



## **Digital Design Verification**

### **Lab Manual #42 – TLM Connections**

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## Revision History

Revision Number	Revision Date	Revision By	Nature of Revision	Approved By
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## Task 1: Using TLM Export Connectors

The image shows a Visual Studio Code window with a terminal output from a UVM test. The terminal is titled 'task1' and shows the following content:  
  
UVM INFO ../channel/sv/channel\_rx\_monitor.sv(144) @ 39250: uvm\_test\_top.env.chan0\_rx\_agent.monitor [channel\_rx\_monitor] Channel 0 Packet collected :  
-----  
Name Type Size Value  
-----  
packet collected channel packet 0 00000  
length integral 6 'h5  
addr integral 2 'h0  
payload da(integral) 5  
integral 0 'h5e  
[1] integral 8 'h71  
[2] integral 8 'h0b  
[3] integral 8 'h0b  
[4] integral 8 'h34  
parity integral 8 'h34  
parity type parity e 1 6004 PARITY  
packet delay integral 32 'd0  
begin time time 64 38550  
end time time 64 39250  
-----  
  
UVM INFO /home/cc/nent/XCELIIQP309/tools/methodology/UVM/CDNS-1.1d/sv/src/base/uvm\_objection.svh(1268) @ 40500: reporter [TEST DONE] 'run' phase is ready to proceed to the 'extract' phase  
UVM INFO ../channel/sv/channel\_rx\_driver.sv(94) @ 40500: uvm\_test\_top.env.chan0\_rx\_agent.driver [channel\_rx\_driver] Report: Channel 0 RX Driver Sent 0 Responses  
UVM INFO ../channel/sv/channel\_rx\_monitor.sv(157) @ 40500: uvm\_test\_top.env.chan0\_rx\_agent.monitor [channel\_rx\_monitor] Report: Channel 0 Monitor Collected 9 Packets  
UVM INFO ../channel/sv/channel\_rx\_driver.sv(94) @ 40500: uvm\_test\_top.env.chan1\_rx\_agent.driver [channel\_rx\_driver] Report: Channel 1 RX Driver Sent 6 Responses  
UVM INFO ../channel/sv/channel\_rx\_monitor.sv(157) @ 40500: uvm\_test\_top.env.chan1\_rx\_agent.monitor [channel\_rx\_monitor] Report: Channel 1 Monitor Collected 6 Packets  
UVM INFO ../channel/sv/channel\_rx\_driver.sv(94) @ 40500: uvm\_test\_top.env.chan2\_rx\_agent.driver [channel\_rx\_driver] Report: Channel 2 RX Driver Sent 2 Responses  
UVM INFO ../channel/sv/channel\_rx\_monitor.sv(157) @ 40500: uvm\_test\_top.env.chan2\_rx\_agent.monitor [channel\_rx\_monitor] Report: Channel 2 Monitor Collected 2 Packets  
UVM INFO ../hbus/sv/hbus\_monitor.sv(132) @ 40500: uvm\_test\_top.env.hbus\_monitor [hbus\_monitor] Report: HBUS Monitor Collected 2 WRITE and 1 READ Transactions  
UVM INFO ../yapp/sv/router\_scoreboard.sv(204) @ 40500: uvm\_test\_top.sv [router\_sb] ===== ROUTER SCOREBOARD REPORT =====  
UVM INFO ../yapp/sv/router\_scoreboard.sv(205) @ 40500: uvm\_test\_top.env.sb [ Total Packets Received : 17  
UVM INFO ../yapp/sv/router\_scoreboard.sv(206) @ 40500: uvm\_test\_top.env.sb [ Total Packets Matched (Channel 0) : 8  
UVM INFO ../yapp/sv/router\_scoreboard.sv(207) @ 40500: uvm\_test\_top.env.sb [ Total Packets Matched (Channel 1) : 6  
UVM INFO ../yapp/sv/router\_scoreboard.sv(208) @ 40500: uvm\_test\_top.env.sb [ Total Packets Matched (Channel 2) : 2  
UVM INFO ../yapp/sv/router\_scoreboard.sv(209) @ 40500: uvm\_test\_top.env.sb [ Total Packets Mismatched (Channel 0) : 1  
UVM INFO ../yapp/sv/router\_scoreboard.sv(210) @ 40500: uvm\_test\_top.env.sb [ Total Packets Mismatched (Channel 1) : 6  
UVM INFO ../yapp/sv/router\_scoreboard.sv(211) @ 40500: uvm\_test\_top.env.sb [ Total Packets Mismatched (Channel 2) : 0  
UVM INFO ../yapp/sv/router\_scoreboard.sv(213) @ 40500: uvm\_test\_top.env.sb [ Queue 0 Left: 0 [ Queue 1 Left: 0 [ Queue 2 Left: 0  
UVM INFO ../yapp/sv/yapp\_tx\_driver.sv(48) @ 40500: uvm\_test\_top.env.uvc\_agent.driver [yapp\_driver] Report: YAPP TX driver sent 17 packets  
UVM INFO ../yapp/sv/yapp\_tx\_monitor.sv(48) @ 40500: uvm\_test\_top.env.uvc\_agent.monitor [yapp\_monitor] Report: YAPP Monitor Collected 17 Packets  
  
--- UVM Report CATCHER Summary ---  
  
Number of denoted UVM FATAL reports : 0  
Number of denoted UVM ERROR reports : 0  
Number of denoted UVM WARNING reports: 0  
Number of caught UVM FATAL reports : 0  
Number of caught UVM ERROR reports : 0  
Number of caught UVM WARNING reports : 0  
  
--- UVM Report Summary ---  
  
\*\* Report counts by severity  
UVM INFO : 169  
UVM WARNING : 1  
UVM ERROR : 2  
  
The terminal output is displayed in a dark-themed editor with syntax highlighting. The left sidebar shows the Explorer view with a file tree containing various UVM components. The top bar shows the Visual Studio Code interface with the 'task1' terminal window selected.

## Task 2: Using TLM Analysis FIFOs

```

File Edit View Search Terminal Help
length      integral      0      'h5
addr         integral      2      'h6
payload      da(integral) 5      -
[0]          integral      8      'h5e
[1]          integral      8      'h71
[2]          integral      8      'h6d
[3]          integral      8      'hdb
[4]          integral      8      'h34
parity       integral      8      'h34
parity type  1          6000 PARITY
packet delay integral      32      'd0
begin time   time        64      38550
end time     time        64      39250
-----
UVM ERROR ../sv/router_scoreboard.sv(94) : 39250: uvm_test_top.env.router.env.scoreboard [PKT_COMPARE] Length mismatch YAPP 1 Chan 5
UVM INFO ../sv/router_scoreboard.sv(94) : 39250: uvm_test_top.env.router.env.scoreboard [Channel 0] Packet Received Wrong
UVM INFO /home/ccm/r/XCELIO2389/tools/methodology/UVM/CMS-1.1d/sv/src/base/uvm_objection.svh(128) : 40500: reporter [TEST DONE] 'run' phase is ready to proceed to the 'extract' phase
UVM INFO ../channel/sv/channel_rx_driver.sv(157) : 40500: uvm_test_top.env.router.env.scoreboard [Channel rx driver] Report: Channel 0 RX Driver sent 9 Responses
UVM INFO ../channel/sv/channel_rx_driver.sv(157) : 40500: uvm_test_top.env.chan0.rx_agent.monitor [Channel rx monitor] Report: Channel 0 Monitor Collected 9 Packets
UVM INFO ../channel/sv/channel_rx_driver.sv(94) : 40500: uvm_test_top.env.chan1.rx_agent.driver [Channel rx driver] Report: Channel 1 RX Driver sent 8 Responses
UVM INFO ../channel/sv/channel_rx_driver.sv(157) : 40500: uvm_test_top.env.chan1.rx_agent.monitor [Channel rx monitor] Report: Channel 1 Monitor Collected 8 Packets
UVM INFO ../channel/sv/channel_rx_driver.sv(94) : 40500: uvm_test_top.env.chan2.rx_agent.driver [Channel rx driver] Report: Channel 2 RX Driver sent 2 Responses
UVM INFO ../channel/sv/channel_rx_driver.sv(157) : 40500: uvm_test_top.env.chan2.rx_agent.monitor [Channel rx monitor] Report: Channel 2 Monitor Collected 2 Packets
UVM INFO ../hbus/sv/hbus_monitor.sv(132) : 40500: uvm_test_top.env.hbus_monitor [hbus monitor] Report: HBUS Monitor Collected 2 WRITE and 1 READ Transactions
UVM INFO ../router_scoreboard.sv(164) : 40500: uvm_test_top.env.router.env.scoreboard [router sb] ===== ROUTER SCOREBOARD REPORT =====
UVM INFO ../sv/router_scoreboard.sv(165) : 40500: uvm_test_top.env.router.env.scoreboard [ ] Total Packets Received (Channel 0): 8
UVM INFO ../sv/router_scoreboard.sv(166) : 40500: uvm_test_top.env.router.env.scoreboard [ ] Total Packets Received (Channel 1): 5
UVM INFO ../sv/router_scoreboard.sv(167) : 40500: uvm_test_top.env.router.env.scoreboard [ ] Total Packets Received (Channel 2): 2
UVM INFO ../sv/router_scoreboard.sv(168) : 40500: uvm_test_top.env.router.env.scoreboard [ ] Total Packets Matched (Channel 0): 4
UVM INFO ../sv/router_scoreboard.sv(169) : 40500: uvm_test_top.env.router.env.scoreboard [ ] Total Packets Matched (Channel 1): 5
UVM INFO ../sv/router_scoreboard.sv(170) : 40500: uvm_test_top.env.router.env.scoreboard [ ] Total Packets Matched (Channel 2): 0
UVM INFO ../sv/router_scoreboard.sv(171) : 40500: uvm_test_top.env.router.env.scoreboard [ ] Total Packets Mismatched (Channel 0): 3
UVM INFO ../sv/router_scoreboard.sv(172) : 40500: uvm_test_top.env.router.env.scoreboard [ ] Total Packets Mismatched (Channel 1): 0
UVM INFO ../sv/router_scoreboard.sv(173) : 40500: uvm_test_top.env.router.env.scoreboard [ ] Total Packets Mismatched (Channel 2): 2
UVM INFO ../yapp/sv/router_scoreboard.sv(164) : 40500: uvm_test_top.env.sb [router sb] ===== ROUTER SCOREBOARD REPORT =====
UVM INFO ../yapp/sv/router_scoreboard.sv(165) : 40500: uvm_test_top.env.sb [ ] Total Packets Received (Channel 0): 0
UVM INFO ../yapp/sv/router_scoreboard.sv(166) : 40500: uvm_test_top.env.sb [ ] Total Packets Received (Channel 1): 0
UVM INFO ../yapp/sv/router_scoreboard.sv(167) : 40500: uvm_test_top.env.sb [ ] Total Packets Received (Channel 2): 0
UVM INFO ../yapp/sv/router_scoreboard.sv(168) : 40500: uvm_test_top.env.sb [ ] Total Packets Matched (Channel 0): 0
UVM INFO ../yapp/sv/router_scoreboard.sv(169) : 40500: uvm_test_top.env.sb [ ] Total Packets Matched (Channel 1): 0
UVM INFO ../yapp/sv/router_scoreboard.sv(170) : 40500: uvm_test_top.env.sb [ ] Total Packets Matched (Channel 2): 0
UVM INFO ../yapp/sv/router_scoreboard.sv(171) : 40500: uvm_test_top.env.sb [ ] Total Packets Mismatched (Channel 0): 0
UVM INFO ../yapp/sv/router_scoreboard.sv(172) : 40500: uvm_test_top.env.sb [ ] Total Packets Mismatched (Channel 1): 0
UVM INFO ../yapp/sv/router_scoreboard.sv(173) : 40500: uvm_test_top.env.sb [ ] Total Packets Mismatched (Channel 2): 0
UVM INFO ../yapp/sv/yapp_tx_driver.sv(48) : 40500: uvm_test_top.env.uvc.agent.driver [yapp driver] Report: YAPP TX Driver sent 17 packets
UVM INFO ../yapp/sv/yapp_tx_monitor.sv(48) : 40500: uvm_test_top.env.uvc.agent.monitor [yapp monitor] Report: YAPP Monitor collected 17 packets

--- UVM Report catcher Summary ---

Number of denoted UVM FATAL reports : 0

```