

1st ITG Workshop on IT Security (ITSec)

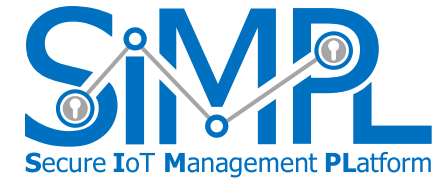


Secure IoT Management Platform

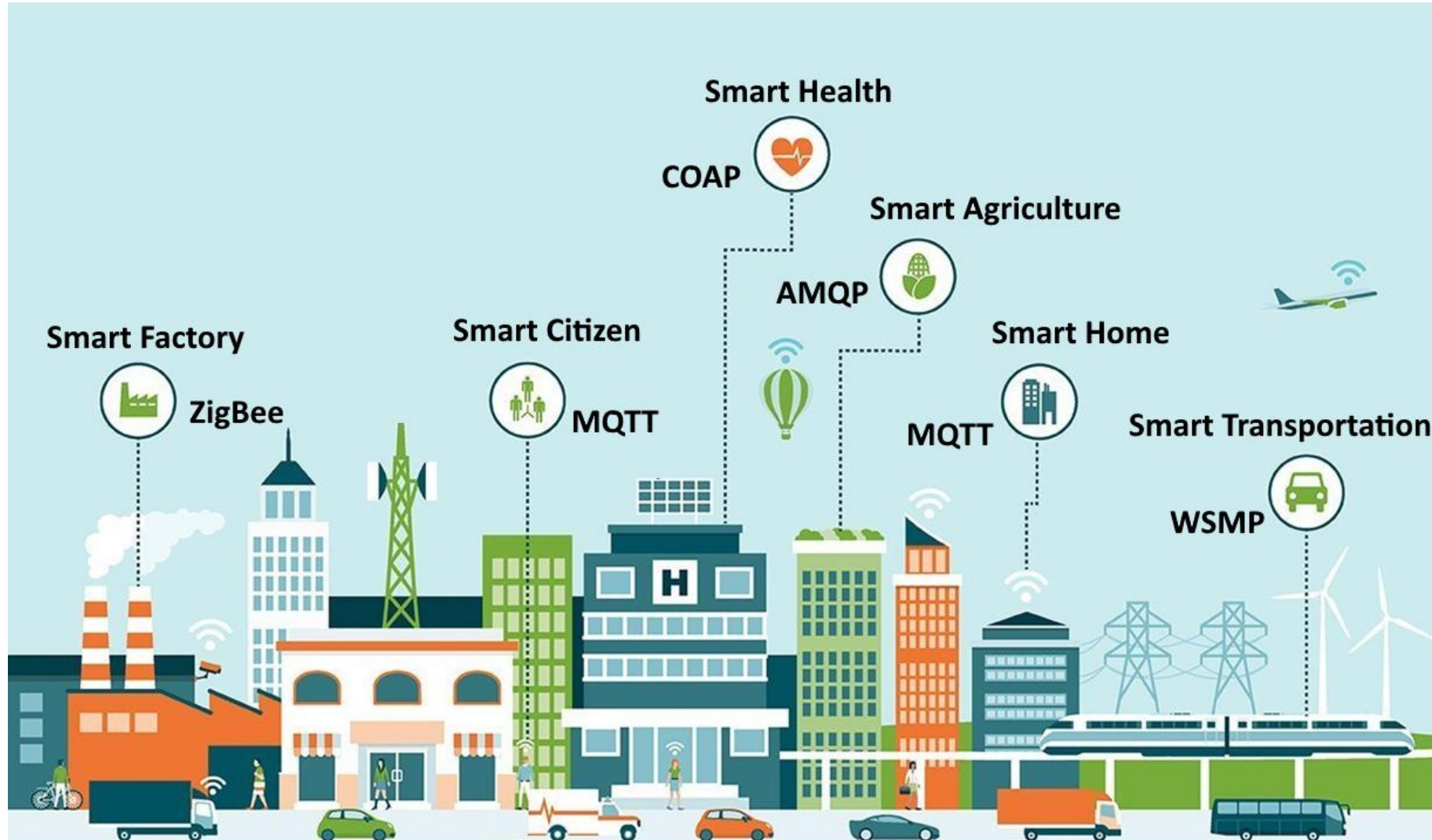
▶ A KMU-Innovativ Project

Objective of this presentation

1. High level project overview
2. Selected examples of current state & open questions
3. Request for ideas, input, potential cooperation

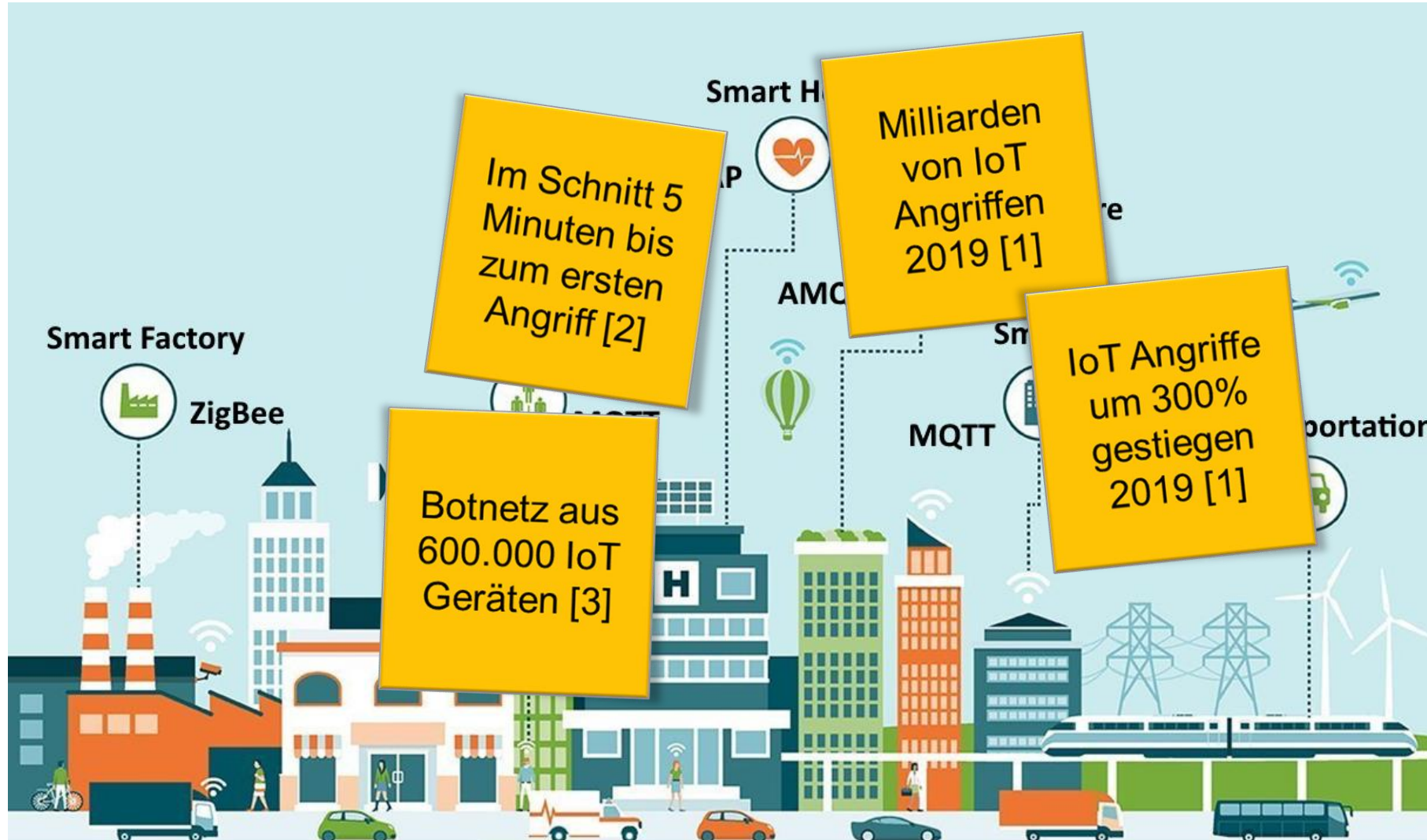


Vision - SIMPL



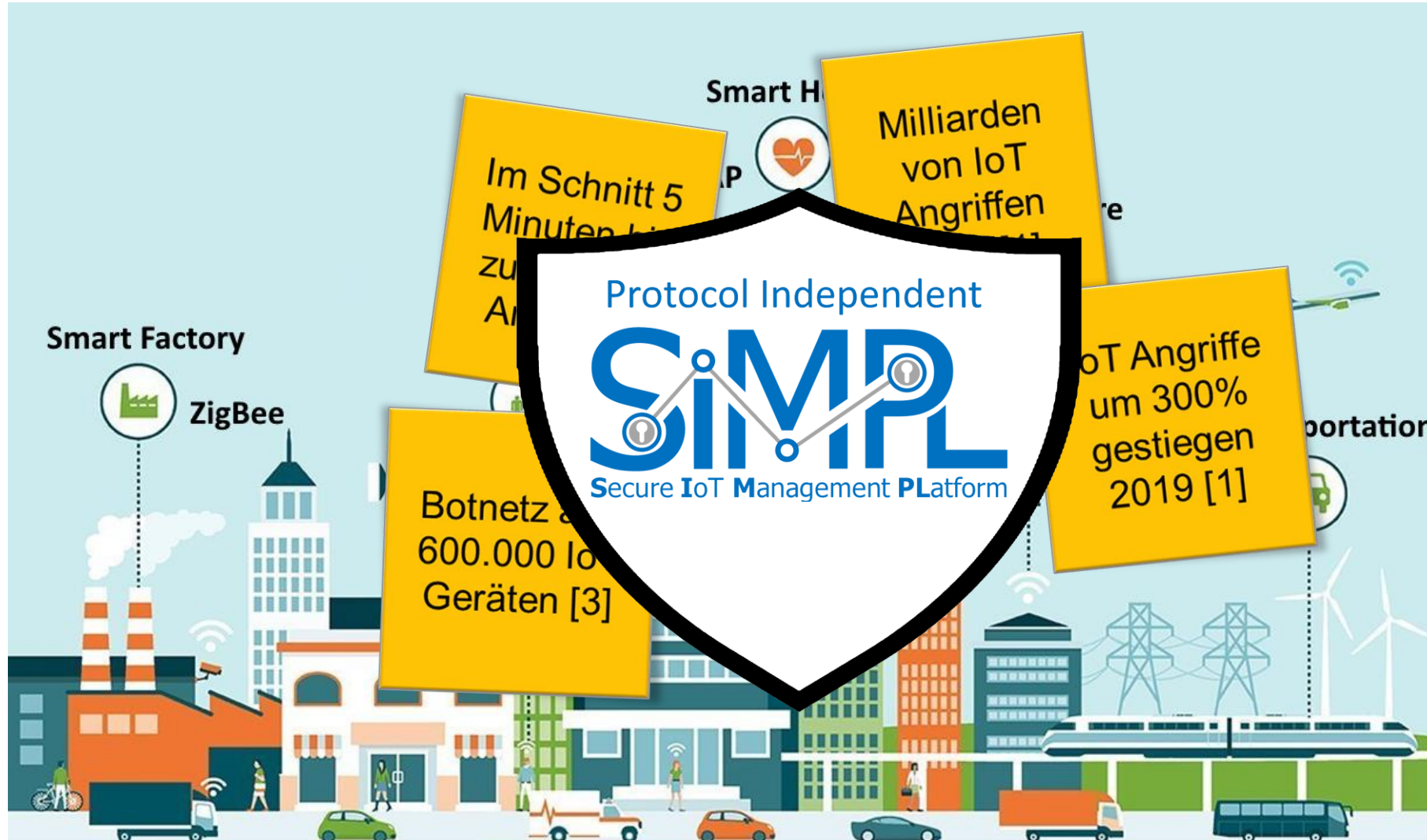
- [1] Forbes, 2019
- [2] Netscout, 2019
- [3] Antonakakis et al.,
USENIX 2017

Vision - SIMPL



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Vision - SIMPL



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THEME AND OBJECTIVES

Situation

- The spread of IoT devices is increasing
- Security mechanisms insufficient

Three Pillars

- Novel blockchain-based security mechanisms (highly scalable, heterogeneous & dynamic environments)
- Compatibility to existing technologies/IoT protocols
- Suitability for embedded nodes with limited resources

Application Scenarios

- Capacity sharing in manufacturing
- E-Health



PROJECT PARTNERS



Infosim GmbH & Co. KG
Würzburg



**Hahn-Schickard-Gesellschaft
für angewandte Forschung e. V.**
Villingen-Schwenningen



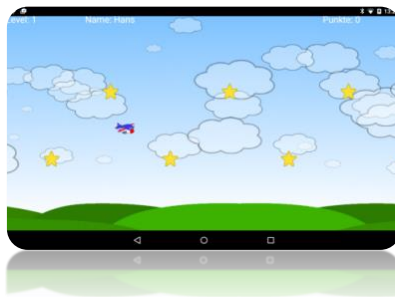
Mixed Mode GmbH
Gräfelfing bei München



Julius-Maximilians-Universität
Lehrstuhl für Software Engineering
Würzburg

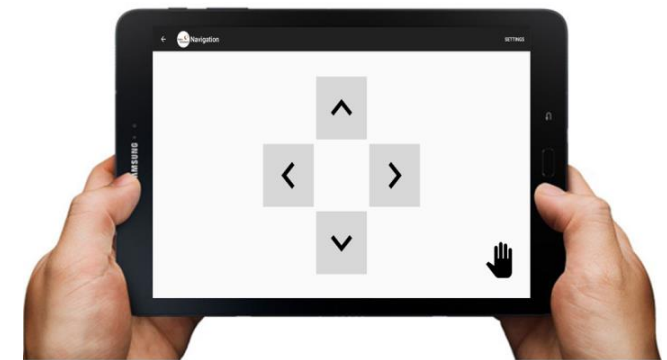
Breathing current sensor

- Measurement of breathing
- Gamification for therapy support



Sensor Tag (DermaPad)

- Recording of vital parameters
 - ECG, pulse, skin resistance
- TENS stimulation
 - Feedback channel



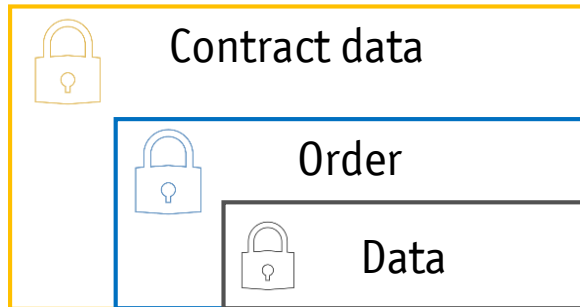
Capacity Sharing Demonstrator

Trading Platform

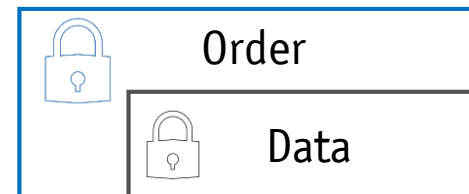
MQTT Broker



MQTT



MQTT



Ordering company



Provider



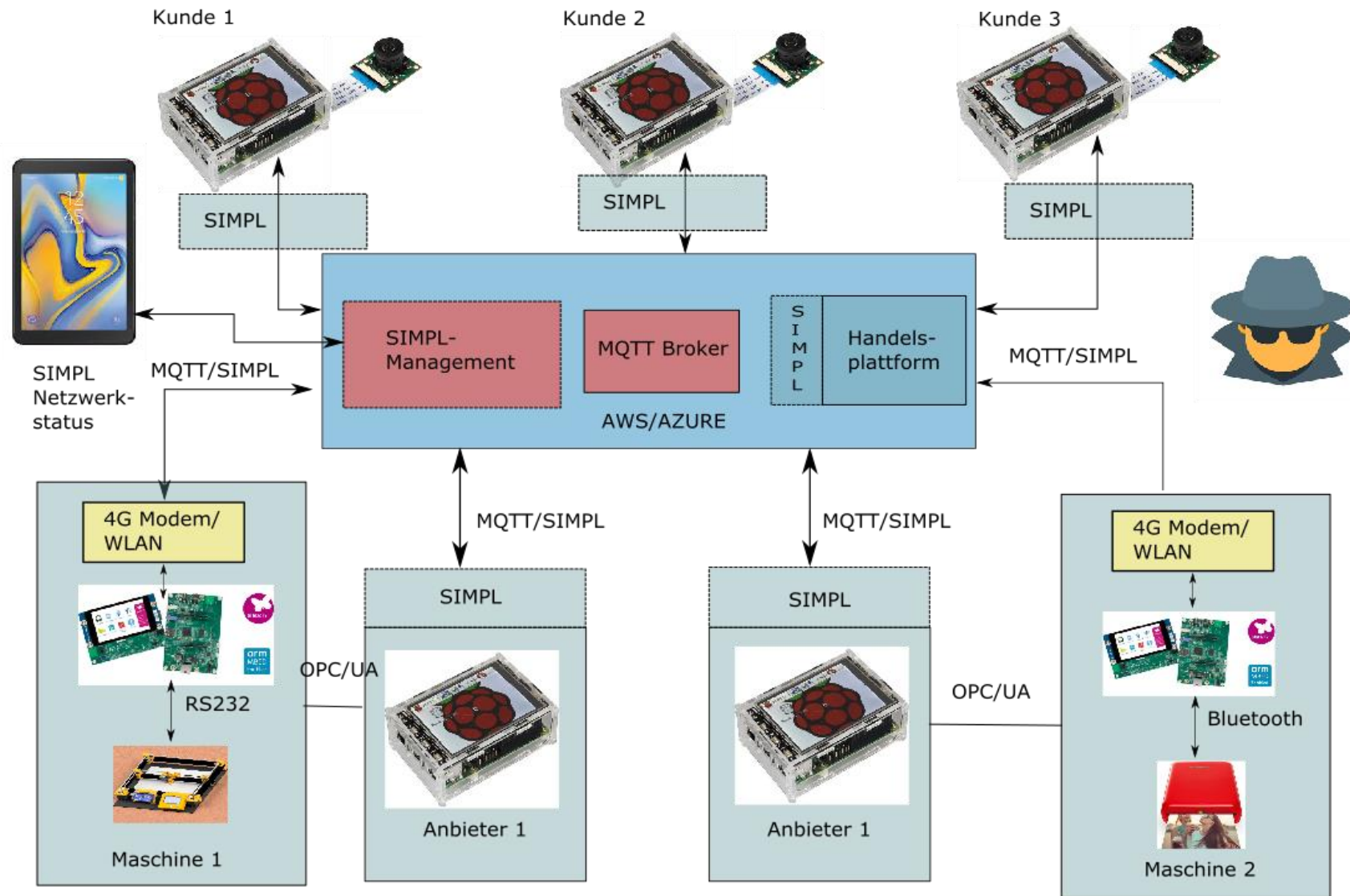
OPC/UA



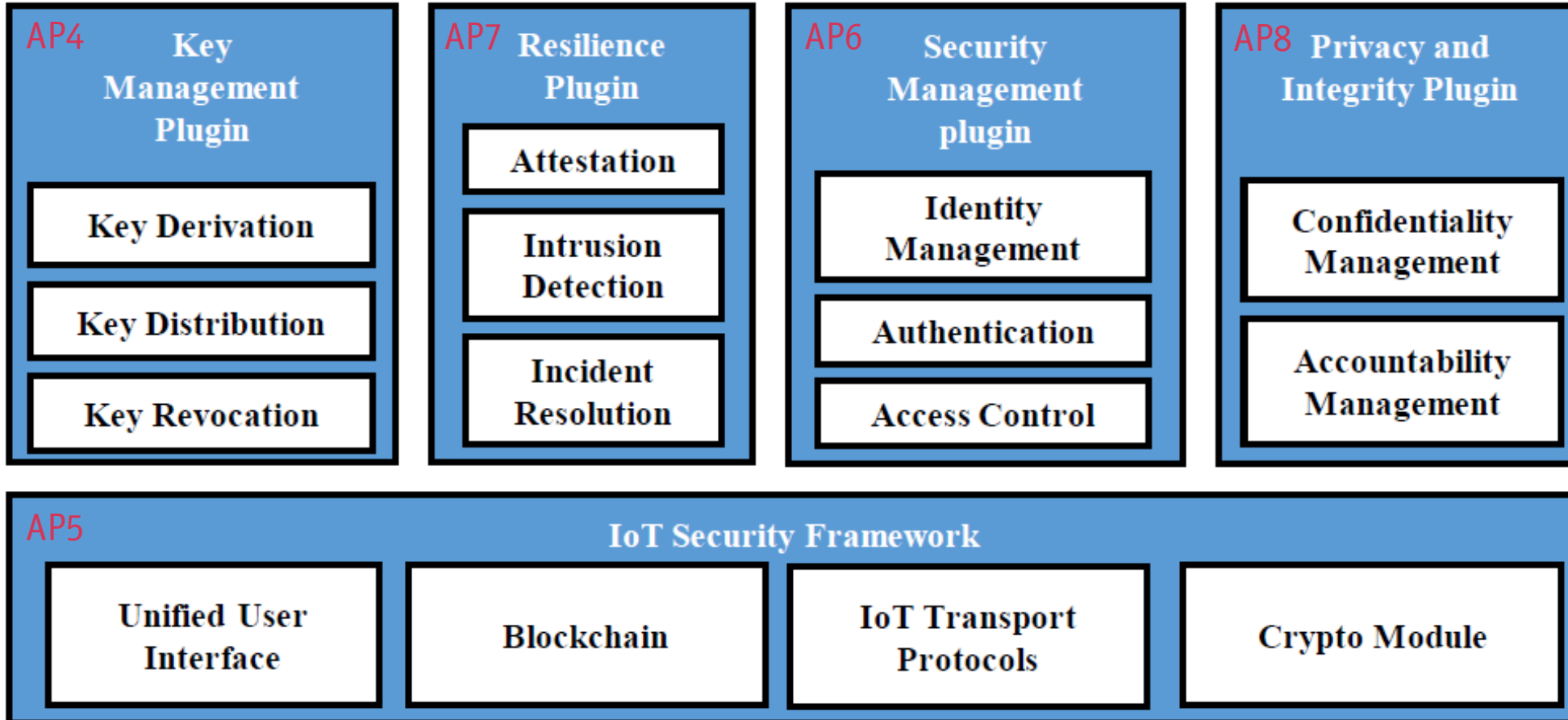
Machine



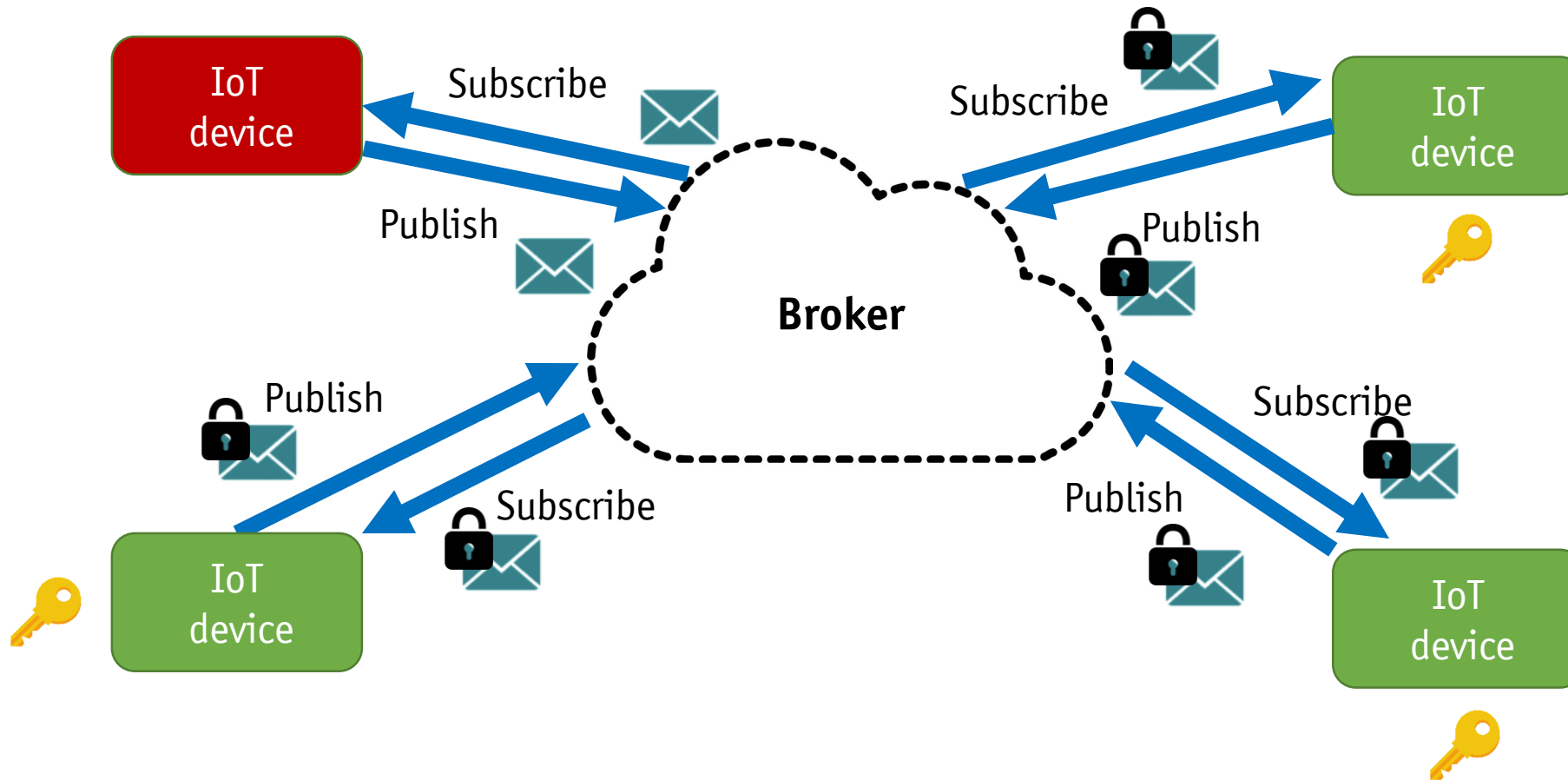
Capacity Sharing Demonstrator



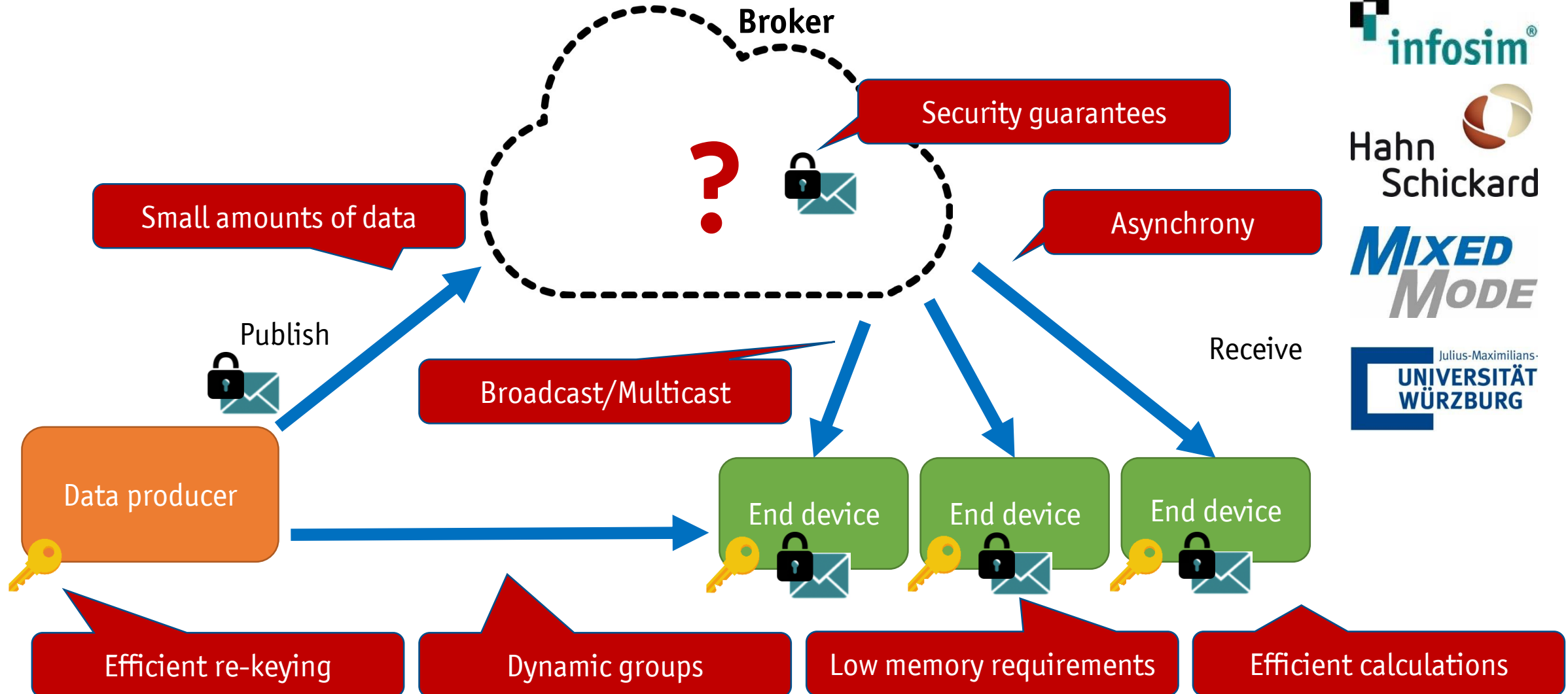
Working Areas (Excerpt of project plan)



Typical IoT Data Flow

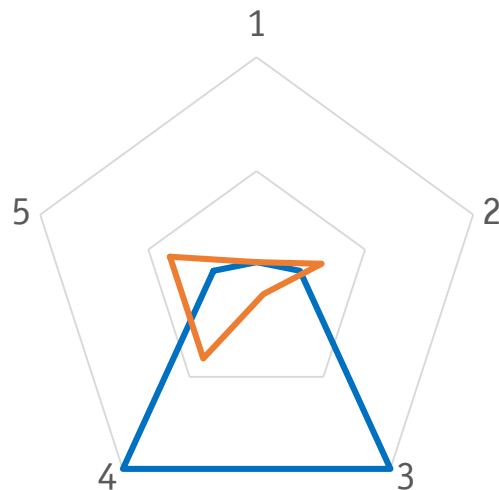


IoT Group Encryption Challenges

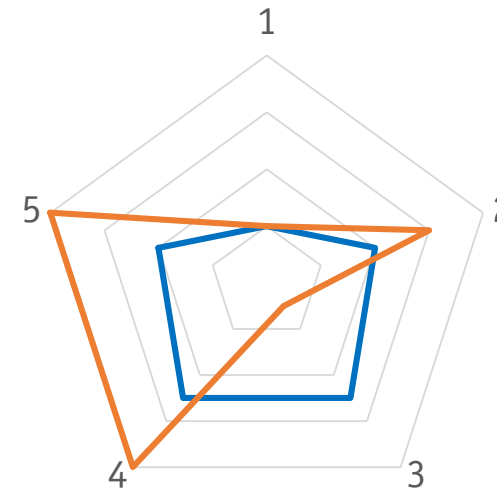


Group Encryption Schemes Analysis

- Group encryption scheme survey: Phan et al., Boneh et al., Nishat et al., ...
 - Attempting to rank the schemes
- No situation independent best scheme



Revoke many
Users



— Datenreihen1

— Datenreihen2

— Datenreihen1

— Datenreihen2

Request for Input

1. Use Cases (e.g. anyone using MQTT?)
2. Potential related work
3. Opportunities to cooperate
4. Anything else



REFERENCES

- [1] <https://www.forbes.com/sites/crowe/2019/03/26/the-7-biggest-cybersecurity-threats-in-an-iot-world/#23696842648a>
- [2] https://www.netscout.com/sites/default/files/2019-02/SECR_001_EN-1901%20-%20NETSCOUT%20Threat%20Intelligence%20Report%202H%202018.pdf
- [3] Antonakakis, Manos, et al. "Understanding the mirai botnet.", *26th USENIX Security Symposium*, 2017.

