

FIFO Collection - Quick Reference

UVVM Support Component

The FIFO Collection is a memory buffer that can be used to hold one or more FIFOs. Each FIFO will be allocated a chosen size and ID number. This allows a selectable number of FIFOs to operate individually and be independently accessed.

uvvm_fifo_init ([buffer_idx,] buffer_size_in_bits)

Example: v_buffer_idx := uvvm_fifo_init(C_BUFFER_SIZE-1); -- returns a buffer index on initialization

Example: uvvm_fifo_init(C_BUFFER_IDX_1, C_BUFFER_SIZE-1); -- buffer index is selected

uvvm_fifo_put (buffer_idx, data)

Example: uvvm_fifo_put(C_BUFFER_IDX_1, v_rx_data);

uvvm_fifo_get (buffer_idx, entry_size_in_bits)

Example: v_rx_data := uvvm_fifo_get (C_BUFFER_IDX_1, C_ENTRY_SIZE_1);

uvvm_fifo_flush (buffer_idx)

Example: uvvm_fifo_flush(C_BUFFER_IDX_1);

uvvm_fifo_peek (buffer_idx, entry_size_in_bits)

Example: v_rx_data := uvvm_fifo_peek(C_BUFFER_IDX_1, C_ENTRY_SIZE_1);

uvvm_fifo_get_count (buffer_idx)

Example: v_num_elements := uvvm_fifo_get_count(C_BUFFER_IDX_1);

uvvm_fifo_get_max_count (buffer_idx)

Example: v_max_fifo_elements := uvvm_fifo_get_max_count(C_BUFFER_IDX_1);

uvvm_fifo_is_full (buffer_idx)

Example: v_fifo_is_full := uvvm_fifo_is_full (C_BUFFER_IDX_1);

FIFO Collection – Functional parameters

| Name | Type | Example(s) | Description |
|---------------------|---------|------------|--|
| buffer_idx | natural | 1 | The index of the FIFO that shall be initialized. |
| buffer_size_in_bits | natural | 1024 | The size of the FIFO. |
| data | SLV | v_rx_data | The data that shall be pushed to the FIFO. |

FIFO Collection details

All FIFO functions and procedures are defined in the UVVM Data FIFO package, `ti_data_fifo_pkg.vhd`

1 FIFO Collection details and examples

| Method | Description |
|-------------------------|---|
| uvvm_fifo_init() | <p>uvvm_fifo_init([buffer_idx,] buffer_size_in_bits)</p> <p>This UVVM FIFO call will allocate space in the FIFO buffer. If no <code>buffer_idx</code> is given, the call will return a buffer index for use when addressing the FIFO. Note that 0 will be returned on error. If a <code>buffer_idx</code> is given, the FIFO is initialized with this index.</p> <p>Example:</p> <pre>uvvm_fifo_init(C_BUFFER_IDX_1, C_BUFFER_SIZE-1); -- initialize buffer with index C_BUFFER_IDX_1 v_fifo_idx := uvvm_fifo_init(C_BUFFER_SIZE-1);</pre> |
| uvvm_fifo_put() | <p>uvvm_fifo_put(buffer_idx, data)</p> <p>This procedure puts data into a FIFO with index <code>buffer_idx</code>. The size of the data is unconstrained, meaning that it can be any size. Pushing data with a size that is larger than the FIFO size results in wrapping, i.e., that when reaching the end that data remaining will overwrite the data that was first written.</p> <p>Example:</p> <pre>uvvm_fifo_put(C_BUFFER_IDX_1, v_rx_data);</pre> |
| uvvm_fifo_get() | <p>uvvm_fifo_get(buffer_idx, entry_size_in_bits)</p> <p>This function returns the data from the FIFO and removes the returned data from the FIFO.</p> <p>Note that <code>buffer_idx</code> is the index of the FIFO that shall be read, and that <code>entry_size_in_bits</code> is the size of the returned data as SLV.</p> <p>Attempting to get data from an empty FIFO is allowed but triggers a <code>TB_WARNING</code> and returns garbage data. Attempting to get a larger value than the FIFO size is allowed but triggers a <code>TB_WARNING</code>.</p> <p>Example:</p> <pre>v_rx_data := uvvm_fifo_get(C_BUFFER_IDX_1, C_ENTRY_SIZE-1);</pre> |

| | |
|----------------------------------|--|
| uvvm_fifo_flush() | uvvm_fifo_flush(buffer_idx) This procedure empties the FIFO given by buffer_idx. Example: <pre>uvvm_fifo_flush(C_BUFFER_IDX_1);</pre> |
| uvvm_fifo_peek() | uvvm_fifo_peek(buffer_idx, entry_size_in_bits) This function returns the data from the FIFO without removing it. Note that, apart from not removing the data, this function will behave in the same way as the uvvm_fifo_get() function. Example: <pre>v_rx_data := uvvm_fifo_peek(C_BUFFER_IDX_1, C_ENTRY_SIZE-1);</pre> |
| uvvm_fifo_get_count() | uvvm_fifo_get_count(buffer_idx) This function returns a natural indicating the number of elements currently occupying the FIFO given by buffer_idx. Example: <pre>v_num_elements := uvvm_fifo_get_count(C_BUFFER_IDX);</pre> |
| uvvm_fifo_get_max_count() | uvvm_fifo_get_max_count(buffer_idx) This function returns a natural indicating the maximum number of elements that can occupy the FIFO given by buffer_idx. Example: <pre>v_max_elements := uvvm_fifo_get_max_count(C_BUFFER_IDX);</pre> |
| uvvm_fifo_is_full() | uvvm_fifo_is_full(buffer_idx) This function returns a boolean indicating if the FIFO is full or not. Example: <pre>v_fifo_is_full := uvvm_fifo_is_full(C_BUFFER_IDX);</pre> |