Lab 3

TLM 2.0 & Simple bus

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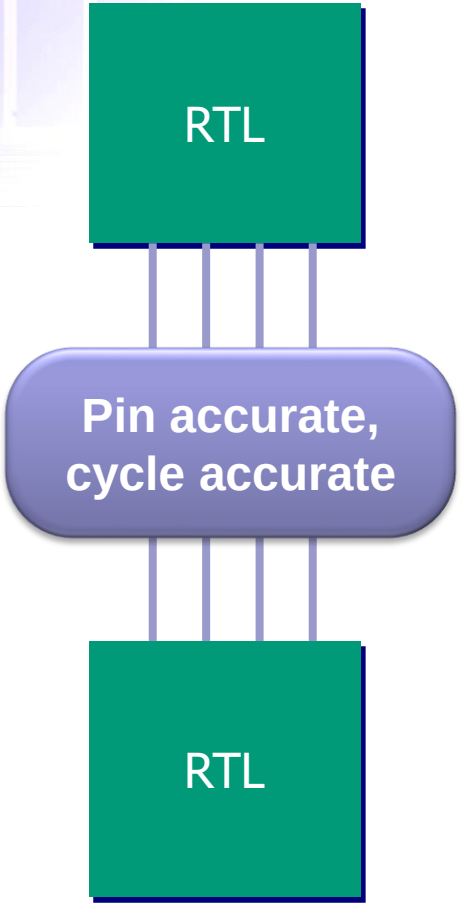
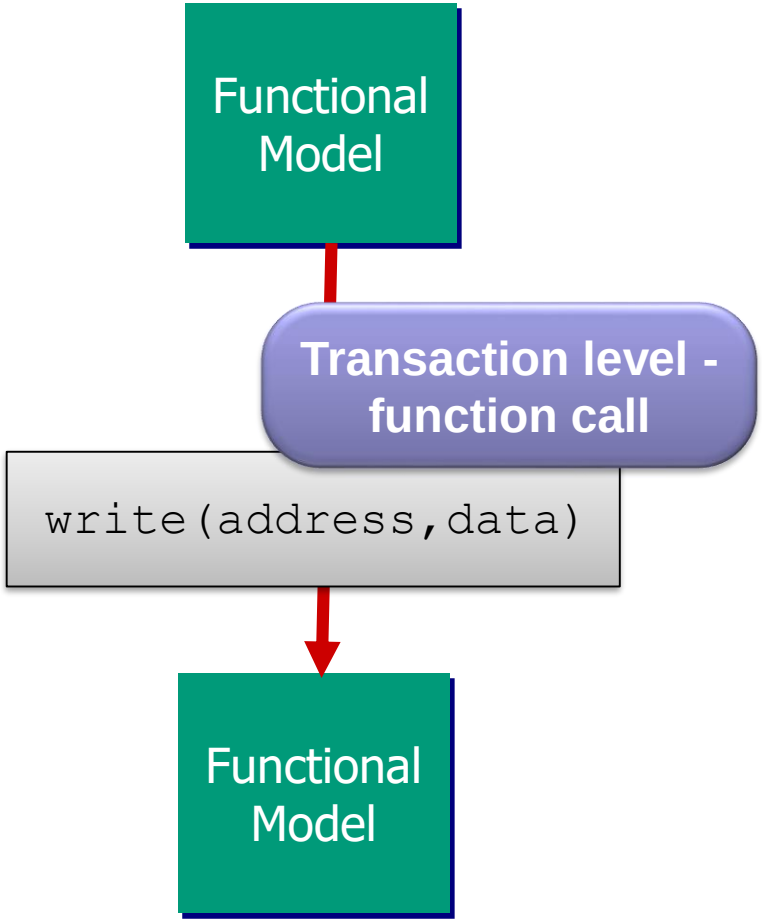
Outline

- TLM 2.0
- Simple Bus Example
- Lab 3 Practice: Edge Detection

TLM2.0 Introduction

Introduction



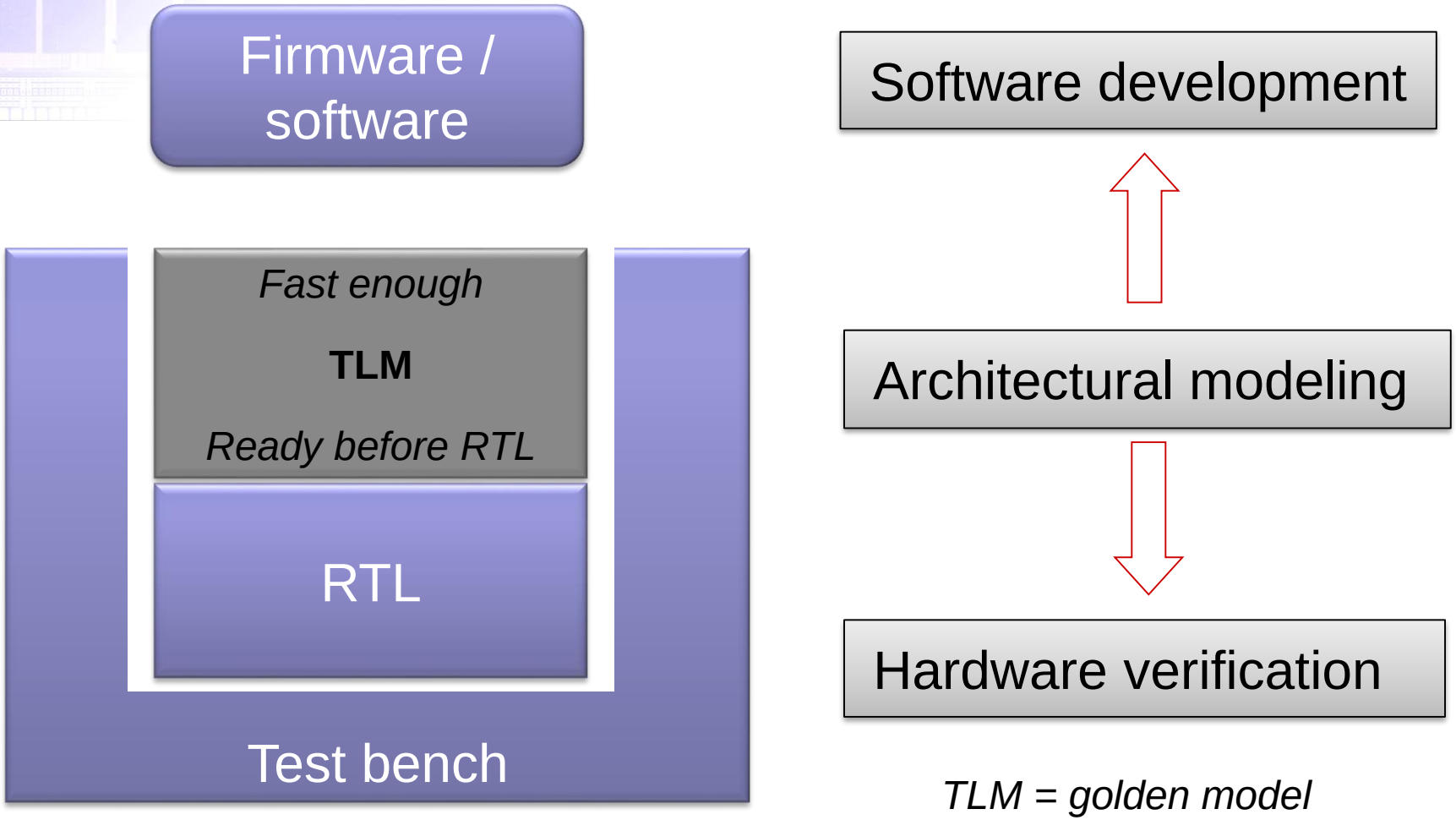


Simulate every event

100-10,000 X faster simulation

Introduction(Cont'd)

Accelerates product release schedule



TLM = golden model

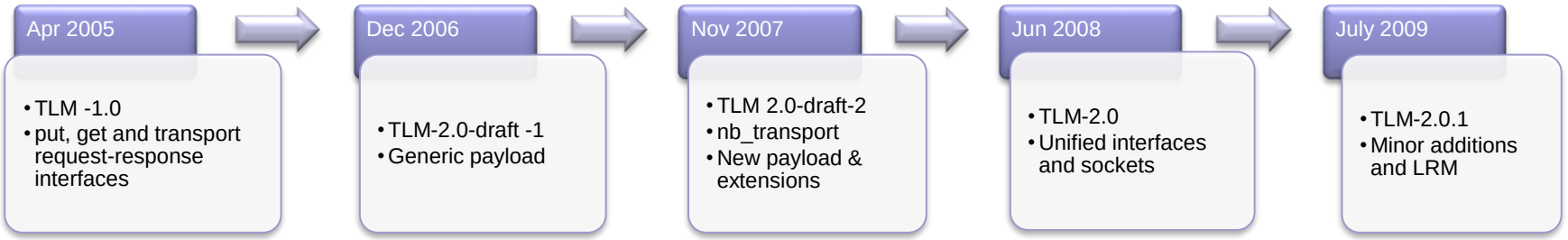
Why is TLM interesting?

- Fast and compact
- Integrate HW and SW models
- Early platform for SW development, easy to distribute
- Early system exploration and verification
- Verification reuse

Fast!

Early!

OSCI TLM Development



TLM-1.0 → TLM-2.0

- TLM-2.0 is the new standard for interoperability between memory mapped bus models
  - Incompatible with TLM-2.0-draft1 and TLM-2.0-draft2
- TLM-1.0 is not deprecated (put, get, nb_put, nb_get, transport)
- TLM-1.0 is included within TLM-2.0
  - Migration path from TLM-1.0 to TLM-2.0

More about TLM2.0…

- More details can be obtained from TLM_2_0_presentation.ppt

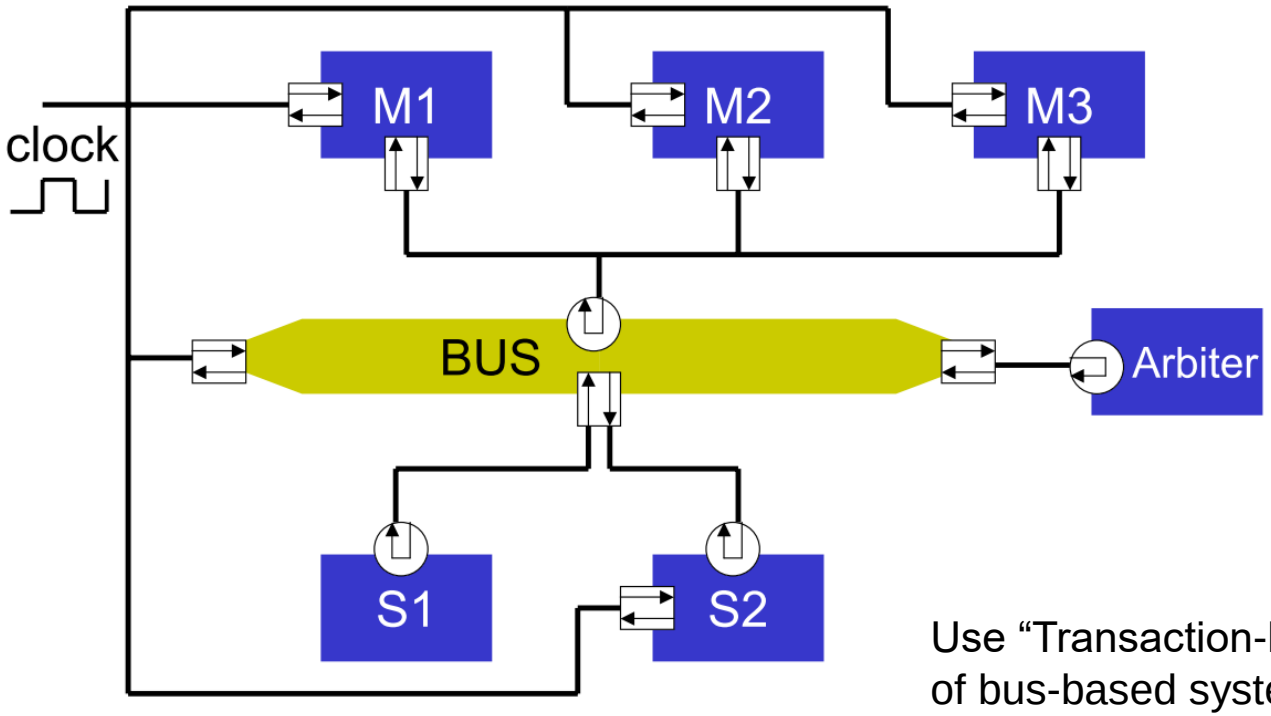
Build TLM2.0 Examples

- You can build and run examples just like building previous Labs and HWs.
  - C:\systemc-2.3.1\examples\tlm
  - There is a directory build-msvc inside every example directory.
  - Follow the doc in the directory and build
  - The doc gives introduction to the example
- Don’t forget to set the environment variables!
  - Include & library directories, Mtd, \vmg, …, etc.

Simple Bus

Simple Bus example

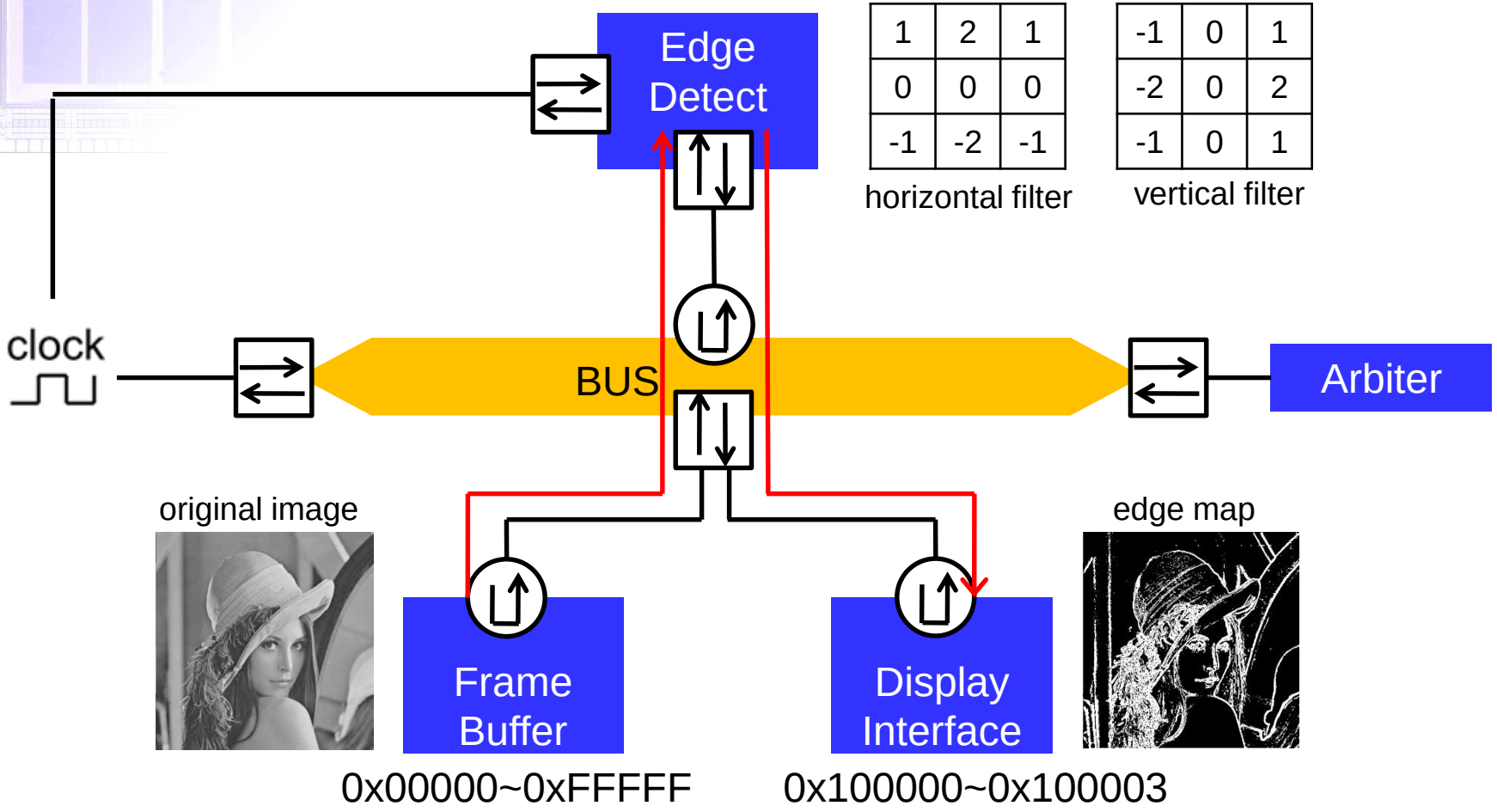
- Try code/simple_bus



Use “Transaction-level modeling of bus-based systems with SystemC 2.0” slide for the following.

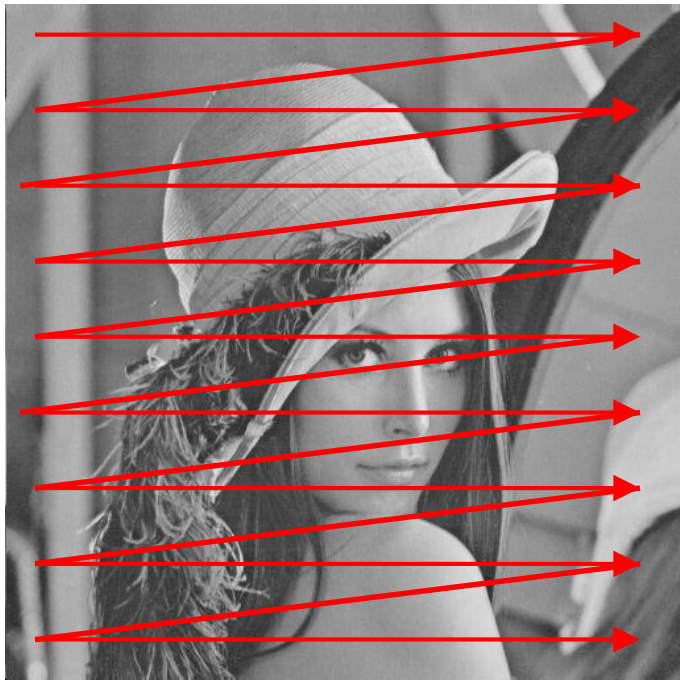
Lab 3 Practice: Edge Detection

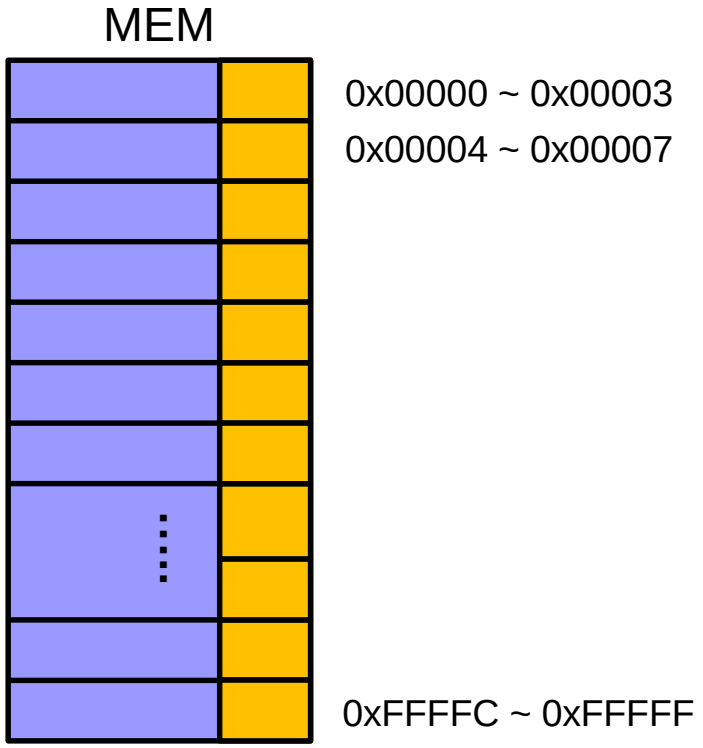
Edge Detection



Edge Detection(Cont'd)

- The bus use a unified 32-bit (4-byte) address
- Image size : 512x512
- Arrangement of frame buffer





Edge Detection(Cont'd)

- Window operation of edge filter

```
int mydata[9];
```

mydata[0]	mydata[1]	mydata[2]
mydata[3]	mydata[4]	mydata[5]
mydata[6]	mydata[7]	mydata[8]

1	2	1
0	0	0
-1	-2	-1

horizontal filter

-1	0	1
-2	0	2
-1	0	1

vertical filter

```
int edge = edge_filtering(mydata);
```

write the value to display interface !

Edge Detection(Cont'd)

- Requirement
  - Use direct master interface to R/W
  - Complete the net connection (main.cpp)
  - Complete the behavior of edge detect (edge_detect.cpp)
  - Complete the behavior of frame buffer (frame_buffer.h)