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);

UVVM™

VHDL 2008 only

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

is_not_empty()

is_not_empty (void)

This function returns true if the queue is not empty and false otherwise.

Example:
```
If generic_queue.is_not_empty(VOID) then ...
```

set_scope()

set_scope(scope)

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.

Example:
```
generic_queue.set_scope(C_QUEUE_SCOPE);
```

get_scope()

get_scope(void)

This function returns the scope of the queue as a string.

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

set_name()

set_name(name)

This procedure takes a string input and sets the name of the queue.

Example:
```
generic_queue.set_name("data packet queue");
```

get_count()

get_count(void)

This function returns the number of elements currently in the queue.

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

set_queue_count_max()

set_queue_count_max(queue_count_max)

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.

Example:
```
generic_queue.set_queue_count_max(1000);
```

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);
```