

AutoTSN

Automated configuration and verification for flexible **Time-Sensitive Networking**

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AutoTSN

Objective

The global vision of the project is to facilitate and accelerate the integration of Time-Sensitive Networking (TSN) in application domains with the following requirements:

- low architectural complexity
- less configuration and verification effort
- guaranteed timing
- safety mechanisms
- plug&play capabilities

Standard	Titel	Status	Datum
IEEE 802.1AS-Rev	Timing and Synchronization for Time-Sensitive Applications ^[2]	Draft ^[3] 4.3	13. Januar 2017
IEEE 802.1Qbu	Frame Preemption ^[4]	Ratifiziert und publiziert	30. August 2016
IEEE 802.1Qbv	Enhancements for Scheduled Traffic ^[5]	Ratifiziert und publiziert	18. März 2016
IEEE 802.1Qca	Path Control and Reservation ^[6]	Ratifiziert und publiziert	11. März 2016
IEEE 802.1CB	Frame Replication and Elimination for Reliability (Seamless Redundancy) ^[7]	Draft 2.6	12. September 2016
IEEE 802.1Qcc	Stream Reservation Protocol (SRP) Enhancements and Performance Improvements ^[8]	Draft 1.1	1. September 2016
IEEE 802.1Qch	Cyclic Queuing and Forwarding ^[9]	Draft 2.1	11. Januar 2017
IEEE 802.1Qci	Per-Stream Filtering and Policing ^[10]	Draft 2.1	15. November 2016
IEEE 802.1CM	Time-Sensitive Networking for Fronthaul ^[11]	Draft 0.5	15. Oktober 2017
IEEE 802.1Qcr	Asynchronous Traffic Shaping	Draft 0.0	9. Januar 2017

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Challenges and Technical goals

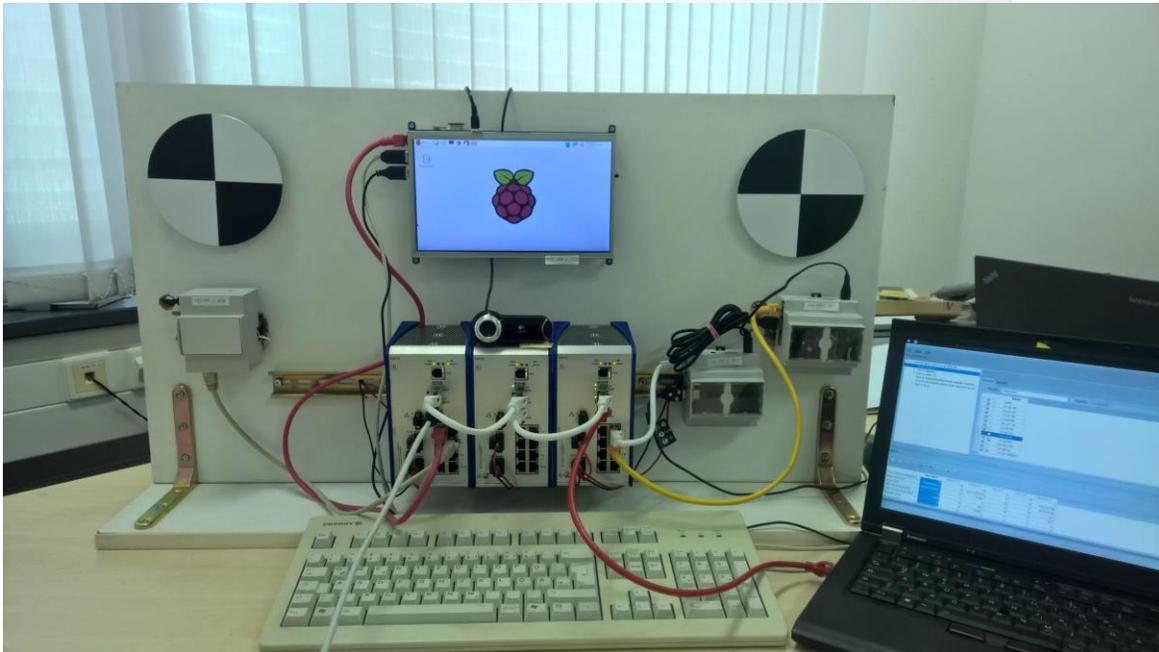
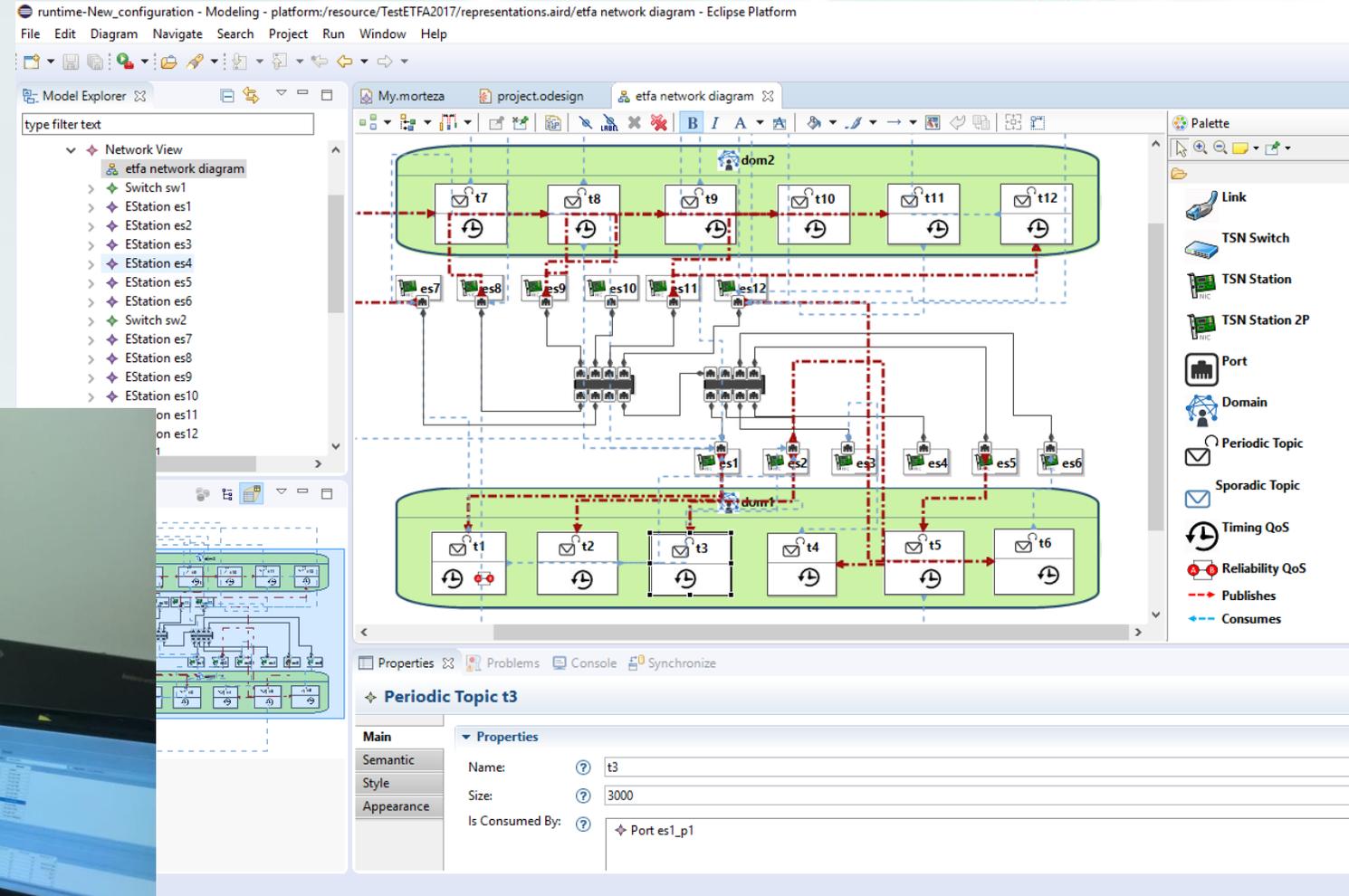
- Modelling and design of complex TSN network architectures covering:
 - Topology (physical layer)
 - Data flow (application layer)
 - Timing and safety requirements (physical and application layer)
- Automated Configuration and Verification:
 - Automated network model analysis
 - Generating of system-wide constraints (ISO/OSI layers)
 - Automated schedule synthesis
 - Overcoming the challenge of long synthesis time for large-scale networks (important for reconfiguration at run time)
 - Analysis of the model unsatisfiabilities (constraints with conflicts)
 - Auto-generated recommendations for network model correction
 - Fast and automated formal timing analysis
 - Data-centricity and Plug&Play concepts for TSN

Design time

Design and run time

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What We Can Offer



AutoTSN

Industrial and Academic Partners

- Industry 4.0
- Automotive/Aerospace
- Healthcare

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Economical impact

- A modular modeling platform for TSN
- Low-cost network management and verification
- Acceleration of developing innovative and critical distributed applications

Expected Duration

36 months