



TLM 2.0 Approximately Timed (AT) System Example - 2 Timing Points

Jack Donovan, Anna Keist, Charles Wilson

ESLX, Inc.

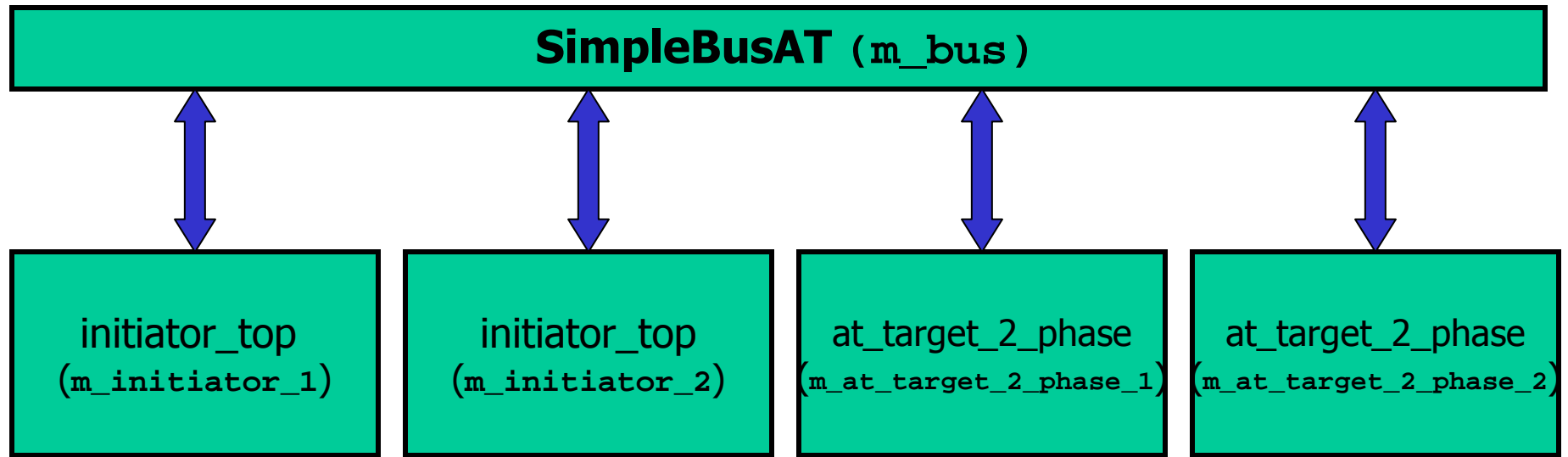
June 2008

AT System Example - Annotated Timing

- **The Goal is to Illustrate:**
 - Application of TLM 2.0 in a real system
 - Non-blocking (NB) option of the approximately timed style
 - ◆ NB annotated timing has been referred to as "2 phase"
 - ◆ Medium complexity version of non-blocking/AT
- **Possible Applications:**
 - Architectural exploration
 - Early software development
 - Crude Architectural Verification



Example Block Diagram



 TLM 2 GP

How to run this example (Linux)

- Set `SYSTEMC_HOME`
- `cd examples/tlm/at_2_phase/build-unix`
- `make clean`
- `make`
- `make run`

How to run this example (MSVC)

- Open a explorer window on `examples/tlm/at_2_phase/build-windows`
- Launch `at_2_phase.sln`
- Select '**Property Manager**' from the '**View**' menu
- Under '`at_2_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_2_phase.cpp: 0 s - nb_transport_fw
      Target: 201 nb_transport_fw (GP, BEGIN_REQ, 0 s)
      Target: 201 transaction moved to send-response PEQ
      Target: 201 UPDATED (GP, END_REQ, 10 ns)

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_2_phase.cpp: 10 ns - nb_transport_fw
      Target: 201 nb_transport_fw (GP, BEGIN_REQ, 0 s)
      Target: 201 transaction moved to send-response PEQ
      Target: 201 UPDATED (GP, END_REQ, 10 ns)
```

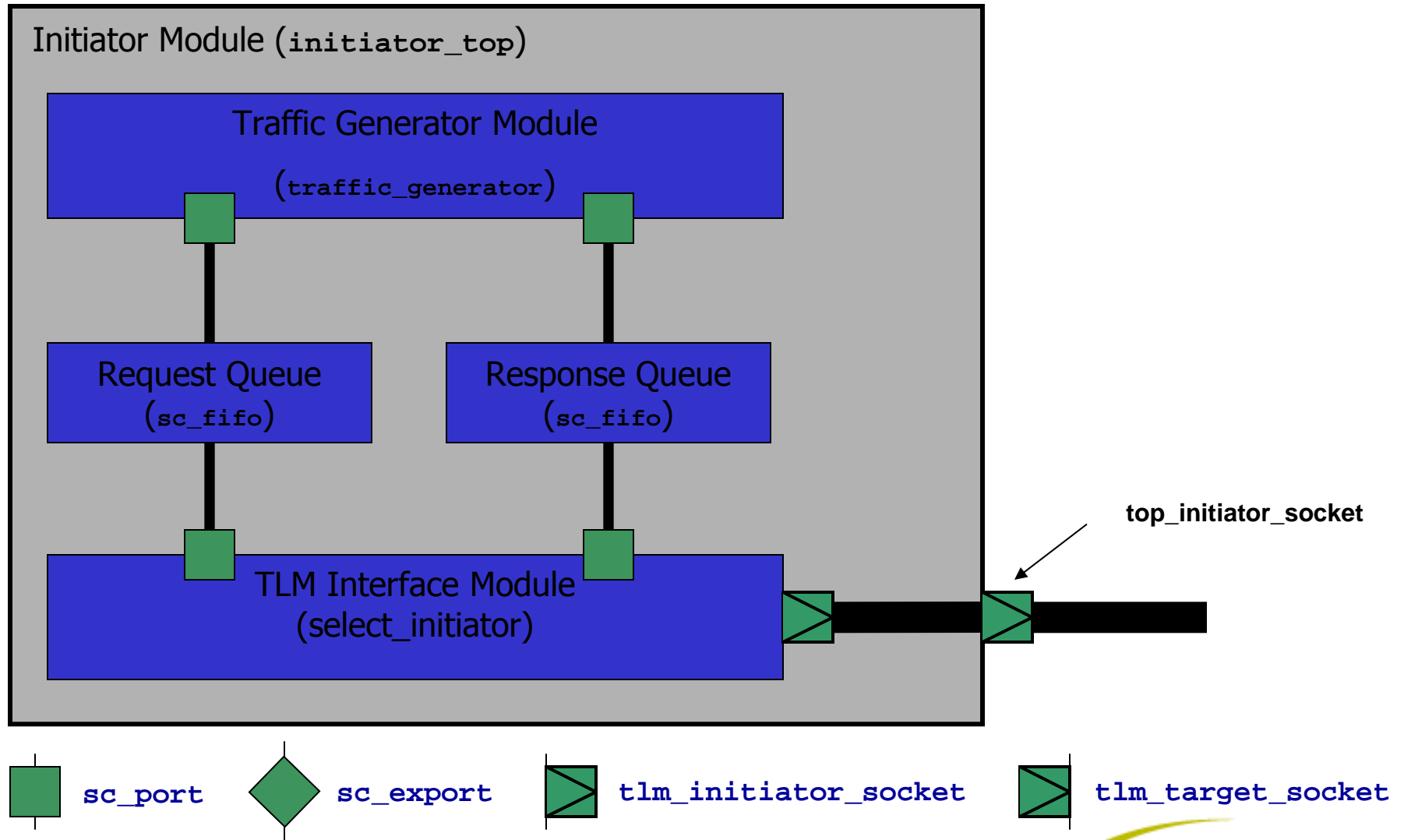


Expected Output (expected.log) 2 of 2

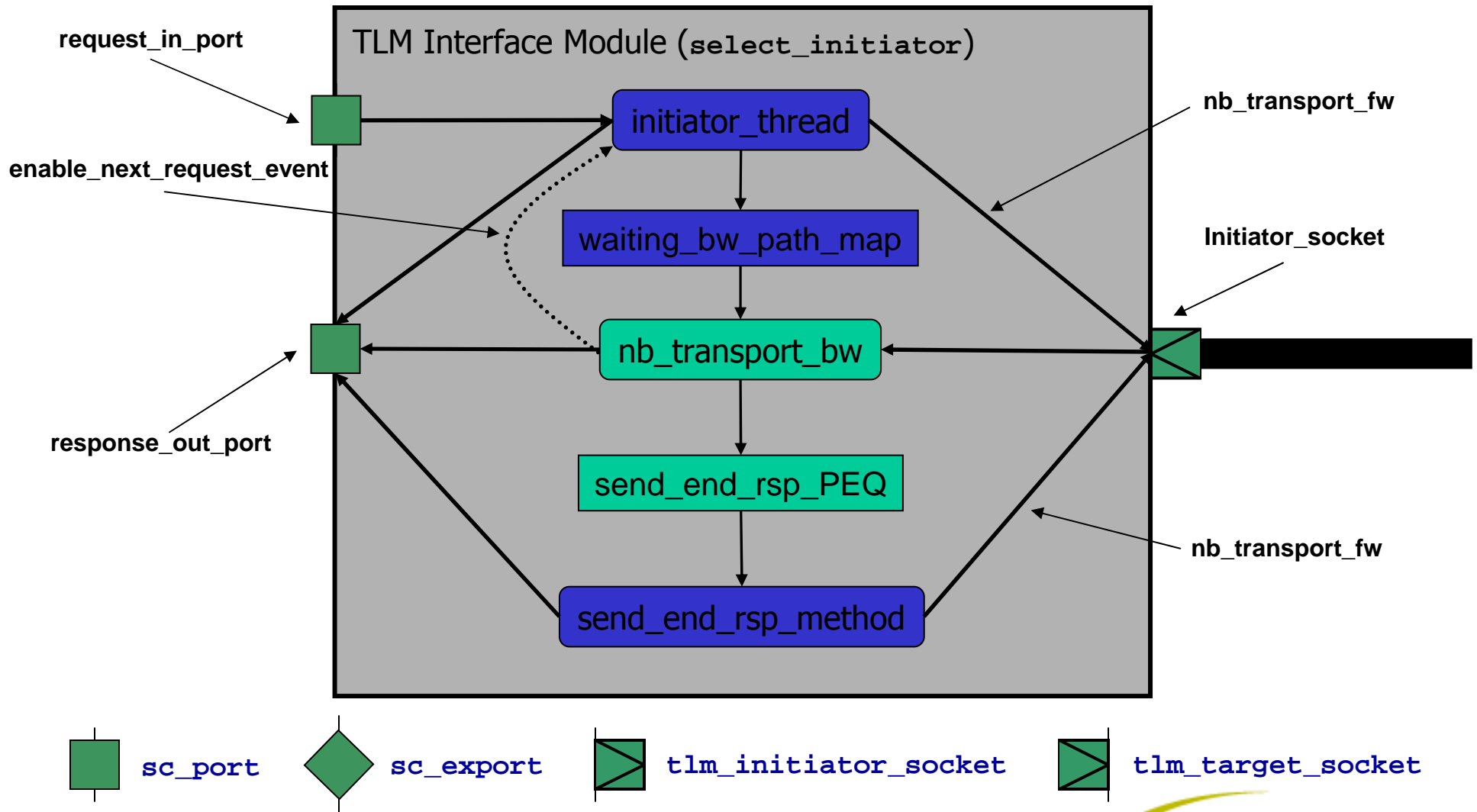
```
...
Info: at_target_2_phase.cpp: 40 ns - begin_response_method
      Target: 201 starting response method
Info: memory.cpp: 40 ns - print
      ID: 201 COMMAND: WRITE Length: 04
      Addr: 0x00000000000000100 Data: 0x00000100
Info: at_target_2_phase.cpp: 40 ns - begin_response_method
      Target: 201 nb_transport_bw (GP, BEGIN_RESP, SC_ZERO_TIME)
Info: at_target_2_phase.cpp: 40 ns - begin_response_method
      Target: 201 ACCEPTED (GP, BEGIN_RESP, 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)
```

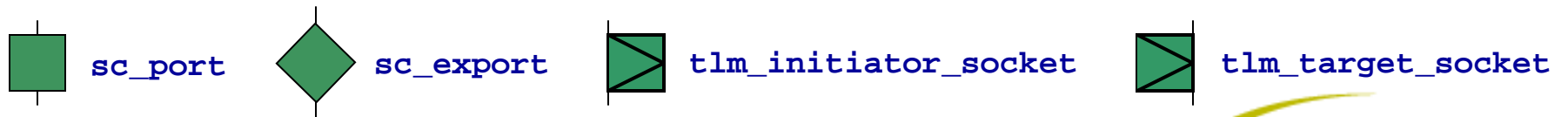
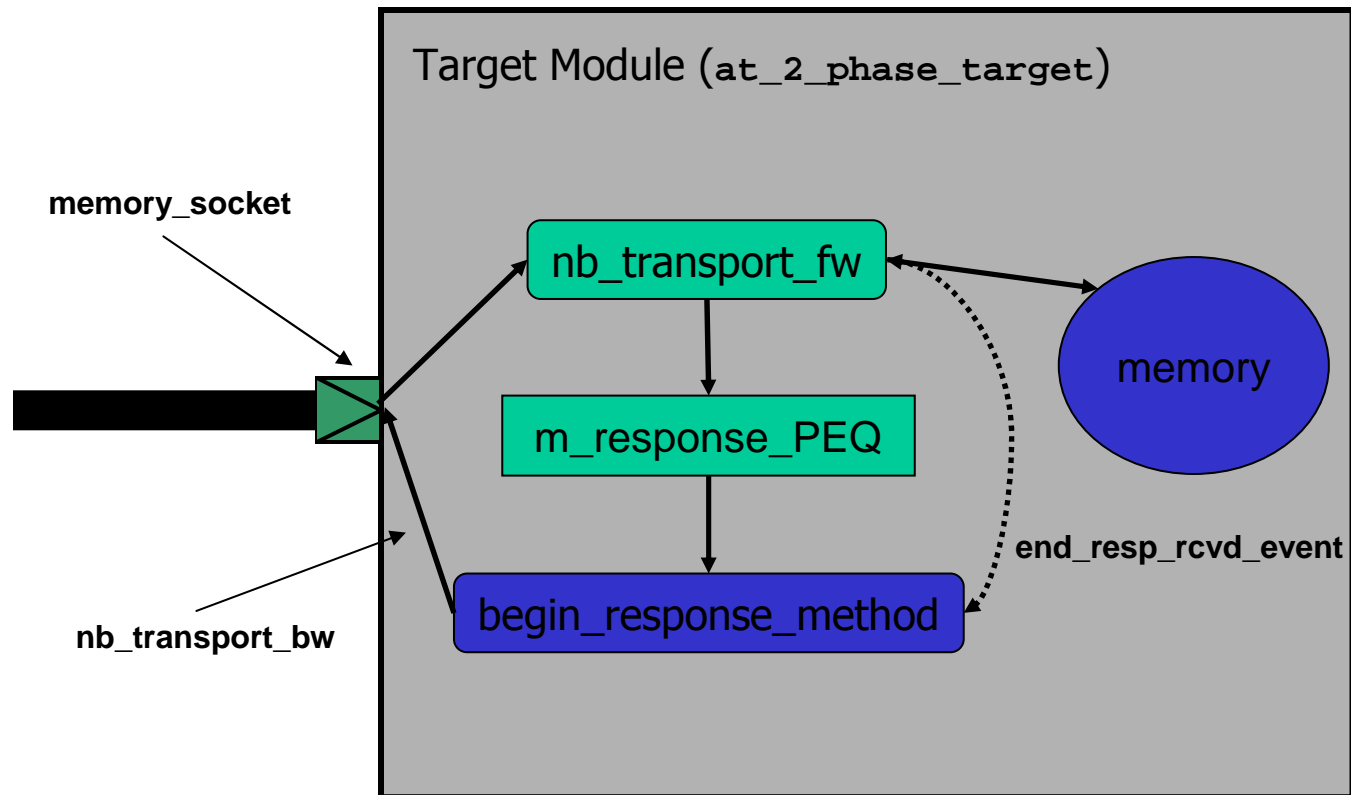
Initiator Module



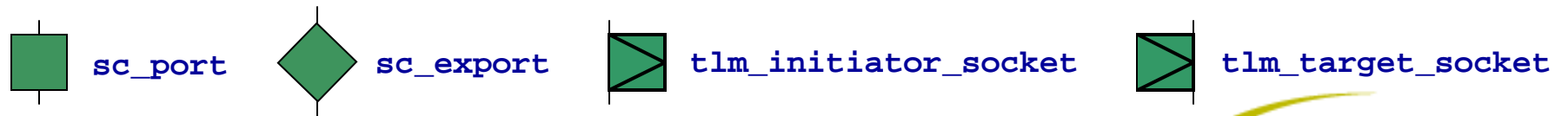
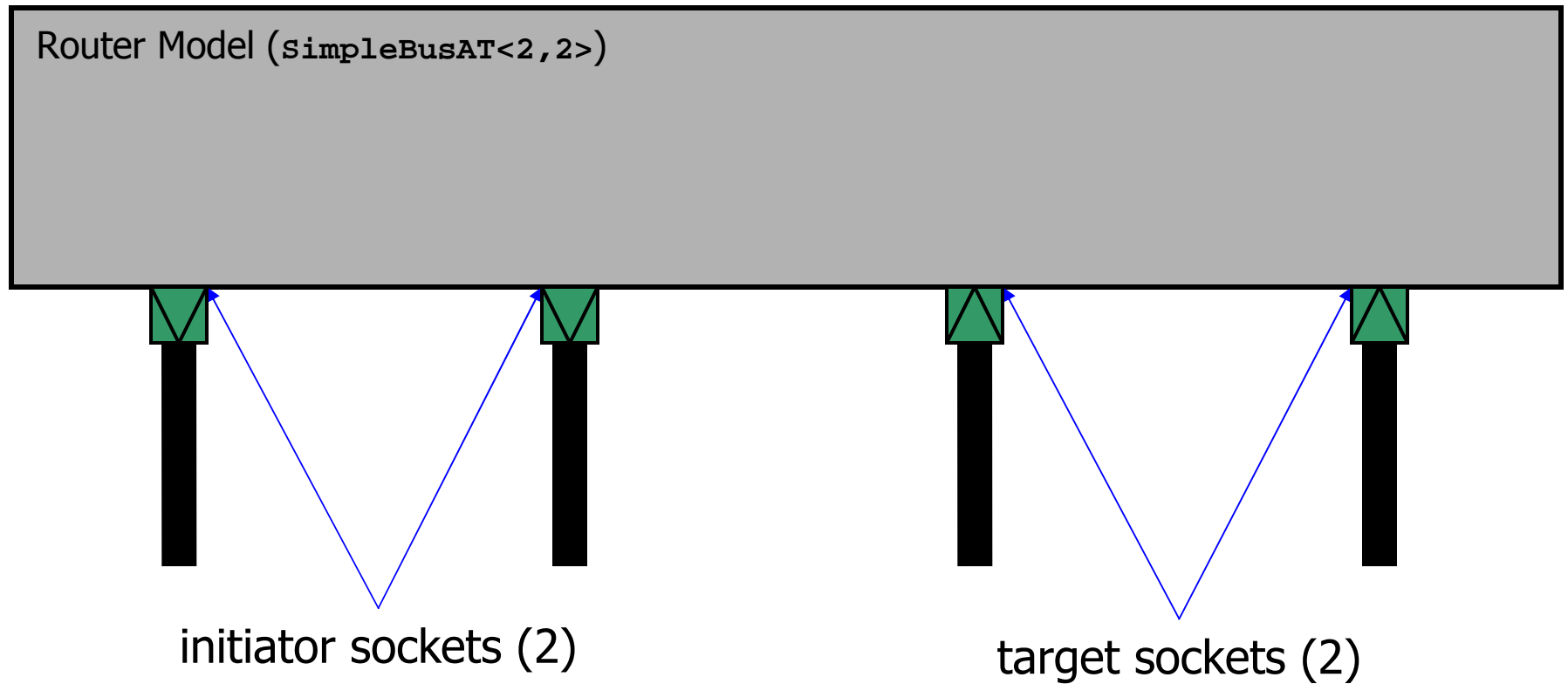
TLM Interface Module



Target Module



Router Component



Expected Timing

