

Laboration 3 Part II

ESL System Level Modeling with TLM 2.0

Task 5.1

Read Doulos' online material on TLM2.0

Tutorial 1 - Sockets, Generic Payload, Blocking Transport

http://www.doulos.com/knowhow/systemc/tlm2/tutorial_1/

Tutorial 2 – Response Status, DMI, and Debug Transport

http://www.doulos.com/knowhow/systemc/tlm2/tutorial_2/

After reading the materials, you answer the following questions:

- 1) What is the purpose of a socket? What is an initiator socket? What is a target socket?
- 2) According to the online description, the generic payload serves as two closely related purposes. What are the two purposes?
- 3) Each generic payload transaction has a standard set of bus attributes: command, address, data, byte enables, streaming width, and response status. Explain their meanings.
- 4) What is the default value of the response status attribute? If the response status is set to TLM_OK_RESPONSE, what does it mean?
- 5) What is the purpose of DMI?
- 6) What is the purpose of the debug transport interface

Task 5.2

Figure 1 shows a point to point connection between an initiator and a target via sockets. The target is a memory. Write a SystemC model using TLM 2.0 LT (loosely timed) coding style to realize and test the following functionality:

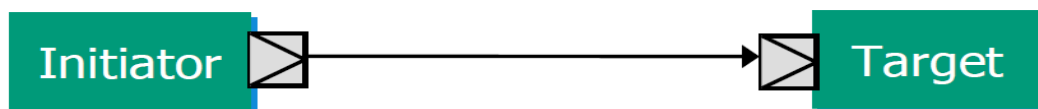


Figure 1. Point-to-point communication over sockets

- 1) The target offers a blocking transport method. It has a configurable size of memory space inside, i.e., its size is a parameter. The width of memory is 32 bits. Initially, the memory content is the same as its address, i.e., address X contains data X.
- 2) The initiator writes to the target randomly (20 times) by calling the blocking transport interface. All writes have no burst, i.e., each write is a single word of 32 bits. Whenever it is a write, both the write address and data are randomly generated. Each transaction takes 10 ns. To facilitate testing of the system, display each write transaction and its data on your computer screen.
- 3) The initiator then randomly reads the target (30 times) by calling the blocking transport interface. Each read transaction takes 5 ns, and reads a single word of 32 bits. To facilitate testing the system, display each read transaction and the data being read out on your computer screen.
- 4) If write/read targets to a memory region beyond the memory space, the transfer fails and it should report error on your computer screen.