SAP Toolbar (BC-CI)

HELP.BCCITOOLBAR

Release 4.6C

SAP™

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Icons

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Content

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Purpose

The SAP toolbar allows you to define a separate toolbar in addition to the normal application toolbar:

Integration

You can embed the SAP Toolbar in any SAP Control Container.

Features

SAP toolbar allows you to create additional toolbars, which may contain the following objects:

- Pushbuttons
- Pushbuttons with a dropdown menu 

: If the user chooses the pushbutton, the action defined for the pushbutton is triggered. If the user chooses the arrow, a menu appears.
- Menus 

: A menu is displayed when the user clicks the button.
- Separators
- Pushbutton groups (similar to radio button groups)
- Toggle buttons (like checkboxes)

When the user chooses an item in the SAP Toolbar, control is passed back to the application program using the event control of the Control Framework. The chosen function is passed to the program as an event parameter.

Constraints

SAP Toolbar requires the Microsoft Common Control. You therefore need to install Microsoft Internet Explorer Version 4.0.

Instance for the SAP Toolbar

Definition

You define this instance with reference to the class **`cl_gui_toolbar`**:

data toolbar type ref to cl_gui_toolbar.

Use

A SAP Toolbar instance administers all of the information relating to an additional toolbar on your screen. You can call the methods of this instance to define and change the attributes of the toolbar control.

Integration

The class **`cl_gui_toolbar`** contains both control-specific methods [Page 18] and methods of the Control Framework [Page 33].

Creating a Control: SAP Picture Example

Prerequisites

The following process applies to all SAP custom controls. The programming examples use the SAP Picture Control. However, to apply the example to other controls, you would only have to change the name of the control class.

The example also assumes that you are using the custom control in a Custom Container. The SAP Container documentation contains details of further scenarios.

Process Flow

Create the Instance

1. Define a reference variable for the Custom Container in which you want to place the custom control (**see** SAP Container [Ext.]).

```
DATA container TYPE REF TO cl_gui_custom_container.
```

2. Define a reference variable for the SAP Picture:

```
DATA picture TYPE REF TO cl_gui_picture.
```

3. Create the Custom Container. You must already have created the area `'CUSTOM'` for the Custom Container in the Screen Painter. When you create the container, you must also specify its lifetime [Ext.] (see constructor [Ext.]).

```
CREATE OBJECT container
  EXPORTING container_name = 'CUSTOM'

        lifetime      = lifetime.
```

4. Create the SAP Picture Control. You can also specify a lifetime for the SAP Picture, but it must not be longer than that of its container.

```
CREATE OBJECT picture
   EXPORTING parent  = container

        lifetime = lifetime.
```

Register the Events

5. There are three steps: Registering the events with the Control Framework, defining a handler method, and registering the hander method. These steps are explained under Registering and Processing Events [Page 11].

Use the Control

6. These steps are control-specific and therefore not described here.

Destroy the Control

The lifetime management [Ext.] is normally responsible for destroying any controls you use. However, the following two steps allow you to destroy the control yourself:

7. Use the method free [Page 42] to destroy the Custom Control at the frontend. If you no longer need the control container, release it as well:

Creating a Control: SAP Picture Example

```
CALL METHOD picture->free
    EXCEPTIONS cntl_error       = 1
               cntl_system_error = 2.
CALL METHOD container->free
    EXCEPTIONS cntl_error       = 1
               cntl_system_error = 2.
```

Pay careful attention to the sequence in which you destroy controls at the frontend. When you destroy a container, all controls in it are automatically destroyed as well. If you have already destroyed a control and try to destroy it again, an error occurs. You can check whether a control has already been destroyed using the method is_alive [Page 47].

8. Delete the reference variables to the custom control and the control container.

```
FREE PICTURE.
FREE CONTAINER.
```

Using the SAP Toolbar

This section lists the functions that are specific to the SAP Toolbar.

Prerequisites

The process described here is an extension of the general process for using controls [Page 7] that is specific to the SAP HTML Viewer. It does not contain all of the steps required to produce a valid instance of the control.

Process Flow

The program extracts are examples that do not necessarily illustrate all of the features of the control. For precise information, refer to the reference section of this documentation.

Your system contains a demonstration program called **SAPTOOLBAR_DEMO1**.

Creating the Instance

1. Define a reference variable for the SAP Toolbar:

```
DATA toolbar TYPE REF TO cl_gui_toolbar.
```

2. Create an instance [Ext.] of the SAP toolbar:

```
CREATE OBJECT toolbar
EXPORTING parent  = container.
```

3. Insert either individual pushbuttons [Page 20] or pushbutton groups [Page 22] into the toolbar control.

```
CALL METHOD toolbar->add_button
        EXPORTING  fcode      = 'FUNC_1'
                   icon       = '@03@'
                   butn_type  = cntb_btype_dropdown
                   text       = 'My Function'
        EXCEPTIONS cntl_error  = 1.
```

Register the Events

4. Register the events for the SAP Toolbar [Page 13]. It supports the following events:

Event name	Meaning
FUNCTION_SELECTED	Pushbutton chosen
DROPDOWN_CLICKED	Context menu of a pushbutton (type **cntb_btype_dropdown** and **cntb_btype_menu**) chosen

Changing Control Attributes at Runtime

5. You can add extra pushbuttons or pushbutton groups.
6. You can change the status [Page 27] of individual pushbuttons:

```
CALL METHOD toolbar->set_button_state
        EXPORTING  enabled = 'X'
                   fcode   = 'FUNC_1'
        EXCEPTIONS cntl_error = 1.
```

7. You can delete one [Page 25] or all [Page 26] of the pushbuttons:

```
CALL METHOD toolbar->DELETE_BUTTON
   exporting  fcode      = 'FUNC_1'
   exceptions CNTL_ERROR = 1.
```

8. You can interpret the SAP Toolbar functions chosen by the user using event handler methods.

Destroying the Control

The lifetime management [Ext.] is normally responsible for destroying any controls you use. However, the following two steps allow you to destroy the control yourself:

9. Destroy the custom control at the frontend. If you no longer need the control container, release it as well:

```
CALL METHOD toolbar->free.
```

10. Delete the reference variables to the custom control and the control container.

```
FREE toolbar.
```

The program **SAPTOOLBAR_DEMO1** provides an example of how to use the SAP Toolbar Control in an application.

Registering and Processing Events

Purpose

The event mechanism of the Control Framework allows you to use handler methods in your programs to react to events triggered by the control (for example, a double-click).

Prerequisites

The following description has been generalized to apply to all custom controls. For more information specific to a particular control, refer to that control's documentation.

Process Flow

1. Assume you are working with a custom control that has the ABAP wrapper **`cl_gui_xyz`**.

```
DATA my_control TYPE REF TO cl_gui_xyz.
```

Registering Events with the Control Framework

2. Define an internal table (type **`cntl_simple_events`**) and a corresponding work area (type **`cntl_simple_event`**).

```
DATA events TYPE cntl_simple_events.
DATA wa_events TYPE  cntl_simple_event.
```

3. Now fill the event table with the relevant events. To do this, you need the event ID (**`event_id`** field). You can find this information in the Class Browser by looking at the attributes of the class **`cl_gui_xyz`**. You must also decide whether the event is to be a system event (**`appl_event = ' '`**) or an application event (**`appl_event = 'X'`**).

```
wa_events-eventid = event_id.
wa_events-appl_event = appl_event.
APPEND wa_events TO events.
```

4. You must now send the event table to the frontend so that it knows which events it has to direct to the backend.

```
CALL METHOD my_control->set_registered_events
        events = events.
```

To react to the events of you custom control, you must now specify a handler method for it. This can be either an instance method or a static method.

Processing an Event Using an Instance Method

5. Define the (local) class definition for the event handler. To do this, specify the name of the handler method (**`Event_Handler`**). You need to look at the class for the custom control cl_gui_xyz in the Class Browser to find out the name of the event (**`event_name`**) and its parameters (**`event_parameter`**). There is also a default event parameter **`sender`**, which is passed by all events. This contains the reference to the control that triggered the event.

```
CLASS lcl_event_receiver DEFINITION.
PUBLIC SECTION.
METHODS Event_Handler
  FOR EVENT event_name OF cl_gui_xyz
```

```
  IMPORTING event_parameter
            sender.
ENDCLASS.
```

6. Register the handler methods with the ABAP Objects Control Framework for the events.

```
DATA event_receiver TYPE REF TO lcl_event_receiver.
CREATE OBJECT event_receiver.
SET HANDLER event_receiver->Event_Handler
          FOR my_control.
```

Processing an Event Using a Static Method

7. Define the (local) class definition for the event handler. To do this, specify the name of the handler method (**`Event_Handler`**). You need to look at the class for the custom control cl_gui_xyz in the Class Browser to find out the name of the event (**`event_name`**) and its parameters (**`event_parameter`**).

```
CLASS lcl_event_receiver DEFINITION.
PUBLIC SECTION.
CLASS-METHODS Event_Handler
       FOR EVENT event_name OF cl_gui_xyz
       IMPORTING event_parameter
                 sender.
ENDCLASS.
```

8. Register the handler methods with the ABAP Objects Control Framework for the events.

```
SET HANDLER lcl_event_receiver=>Event_Handler
          FOR my_control.
```

Processing Control Events

9. You define how you want the system to react to an event in the implementation of the handler method.

```
CLASS lcl_event_receiver IMPLEMENTATION.
METHOD Event_Handler.
* Event processing
ENDMETHOD
ENDCLASS.
```

10. If you registered your event as an application event, you need to process it using the method **`CL_GUI_CFW=>DISPATCH`**. For further information, refer to Event Handling [Ext.].

Events for the SAP Toolbar

Use

When the user chooses a pushbutton in the SAP Toolbar, one of the following events is triggered, depending on the type of the pushbutton:

Event	Event ID cl_gui_toolbar=>	Meaning
FUNCTION_SELECTED	M_ID_FUNCTION_SELECTED	Pushbutton chosen User chose a menu with type **cntb_btype_dropdown** or **cntb_btype_menu**.
DROPDOWN_CLICKED	M_ID_DROPDOWN_CLICKED	Context menu of a pushbutton (type **cntb_btype_dropdown** and **cntb_btype_menu**) chosen

The events have the following parameters:

Event	Parameters	Meaning
FUNCTION_SELECTED	fcode	Function code of pushbutton
DROPDOWN_CLICKED	fcode	Function code of pushbutton
	posx posy	Position of the pushbutton for which the menu should be displayed

Integration

To react to an event in your ABAP program, you must have registered it. To do this, use the method set_registered_events [Page 45]. Events that are triggered but for which you are not registered are filtered by the presentation server, and not passed to the application server. **See** event handling [Ext.].

Features

Event FUNCTION_SELECTED

This event is always triggered when the user chooses a pushbutton or a menu entry from a pushbutton with type **cntb_btype_dropdown** or **cntb_btype_menu**.

Pushbuttons with type **cntb_btype_dropdown** have two parts: On the left-hand side is the actual pushbutton, with a particular function assigned to it, just like a normal pushbutton. If you click the button, the **FUNCTION_SELECTED** event is triggered. On the right-hand side is a pushbutton with an arrow. If you click this, the event **DROPDOWN_CLICKED** is triggered.

If the pushbutton has the type cntb_btype_menu, the event **DROPDOWN_CLICKED** is always triggered.

Events for the SAP Toolbar

The function code of the pushbutton is passed as a parameter of the event **FUNCTION_SELECTED**. This allows you to identify the pushbutton and react accordingly in your program.

Event DROPDOWN_CLICKED

This event is triggered whenever a menu is requested for a pushbutton. This is only possible for pushbuttons with the type **cntb_btype_dropdown** and **cntb_btype_menu**.

The event parameters are the function code and position of the pushbutton. You can use the function code to identify the pushbutton. You can use the position to place the context menu in the correct position.

To construct the context menu, use the methods of class **CL_CTMENU**. To display it, use the method track_context_menu [Page 32].

Activities

Read the general process [Page 11] for working with events in the Control Framework.

Using Controls in a WAN

When you use controls in your programs, you place an extra load on the communication channel between the frontend and backend. In a LAN, and particularly in a WAN environment, this can be a critical factor.

The problem is alleviated somewhat by buffering mechanisms (see also Automation Queue [Ext.]). Use these points as a guideline to using controls in a WAN.

The documentation for the individual controls also contains more specific notes about using that control in a WAN.

Using CL_GUI_CFW=>FLUSH

The method CL_GUI_CFW=>FLUSH [Page 36] synchronizes the automation queue and the ABAP variables in it. Calling it often generates a synchronous RFC call from the application server to the frontend. To optimize the performance of your application, you should call this method as little as possible.

It is often a good idea to read all control attributes in a single automation queue (for example, at the beginning of the PAI) and retrieve them in a single synchronization. You should, in particular, do this when you read attributes that are not necessary in your event handlers or the PAI/PBO cycle.

You do not need to include a "safety flush" at the end of the PBO to ensure that all method calls are transported to the frontend. A flush at the end of the PBO is guaranteed. Consequently, you cannot construct an automation queue spread over several screens.

There is no guarantee that an automation queue will be sent when you call `CL_GUI_CFW=>FLUSH`. The queue recognizes whether it contains any return values. If this is not the case, it is not sent.

If you have a queue with no return values, and want to ensure that it is synchronized, you can use the Control Framework method CL_GUI_CFW=>UPDATE_VIEW [Page 39]. You should only use this method if you absolutely need to update the GUI. For example, you might have a long-running application in which you want to provide the user with regular updates on the status of an action.

After you have read the attributes of a control, the contents of the corresponding ABAP variables are not guaranteed until after the next flush. The contents of the ABAP variables remain undefined until this call occurs. In the future, there will be cases in which this flush is unnecessary. They will be recognized by the automation queue and the corresponding flush call will be ignored.

Creating Controls and Passing Data

Creating controls and passing data to them is normally a one-off procedure, which in comparison to using normal screen elements can be very runtime-intensive. You should therefore not use any unnecessary controls, or pass unnecessary data to the controls that you are using.

A typical example is a tabstrip control with several tab pages. If the pages contain controls, you should consider using application server scrolling instead of local scrolling, and not loading the controls until the corresponding page is activated by the user. The same applies to passing data to the controls on tab pages.

If you want to differentiate between LAN and WAN environments when you pass data to a control, you can use the function module **`SAPGUI_GET_WANFLAG`**. In some applications, you may

need to pass different amounts of data or use a complete fallback in a WAN application. The environment affects, for example, the number of same-level nodes that you can transfer to a tree control without having to introduce artificial intermediate levels.

Unlike screen elements, controls only have to be created and filled with data once. From a performance point of view, this means that they become more profitable the longer they exist. In applications that are called repeatedly, and therefore initialized repeatedly, controls can have a negative effect on performance. In applications that use the same screen for a long time, on the other hand, you may find that using controls results in improved performance.

You can always use the performance tools [Ext.] to check the advantages and disadvantages in terms of network load that using a control brings.

Storing Documents, Picture, and Other Data

Release 4.6A sees the introduction of a frontend cache for accessing documents from the Business Document Service (BDS). You are strongly recommended to store desktop documents, images, and other data in the BDS and not in the R/3 database. Documents from the BDS can be cached at the frontend, and therefore only have to be loaded over the network once.

Special Considerations for the SAP Toolbar

There are no specific problems to bear in mind when you use the SAP Toolbar Control in a WAN.

Methods of Class CL_GUI_TOOLBAR

This class contains both specific methods for the SAP Toolbar and inherited methods from the Control Framework. However, this section deals only with the methods specific to SAP Toolbar. For information about the Control Framework methods, refer to the Methods of the Control Framework [Page 33] section.

constructor

You use this method to instantiate the SAP Toolbar.

```
CREATE OBJECT toolbar
        EXPORTING  parent     = parent
                   shellstyle = shellstyle
                   lifetime   = lifetime
                 display_mode = display_mode
        EXCEPTIONS cntl_install_error = 1
                   cntl_error         = 2.
```

Parameter	Meaning
lifetime	Lifetime management [Ext.] parameter. The following values are permitted: **`toolbar->lifetime_imode`**: The control remains alive for the duration of the internal session (that is, until the session is ended by one of the following statements: **`leave program. leave to transaction. set screen 0, leave screen.`**). After this, the finalize [Page 44] method is called. **`toolbar->lifetime_dynpro`**: The control remains alive for the lifetime of the screen instance, that is, for as long as the screen remains in the stack. After this, the free [Page 42] method is called. Using this mode automatically regulates the visibility of the control. Controls are only displayed when the screen on which they were created is active. When other screens are active, the controls are hidden. **`toolbar->lifetime_default`**: If you create the control in a container, it inherits the lifetime of the container. If you do not create the control in a container (for example, because it is a container itself), the lifetime is set to **`toolbar->lifetime_imode`**.
Shellstyle	Controls the appearance and behavior of the control You can pass any constants from the ABAP include **`<CTLDEF>`** that begin with WS. You can combine styles by adding the constants together. The default value sets a suitable combination of style constants internally.
parent	Container in which the SAP Toolbar can be displayed (**see also** SAP Container [Ext.]).
display_mode	The alignment of the toolbar: • **`cl_gui_toolbar=>m_mode_horizontal`**: Horizontal • **`cl_gui_toolbar=>m_mode_vertical`**: Vertical

add_button

You use this method to add a new pushbutton to the toolbar.

```
CALL METHOD toolbar->add_button
            EXPORTING  fcode       = fcode
                       icon        = iconid
                       is_disabled = is_disabled
                       butn_type   = butn_type
                       text        = text
                       quickinfo   = quickinfo
                       is_checked  = is_checked
            EXCEPTIONS cntl_error  = 1.
```

Parameters	Meaning
fcode	Function code that will be passed to the application program by an event when the user chooses the pushbutton.
icon	Icon to be displayed on the pushbutton.
is_disabled	`'X'`: Pushbutton is inactive `' '`: Pushbutton is active
butn_type	**`cntb_btype_button`**: Pushbutton **`cntb_btype_dropdown`**: Pushbutton with menu **`cntb_btype_menu`**: Menu **`cntb_btype_sep`**: Separator **`cntb_btype_group`**: Pushbutton group **`cntb_btype_check`**: Toggle button **Note**: You should use **static menus wherever possible**, since this helps to eliminate excessive roundtrips. This is especially important under SAPGUI for HTML. For further details, refer to set_static_ctxmenu [Page 29] or assign_static_ctxmenu_table [Page 30].
text	Text to be displayed on the pushbutton.
quickinfo	Quick info for the pushbutton
is_checked	Only for pushbuttons with type **`cntb_btype_group`** and **`cntb_btype_check`**: `'X'`: Button is chosen `' '`: Button not chosen

You can address the icon using its name, for example, **`ICON_ANNOTATION`**. To do this, the statement **`INCLUDE <ICON>.`** must appear in your program. The executable program **`SHOWICON`** displays all of the icons in your system.

Otherwise, you can address the icons using the form `@xy@`, where `xy` is the relevant icon code.

add_button_group

You use this method to add a list of pushbuttons to your toolbar.

```
CALL METHOD toolbar->add_button_group
    EXPORTING  data_table = data_table
    EXCEPTIONS dp_error   = 1.
```

Parameter	Meaning
data_table	Table of pushbuttons that you want to add to the toolbar. You create the table with reference to the type **TTB_BUTTON**. You can use the method fill_buttons_data_table [Page 23] to fill the table.

You should use **static menus wherever possible**, since this helps to eliminate excessive roundtrips. This is especially important under SAPGUI for HTML. For further details, refer to set_static_ctxmenu [Page 29] or assign_static_ctxmenu_table [Page 30].

fill_buttons_data_table

You use this method to fill the internal table that you pass to the method add_button_group [Page 22] in order to create a set of new pushbuttons in your toolbar.

```
CALL METHOD toolbar->fill_buttons_data_table
            EXPORTING  fcode       = fcode
                       icon        = iconid
                       disabled    = disabled
                       butn_type   = butn_type
                       text        = text
                       quickinfo   = quickinfo
                       checked     = checked
            CHANGING   data_table  = data_table.
```

Parameters	Meaning
fcode	Function code that will be passed to the application program by an event when the user chooses the pushbutton.
icon	Icon to be displayed on the pushbutton.
disabled	`'X'`: Pushbutton is inactive `' '`: Pushbutton is active
butn_type	**`cntb_btype_button`**: Pushbutton **`cntb_btype_dropdown`**: Pushbutton with menu **`cntb_btype_menu`**: Menu **`cntb_btype_sep`**: Separator **`cntb_btype_group`**: Pushbutton group **`cntb_btype_check`**: Toggle button **Note**: You should use **static menus wherever possible**, since this helps to eliminate excessive roundtrips. This is especially important under SAPGUI for HTML. For further details, refer to set_static_ctxmenu [Page 29] or assign_static_ctxmenu_table [Page 30].
text	Text to be displayed on the pushbutton.
quickinfo	Quick info for the pushbutton
checked	Only for pushbuttons with type **`cntb_btype_group`** and **`cntb_btype_check`**: `'X'`: Button is chosen `' '`: Button not chosen
data_table	Table of pushbuttons that you want to add to the toolbar. You create the table with reference to the type **`TTB_BUTTON`**. You then pass the table to the method add_button_group [Page 22].

fill_buttons_data_table

You can address the icon using its name, for example, **ICON_ANNOTATION**. To do this, the statement **INCLUDE <ICON>.** must appear in your program. The executable program **SHOWICON** displays all of the icons in your system.

Otherwise, you can address the icons using the form **@xy@**, where **xy** is the relevant icon code.

delete_button

You use this method to delete a pushbutton from the toolbar.

```
CALL METHOD toolbar->DELETE_BUTTON
    exporting  fcode      = fcode
    exceptions CNTL_ERROR = 1.
```

Parameter	Meaning
fcode	Function code of the pushbutton that you want to delete.

If you created more than one pushbutton with the same function code, the system only deletes the last one.

delete_all_buttons

You use this method to delete all pushbuttons from the toolbar.

```
CALL METHOD toolbar->DELETE_ALL_BUTTONS
    exceptions CNTL_ERROR = 1.
```

set_button_state

You use this method to change the status of an individual pushbutton:

```
CALL METHOD toolbar->set_button_state
        EXPORTING  enabled = enabled
                   checked = checked
                   fcode   = fcode
        EXCEPTIONS cntl_error = 1.
```

Parameters	Meaning
enabled	`' '`: Pushbutton is inactive `'X'`: Pushbutton is active
is_checked	Only for pushbuttons with type **`cntb_btype_group`** and **`cntb_btype_check`**: `'X'`: Button is chosen `' '`: Button not chosen

set_button_info

Use this method to change the text, icon, or quick info for a button.

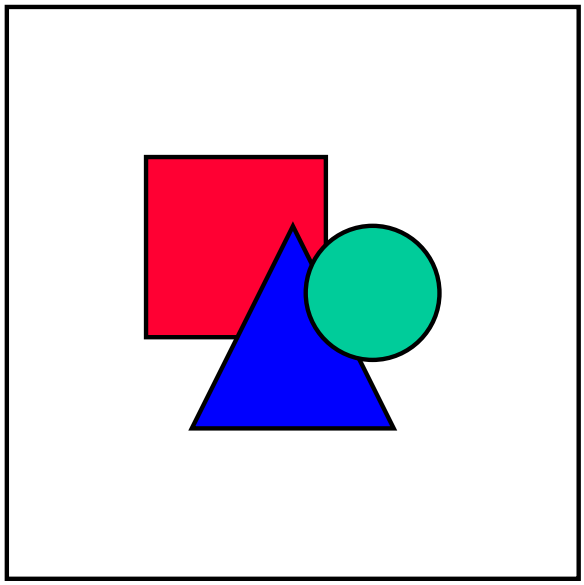
```
CALL METHOD toolbar->set_button_info
           EXPORTING fcode = fcode
                     icon  = icon
                     text  = text
                 quickinfo = quickinfo.
```

Parameter and Type	Optional	Meaning
fcode **TYPE UI_FUNC**		Function code of the button (used to identify the button - may not be changed)
icon **TYPE ICOPNNAME**	X	New icon in the form **'@XY@'**
text **TYPE TEXT40**	X	New text for the button
quickinfo **TYPE ICONQUICK**	X	New quickinfo text for the button

set_static_ctxmenu

Use this method to assign a context menu to a pushbutton for the entire lifetime of the control. When you assign a context menu statically, the system loads it into the frontend control and it remains there after the user has closed it. Normally the system triggers the DROPDOWN_CLICKED event when the user clicks a pushbutton that has a dropdown menu. In your application, you would then assign the context menu to the button, but only for that one occasion. If you assign the context menu statically, it resides at the frontend, and is available each time the user clicks the corresponding pushbutton without you having to reassign it each time.

You should use static context menus in all but the most context-sensitive cases.



Any changes that are made to the context menu during the lifetime of the control are automatically updated at the frontend.

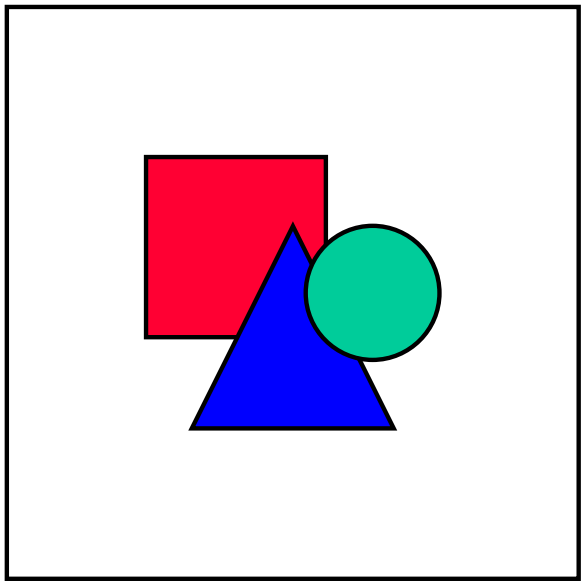
```
CALL METHOD toolbar->set_static_ctxmenu
                EXPORTING   fcode = fcode
                          ctxmenu = ctxmenu
```

Parameter and Type	Meaning
fcode **TYPE UI_FUNC**	Function code of the button to which you want to assign the context menu Note: The button must have the type **cntb_btype_dropdown** or **cntb_btype_menu**.
ctxmenu **TYPE REF TO CL_CTMENU**	Reference variable pointing to the context menu instance you want to assign (see Context Menus [Ext.])

assign_static_ctxmenu_table

Use this method to assign context menus to a group of pushbuttons for the entire lifetime of the control. When you assign a context menu statically, the system loads it into the frontend control and it remains there after the user has closed it. Normally the system triggers the DROPDOWN_CLICKED event when the user clicks a pushbutton that has a dropdown menu. In your application, you would then assign the context menu to the button, but only for that one occasion. If you assign the context menus statically, they reside at the frontend, and are available whenever the user clicks the corresponding pushbutton without you having to reassign it each time.

You should use static context menus in all but the most context-sensitive cases.



Any changes that are made to the context menu during the lifetime of the control are automatically updated at the frontend.

```
CALL METHOD toolbar->assign_static_ctxmenu_table
                EXPORTING   table_ctxmenu = table_ctxmenu.
```

Parameter and Type	Meaning
table_ctxmenu **TYPE TTB_BTNMNU**	Internal table containing the assignments of context menus to pushbuttons in the toolbar instance. It has the line type **STB_BTNMNU** (described below).

Structure STB_BTNMNU

Component and Type	Meaning
Function **TYPE UI_FUNC**	The function code of the pushbutton in the toolbar to which you want to assign the context menu
ctmenu **TYPE REF TO CL_CTMENU**	A reference variable pointing to the context menu you want to assign to the pushbutton (see Context Menus [Ext.])

track_context_menu

Use this method to display a context menu. It is particulaly useful in connection with the events of pushbuttons with type **cntb_btype_dropdown** and **cntb_btype_menu**.

```
CALL METHOD toolbar->track_context_menu
    EXPORTING context_menu = menu
              posx         = posx
              posy         = posy
    EXCEPTIONS ctmenu_error = 1.
```

Parameters	Description
context_menu	Name of the context menu. You create the menu with reference to the class **CL_CTMENU**. You must use this class to fill it.
posx	Horizontal display position for the menu
posy	Vertical display position for the menu

Methods of the Control Framework

This section describes the methods of the Control Framework that you need to implement the SAP Toolbar.

Methods of Class CL_GUI_CFW

The class `CL_GUI_CFW` contains static methods that apply to all instantiated custom controls when you call them.

dispatch

Use this method to dispatch application events (**see** Event Handling [Ext.]) to the event handlers registered for the events. If you do not call the method within the PAI event of your application program, it is called automatically by the system after the PAI has been processed. The method returns a return code from which you can tell if the call was successful.

```
CALL METHOD cl_gui_cfw=>dispatch
    IMPORTING return_code = return_code.
```

Parameters	Description
return_code	**`cl_gui_cfw=>rc_found`**: The event was successfully directed to a handler method. **`cl_gui_cfw=>rc_unknown`**: The event was not registered in the event list. **`cl_gui_cfw=>rc_noevent`**: No event was triggered in a control. The function code was therefore a normal one (for example, from a menu entry). **`cl_gui_cfw=>rc_nodispatch`**: No handler method could be assigned to the event.

An event can only be dispatched once. After that, it is "spent". Consequently, attempting to dispatch the events a second time does not trigger the handler events again.

flush

Use this method to synchronize the automation queue [Ext.]. The buffered operations are sent to the frontend using GUI RFC. At the frontend, the automation queue is processed in the sequence in which you filled it.

If an error occurs, an exception is triggered. You must catch and handle this error. Since it is not possible to identify the cause of the error from the exception itself, there are tools available in the Debugger and the SAPgui to enable you to do so.

Debugger: Select the option *Automation Controller: Always process requests synchronously*. The system then automatically calls the method **`cl_gui_cfw=>flush`** after each method called by the Automation Controller.

SAPGUI: In the SAPgui settings, under *Trace*, select *Automation*. The communication between the application server and the Automation Controller is then logged in a trace file that you can analyze at a later date.

```
CALL METHOD cl_gui_cfw=>flush
          EXCEPTIONS CNTL_SYSTEM_ERROR = 1
               CNTL_ERROR = 2.
```

Do not use any more synchronizations in your program than are really necessary. Each synchronization opens a new RFC connection to the SAPgui.

get_living_dynpro_controls

This method returns a list of reference variables to all active custom controls.

```
CALL METHOD cl_gui_cfw=>get_living_dynpro_controls
                 IMPORTING control_list = control_list.
```

Parameters	Description
`control_list`	List of reference variables of active custom controls. The list has the type `CNTO_CONTROL_LIST` (defined in class `CL_GUI_CFW`).

set_new_ok_code

You may only use this method in the handler method of a system event. It sets an **OK_CODE** that triggers PAI processing. This means that data is transferred from the screen to the program, and you can take control of the program in your PAI modules.

```
CALL METHOD cl_gui_cfw=>set_new_ok_code
        EXPORTING new_code = new_code
        IMPORTING      rc = rc.
```

Parameters	Description
new_code	Function code that you want to place in the **OK_CODE** field (**SY-UCOMM**).
return_code	**cl_gui_cfw=>rc_posted**: The OK_CODE was set successfully and the automatic field checks and PAI will be triggered after the event handler method has finished. **cl_gui_cfw=>rc_wrong_state**: The method was not called from the handler method of a system event. **cl_gui_cfw=>rc_invalid**: The **OK_CODE** that you set is invalid.

update_view

Calling the flush [Page 36] method only updates the automation queue if the queue contains return values.

If you have a queue with no return values, and want to ensure that it is synchronized, you can use the Control Framework method **CL_GUI_CFW=>UPDATE_VIEW**. You should only use this method if you absolutely need to update the GUI. For example, you might have a long-running application in which you want to provide the user with regular updates on the status of an action.

```
CALL METHOD cl_gui_cfw=>update_view
          EXCEPTIONS CNTL_SYSTEM_ERROR = 1
                CNTL_ERROR       = 2.
```

Methods of Class CL_GUI_OBJECT

The class **CL_GUI_OBJECT** contains important methods for custom control wrappers. The only one relevant for application programs is the is_valid [Page 41] method.

is_valid

This method informs you whether a custom control for an object reference still exists at the frontend.

```
CALL METHOD my_control->is_valid
        IMPORTING result = result.
```

Parameters	Description
result	`0`: Custom control is no longer active at the frontend `1`: Custom control is still active

free

Use this method to destroy a custom control at the frontend. Once you have called this method, you should also initialize the object reference (**`FREE my_control`**).

```
CALL METHOD my_control->free
    EXCEPTIONS cntl_error        = 1
               cntl_system_error = 2.
```

Methods of Class CL_GUI_CONTROL

The class `CL_GUI_CONTROL` contains methods that you need to set control attributes (for example, displaying the control), register events, and destroy controls.

finalize

This method is redefined by the relevant control wrapper. It contains specific functions for destroying the corresponding control. This method is called automatically by the free [Page 42] method, before the control is destroyed at the frontend.

```
CALL METHOD my_control->finalize.
```

set_registered_events

Use this method to register the events of the control. **See also:** Event Handling [Ext.]

```
CALL METHOD my_control->set_registered_events
    EXPORTING  events           = events
    EXCEPTIONS cntl_error       = 1
               cntl_system_error = 2
      illegal_event_combination = 3.
```

Parameters	Description
events	Table of events that you want to register for the custom control **my_control**.

The table **events** is a list of the events that you want to register. It is defined with reference to table type **CNTL_SIMPLE_EVENTS**. The table type is based on the structure **CNTL_SIMPLE_EVENT**, which consists of the following fields:

Field	Description
EVENTID	Event name
APPL_EVENT	Indicates whether the event is a system event (initial) or an application event (X).

The values that you assign to the field **EVENTID** are control-specific and therefore described in the documentation of the individual controls.

get_registered_events

This method returns a list of all events registered for custom control **my_control**.

```
CALL METHOD my_control->get_registered_events
    IMPORTING  events     = events
    EXCEPTIONS cntl_error = 1.
```

Parameters	Description
events	Table of events that you want to register for the custom control **my_control**.

The table **events** is a list of the events that you want to register. It is defined with reference to table type **CNTL_SIMPLE_EVENTS**. The table type is based on the structure **CNTL_SIMPLE_EVENT**, which consists of the following fields:

Field	Description
EVENTID	Event name
APPL_EVENT	Indicates whether the event is a system event (initial) or an application event (X).

The values that you assign to the field **EVENTID** are control-specific and therefore described in the documentation of the individual controls.

For general information about event handling, refer to the Event Handling [Ext.] section of the SAP Control Framework documentation.

is_alive

This method informs you whether a custom control for an object reference still exists at the frontend.

```
CALL METHOD my_control->is_alive
    RETURNING state = state.
```

Parameters	Description
state	**`my_control->state_dead`**: Custom control is no longer active at the frontend **`my_control->state_alive`**: Custom control is active on the current screen. **`my_control->state_alive_on_other_dynpro`**: Custom control is not active on the current screen, but is still active (but invisible) at the frontend.

set_alignment

Use this method to align the custom control within its container:

```
CALL METHOD my_control->set_alignment
    EXPORTING  alignment        = alignment
    EXCEPTIONS cntl_error       = 1
               cntl_system_error = 2.
```

Parameters	Description
alignment	Control alignment

The **`alignment`** parameter may consist of combinations of the following alignments:

Name	Description
my_control->align_at_left	Alignment with left-hand edge
my_control->align_at_right	Alignment with right-hand edge
my_control->align_at_top	Alignment with top edge
my_control->align_at_bottom	Alignment with bottom edge

You can combine these parameters by adding the components:

alignment = my_control->align_at_left + my_control->align_at_top.

set_position

Use this method to place the control at a particular position on the screen.

The position of the control is usually determined by its container.

```
CALL METHOD my_control->set_position
    EXPORTING  height        = height
               left          = left
               top           = top
               width         = width
    EXCEPTIONS cntl_error        = 1
               cntl_system_error = 2.
```

Parameters	Description
height	Height of the control
left	Left-hand edge of the control
top	Top edge of the control
width	Width of the control

set_visible

Use this method to change the visibility of a custom control.

```
CALL METHOD my_control->set_visible
    EXPORTING  visible          = visible
    EXCEPTIONS cntl_error       = 1
               cntl_system_error = 2.
```

Parameters	Description
visible	`X`: Custom control is visible `' '`: Custom control is not visible

get_focus

This static method returns the object reference of the control that has the focus.

```
CALL METHOD cl_gui_control=>get_focus
    IMPORTING  control          = control
    EXCEPTIONS cntl_error       = 1
               cntl_system_error = 2.
```

Parameters	Description
control	Object reference (`TYPE REF TO cl_gui_control`) to the control that has the focus.

set_focus

Use this static method to set the focus to a custom control.

```
CALL METHOD cl_gui_control=>set_focus
    EXPORTING  control          = control
    EXCEPTIONS cntl_error       = 1
               cntl_system_error = 2.
```

Parameters	Description
control	Object reference (`TYPE REF TO cl_gui_control`) to the control on which you want to set the focus.

get_height

This method returns the height of the control.

```
CALL METHOD control->get_height
    IMPORTING  height          = height
    EXCEPTIONS cntl_error      = 1.
```

Parameters	Description
height	Current height of the control

get_width

This method returns the width of the control.

```
CALL METHOD control->get_width
    IMPORTING  width          = width
    EXCEPTIONS cntl_error       = 1.
```

Parameters	Description
width	Current width of the control