Term paper suggestions

Possible topics for term paper

- Simulation of an application over Ethernet TSN
- Timing analysis
- Time-Triggered Ethernet
- Design tools and methods for static configuration of time-aware shaper
- 802.1Qch (CQF cyclic queuing and forwarding; another TSN scheduler)
- Ethernet Security
    - Survey common Ethernet attacks and their countermeasures
    - Analysis and Attack trees
    - Key provisioning (802.1X)
    - Integrity and privacy of payload (802.1AE MACsec)

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Possible topics for term paper

- AVB transport protocol (IEEE 1722)
- Stream reservation protocols (AVB)
- Application of any TSN protocols (e.g., create offline schedules for a given network and application)
- Clock synchronization or scheduling in wireless networks
- Babbling idiot errors caused by switches
- Survey of (parts of) TTEthernet (synchronization, scheduling, fault tolerance, …)
- Survey of (parts of) AFDX

Possible topics for term paper

- 802.1AS-2020:
  - Multiple grand masters
  - Multiple time domains
  - Redundant clock synchronization
  - Security issues in clock synchronization

- **Feel free to suggest and select another topic**
- **Feel free to ask for support/feedback in finding relevant literature**

Literature examples

IEEE 802.1 websites

- IEEE 802.1 websites are a good source of past and current standardization work, as well as public presentations made at meetings

- The TSN group meets 6 times per year

- 802.1: http://www.ieee802.org/1/

- 802.3: http://www.ieee802.org/3/

- TSN: https://1.ieee802.org/tsn/

- Participation is open to all; all presentations are in the public folder

- Drafts (ongoing standardization) are available too
  - Username: p8021   Password: go_wildcats

Free access to IEEE 802 standards

- http://ieeexplore.ieee.org/browse/standards/get-program/page/
- Also linked from the 802.1 website
- Select "802(R) standards"
- Select "IEEE 802.1: Bridging and Management"
- Select the standard (e.g., IEEE 802.1Q-2018, IEEE 802.1CB-2017, IEEE802.1-AS-2020 to name a few examples)
- You may need to create an account (if you don't already have an IEEE account)
- You can also download directly in IEEE Xplore (just make sure you download the completed standard and not any of the drafts, which start with "Dx.y")
- The key TSN standards are also available here: https://www.ida.liu.se/~sohsa65/courses/tsn-course-2021/stds/

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Industry conferences

- IEEE-SA Ethernet & IP @ Automotive Technology Days 2021:
  - Presentations in pdf available online. There are multiple presentations on TSN and security.
  - https://standards.ieee.org/events/automotive/index.html#program
  - See also past years' programs and presentations

Papers

- See selected papers: https://www.ida.liu.se/~sohsa65/courses/tsn-course-2021/selected%20papers/

- You are encouraged to conduct a thorough literature search based on the selected topic of your term paper

- IEEE Communications Standards Magazine has a special issue on TSN (2018).

  - Find on IEEE Xplore

  - Or here: https://www.ida.liu.se/~sohsa65/courses/tsn-course-2021/selected%20papers/IEEE%20ComSoc%20-%20TSN%20special%20issue%202018/