent.
- __extern int caca_conio_putch (int ch)
  DOS conio.h putch() equivalent.
- __extern int caca_conio_puttext (int left, int top, int right, int bottom, void *destin)

DOS conio.h puttext() equivalent.

- __extern void caca_conio__setcursortype (int cur_t)
  DOS conio.h _setcursortype() equivalent.
- __extern void caca_conio_sleep (unsigned int)
  DOS dos.h sleep() equivalent.
- __extern void caca_conio_sound (unsigned int)
  DOS dos.h sound() equivalent.
- __extern void caca_conio_textattr (int newattr)
  DOS conio.h textattr() equivalent.
- __extern void caca_conio_textbackground (int newcolor)
  DOS conio.h textbackground() equivalent.
- __extern void caca_conio_textcolor (int newcolor)
  DOS conio.h textcolor() equivalent.
- __extern void caca_conio_textmode (int newmode)
  DOS conio.h textmode() equivalent.
- __extern int caca_conio_ungetch (int ch)
  DOS conio.h ungetch() equivalent.
- __extern int caca_conio_wherex (void)
  DOS conio.h wherex() equivalent.
- __extern int caca_conio_wherey (void)
  DOS conio.h wherey() equivalent.
- __extern void caca_conio_window (int left, int top, int right, int bottom)
  DOS conio.h window() equivalent.

Variables

- __extern int caca_conio_directvideo
  DOS direct video control.
- __extern int caca_conio__wscroll
  DOS scrolling control.

4.1.1 Detailed Description

Author:

Sam Hocevar <sam@hocevar.net> This header contains the public types and functions that applications using *libcaca* may use.

4.1.2 Define Documentation

4.1.2.1 #define CACA_API_VERSION_1

libcaca API version

4.1.3 Typedef Documentation

4.1.3.1 typedef struct caca_canvas caca_canvas_t

libcaca canvas

4.1.3.2 typedef struct caca_dither caca_dither_t

dither structure

4.1.3.3 typedef struct caca_font caca_font_t

font structure

4.1.3.4 typedef struct caca_file caca_file_t

file handle structure

4.1.3.5 typedef struct caca_display caca_display_t

libcaca display context

4.1.3.6 typedef struct caca_event caca_event_t

libcaca event structure

4.1.4 Enumeration Type Documentation

4.1.4.1 enum caca_event_type

This enum serves two purposes:

- Build listening masks for caca_get_event().
- Define the type of a *caca_event_t*.

Enumerator:

CACA_EVENT_NONE No event.
CACA_EVENT_KEY_PRESS A key was pressed.
CACA_EVENT_KEY_RELEASE A key was released.
CACA_EVENT_MOUSE_PRESS A mouse button was pressed.
CACA_EVENT_MOUSE_RELEASE A mouse button was released.
CACA_EVENT_MOUSE_MOTION The mouse was moved.
CACA_EVENT_RESIZE The window was resized.
CACA_EVENT_QUIT The user requested to quit.
CACA_EVENT_ANY Bitmask for any event.

4.1.4.2 enum caca_key

Special key values returned by caca_get_event() for which there is no printable ASCII equivalent.

Enumerator:

CACA_KEY_UNKNOWN Unknown key.
CACA_KEY_CTRL_A The Ctrl-A key.
CACA_KEY_CTRL_B The Ctrl-B key.
CACA_KEY_CTRL_C The Ctrl-C key.
CACA_KEY_CTRL_D The Ctrl-D key.
CACA_KEY_CTRL_E The Ctrl-E key.
CACA_KEY_CTRL_F The Ctrl-F key.
CACA_KEY_CTRL_G The Ctrl-G key.
CACA_KEY_BACKSPACE The backspace key.
CACA_KEY_TAB The tabulation key.
CACA_KEY_CTRL_J The Ctrl-J key.
CACA_KEY_CTRL_K The Ctrl-K key.
CACA_KEY_CTRL_L The Ctrl-L key.
CACA_KEY_RETURN The return key.
CACA_KEY_CTRL_N The Ctrl-N key.
CACA_KEY_CTRL_O The Ctrl-O key.
CACA_KEY_CTRL_P The Ctrl-P key.
CACA_KEY_CTRL_Q The Ctrl-Q key.
CACA_KEY_CTRL_R The Ctrl-R key.
CACA_KEY_PAUSE The pause key.
CACA_KEY_CTRL_T The Ctrl-T key.
CACA_KEY_CTRL_U The Ctrl-U key.
CACA_KEY_CTRL_V The Ctrl-V key.
CACA_KEY_CTRL_W The Ctrl-W key.
CACA_KEY_CTRL_X The Ctrl-X key.
CACA_KEY_CTRL_Y The Ctrl-Y key.
CACA_KEY_CTRL_Z The Ctrl-Z key.
CACA_KEY_ESCAPE The escape key.
CACA_KEY_DELETE The delete key.
CACA_KEY_UP The up arrow key.
CACA_KEY_DOWN The down arrow key.
CACA_KEY_LEFT The left arrow key.
CACA_KEY_RIGHT The right arrow key.
CACA_KEY_INSERT The insert key.
CACA_KEY_HOME The home key.
CACA_KEY_END The end key.
CACA_KEY_PAGEUP The page up key.

CACA_KEY_PAGEDOWN The page down key.
CACA_KEY_F1 The F1 key.
CACA_KEY_F2 The F2 key.
CACA_KEY_F3 The F3 key.
CACA_KEY_F4 The F4 key.
CACA_KEY_F5 The F5 key.
CACA_KEY_F6 The F6 key.
CACA_KEY_F7 The F7 key.
CACA_KEY_F8 The F8 key.
CACA_KEY_F9 The F9 key.
CACA_KEY_F10 The F10 key.
CACA_KEY_F11 The F11 key.
CACA_KEY_F12 The F12 key.
CACA_KEY_F13 The F13 key.
CACA_KEY_F14 The F14 key.
CACA_KEY_F15 The F15 key.

4.1.4.3 enum CACA_CONIO_COLORS

This enum lists the colour values for the DOS conio.h compatibility layer.

4.1.4.4 enum CACA_CONIO_CURSOR

This enum lists the cursor mode values for the DOS conio.h compatibility layer.

4.1.4.5 enum CACA_CONIO_MODE

This enum lists the video mode values for the DOS conio.h compatibility layer.

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