Anomaly Detection in 1588-PTP Synchronized Clocks

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Bachelor Thesis, Master Thesis

Are you interested in a highly exciting machine-learning project in the field of secure time synchronization and anomaly detection? Would you like to use your scientific and programming skills to write a successful bachelor or master thesis? We have a thesis proposal for you!!

Precision Time Protocol (PTP) is a clock synchronization protocol used in industrial real-time applications with tight timing requirements. The protocol uses the standard Ethernet and IP stack for communication between the master and slave clocks.

However, the use of this protocol also opens up the possibility of attacks, which can disturb the correct execution of the safety-critical applications very dangerously. Your task is to develop and implement a machine learning approach (e.g. by clustering) that monitors the communication traffic between master and slave clocks to detect any anomalies.

Tasks

- Collecting data from an existing 1588 setup
- Developing a ML-based approach for clustering the communication frames between master and slave clock
- Simulation of an attack (e.g. by intended wrong configuration of a switch) and detecting it

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