Msc. Ing. Thomas Tacke - Software Engineer

About

Passionate **Software Engineer / Software Architect** with a Master of Science (M.Sc.) in IT Security from **Ruhr-Universität Bochum**. With a strong foundation in applied informatics, I have a demonstrated history of designing and developing scalable applications using **Node.js**, **C#**, **Angular**, **Python** and microservices architecture.

My enthusiasm for **new technologies** and **security development** drives me to continuously explore and implement innovative solutions. In addition to my professional experience, I actively manage personal projects utilizing **Docker** and version control, showcasing my skills in **system administration** and self-hosting applications.

I am eager to contribute to the development of both existing and new applications as a **Fullstack Engineer/Architect**, bringing a comprehensive understanding of security practices to the software development lifecycle.

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Xing
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Github
GitLab (Outdated, moved to GitHub)
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Experience

Work

2020 - Now

Software Engineer / Software Architect@Intel

- → **Migrated version control and CI/CD systems** from an on-premises **GitLab** solution to a cloud-based **GitHub VCS** with **GitHub Actions** and **Jenkins CI/CD** pipelines, improving scalability and simplifying maintenance.
- → **Developed custom GitHub Actions**, used across all repositories to standardize workflows and automate repetitive tasks, significantly improving efficiency in CI/CD processes.
- → **Administered and maintained Active Directory** roles and groups for the department, ensuring proper access controls and security policies.

- → Led the creation of **comprehensive documentation** for internal tools and systems using **DocFX** and **mkdocs-material**, improving knowledge sharing and onboarding for the team.
- → Designed a **publish-subscribe communication system** using **Redis** as a broker to enable efficient bidirectional communication between services. Implemented the services in **C#**, ensuring scalable and real-time interaction between components.
- → Designed and implemented a **machine learning solution database** using **Entity Framework**, tracking test data and enabling predictive analytics for test result probabilities.
- → Developed and maintained an extensive suite of **unit tests in Python** using the **pytest** framework, ensuring high code coverage and reliable system functionality.
- → Contributed to a confidential project leveraging **large language models (LLMs)**, focusing on enhancing the **CLI experience** by migrating from **argparse** to **Python Typer**, which significantly improved user interface efficiency and maintainability.
- → Developed **integration services** for automated uploads of test results to **Splunk** and **Jira**, streamlining reporting and tracking of test outcomes across the development lifecycle.

2017 - 2020 

Software Engineer @Intel

- → Worked in a department focused on empowering semiconductor teams with tools, workflows, and technical expertise to ensure seamless product bring-up.
- → **Designed and developed new applications** from the ground up, including architecting a microservice-based solution with a **NodeJS** and **.NET Core** backend and a user interface built with **Angular**. The UI was delivered both as a web app and a desktop application using **Electron**, enabling a flexible user experience.
- → **Maintained and extended legacy systems** like a regression testing tool written in **Perl**, implementing bug fixes and modernizing parts of the stack by developing new services to replace aging components.

- → **Security and software design advisor:** Frequently consulted by colleagues for guidance on secure coding practices, architecture decisions, and best practices in software design.
- → **Migrated projects** from legacy version control and continuous integration systems to a modern, GitLab-based solution, integrated with a **Kubernetes cluster** for streamlined CI/CD processes, enhancing scalability and automation.
- → Played a pivotal role as a **technical contact for working students**, providing mentorship and overseeing bachelor thesis projects, fostering a culture of learning and collaboration within the team.
- → Adapted to fully **remote work** starting in January 2020, successfully managing all responsibilities and maintaining productivity while working from home.

2015 - 2016

Software Developer (Working Student) @Intel

- → Assisted in the development of internal tools and utilities for a supportive department, working closely with senior developers to enhance functionality and streamline processes.
- → Contributed to the design and implementation of an **End-to-End XML-Encryption utility** using **Java**, enabling secure data transmission and improving overall system security.
- → Worked on bug fixes and performance improvements for legacy systems, specifically refactoring and maintaining **Perl** code to ensure stability and compatibility with new tools.
- → Gained hands-on experience with **Java**, **Perl**, and **XML encryption**, applying knowledge from academic studies to real-world development challenges.
- → Supported continuous improvement efforts by identifying inefficiencies in legacy code and recommending optimization strategies.

2012 - 2014

System Administrator (Working Student) @Chair for System Security

- → Provided technical support and managed systems for the **Systems Security** department, ensuring the availability, security, and reliability of critical IT infrastructure.
- → Worked closely with faculty and researchers to troubleshoot system issues, enabling a seamless environment for academic research in IT security.
- → Procured new servers, networking hardware, and other necessary equipment by coordinating with vendors, managing orders, and ensuring timely installation to meet department needs.
- → Gained hands-on experience with Linux/Unix systems, networking.

2008 - 2011

Software Developer (Dual Study Program) @Sage

- → Leveraged foundational knowledge gained from academic coursework and self-learning to quickly support the development team as a Software Developer.
- → Contributed to the improvement of a Business Intelligence (BI) solution by rewriting key components of the backend in **C#**, leading to improved system performance and maintainability.
- → Developed and extended custom applications for the BI platform, utilizing **C#** and related technologies, enabling more advanced data analysis and reporting features.
- → Collaborated closely with senior developers and business stakeholders to gather system requirements and deliver tailored solutions.
- → Demonstrated ability to apply theoretical concepts in a practical environment, effectively bridging the gap between education and real-world software development.

2007 - 2008

Civilian Service @General Hospital Hamelin

- → **Patient Transport:** Collaborated with medical teams to efficiently transport patients between hospital departments (e.g., MRI, surgery), ensuring smooth communication and timely operations.
  - → Developed strong interpersonal and teamwork skills while coordinating patient transfers in a high-paced environment.
  - → Improved time management by balancing transport schedules and emergency requests.
- → **Post Office and Special Deliveries:** Managed daily mail deliveries and handled urgent transportation of blood samples to the testing center.
  - → Carried out time-sensitive tasks by responding to urgent calls from hospital units via beeper for special deliveries, ensuring quick turnaround for critical tests.
  - → Gained problem-solving skills by managing unforeseen logistical challenges and maintaining consistent service under pressure.

Education

2011 - 2016

Master of Science - IT Security @Ruhr University Bochum

2008 - 2011

Bachelor of Science - Applied Computer Science @Cooperative State University

Languages

Language	Skill-Level
German	Native speaker
English	Fluent in speech and writing

Baden Wuerttemberg

2004 - 2007 University-entrance diploma - Informatics

@Eugen-Reintjes-Schule

Miscellaneous

Programming Skills

C# Programming

- C#
- ASP.NET Core
- Entity Framework

Skills

Markup Languages

- HTML5/CSS3
- Markdown

DevOps

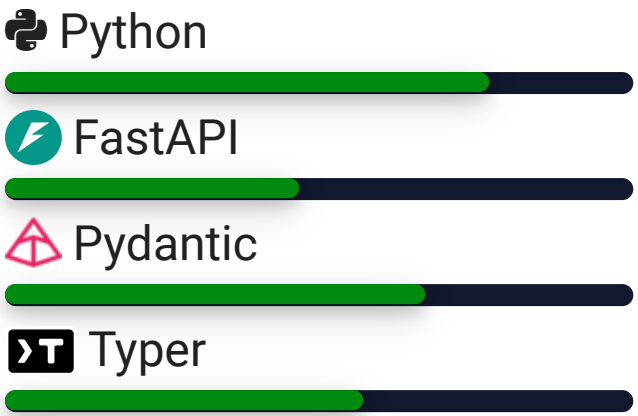
- Docker
- Github/Github Actions
- Rancher/Kubernetes

Publications

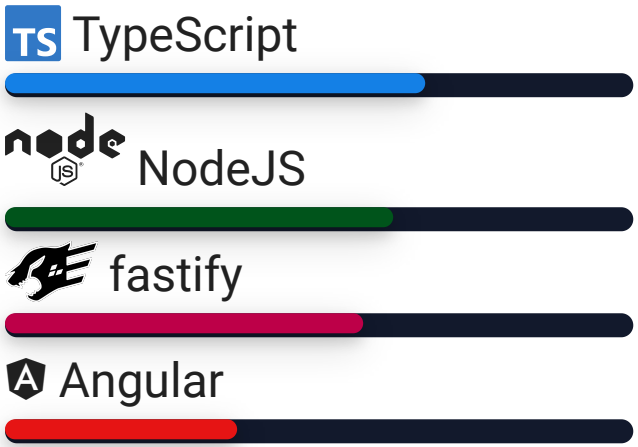
Bachelor Thesis – Development and implementation of a secure WLAN concept

This thesis focuses on the development and deployment of a **secure WLAN** solution for multiple establishments. Various **encryption techniques**, **authentication**, and **authorization mechanisms** were analyzed to determine the most effective approach to ensuring network security. After designing the WLAN security concept, a **pilot project** was carried out at a selected establishment, where the solution was implemented and thoroughly tested through **performance evaluations**.

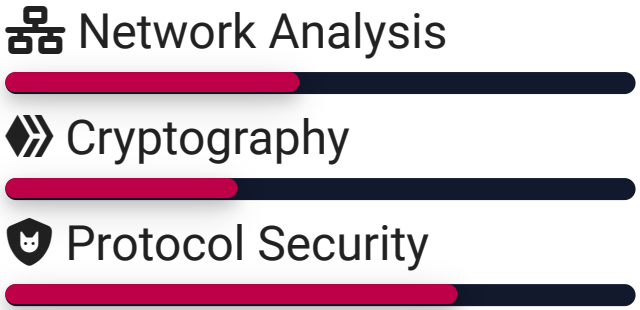
Python Programming



TypeScript Programming



IT-Sec



Master Thesis – Analysis, Implementation and Optimization of an End-2-End Security Concept for the Internet of Things in an Industry 4.0 Scenario

This thesis addresses the challenge of securing communication in **Industry 4.0** environments, where computational devices communicate over potentially insecure channels, such as cellular radio. While existing solutions often rely on transport layer encryption, this approach does not offer **end-to-end security** across multiple untrusted hosts.

The thesis designs and evaluates **end-to-end encryption mechanisms** for constrained IoT devices, using protocols such as **CoAP**, **MQTT**, **MQTT-SN**, and **WebSocket**. The work was demonstrated on Intel's **Quark™ SE Microcontroller**, which provided the necessary hardware environment. Through this evaluation, the most suitable encryption method was identified and implemented across the selected protocols.

The results confirmed that **end-to-end encryption** can be effectively implemented without significantly affecting protocol performance, though scalability issues arose with increasing numbers of participants due to communication and computation overhead.