



# From Cloud to Edge

Disruptive innovation in existing environments?!

5G.NRW - Living on the Edge  
Benedikt Franke (Seashell GmbH)



# 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.

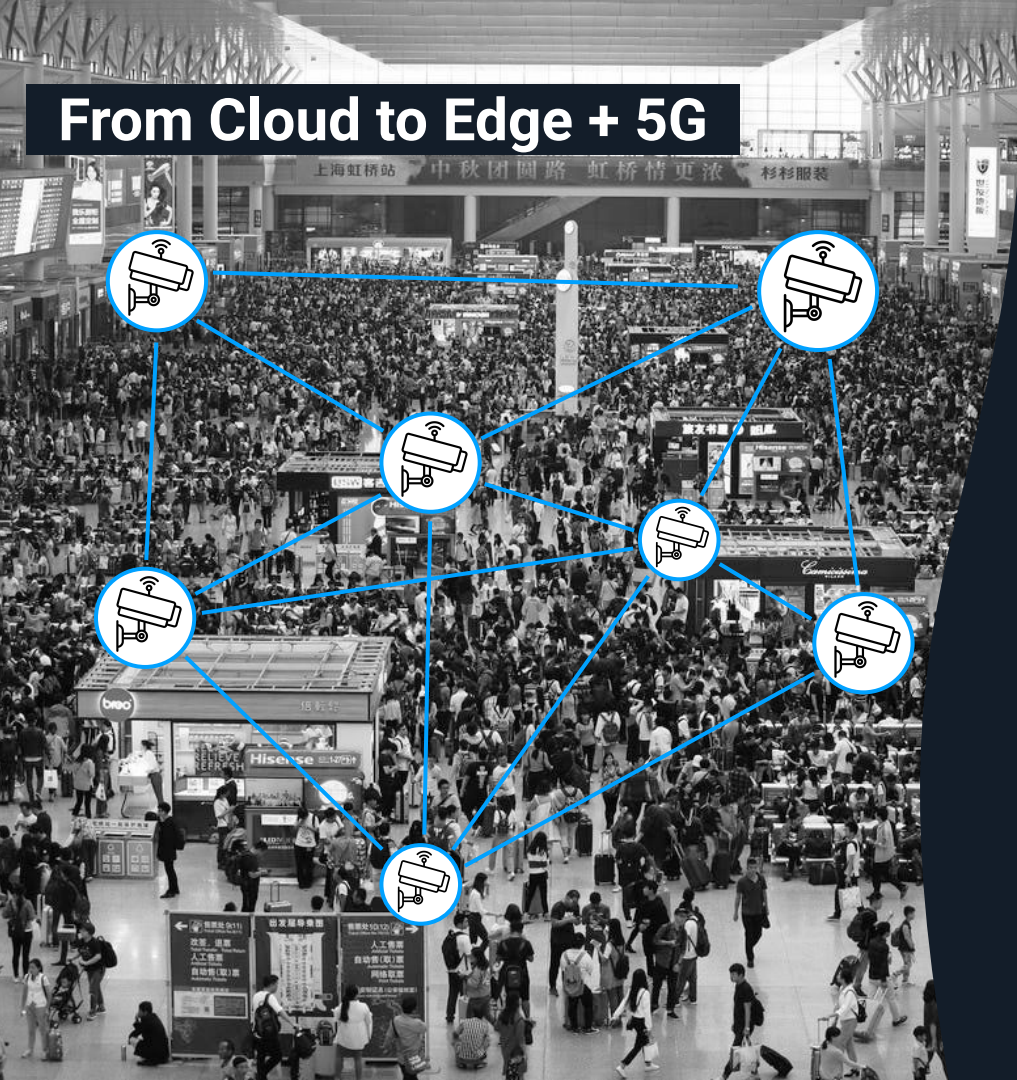
## Requirements

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



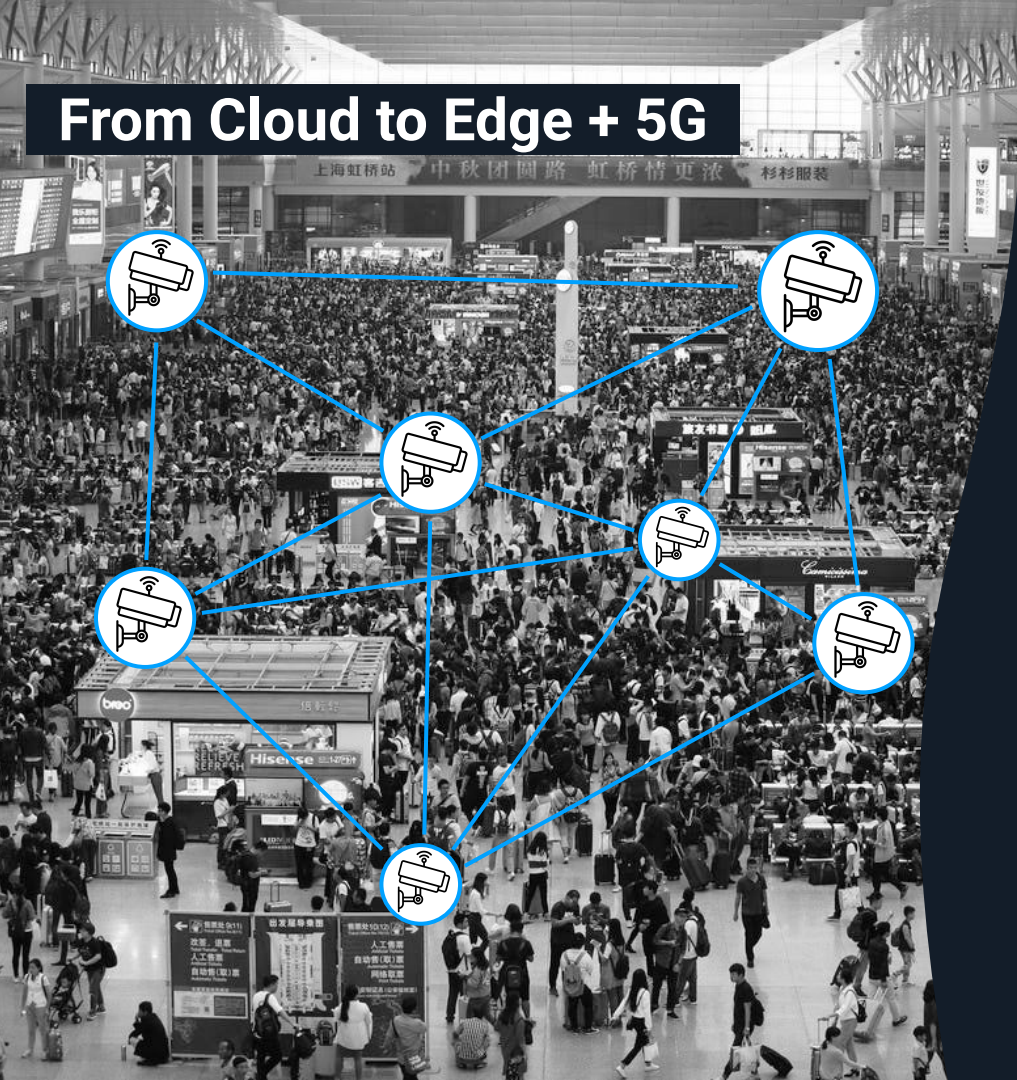
## Technology is the key

**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



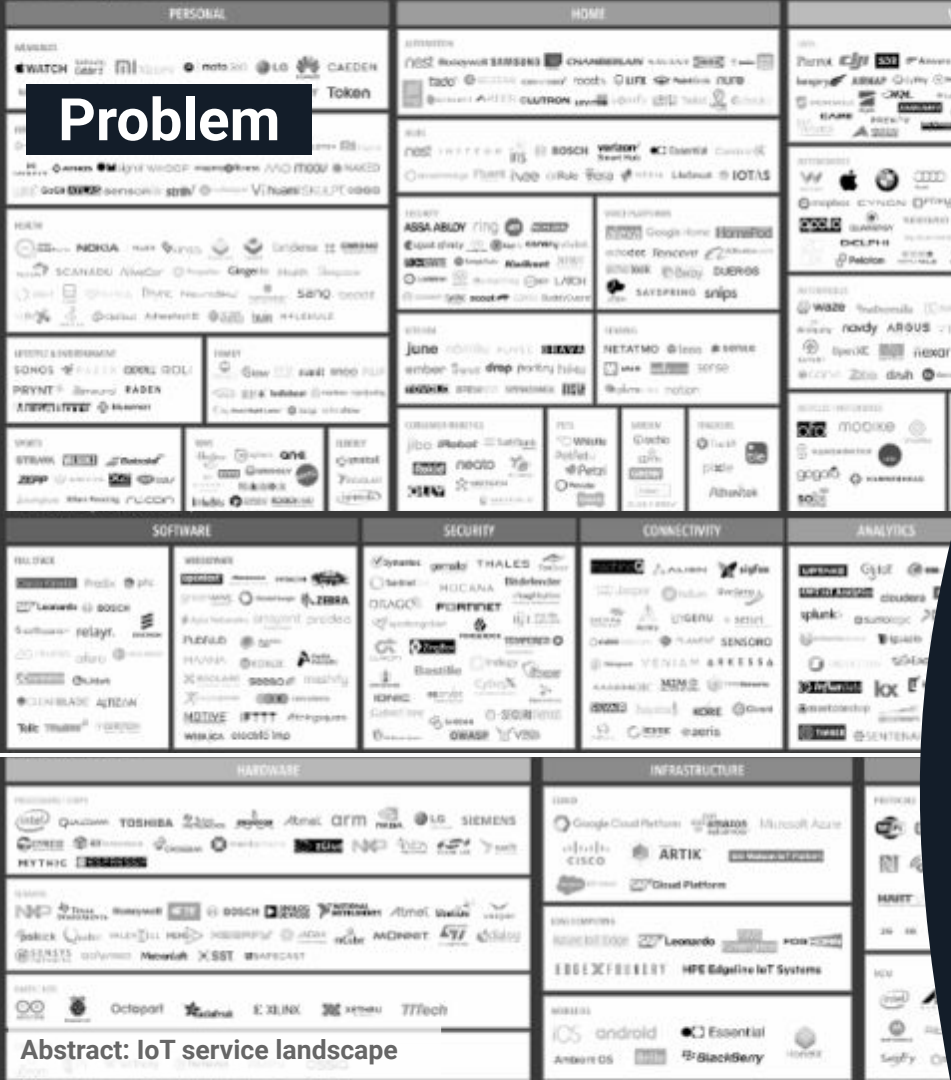
## Technology is the key

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

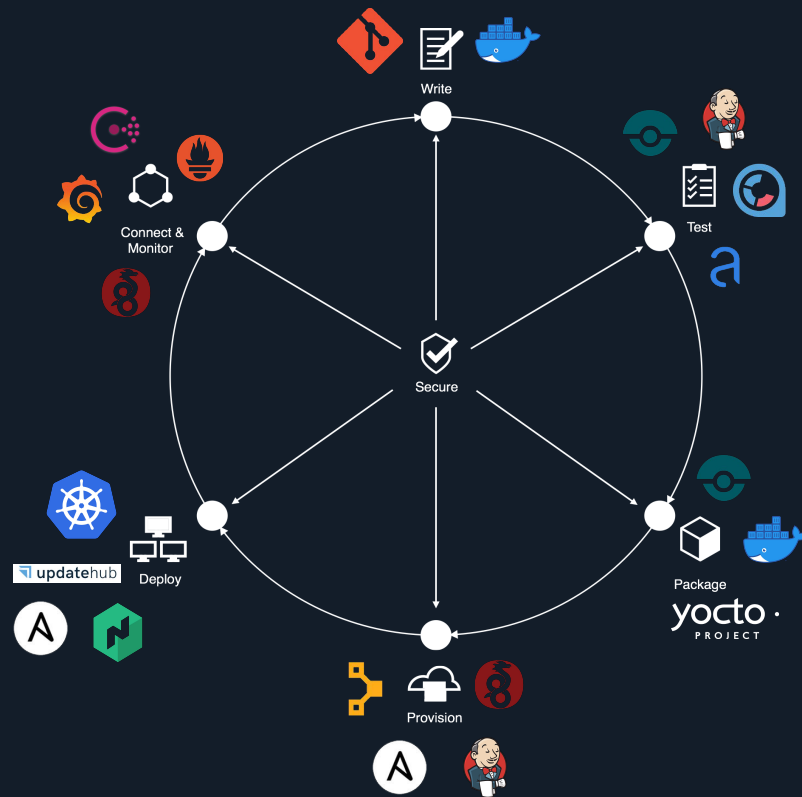




# Problem



# Huge pain for developers



Abstract: IoT service landscape



## True relieve for developers





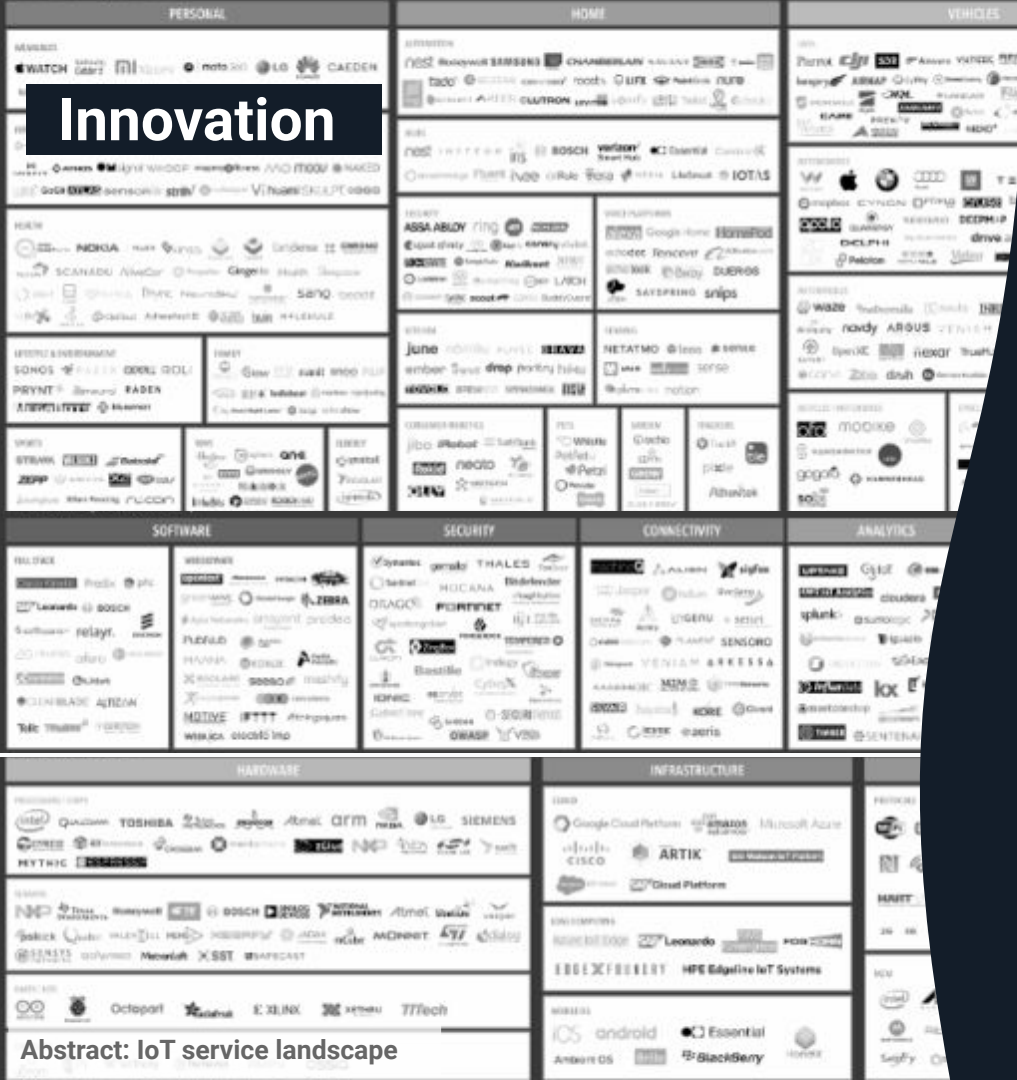
# Innovation

## 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

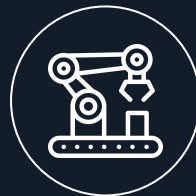
**Generic:** Integrate single existing solutions into a developer friendly workflow



Abstract: IoT service landscape

# Outlook

## Tons of use cases







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



**bfranke@seashell.sh**  
[www.seashell.sh](http://www.seashell.sh)  
[www.github.com/seashell](https://www.github.com/seashell)

