

Making New Themes For Kvantum

Please install Kvantum, read the file “Theme-Config”, and create the configuration folder before reading this document! A basic knowledge of Inkscape is also presupposed here.

Making new themes may take time but its logic is not complex. Each Kvantum theme consists of a configuration file (explained in “Theme-Config”) and an SVG image. Both should have the same name – **MY_THEME**, for example – and be put into the same folder “`~/.config/Kvantum/MY_THEME`”. This document explains how you could create an SVG image for your new theme.

But let us first try an alternative theme that is already included in the source. Its name is **Glassy**. The folder “`doc/Glassy`” contains the configuration file “**Glassy.kvconfig**” and the SVG image “**Glassy.svg**”. If you install **Glassy** and change the active theme to it with **Kvantum Manager**, the folder “Glassy” will be created inside “`~/.config/Kvantum/`”, the above-mentioned files will be put into it, and the file “`~/.config/Kvantum/kvantum.kvconfig`” will contain:

theme=**Glassy**

Now run any Qt or KDE application and see the difference:



Scrollbar and buttons have a glassy look with rounded edges, tabs, progressbars and line-edits also have rounded edges, tabs are left aligned and the active tab is attached to the tab widget. If you open “**Glassy.svg**” with Inkscape, you will find just a few objects in it. Kvantum first searches that image for

the widget parts and if it does not find the relevant object names, it will go to the image of the default theme. That is similar to what Kvantum does with the configuration files, as was explained in “Theme-Config”.

For instance, to not show scrollbar grip indicators of the default theme, invisible rectangles with names “grip-normal”, “grip-focused” and “grip-pressed” are created in “*Glassy.svg*”. On the other hand, in the same image, there is no object for the interior of progressbar patterns but just objects for their frame, so that the new frame is used alongside the default interior.

The number of objects you create inside your SVG image depends on how much you want your theme to be different from the default one. The easiest way is to start with the default SVG image itself. The file “*default.svg*” in the “doc” folder is the image for the default theme. It contains useful comments on various objects. *(Please do not use the image with the same name in the folder “style/themeconfig/” because it is cleaned by **SVG Cleaner** and not only does not contain any comment, the groupings of its objects could also be misleading!)* You could change the objects one by one in whatever way you prefer, delete those objects you do not want to change, put invisible rectangles in place of those you want to omit, and even add new objects.

Do not forget that the look of your theme is determined by its configuration file too. Also note that your theme will be used together with a color scheme of your choice. Therefore, select colors and gradients carefully, so that they match your color scheme. Yes! There may be a lot of work to do but it is what you pay for being able to control virtually every aspect of each widget.

After you have finished your work with the image, first back it up and then, preferably, clean it with *SVG Cleaner*. It is a nice tool that can reduce the size of an SVG image considerably. In this way, the memory footprint will be minimized. If *SVG Cleaner* is not in the repository of your Linux distro, you could get its latest source from <https://github.com/RazrFalcon/SVGCleaner>. If you have used the cloning menu-item of Inkscape (which links similar objects) as far as possible, the image will have the minimum size.

To make your theme available to others, put these three files in a folder named **MY_THEME**:

MY_THEME.svg (the SVG image)
MY_THEME.kvconfig (the Kvantum configuration file)
MY_THEME.colors (a KDE color scheme)

In this way, your users could install and choose your theme easily with “Kvantum Manager”, which is a simple GUI made for that purpose.

Alternatively, you could put **MY_THEME.svg** and **MY_THEME.kvconfig** in the folder ‘**MY_THEME/Kvantum/**’, compress it, and tell your users to extract the archive in ‘**~/themes/**’ or ‘**~/local/share/themes/**’.

There are also two root installation paths, namely ‘**/usr/share/Kvantum/MY_THEME/**’ and ‘**/usr/share/themes/MY_THEME/Kvantum/**’. (For more information, see [Theme Installation Paths!](#))

That is the basic logic behind making themes for Kvantum. Now, we pay attention to some details in the following sections:

Elements
Interior and Frames
Indicators
Flat indicators and Hight Contrast
States
Orientations
Inactiveness
The Default (Push) Button
Inheritance and Alignment
Patterns
Junctions for Tab Widgets
Floating Tabs
Translucency and Shadow for Menus and Tooltips
Blurring for Menus and Tooltips
Window Translucency
Maximum Corner Roundness (Frame Expansion)
Frame Expansion and Border
Theme Installation Paths

Elements

Each section of the configuration file – except for the General, GeneralColors and Hacks sections – determines the look of a widget by setting the elements that are used to draw it (see Sections Table in “Theme-Config”). Usually, there are three kinds of elements, namely, *frame*, *interior* and *indicator*. Some widgets may not need all of them and some may need more.

The basic names of elements are mostly optional but there are a few exceptions, i. e. the names of dial elements (*dial*, *dial-notches*, *dial-handle*) MDI titlebar buttons (*mdi-maximize*, *mdi-restore*, *mdi-minimize*, *mdi-close*, *mdi-shade*, *mdi-menu*), the default button indicator (*button-default-indicator*), and the header separator (*header-separator*).

Interior and Frames

The *names* (or *id* strings) of the rectangular objects, that are used to draw the frame and interior elements of a widget, depend on its state. There are five states at most: *normal*, *focused*, *pressed*, *toggled*, and *disabled*. For each state, there are at most nine rectangular objects: one for the interior and eight for the frame.

Each interior object should have a name (id) with this format:

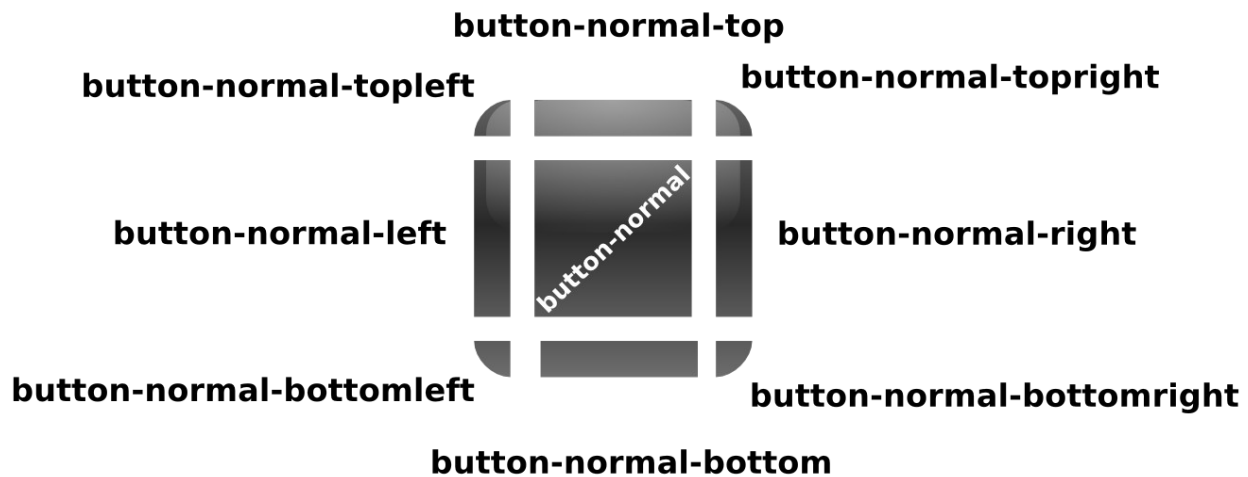
iNAME-STATE

Here, iNAME is set as the string value of “interior.element” in the configuration file, and STATE is the state of the widget the object represents. The name of each frame object should be:

fNAME-STATE-POSITION

Where fNAME is set as the string value of “frame.element” in the configuration file, and POSITION could be *top*, *bottom*, *left*, *right*, *topleft*, *topright*, *bottomleft* or *bottomright*.

For example, the following image shows the names of the nine objects that together draw the normal state of a button widget, whose frame and interior names are both “button”. It could be defined in the “PanelButtonCommand” or “PanelButtonTool” section of the configuration file.



Not all widgets have frame. For example, windows do not have frame and it will make no difference whether you set “*frame=true*” and define a frame element under the *Window* section.

Also some framed widgets may not exactly obey the frame widths provided under their corresponding sections. For example, the frame of a tooltip has a uniform thickness on all sides, which is equal to the maximum of the frame widths defined under the *Tooltip* section. Or if there is not enough space for a button, all of its frame widths will be set to 3px at most.

Indicators

An indicator is a sign or icon on a widget that shows some action is available or informs the user of something about that widget.

For instance, some tool buttons have “arrow indicators,” which will show a drop-down menu if pressed. Arrow indicators also appear on combo boxes to show that other options are available. Or the handle of a scrollbar slider may have an indicator that can make it easier to find it. The close button of a tab can be seen as an indicator too. And so on.

The element name of an indicator is (made out of) the string value of “indicator.element” under the relevant section of the configuration file. Its SVG object name is made by adding its state to its element name with a dash, as in case of interior and frames.

The following table is a list of all indicators Kvantum draws and also their possible states. Some of them are simple indicators, some are complex ones consisting of multiple elements whose names are derived from the same string, and yet some others are complete elements with interior, frame and

indicator parts. Here, “indicator base name” means the string value of “indicator.element” under the relevant section. For simple indicators, it is the indicator element name itself.

Section	Indicator
TreeExpander	A sign that shows whether a tree branch is expanded or not. It is a complete element with interior, frame and indicator parts. The names of its indicator elements are made by adding “ <i>-minus</i> ” and “ <i>-plus</i> ” to its indicator base name. Its indicator can have normal, pressed, focused and disabled states .
IndicatorSpinBox	Up/down and plus/minus indicators for spin widgets. Their element names are made by adding “ <i>-up</i> ”, “ <i>-down</i> ”, “ <i>-left</i> ”, “ <i>-right</i> ”, “ <i>-plus</i> ” and “ <i>-minus</i> ” to the indicator base name of IndicatorSpinBox. They can have all possible states .
HeaderSection	<p>The sorting indicators for headers in item views, whose element names are made by adding “<i>-down</i>” and “<i>-up</i>” to the indicator base name of HeaderSection. They can have normal, pressed, focused and disabled states.</p> <p>Also the header separator, whose SVG object name is always <i>header-separator</i>. If no header separator is included in the SVG image, the left frame of the HeaderSection will be used as a separator too.</p>
DropDownButton	An indicator that shows a drop menu is available. It can have all possible states (but see IndicatorArrow below).
Tab	Tab close button and also tab-tear indicators. Their indicator names are made by adding “ <i>-close</i> ” and “ <i>-tear</i> ” to the indicator base name of Tab, respectively. The close indicator can have normal, pressed, focused and disabled states but the tear indicator is stateless.
IndicatorArrow	Up/down/left/right/ arrows used in various widgets. Their indicator names are made by adding “ <i>-up</i> ”, “ <i>-down</i> ”, “ <i>-left</i> ” and “ <i>-right</i> ” to the indicator base name of IndicatorArrow and they can have all possible states but the <i>toggled</i> state can be omitted, in which case the <i>pressed</i> state will be used instead.
Scrollbar	Indicators for scrolling. Their indicator names are made as in case of IndicatorArrow above.
ScrollbarSlider	A decorative indicator on the slider of a scrollbar. It can have normal, pressed and focused states .
ScrollbarGroove	Glows at the top and bottom of the scrollbar but inside its groove interior. Their indicator names are made by adding “ <i>-topglow</i> ” and “ <i>-bottomglow</i> ” to the name of the interior element of ScrollbarGroove and they can only have the normal state (but can also have “ <i>inactive</i> ” counterparts). Their extent is always twice the scrollbar thickness.

Toolbar	<p>The handle of a floatable toolbar, whose indicator name is made by adding “<i>-handle</i>” to the Toolbar indicator name. It has no state. Its thickness is the toolbar indicator size. If the key “center_toolbar_handle” is set to true under the General section, its height (for horizontal toolbars) is the same as its width; otherwise, its height would be equal to the toolbar interior height.</p> <p>Also the toolbar separator, whose indicator name is made by adding “<i>-separator</i>” to the Toolbar indicator name. It has no state either. Its thickness is the toolbar indicator size too.</p>
SizeGrip	<p>The window resize indicator with a maximum size of 13px. Its states are only normal and focused and it should be drawn for the right bottom corner.</p>
PanelButtonCommand	<p>An indicator for the default push button, whose SVG object name is always <i>button-default-indicator</i>.</p> <p>Also another indicator showing that the button has a drop menu, whose indicator name is made by adding “<i>-down</i>” to the indicator name of PanelButtonCommand. It can have normal, pressed, focused and disabled states.</p>
PanelButtonTool	<p>Arrow indicators. Their indicator names are made as in case of IndicatorArrow above.</p> <p>Note: By choosing the same name (“arrow”, for example) for the indicators of TreeExpander, IndicatorSpinBox, HeaderSection, IndicatorArrow, Scrollbar, PanelButtonCommand and PanelButtonTool, you could use the same set of SVG elements for all of them. However, that is optional.</p>
SliderCursor	<p>That handle of a slider (a volume control, for example). It is a complete element with interior, frame and indicator parts. Its states can be normal, pressed, focused and disabled.</p>
TitleBar	<p>Maximize/restore/minimize/close/shade/menu buttons of the titlebar of a QmdiSubWindow.</p>
MenuItem	<p>The tear-off indicator for detachable menus, whose indicator name is made by adding “<i>-tearoff</i>” to the indicator base name of MenuItem. It only has normal and focused states and is repeated every 20px horizontally.</p> <p>Also the menu-item separator, whose indicator name is made by adding “<i>-separator</i>” to the indicator base name of MenuItem. It has no state and is repeated every 20px horizontally.</p> <p>Also the submenu/scroller arrows, whose indicator names are made as in case of IndicatorArrow and whose states can be normal, pressed, focused and disabled.</p>

	Note: If there is no submenu/scroller arrow element for menu-items in the SVG image, those of IndicatorArrow will be used.
Splitter	An indicator for the handle of a splitter. It is a complete element with interior, frame and indicator parts. Its states are normal, focused and pressed.

Also see [“Orientations”](#).

“Flat” Indicators and High Contrast

Like other widgets, tool or push buttons can have different backgrounds and their text colors should be set appropriately to have enough contrast with their background colors. But unlike other widgets, tool and push buttons can be flat, in which case no background (panel) is drawn for their normal state. In such cases, Kvantum automatically sets their text color to that of the widget behind them (toolbar, menubar or any container whose text color can be set). It will also use “flat” indicators instead of the usual ones *if* they exist in the SVG image and *if* the usual indicators do not have enough contrast with the widget behind flat buttons.

The names of flat indicator objects are made by adding the string “**flat-**” to the beginning of the names of usual indicators. For example, if the name of the indicator element under the *PanelButtonCommand* section is “arrow”, extra objects with names “***flat-arrow-up-normal***”, “***flat-arrow-down-normal***”, ..., “***flat-arrow-right-focused***”, “***flat-arrow-left-pressed***”, etc. could be added to the SVG image. Also the default button indicator, whose name is always *button-default-indicator*, can have a flat counterpart with the name ***flat-button-default-indicator***.

If Kvantum does not found the “down-normal” objects of “flat” indicators, it will use the usual ones for drawing the indicators of flat buttons. “Flat” indicators are good only when there is a high contrast between the background color of buttons and that of widgets behind them, for example, when dark buttons with white texts and indicators are used together with light containers.

To determine whether there is a high contrast, Kvantum relies on the value of *text.normal.color*. Therefore, ***apart from textless widgets, only the interior elements of those widgets that accept state-specific text colors can have a high contrast with the window or base background.*** For example, menubars, toolbars and buttons have state-specific text colors but generic frames or tab frames do not (see the note in the explanation of the key *text.normal.color* in the file *Theme-Config.pdf*). As a result, the interior colors of toolbars, menubars or buttons can have a high contrast with the window color (the value of *window.color* under the section *GeneralColors*), provided that their normal text colors are set correctly in the configuration file. However, the interior colors of generic frames or tab frames (if they have any interior element at all) should NOT have a high contrast with the window color because *text.normal.color* has no meaning for them.

States

As mentioned before, there are five states at most: *normal*, *focused*, *pressed*, *toggled*, and *disabled*. You

do not need to draw any object for the disabled state of interiors or frames because they are automatically created based on the normal state by reducing its opacity.

However, the disabled states of most *indicators* should be included in the SVG image because, for example, we may want disabled indicators to be totally invisible or have a neutral color.

Not all widgets have all the possible states. For example, menu-items and menubar-items do not have normal and disabled states; toolbars only have the normal and disabled states; and line-edits can only be in a normal, focused or disabled state, etc. On the other hand, the SVG elements used for drawing frame focus rectangle (under the *Focus* section) cannot have any state because they are used for distinguishing some widgets that already have keyboard focus.

You could know about the possible states by examining the image “*doc/default.svg*” with Inkscape. For possible states of [indicators](#), see their [table](#). Not drawing redundant objects not only saves your time but also reduces the memory usage.

Orientations

Some widgets, like scrollbars, can be oriented both vertically and horizontally; some others, like tabs, have even more orientations. Even if you use gradients, you will need to draw objects only for one of the possible orientations, which may be different based on which orientation a widget most commonly has in various applications. There is no consensus about that but these are the orientations you should use when you draw objects for Kvantum:

Widget	Orientation
Scrollbar (slider, groove, indicator, grip)	Vertical
Slider groove (like in volume controls)	Vertical
Header	Horizontal
Header Separator (between header sections)	Vertical (the header itself is horizontal)
Slider Handle	Vertical with tick marks to the right of the slider. <i>(The handle will be rotated or mirrored only if its width and height are different.)</i>
Splitter Handle	Vertical (which means that the splitter itself is horizontal technically)
Progressbar (groove, pattern/indicator)	Horizontal
Tab	Horizontal (and top)
Toolbar	Horizontal
Toolbar Handle (for floatable toolbars)	Vertical (the toolbar itself is horizontal)
Toolbar Separator (between toolbar buttons)	Vertical (the toolbar itself is horizontal)
SizeGrip	To be drawn for the right bottom corner.

Kvantum automatically draws the other orientation(s) for each of the above widgets. There is only one exception and it is the arrow indicators of the “[IndicatorArrow](#)” section, all of whose orientations should be included. It is better to draw all orientations of the arrow indicators of the “[MenuItem](#)” section too but if they are missing, those of “IndicatorArrow” will be used.

Inactiveness

The window containing a widget may not have keyboard focus, in which case it is said to be inactive. Inactive windows are usually distinguished from the active one by their title-bars.

In Kvantum, inactiveness of a widget means that its window is inactive. Inactiveness can be considered as a sub-state so that, for each state of an SVG object, an “inactive” counterpart can be added. The name of such objects should have the string “*-inactive*” after their state strings. For example:

E-normal-**inactive**(-top/-bottom/...)
E-focused-**inactive**(-top/-bottom/...)
E-pressed-**inactive**(-top/-bottom/...)
E-toggled-**inactive**(-top/-bottom/...)
E-disabled-**inactive**(-top/-bottom/...)

Where “E” is the name of the element that object draws, as it appears in the configuration file.

This feature is completely optional and is not used in the default theme. If “inactive” objects are present, they will be used for drawing widgets on inactive windows; otherwise the usual objects will be used for drawing widgets on both active and inactive windows.

The Default (Push) Button

The default push button is the one that has the keyboard focus. There are two (optional) ways to make it distinct: (1) adding a default button indicator; and/or (2) giving a default frame to it.

The default button indicator has no state and the name of its SVG object is always “***button-default-indicator***”. When drawn on the button, its size is equal to the value of the key “*indicator.size*” under the *PanelButtonCommand* section and its place is on the right or left bottom corner of the widget for LTR or RTL layout direction respectively.

The names of the default frame SVG objects are made by adding the string “***-default***” to the end of the name of button frame element under the *PanelButtonCommand* section. For example, if the latter is “button”, the default button SVG objects should be named as “*button-default-top*”, “*button-default-topleft*”, “*button-default-topright*”, etc. Since the interior element (“*button-default*”, in this example) is not used in drawing, you do not need to include it. Like the default indicator, the default frame does not have any state.

Inheritance and Alignment

Although the key *inherits* can be used under various widget sections for not repeating identical properties, its use can result in an interesting visual effect too. For example, if this key is used under the *ComboBox* section as “inherits=PanelButtonCommand”, and provided that no frame width or text margin is specified, the frame widths and text margins of combo-boxes will be equal to those of push-buttons. As a result, if a combo-box is located adjacent to a push-button horizontally and if both of them either have icon or are iconless, they will look aligned; in other words, their top as well as bottom borders will be on the same level. The same thing can be said about tool-buttons (under the section *PanelButtonTool*), line-edits and spin-boxes.

Therefore, if you want the horizontally adjacent widgets to look aligned as far as possible, you could rely on the key *inherits* and set it to PanelButtonCommand, as the best candidate for inheritance.

Patterns

A pattern is an image used for tiling the interior of an element. The interior is tiled by it when, at least, one of the keys *interior.x.patternsize* or *interior.y.patternsize* has a positive value under the corresponding section. (The absence of these keys means no tiling.) These keys show how the interior is tiled by the pattern in the horizontal and vertical directions, respectively. If one of them is zero, there will be no tiling in its direction.

The SVG object used for tiling is the interior object itself unless there is another SVG object whose name is made by adding “*-pattern*” to the end of the name of the interior object, in which case, the pattern is drawn as a tiled layer over the interior background. Needless to say, in the latter case, the pattern object should have some translucency for the background to be seen behind it.

For example, if the Window section has an interior element called “window” and if, at least, one of the pattern sizes is greater than zero, the SVG object “window-normal” will be used for tiling the background of windows and dialogs (see [Interior and Frames](#)). However, if an object with the name “window-normal-pattern” is also present, the background will be drawn by “window-normal” *without tiling* and then, “window-normal-pattern” will be used for tiling over it.

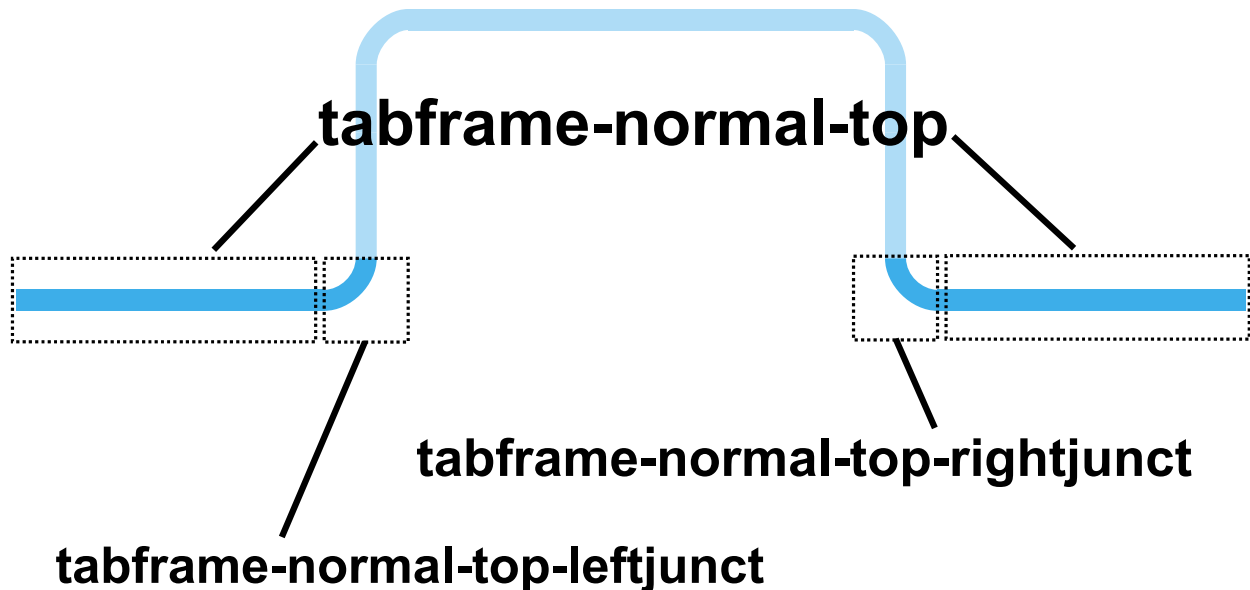
Also note that some widgets never accept patterns, even when the pattern size keys have positive values for them. They are widgets, like grouped toolbar buttons, spinbox buttons and view-items, for which a pattern does not have much meaning.

Junctions between Attached Active Tabs and Tab Widgets

If the key *attach_active_tab* is true, active tabs will be attached to their tab widgets. In fact, the frame element from the section *TabFrame* will be cut under an active tab. Of course, the bottom frames of active tabs should be drawn in such a way that they appear really attached to their tab widgets. If the frames in the sections *Tab* and *TabFrame* are thin, everything will be all right. But in the case of thick frames or when you want to customize the two junctions between the left and right frames of the tab,

on the one hand, and the cut frame of the tab widget, on the other hand, you could add extra SVG objects, whose names are those of the frame elements of *TabFrame* plus the two strings “-leftjunct” and “-rightjunct”.

Provided that the frame name under *TabFrame* is *tabframe*, the following image shows two of these extra objects for the top frame of a tab widget.



In this image, the dotted rectangles show whole frames, which are drawn in such a way that only their blue part is visible.

Three other pairs of such objects for left, right and bottom frames should also be drawn appropriately if such junctions are used at all.

“Floating” Tabs

In some applications, the tab-bar has no tab widget or the latter is in the “document mode”, so that tabs seem “floating”. If you have used tab junctions or chosen shapes suitable for attaching tabs to a tab widget, you might want to choose different shapes for the tab interior and (bottom) frames in such cases. You could do so by adding another set of objects, whose names are made by adding the string “floating-” to the beginning of the names of the original tab objects.

For example, if the interior and frame elements under the *Tab* section are named “tab”, the names of the extra “floating” objects will be “*floating-tab-normal*”, “*floating-tab-normal-left*”, ... , “*floating-tab-toggled*”, “*floating-tab-toggled-left*”, etc.

This feature is optional, of course. If Kvantum finds an *interior* object for the normal floating tab (“*floating-tab-normal*” in the above example), it will use the floating objects for drawing tabs when

there is no tab widget or when it is in the document mode; otherwise, it will use ordinary tabs in all places.

Translucency and Shadow for Menus and Tooltips

If compositing is enabled, menus and tooltips can be translucent and/or have shadow. The following explanation is for menus but it applies to tooltips as well.

Let us suppose that the name of the menu element is “menu”, as is the case with the default theme. So, the names of its corresponding SVG objects are *menu-normal*, *menu-normal-top*, *menu-normal-topleft*, *menu-normal-left*, etc. If these nine objects have translucency, the menus will be translucent when compositing is available.

To have shadow, we should set the key *menu_shadow_depth* to a positive value and also add another group of frame objects, whose names include the word “shadow” as the second word in their names, i.e. *menu-shadow-top*, *menu-shadow-topleft*, *menu-shadow-left*, etc. The shadow and the menu frame should together be divided into these eight objects. For example, *menu-shadow-top* draws the shadow for the top part of menus and when menus have frame, it also includes the top part of their frame. The object *menu-normal* is used, with or without shadow, for drawing the interior of menus.

The keys *menu_shadow_depth* and *tooltip_shadow_depth*, in the General section of the configuration file, control the width of menu and tooltip shadows respectively.

If the key *composite* is set to false or the environment does not support compositing, menus and tooltips will be drawn without translucency and shadow and with a frame width of, at most, 2px.

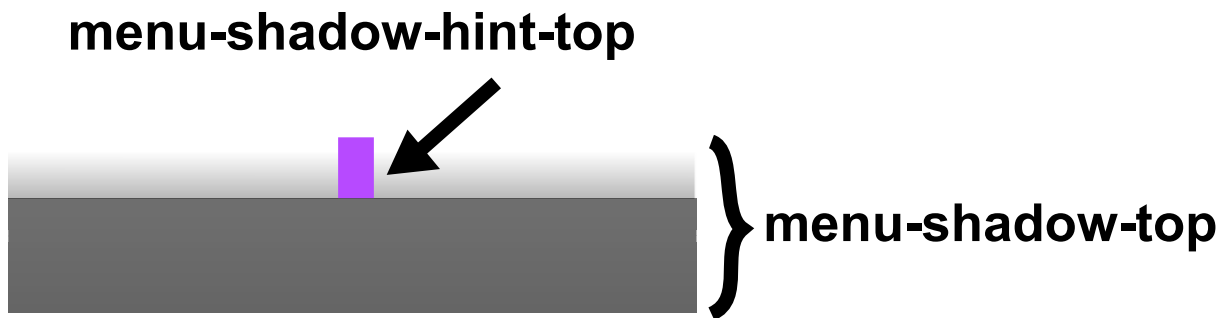
Blurring for Menus and Tooltips: “Shadow Hint” Rectangles

If (pop-up) blurring is enabled (which is possible only under KDE), the regions behind translucent menus and tooltips will be blurred. But for blurring not to include their shadows, extra “shadow-hint” rectangles should be appropriately drawn to inform Kvantum about pure shadows.

For example, suppose that the name of the menu element is “menu”. Then, there are four “shadow-hint” rectangles with these names:

menu-shadow-hint-top
menu-shadow-hint-bottom
menu-shadow-hint-left
menu-shadow-hint-right

They determine the height or width of the *purely shadowy* parts of the top, bottom, left and right frames respectively. For example, the height of *menu-shadow-hint-top* is that of *menu-shadow-top* minus the height of the top frame included in it, etc. The following image shows this:



Therefore, only the heights of *menu-shadow-hint-top* and *menu-shadow-hint-bottom* are important, while for *menu-shadow-hint-left* and *menu-shadow-hint-right*, only the widths are pertinent.

The same is true for tooltips, of course. So, there can be eight “shadow-hint” rectangles in total.

Even if you do not use blurring with your theme, it is a good idea to include these eight rectangles when your menu and tooltip objects are translucent because the user might enable blurring with **Kvantum Manager** later.

Window Translucency

Whole windows and dialogs can be made translucent. That needs compositing, a true value for *translucent_windows* in the configuration file and a translucent SVG image for the interior element of the Window section. As is the case with menus and tooltips, there will be no translucency if compositing is not enabled in the configuration file or not supported by the environment.

Some applications are not compatible with window translucency and may show totally transparent windows or even crash. They are usually Qt video playing applications (although some Qt-based video players, like VLC, support window translucency). You could exclude them by adding the names of their executable files to the *opaque* key.

Maximum Corner Roundness and Frame Expansion

Although the four SVG objects used for drawing corner frames (-topleft, -topright, -bottomleft, -bottomright) can be quite curved, the degree of corner roundness depends on the frame widths too and so, it cannot be high.

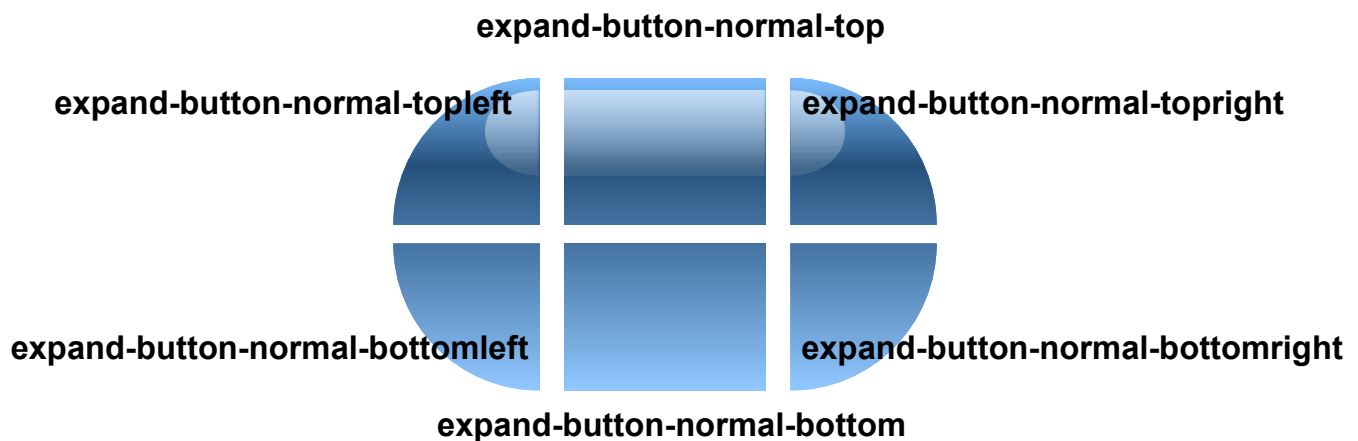
However, Kvantum has a key that can expand frames, namely ***“frame.expansion”***. If its value is greater than zero under any widget section, the frames of that widget will be expanded until the corner frames meet each other either horizontally or vertically, depending on the aspect ratio of the actual widget, *provided that at least the height or the width of the actual widget is less than or equal to the value of “frame.roundness”*. The expansion is so that the corner frame objects become equal squares even when they are not drawn as SVG squares.

You could use this key to make widget corners as rounded as possible. By giving a positive value to “*frame.expansion*”, you could not only decide which widgets have extremely rounded corners but also set size limits, beyond which, they should have ordinary corners (because too big widgets would look weird with completely rounded corners).

The SVG objects used for drawing the completely rounded corners can be the usual ones, in which case you would not need to add anything to your SVG image. But, except for totally flat objects (which do not have color gradient), you might want to add extra objects for maximally rounded widgets. If so, you should name them by adding the prefix “*expand-*” to the beginning of the usual object names. For example, for maximally rounded buttons with the frame element named as “button” under the *PanelButtonCommand* section, the names of the objects that are used specifically for complete rounding are “*expand-button-normal-top*”, “*expand-button-normal-topleft*”, “*expand-button-normal-topright*”, ..., “*expand-button-focused-top*”, “*expand-button-focused-topleft*”, “*expand-button-focused-topright*”, etc. The interior, left or right objects are not used in drawing and you do not need to include them. However, Kvantum looks for the **top objects** (whose names end with “-top”) and only if it finds them, it will use the other “*expand-*” objects. Of course, you should draw the corner objects rounded and give all objects appropriate color gradients if any.

In case of “*expand-*” objects, the color gradients of opposite frame objects should be complementary, so that when they are adjacent to each other due to frame expansion, a smooth gradient forms.

The following image can serve as an example:



As you can see, in the above image, there are no objects for the interior, the right frame or the left frame. It is obvious why the interior object is redundant. As for the right and left frames, if the height of widget is greater than its width, Kvantum first rotates its rectangle by 90 degrees, draws it by using the available objects and then rotates it by 90 degrees again but in the opposite direction, so that right and left objects are not needed (this is only a rough description). The reason is that the widget looks more natural in this way.

Although the interior, left and right “*expand-*” objects are not used in this, *if they exist* (and Kvantum looks for the interior object to know that), the corners of those widgets, whose heights and widths are greater than the value of “*frame.expansion*”, will be also rounded but not maximally. This may be useful when the objects are flat (have no gradient). Even in this case, you should not remove the usual

objects because they will be needed in some places.

The key “*frame.expansion*” can also be used for purposes other than corner rounding. The main idea is to make the corner objects as big as possible so that the left and right (or top and bottom) sides of widgets get their shapes.

Please also note that:

(a) Sliders, scrollbars, and container widgets (tab widgets, for example, but not tabs) do not support frame expansion. You could still round the edges of sliders and scrollbars by not giving them any interior, drawing appropriate images for their corner frames, and choosing their left and right frame widths equal to half of their widths. If you do so, it is better that you also set their widths to even numbers.

(b) Header sections and item-views can be only *partially* rounded and so, their interior, left and right “*expand-*” objects should be present for frame expansion.

(c) Some instances of other widgets may fall back to the usual SVG objects under certain conditions (lack of space, for example).

Frame Expansion and Border

Since, in the case of frame expansion, the frames themselves are expanded, they cannot serve as a border anymore. When the “*expand-*” objects have gradient, there is no need to a border, although widgets may look more elegant with it. But, when they are flat, a border may be really needed. However, there is a way to give the completely (or partially) rounded widgets a nice border. That is done by using the “*border-*” objects. They are exactly like the “*expand-*” objects except for their names, which are started with the string “*border-*”, and their background color, which is the color of the desired border. Although their shapes should be identical to the shapes of their corresponding “*expand-*” objects, Kvantum uses them to make a border, whose thickness is equal to the frame width (it does so by making the “*expand-*” objects a little smaller and putting them inside the “*border-*” objects).

Again, if the interior, left and right “*border-*” objects also exist alongside the interior, left and right “*expand-*” objects, not only the corners of those widgets, whose heights and widths are greater than the value of “*frame.expansion*”, will be partially rounded, but also those widgets will have border too.

Theme Installation Paths

The default user installation path, which Kvantum Manager uses, is always ‘*~/.config/Kvantum/\$THEME_NAME/*’, and the default root installation path, used by Kvantum’s extra themes, is ‘*\$DATADIR/Kvantum/\$THEME_NAME/*’ (\$DATADIR is often ‘*/usr/share*’ but depends on the Kvantum installation prefix).

To make theme packaging easier, three extra installation paths are (unwillingly) added too, namely,

'~/themes/\$THEME_NAME/Kvantum/', '~/local/share/themes/\$THEME_NAME/Kvantum/' and '\$DATADIR/themes/\$THEME_NAME/Kvantum/'.

Kvantum uses the concept of **priority** for theme installation. If the same theme is installed in more than one path, the one whose path has the highest priority will be used. The user paths always take priority over the root ones. All paths, arranged in the order of their priorities from high to low, are as follows:

```
~/config/Kvantum/$THEME_NAME/  
~/themes/$THEME_NAME/Kvantum/  
~/local/share/themes/$THEME_NAME/Kvantum/  
$DATADIR/Kvantum/$THEME_NAME/  
$DATADIR/themes/$THEME_NAME/Kvantum/
```

Because of this hierarchy, if you manually remove a Kvantum theme, it might still be shown on the list of installed themes by Kvantum Manager. Also if you manually install a newer version of a theme, an older version with a higher priority might still be used. However, if you install a theme with Kvantum Manager, it will always take priority over its other installations.

Therefore, in the case of theme installation or updating *without* Kvantum Manager, it is better first to delete the same theme with Kvantum Manager if it is already installed because Kvantum Manager takes into account all user installation paths when deleting a theme.

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Anyway, by renaming “*default.svg*” to “**MY_THEME.svg**”, putting it alongside the file “**MY_THEME.kvconfig**” in “~/config/Kvantum/**MY_THEME**”, and playing with them, you could learn more about theme-making than by reading any document.

After every change you make to the SVG image or configuration file, you could see how various widgets look by clicking on the **Preview** button of **Kvantum Manager** or by entering the command *kvantumpreview* in terminal.