SystemC Median

MICROELECTRONIC SYSTEMS DESIGN RESEARCH GROUP

FPGAHS Lab - SystemC Median
Dr.-Ing. Christian De Schryver

Goals

- Get started with TLM 2
- Use TLM to describe a Median Filter with internal Memory.
- Develop a SystemC Module according to the functional Model.

Setup

A template code is provided on the GitHub System in the repository:

```
median.systemc
```

Please clone this repository to a working directory. You will find template code for this task and a Makefile there.

The folder contains the following files:

- `median_module.h` and `median_module.cpp` contains the module implementing the median filter algorithm.
- `memory.h` and `memory.cpp` contains the memory module that is used to store the image internally.
- `median_tb.h` and `median_tb.cpp` contains the testbench for the complete module.
- `main.cpp` specifies the executable program that combines all modules to a complete simulation.
- `Makefile` is a pre-defined config file for the make command that holds the settings for building this project.
- `systemc.median.pro` is the project file for QT creator. Open it with `qtcreator systemc.median.pro &`.

Task Description

1) Implement a module that filters an image stored inside a given memory module. Develop the module `median_module` that implements the median filter algorithm. The module needs to read and write from the memory.
2) Build and run the project with QT creator or using the command line and `make`. Check the output for errors and warnings.

Questions

- What can be described with TLM?

- What is the generic payload?
- What is the difference between blocking and non-blocking protocols?