



An SMT-based Tool for Automatic Schedule Generation for Time Sensitive Networking

Aellison Cassimiro T. dos Santos*, Ben Schneider*, Vivek Nigam**

* Universidade Federal da Paraíba, + fortiss

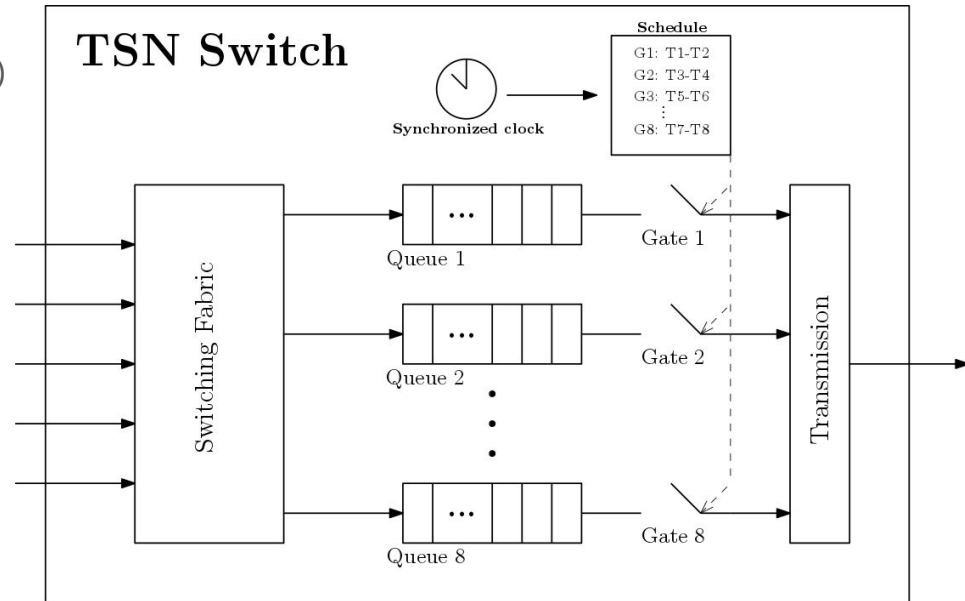
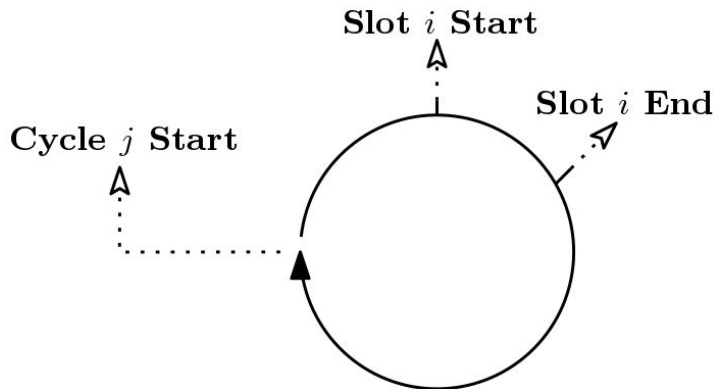
What is TSN?

- Critical, deterministic communication
- Industry automation, vehicular applications, voltage sampling, etc.

Basis of the time-triggered scheduling problem:

- VLAN tag encoded priority values
- Priority values assign packets to queues
- Gates stay open in fixed time (called time slots)
- Cyclic behavior

TSNsched (<https://github.com/ACassimiro/TSNsched>)





An SMT-based Tool for Automatic Schedule Generation for Time Sensitive Networking

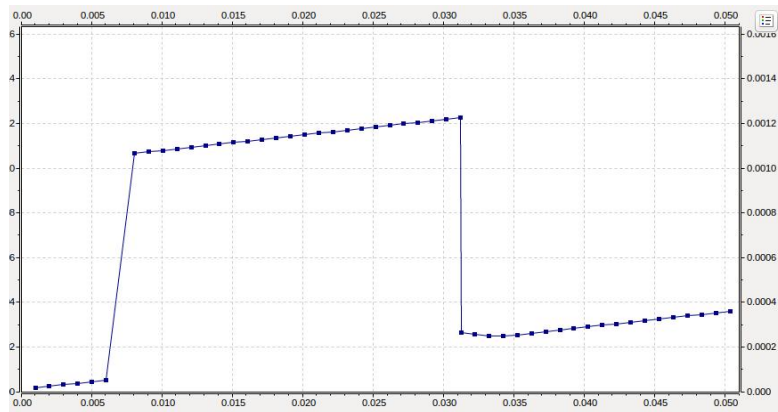
Aellison Cassimiro T. dos Santos*, Ben Schneider+, Vivek Nigam**

* Universidade Federal da Paraíba, + fortiss

Next steps:

- Integration of TSNsched with 4diac
- Schedule validation and testing
- Implementation of software-defined application periods
- New time-efficient scheduling approaches

Flexibility and expressiveness ⇒ freedom!



Simulation results



- Transmission of flow 1 packets



- Transmission of flow 2 packets

Flow 1 periodicity: 1000
Flow 2 periodicity: 1500

Cycle
Start

500 1000 1500 2000 2500 3000

Cycle
End

Software-defined application period: Hypercycle