

Generic Queue - Quick Reference

UVVM Support Component

The Generic Queue operate as a FIFO that can hold generic elements, which enable large FIFO and e.g. record elements possibilities.

put (element)

Example: generic_queue.put(v_data_packet);

get (void)

Example: v_data_packet := generic_queue.get(VOID);

flush (void)

Example: generic_queue.flush(VOID);

is_empty / is_not_empty(void)

Example: v_queue_is_empty := generic_queue.is_empty(VOID);

Example: v_queue_is_not_empty := generic_queue.is_not_empty(VOID);

set/get_scope (scope / void)

Example: generic_queue.set_scope(C_QUEUE_SCOPE);

Example: v_queue_scope := generic_queue.get_scope(VOID);

set_name (name)

Example: generic_queue.set_name(C_QUEUE_NAME);

get_count (void)

Example: v_num_elements := generic_queue.get_count(VOID);

set/get_queue_count_max (queue_count_max / void)

Example: generic_queue.set_queue_count_max(1000);

Example: v_max_queue_elements := generic_queue.get_queue_count_max(VOID);

set/get_queue_count_threshold (queue_count_alert_level / void)

Example: generic_queue.set_queue_count_threshold(950);

Example: v_queue_threshold := generic_queue.get_queue_count_threshold(VOID);

set/get_queue_count_threshold_severity (alert_level / void)

Example: generic_queue.set_queue_count_threshold_severity(TB_WARNING);

Example: v_queue_threshold_severity := generic_queue.get_queue_count_threshold_severity(VOID);

Generic Queue – Functional parameters

Name	Type	Example(s)	Description
scope	String	C_QUEUE_SCOPE	The scope for the generic queue. Has to be set prior to usage of several procedure and functions.
name	String	"rx_packet_queue"	The name of the generic queue.
element	t_generic_element	v_rx_data	The element that shall be pushed to the queue.
void	t_void	VOID	Unused, empty input parameter.
queue_count_max	natural	1000	The maximum number of elements the queue shall hold.
queue_count_alert_level	natural	950	The number of elements the queue can hold before an alert is raised.
alert_level	t_alert_level	TB_WARNING	The alert level is raised when the number of elements in the queue exceeds queue_count_alert_level.

Generic Queue – Prerequisites

Generic Queue generics

Generic element	Type	DEFAULT
<generic_element>	t_generic_element	<none>
GC_QUEUE_COUNT_MAX	natural	1000
GC_QUEUE_COUNT_MAX_THRESHOLD	natural	950

Package declaration example:

```
package td_queue_pkg is new uvvm_vvc_framework.ti_generic_queue_pkg
    generic map(
        t_generic_element => integer,
        GC_QUEUE_COUNT_MAX => 1000,
        GC_QUEUE_COUNT_THRESHOLD => 950);
```

Queue declaration example:

```
use work.td_queue_pkg.all;
shared variable generic_queue : t_generic_queue;
```

Generic Queue details

All Generic Queue functions and procedures are defined in the UVVM Generic Queue package, `ti_generic_queue_pkg.vhd`

1 Generic Queue details and examples

Method	Description
put()	<p>put(element)</p> <p>This procedure puts an element into a generic queue.</p> <p>The queue element is generic, meaning that it can be of any type, specified by the package declaration (see page 2 for example).</p> <p>Note that if no scope is set for the queue, a TB_WARNING will be raised. An alert, set by <code>set_queue_count_threshold_severity()</code>, will be raised when the queue reach a level, set by <code>set_queue_count_threshold()</code>. Also note that trying to <code>put()</code> to a full queue will raise a TB_ERROR.</p> <p>Example:</p> <pre>generic_queue.put(v_data_packet);</pre>
get()	<p>get(void)</p> <p>This function returns an element from the generic queue and removes it from the queue.</p> <p>Note that the oldest element in the queue is returned first. Attempting to <code>get()</code> from the queue without setting queue scope first (see <code>set_scope()</code>), will trigger a TB_WARNING, and attempting to <code>get()</code> from an empty queue will trigger a TB_ERROR.</p> <p>Example:</p> <pre>v_data_packet := generic_queue.get(VOID);</pre>
flush ()	<p>flush(void)</p> <p>This procedure empties the queue. A TB_WARNING will be raised if no scope is set for the queue prior to calling <code>flush()</code>.</p> <p>Example:</p> <pre>generic_queue.flush(VOID);</pre>
is_empty()	<p>is_empty(void)</p> <p>This function returns true if the queue is empty and false otherwise.</p> <p>Example:</p> <pre>If not(generic_queue.is_empty(VOID)) then ...</pre>

is_not_empty()	<p>is_not_empty (void)</p> <p>This function returns true if the queue is not empty and false otherwise.</p> <p>Example:</p> <pre>If generic_queue.is_not_empty(VOID) then ...</pre>
set_scope()	<p>set_scope(scope)</p> <p>This procedure will set the scope of the queue. Note that most of the procedures and functions in the generic queue will raise a TB_WARNING if no scope has been set for the queue.</p> <p>Example:</p> <pre>generic_queue.set_scope(C_QUEUE_SCOPE);</pre>
get_scope()	<p>get_scope(void)</p> <p>This function returns the scope of the queue as a string.</p> <p>Example:</p> <pre>v_queue_scope := generic_queue.get_scope(VOID);</pre>
set_name()	<p>set_name(name)</p> <p>This procedure takes a string input and sets the name of the queue.</p> <p>Example:</p> <pre>generic_queue.set_name("data packet queue");</pre>
get_count()	<p>get_count(void)</p> <p>This function returns the number of elements currently in the queue.</p> <p>Example:</p> <pre>v_num_elements := generic_queue.get_count(VOID);</pre>
set_queue_count_max()	<p>set_queue_count_max(queue_count_max)</p> <p>This procedure sets the maximum number of elements the queue can hold. Note that a TB_ERROR is raised if parameter queue_count_max is less than the number of elements currently in the queue.</p> <p>Example:</p> <pre>generic_queue.set_queue_count_max(1000);</pre>

get_queue_count_max()**get_queue_count_max(void)**

This function returns the maximum number of elements the queue can hold.

Example:

```
v_queue_max_elements := generic_queue.get_queue_count_max(VOID);
```

set_queue_count_threshold()**set_queue_count_threshold(queue_count_alert_level)**

This procedure sets the threshold value that will raise an alert, set by `set_queue_count_threshold_severity()`, if the number of queue elements exceeds the `queue_count_alert_level`.

Example:

```
generic_queue.set_queue_count_threshold(950);
```

get_queue_count_threshold()**get_queue_count_threshold(void)**

This function returns the threshold value that will raise an alert, set by `set_queue_count_threshold_severity()`, if the number of queue elements exceeds the `queue_count_alert_level`.

Example:

```
v_queue_threshold := generic_queue.get_queue_count_threshold(VOID);
```

set_queue_count_threshold_severity()**set_queue_count_threshold_severity(severity_level)**

This procedure sets the severity level for the alert that is raised when the number of queue elements exceeds the value set by `set_queue_count_threshold()`.

Example:

```
generic_queue.set_queue_count_threshold_severity(TB_WARNING);
```

get_queue_count_threshold_severity()**get_queue_count_threshold_severity(void)**

This function return the severity level for the alert that is raised when the number of queue elements exceeds the value set by `set_queue_count_threshold()`.

Example:

```
v_queue_level_severity := generic_queue.get_queue_count_threshold_severity(VOID);
```

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