Hochschule Offenburg
offenburg.university

ivESK Institut für verlässliche Embedded Systems und Kommunikationselektronik

Reliable Communication Solutions for the Industrial Internet of Things

The Institute of Reliable Embedded Systems and Communication Electronics (ivESK) at Offenburg University is concentrating on the conceptualization, implementation and validation of wired and wireless, safe and secure, efficient and modular, standardized and pre-standard protocols for the Internet of Things. A team of 12 full time researchers and around the same number of students enjoys close collaboration with industrial and other research partners under the guidance of Prof. Dr.-Ing. Axel Sikora. ivESK actively contributes to standardization, e.g. in Profibus and Profinet International (PI), CAN in Automation e.V. (CiA), Open Metering System (OMS) Group and IETF.

University of Stuttgart
Institute for Control Engineering of Machine Tools and Manufacturing Units
ISW

We Control the Future

The Institute is one of the leading international research centers in the field of control engineering – from the sensor to the cloud. We conduct interdisciplinary research on technologies for the future production and automation. For the industry, we have been an innovative and reliable partner for ambitious challenges for over 50 years, from the initial idea to the end product.
For many years we have accompanied the development of industrial communication with its various fieldbus protocols – from specification to certification. In the area of real-time Ethernet and TSN, we connect players from IT and automation and ensure that the specific requirements of industrial production systems are taken into account in the current technology development.

Get in Contact

We are looking for applications, requirements and use cases from different industries as well as for interested parties for an early evaluation.

Linutronix GmbH
Bahnhofstrasse 3
D-88690 Uhldingen-Mühlhofen

Jan Altenberg
Sales@linutronix.de

Hirschmann Automation and Control GmbH
Stuttgarter Strasse 45-51
D-72654 Neckartenzlingen

Stephan Kehrer
Stephan.Kehrer@belden.com

Offenburg University Institute of Reliable Embedded Systems and Communication Electronics (ivESK)
Badstrasse 24
D-77652 Offenburg

Edgar Schmitt
edgar.schmitt@hs-offenburg.de

University of Stuttgart Institute for Control Engineering of Machine Tools and Manufacturing Units (ISW)
Seidenstrasse 36
D-70174 Stuttgart

Florian Frick
Florian.Frick@isw.uni-stuttgart.de

www.accesstsn.com

Supported by:

Federal Ministry for Economic Affairs and Energy

on the basis of a decision by the German Bundestag

AccessTSN()

Open Source Framework for GNU/Linux-based TSN End Devices

HIRSCHMANN
A BELDEN BRAND

LINUTRONIX
LINUX FOR INDUSTRY

Hochschule Offenburg
offenburg.university

University of Stuttgart
Institute for Control Engineering of Machine Tools and Manufacturing Units
ISW

www.accesstsn.com

MOTIVATION

- Time Sensitive Networking (TSN) is the enabling technology for future real-time applications in
  - Control and automation
  - Transportation and mobility
  - Infrastructure and IT
- Various partial solutions exist, though no complete application framework is available
- Getting started with the technology is challenging, especially for SME
- The availability of reference designs is crucial for fast adoption in multi-vendor environments

CONCEPT OF ACCESS TSN

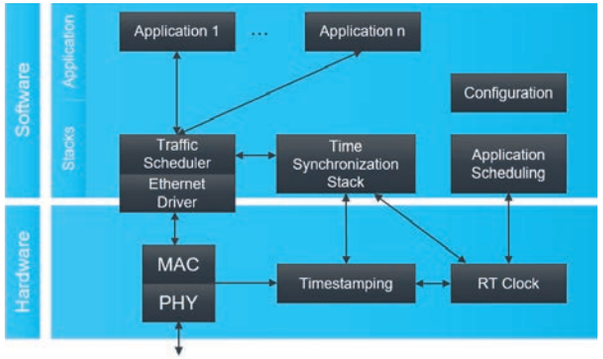
- Develop a generic communication framework for end devices in TSN networks
- Provide the functionality of different TSN standards within a vendor-independent application interface
- Use native GNU/Linux networking mechanisms for scheduled traffic
- Rely on industry-proven real-time environments like PREEMPT_RT (all required features are entering mainline kernel)
- Adapt the Linux system configuration and management to upcoming TSN standards
- Integrate open OPC UA functionality

WHAT WE DO

- Requirement engineering from the endpoint perspective for different industries
- Characterizing existing solutions
- Combining existing open source solutions and building unified configuration interfaces
- Development of functionality to support various TSN mechanisms as well as OPC UA
- Setting up test cases and real verification environments
- Reflecting open issues into the current standardization process

BENEFITS

- Support for a broad range of platforms and applications
- Entry point into the technology with minimal effort and without license fees
- Access to a holistic, modular framework combining all needed real-time functionality
- Reduction of maintenance cost and simplification of migration to future technologies



LINUTRONIX
LINUX FOR INDUSTRY

Your Project Partner for All Things Linux!

Linutronix GmbH is one of the leading service providers for all aspects of 'Linux in an industrial environment'. Ranging from board support package, to the development environment and browser application, to consultation services for ongoing projects, we offer the full range of support from a single source!
However, all-in-one solutions are only a part of what we can offer. We provide support for individual aspects of your projects as well. Naturally, we are committed to actively furthering the development of Linux. Among other things, we are maintainers of the x86 architecture and have also developed essential parts of the flash driver infrastructure; just to name two examples.
Moreover, we are the 'creators' of PREEMPT_RT – the de facto standard for Linux and Real-Time! For this, the Linux Foundation lays its trust in our knowledge to advance the integration into the mainline Linux kernel!

HIRSCHMANN
A BELDEN BRAND

Hirschmann Automation and Control GmbH

Hirschmann Automation and Control GmbH is the world's leading manufacturer of robust Industrial Ethernet devices for mission-critical applications. Hirschmann offers a complete product portfolio based on Ethernet and fieldbus systems. These include Layer 2 and Layer 3 switches, industrial security and WLAN systems as well as software solutions for centralized network management. Hirschmann promotes the use of open standards in industrial networks by actively participating in standardization committees and research projects.