Thesis B.Sc.

Thesis M.Sc.

IDP

Analyzing the Characteristics of Shop Floor Networks

Motivation

The traffic characteristics of networks highly depend on their settings. Thus, several works analyze the properties of different network types, such as data centers [1] or IoT networks [2]. Knowledge about typical traffic properties helps in various tasks, such as network planning or resource allocation optimization. Due to a lack of data, a less commonly analyzed network type are shop floor networks, such as factory networks and industrial control systems [3].
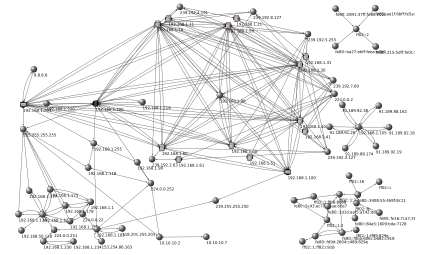
Shop floor network example

Topic

This thesis aims to analyze the characteristics of shop floor networks. The first step of the thesis is an analysis of the structure, components, and protocols in such networks. In addition, you need to identify commonly considered characteristics of networks and techniques to obtain them in related work [1,2]. Based on your insights, you should design a pipeline to extract those characteristics from a given network capture. Finally, you characterize a set of shop floor captures and compare the results to other network types. Further, you analyze if existing research datasets reflect the properties of real captures.

Your Task

- Analyze the components of shop floor networks
- Identify typical network traffic characteristics
- Implement a pipeline to extract network traffic characteristics
- Apply your work to analyze characteristics of shop floor networks

Sources

- [1] Benson et al., Network Traffic Characteristics of Data Centers in the Wild. IMC' 10.
- [2] Pekar et al., Application Domain-Based Overview of IoT Network Traffic Characteristics. CSUR 53.4, 2020.
- [3] Barbosa et al., A First Look Into SCADA Network Traffic. NOMS 2012.

Contact

Lars Wüstrich   wuestrich@net.in.tum.de

http://go.tum.de/080755