SCope – Time Decoupled Parallel SystemC Simulation

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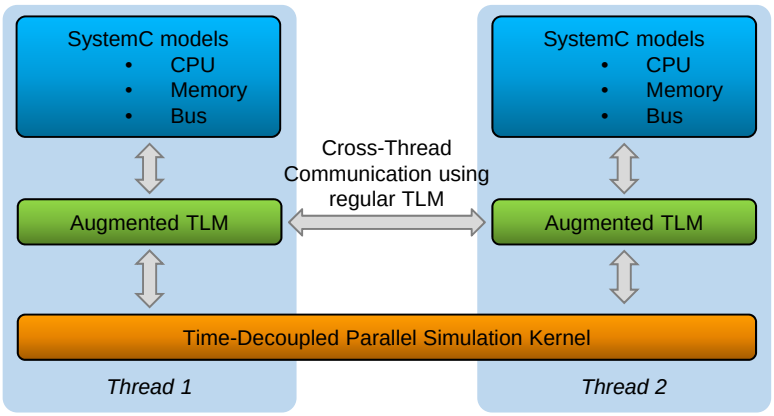
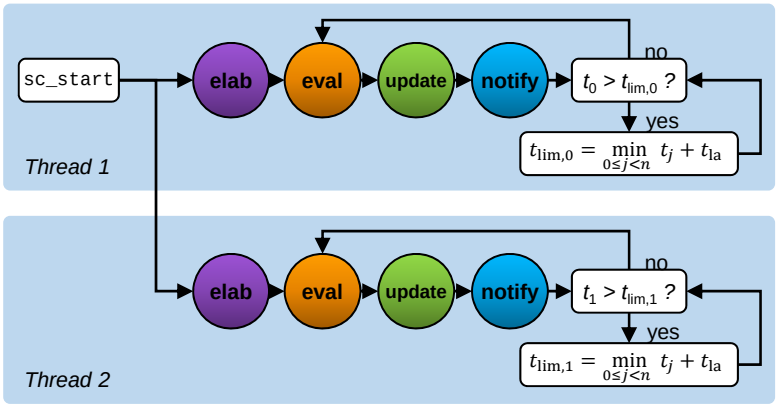
❑ SCope is a parallel SystemC kernel, compliant with IEEE 1666-2011



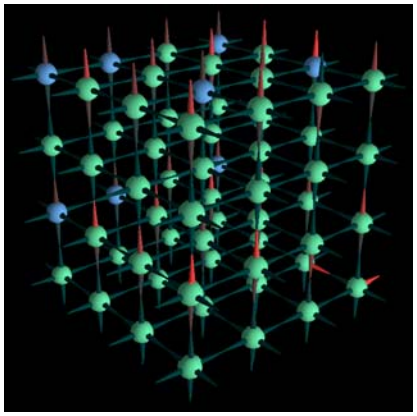
- **SystemC Models:** SCope has been tested to work with Synopsys Processor Designer Models, SCML- and TLM-based models
- **SCope's TLM** software layer abstracts cross thread communication
- **SCope's SystemC kernel** allows SC_THREADS and SC_METHODS to run in parallel

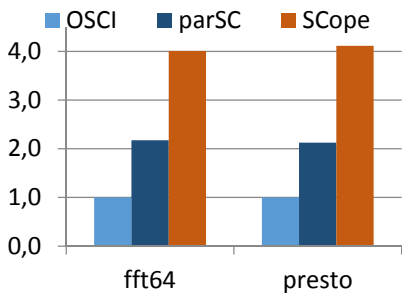
❑ SCope uses multiple threads for simulation, each with its own state – such as time

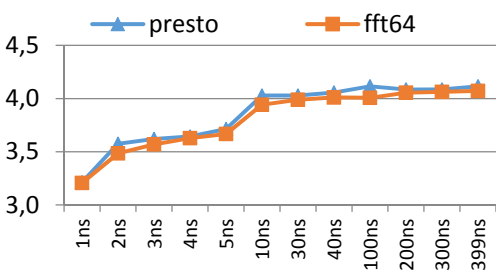
- Each simulation thread receives its **own state** (e.g. time) and executes its **own simulation loop**
- Thread simulation times must not deviate from each other by more then the **lookahead** t_{la} : $\forall t_i \nexists t_j, t_j > t_i + t_{la}$
- **SCope** avoids causality errors and operates **deterministically**



❑ SCope achieves linear speedups simulating the EURETILE system







- Tests show **linear speedup** running a system with 64 RISCs (System runs a distributed FFT and a network stress-test app)
- Speedup > 3.8 until lookahead drops below CPU cycle time