



From Cloud to Edge

Disruptive innovation in existing environments?!

5G.NRW - Living on the Edge
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IoT adoption & its security risks have both grown

17 B connected devices today

>42 B devices expected by 2025



There are 500k developers today

>4.5 M developers needed by 2025



57% of IoT devices are vulnerable

>200 M cyber attacks only in 2019



Example



Fight crime with technology

Example: The Glass House / Train Station

Status



Fight crime with technology

Current status

- Existing, heterogeneous, fleet of CCTV cameras
- A distributed network of single cameras spread all over the train station

Innovation project

- A cloud server, which is processing data feed by three connected cameras (not scalable)

Idea



The smart network

The goal is to have one comprehensive network of connected cameras, exchanging data and automatically sending alerts / critical information to relevant authorities.

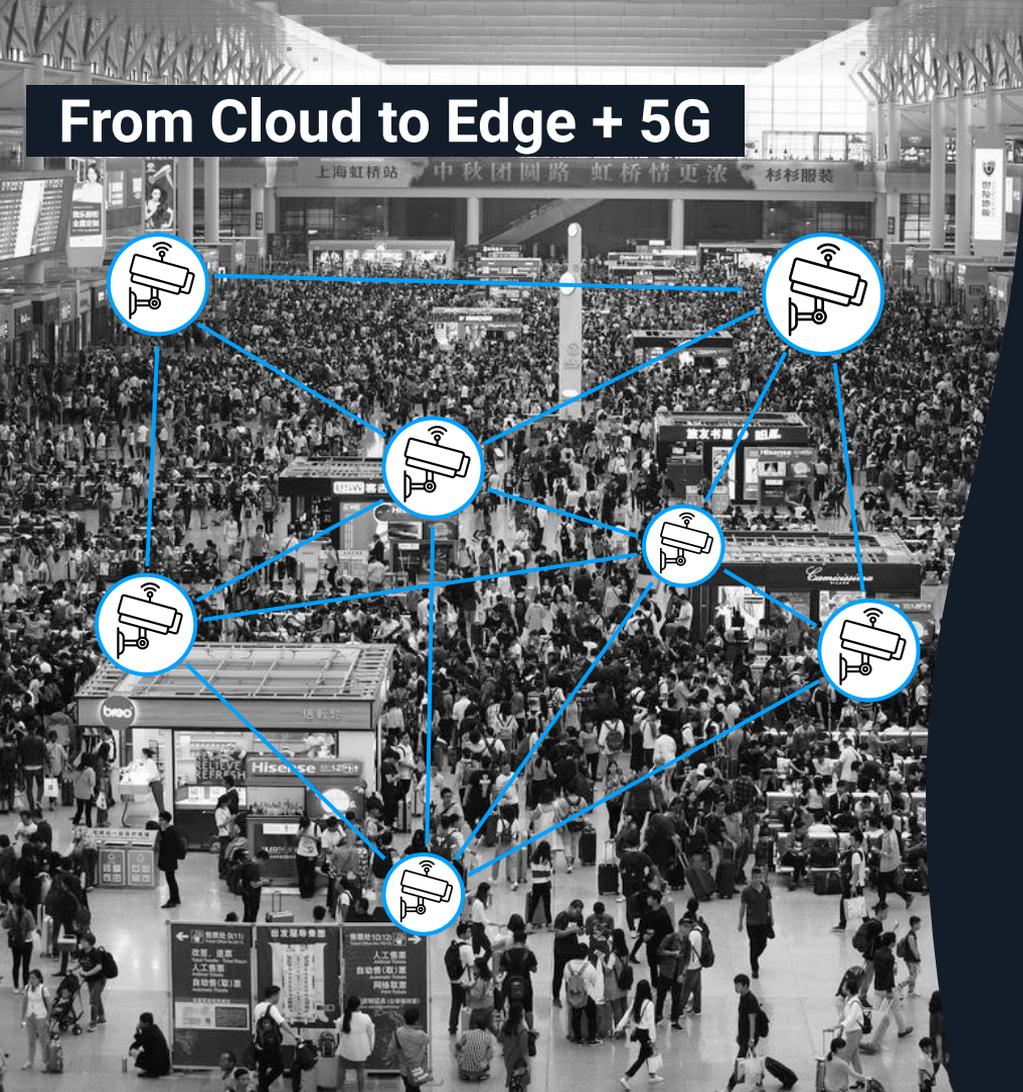
Requirements

1. Real time data (object/face recognition, capacity)
2. Real time action taking
3. Real time performance & problem visualization
4. Data protection & high privacy standards

Challenges:

1. Heterogeneous device fleets
2. Complex software infrastructure to fulfill requirement.
3. Lack of transparency (problem- /performance-wise)
4. Cloud-Resource-bottleneck

From Cloud to Edge + 5G

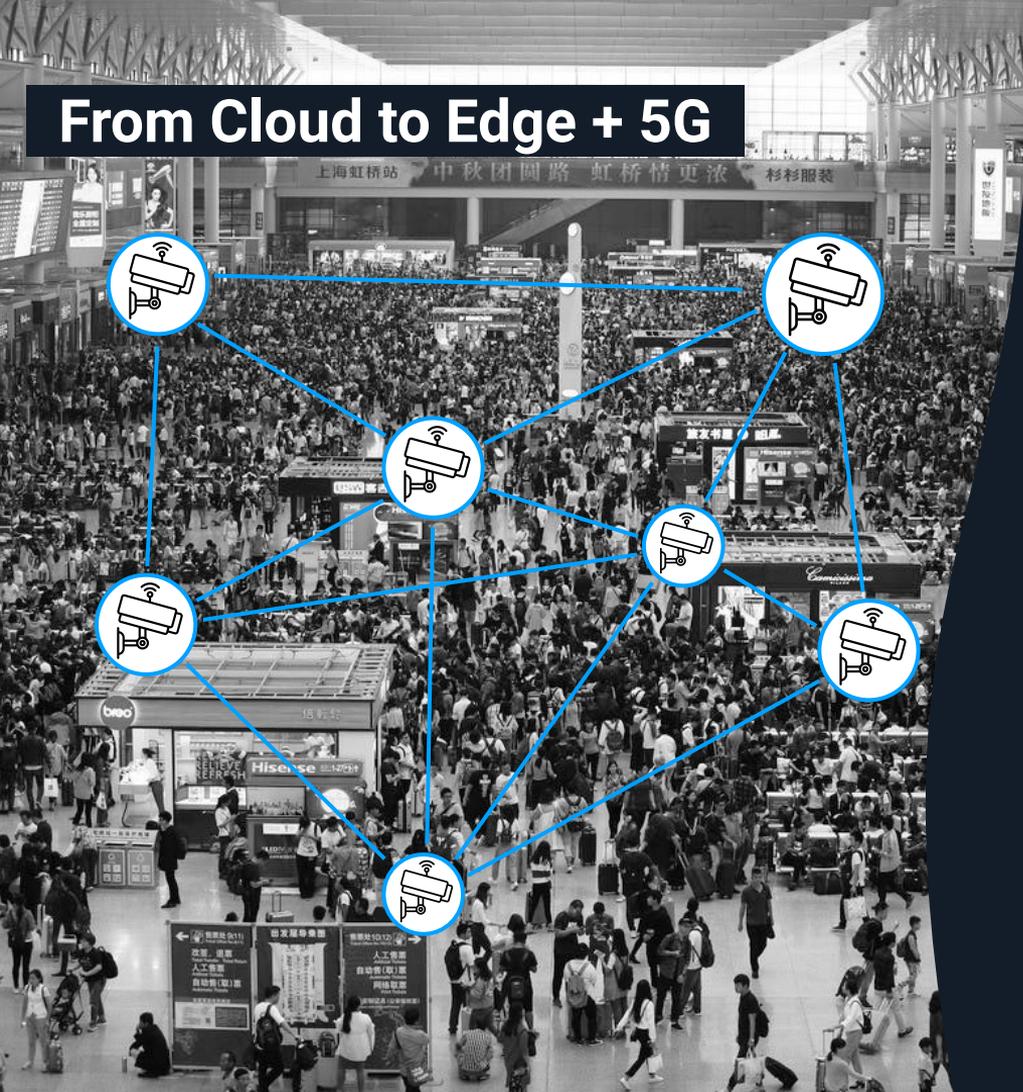


Technology is the key

From Cloud to Edge + 5G a powerful combination

- Process data where it's generated
 - Avoid expensive Cloud resources
 - Increase security
 - Improve performance
- Make it possible with 5G
 - Ultra-low latency
 - Large bandwidth
 - Extra security
 - Scalable for ambitious scenarios
- Area of conflict: Hardware vs. Software

From Cloud to Edge + 5G



Technology is the key

Let's focus on software: Developers are clearly missing a comprehensive workflow to get support in their daily tasks:

- Lack of standards
- Lack of automation
- Huge manual effort
- Missing workflow



Problem



The development lifecycle

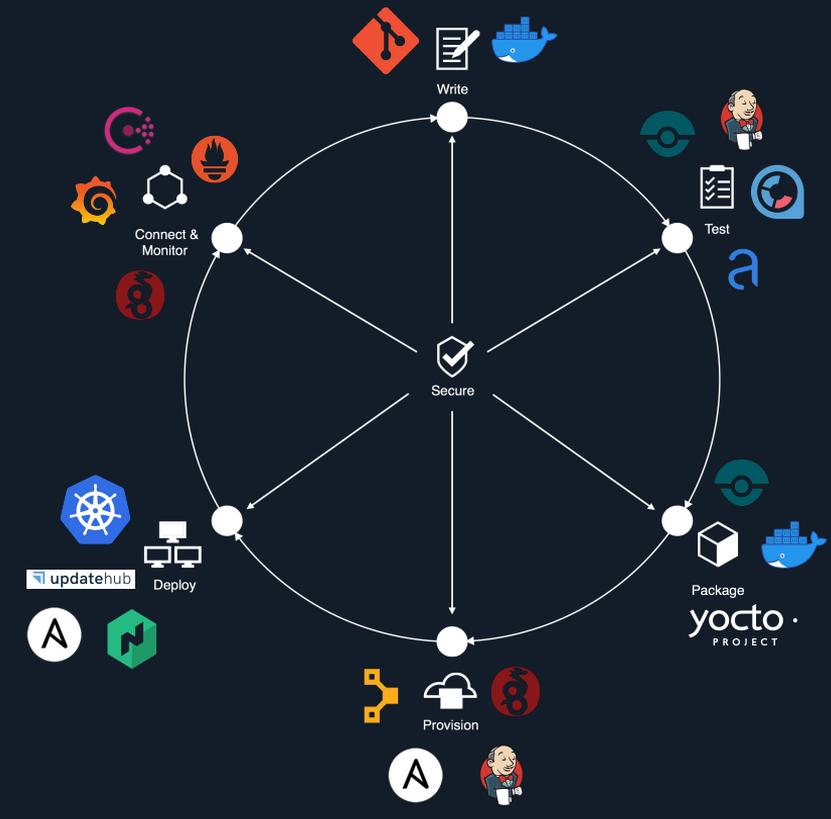


Abstract: IoT service landscape

Problem



Huge pain for developers



Abstract: IoT service landscape



True relieve for developers



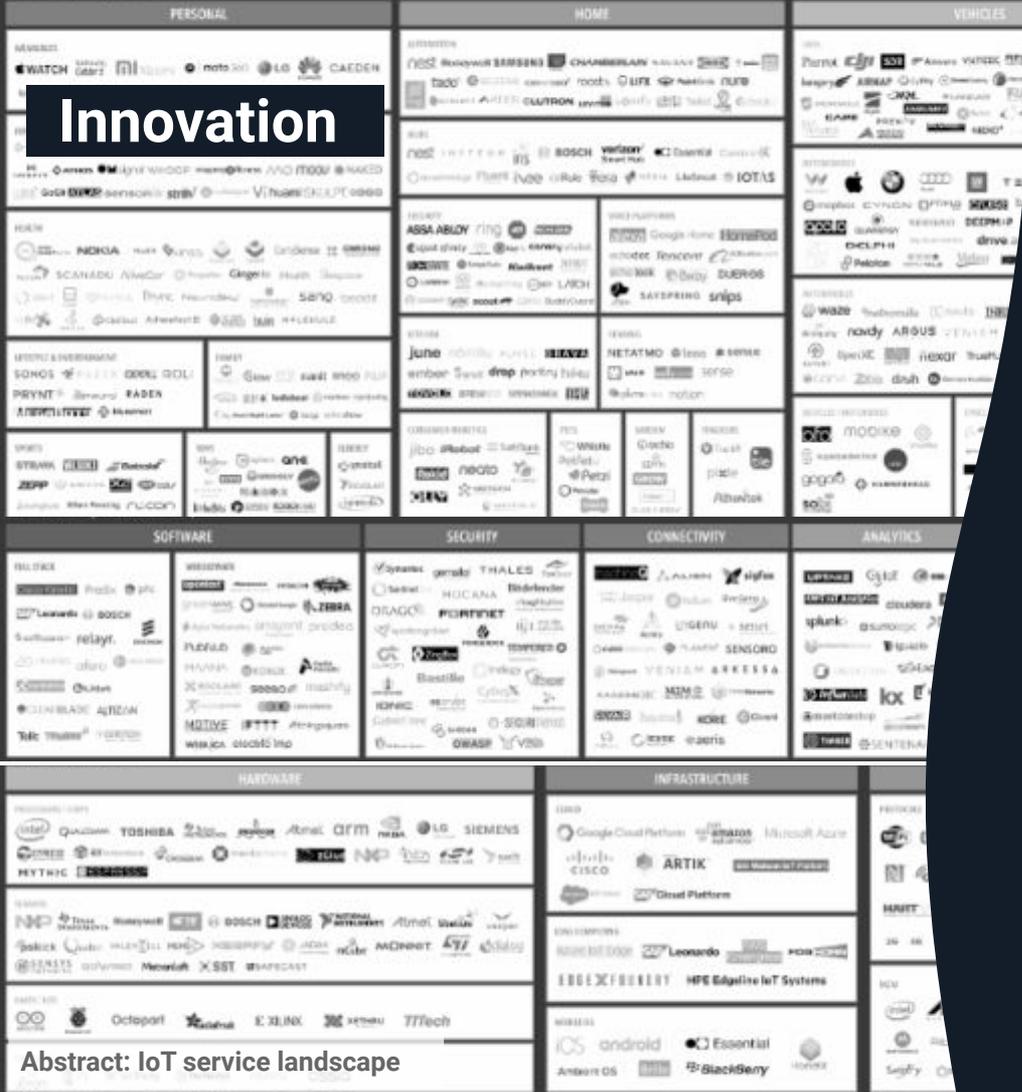
Innovation

Innovation has many faces

There is a lot of technology ready to be used and some other which needs to be developed. Two big levers to drive innovation:

Specific: Solve specific technical challenges through new technologies, e.g. the Mobile Edge Platform from the Lehrstuhl für Software Engineering

Generic: Integrate single existing solutions into a developer friendly workflow



Abstract: IoT service landscape

Outlook



Tons of use cases





Thank you very much for your
kind attention. Any questions?



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