TLM 2.0 Approximately Time (AT) System Example – 4 Timing Points

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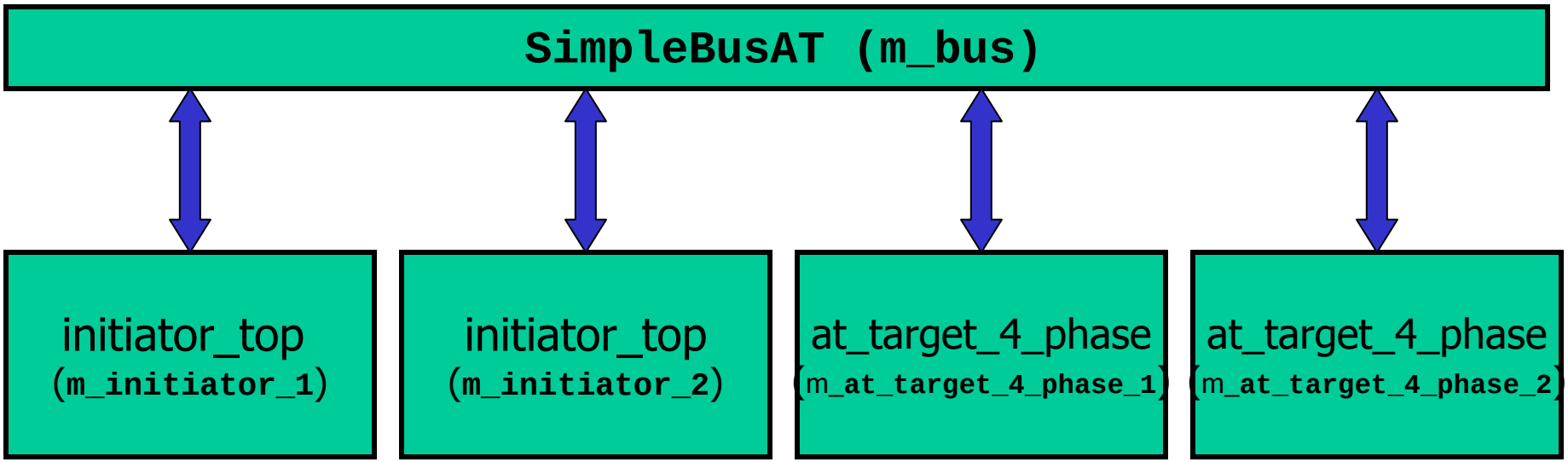
AT System Example - Annotated Timing

- **The Goal is to Illustrate:**
  - **Application of TLM 2.0 in a real system**
  - **option of the non-blocking style**
    - **This style has been previously referred to as "4 phase"**
    - **Most complex version of non-blocking/AT style**
- **Possible Applications:**
  - **Architectural Verification**
  - **Software Verification**
  - **Early Performance Validation**

Example Block Diagram



TLM 2 GP

How to run this example (Linux)

- Set **`SYSTEMC_HOME`**
- **`cd examples/tlm/at_4_phase/build-unix`**
- **`make clean`**
- **`make`**
- **`make run`**

How to run this example (MSVC)

- Open a explorer window on **`examples/tlm/at_4_phase/build-windows`**
- Launch **`at_4_phase.sln`**
- Select **‘Property Manager’** from the **‘View’** menu
- Under **‘at_4_phase > Debug | Win32’** select **‘systemc’**
- Select **‘Properties’** from the **‘View’** menu
- Select **‘User Macros’** under **‘Common Properties’**
- Update the **‘SYSTEMC’** entry and apply
- Build and run

Expected Output (`expected.log`) 1 of 2

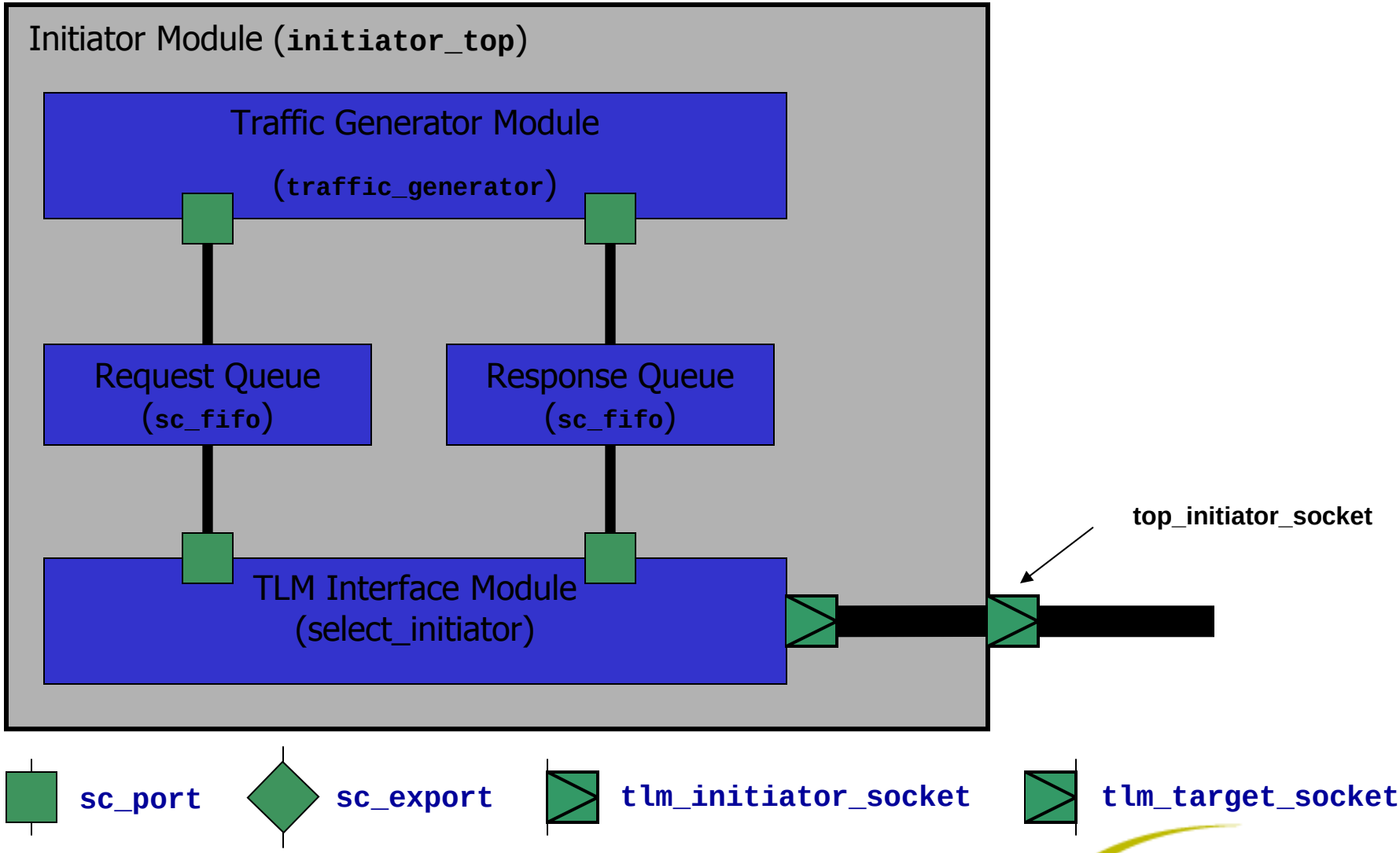
```
Info: traffic_generator.cpp: 0 s - traffic_generator_thread
    Initiator: 101 Starting Traffic
Info: select_initiator.cpp: 0 s - initiator_thread
    Initiator: 101 starting new transaction for Addr:0x00000100
    Initiator: 101 nb_transport_fw (GP, BEGIN_REQ, 0 s)
Info: select_initiator.cpp: 0 s - initiator_thread
    Initiator: 101 ACCEPTED (GP, BEGIN_REQ, 0 s)
    Initiator: 101 transaction waiting end-request on backward-path
...
Info: at_target_4_phase.cpp: 0 s - nb_transport_fw
    Target: 201 nb_transport_fw (GP, BEGIN_REQ, 0 s)
    Target: 201 ACCEPTED (GP, BEGIN_REQ, 0 s)
Info: at_target_4_phase.cpp: 10 ns - end_request_method
    Target: 201 starting end-request method
    Target: 201 transaction moved to send-response PEQ
    Target: 201 nb_transport_bw (GP, END_REQ, 0 s)
Info: at_target_4_phase.cpp: 10 ns - end_request_method
    Target: 201 ACCEPTED (GP, END_REQ, 0 s)
...
Info: select_initiator.cpp: 10 ns - nb_transport_bw
    Initiator: 101 nb_transport_bw (GP, END_REQ, 0 s)from Addr:0x00000100
    Initiator: 101 transaction waiting begin-response on backward path
    Initiator: 101 ACCEPTED (GP, END_REQ, 0 s)
Info: at_target_4_phase.cpp: 10 ns - nb_transport_fw
    Target: 201 nb_transport_fw (GP, BEGIN_REQ, 0 s)
    Target: 201 ACCEPTED (GP, BEGIN_REQ, 0 s)
```

Expected Output (expected.log) 2 of 2

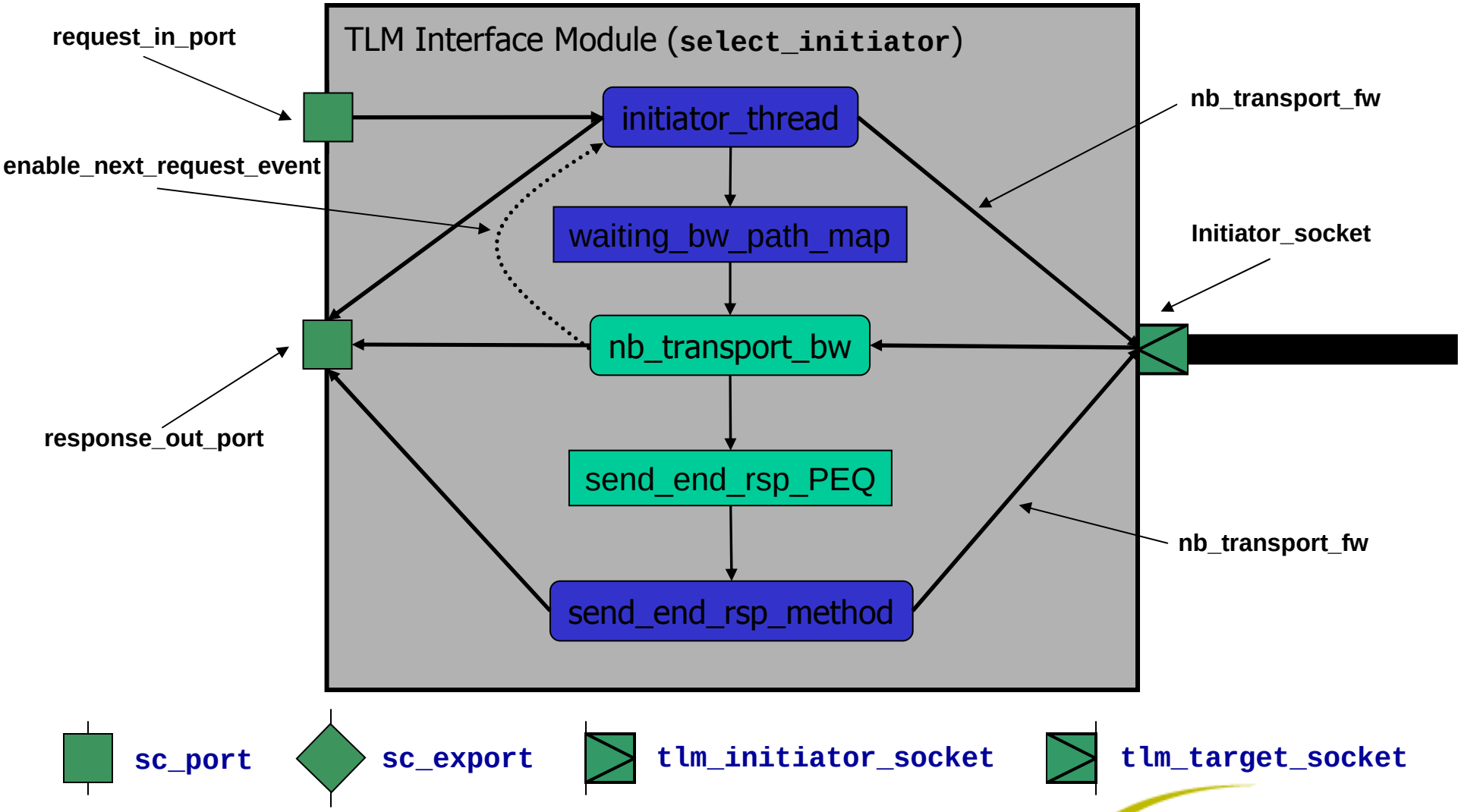
```
Info: at_target_4_phase.cpp: 20 ns - end_request_method
     Target: 201 starting end-request method
     Target: 201 transaction moved to send-response PEQ
     Target: 201 nb_transport_bw (GP, END_REQ, 0 s)

Info: at_target_4_phase.cpp: 20 ns - end_request_method
     Target: 201 ACCEPTED (GP, END_REQ, 0 s)
…
Info: select_initiator.cpp: 40 ns - nb_transport_bw
     Initiator: 101 nb_transport_bw (GP, BEGIN_RESP, 0 s)from Addr:0x00000100
     Initiator: 101 transaction moved to send-end-response PEQ
     Initiator: 101 ACCEPTED (GP, BEGIN_RESP, 0 s)
Info: select_initiator.cpp: 47 ns - send_end_rsp_method
     Initiator: 101 starting send-end-response method
     Initiator: 101 nb_transport_fw (GP, END_RESP, 0 s)
Info: select_initiator.cpp: 47 ns - send_end_rsp_method
     Initiator: 101 COMPLETED (GP, END_RESP, 0 s)
```

Initiator Module

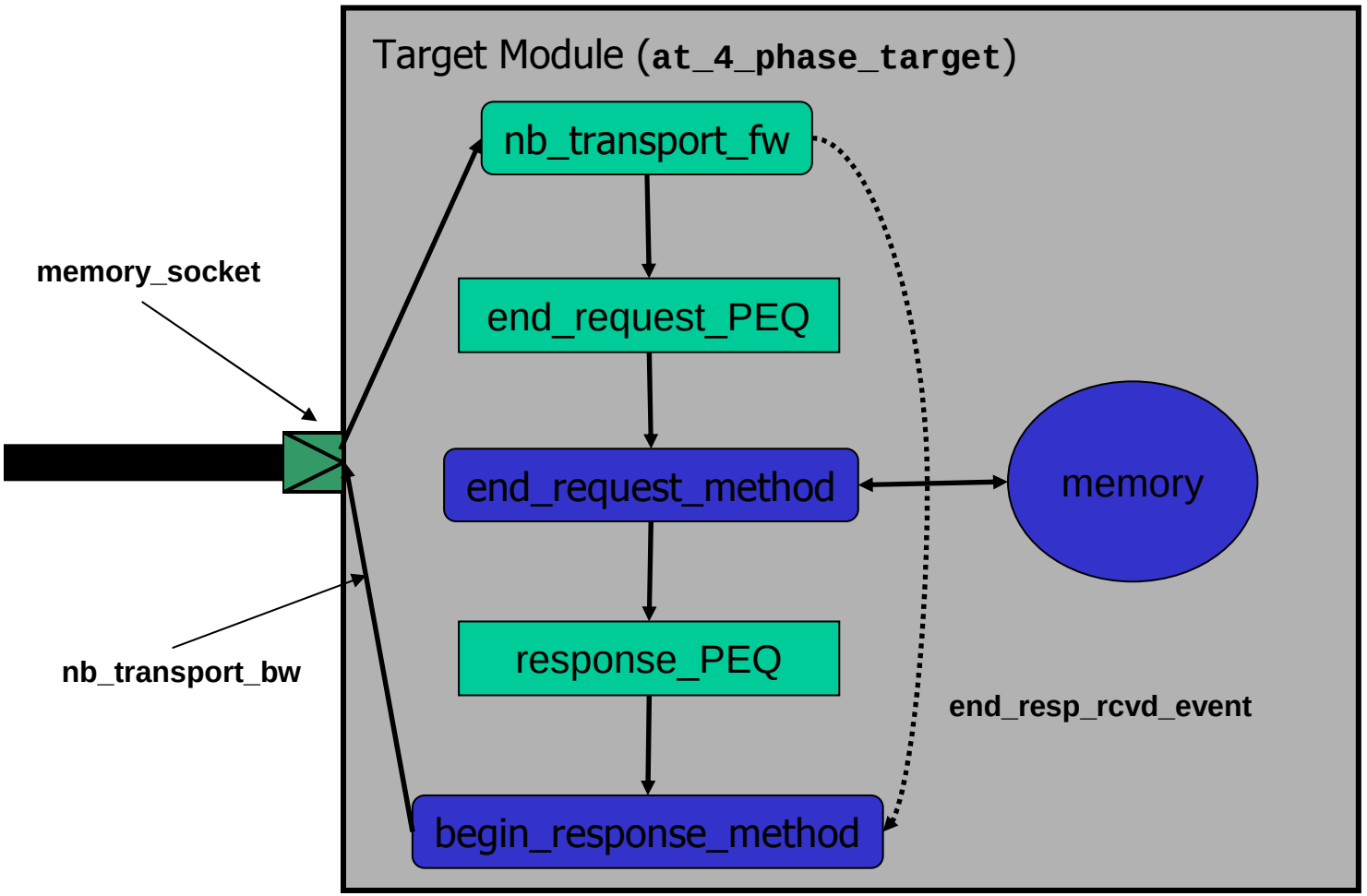


TLM Interface Module



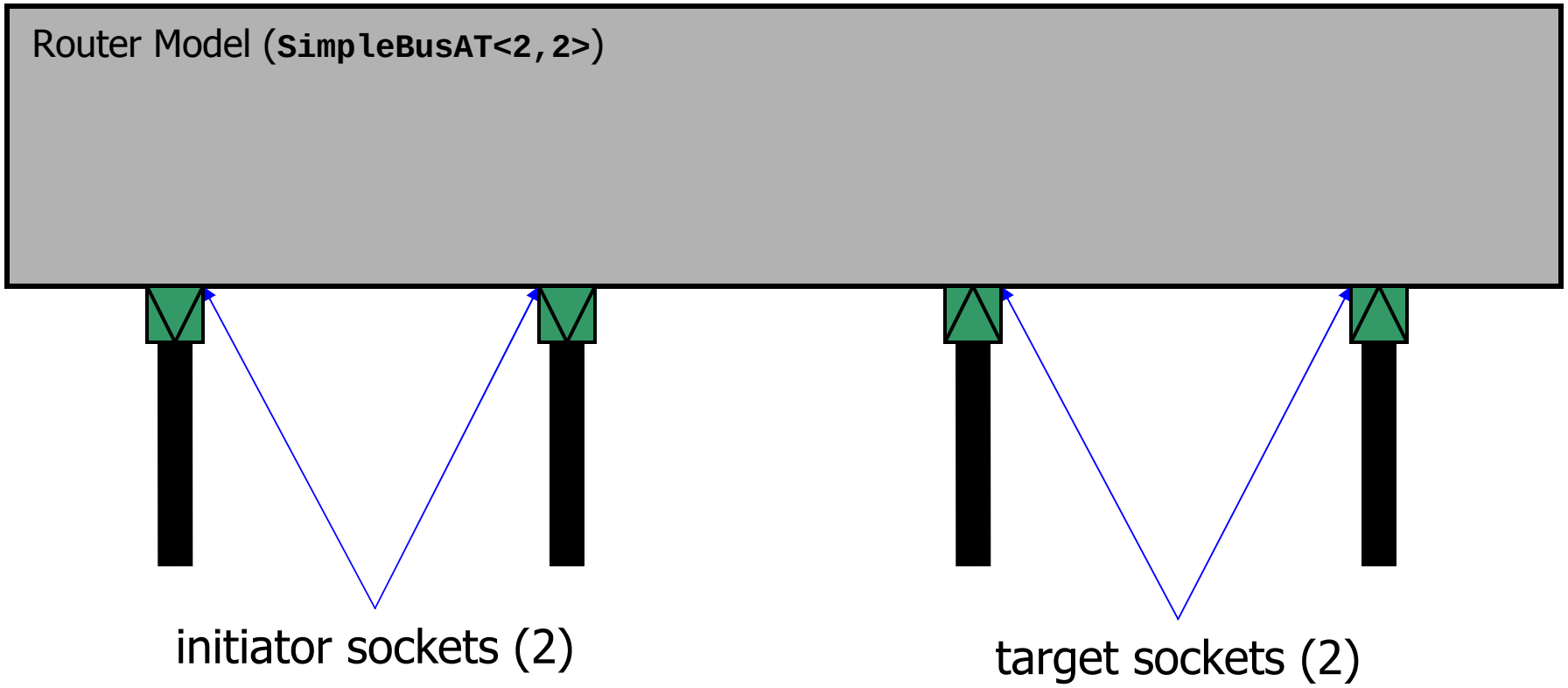
SYSTEMC™

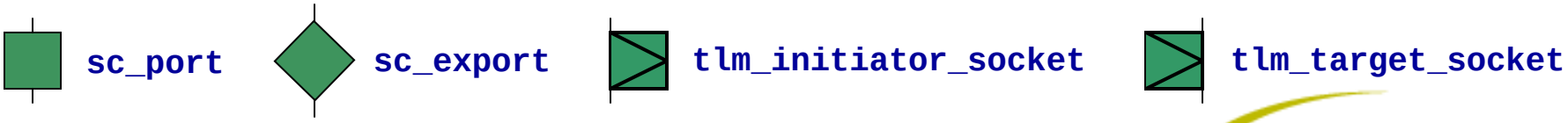
Target Module



sc_port sc_export tlm_initiator_socket tlm_target_socket

Router Component





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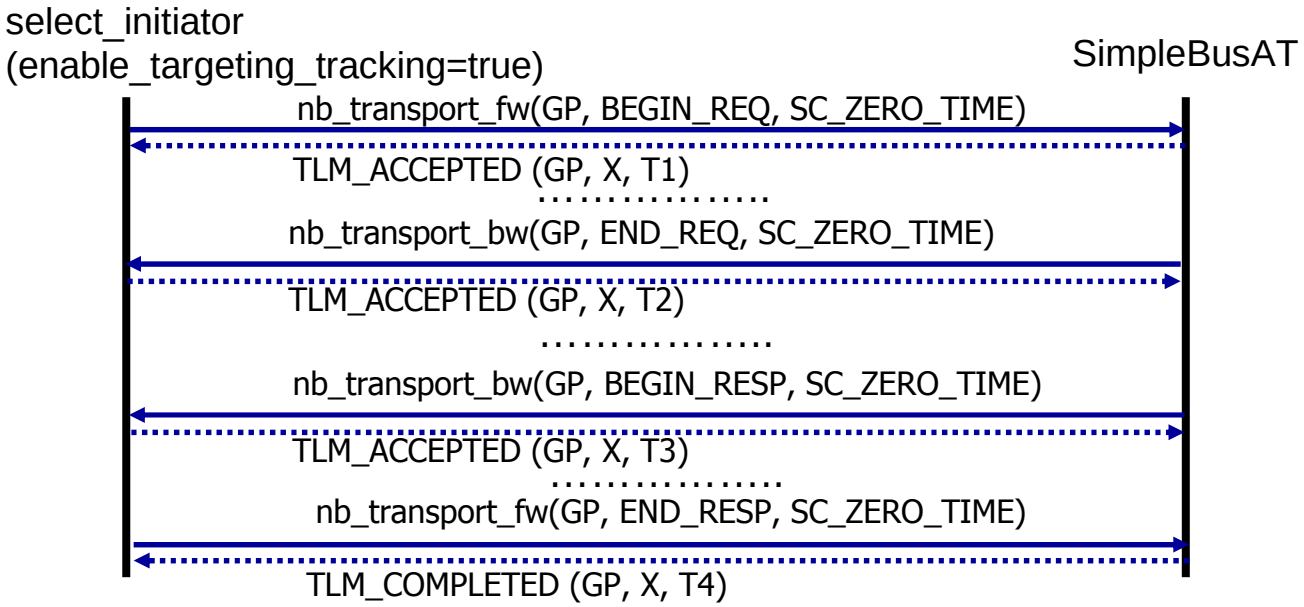
Expected Timing (1 of 2)



Expected Timing (2 of 2)