



# Data Security & Privacy through Edge Cloud Computing

Use Case Smart City @ 5G Playground Carinthia

Grazer Linuxtage 2021

10<sup>th</sup> April 2021

# Overview

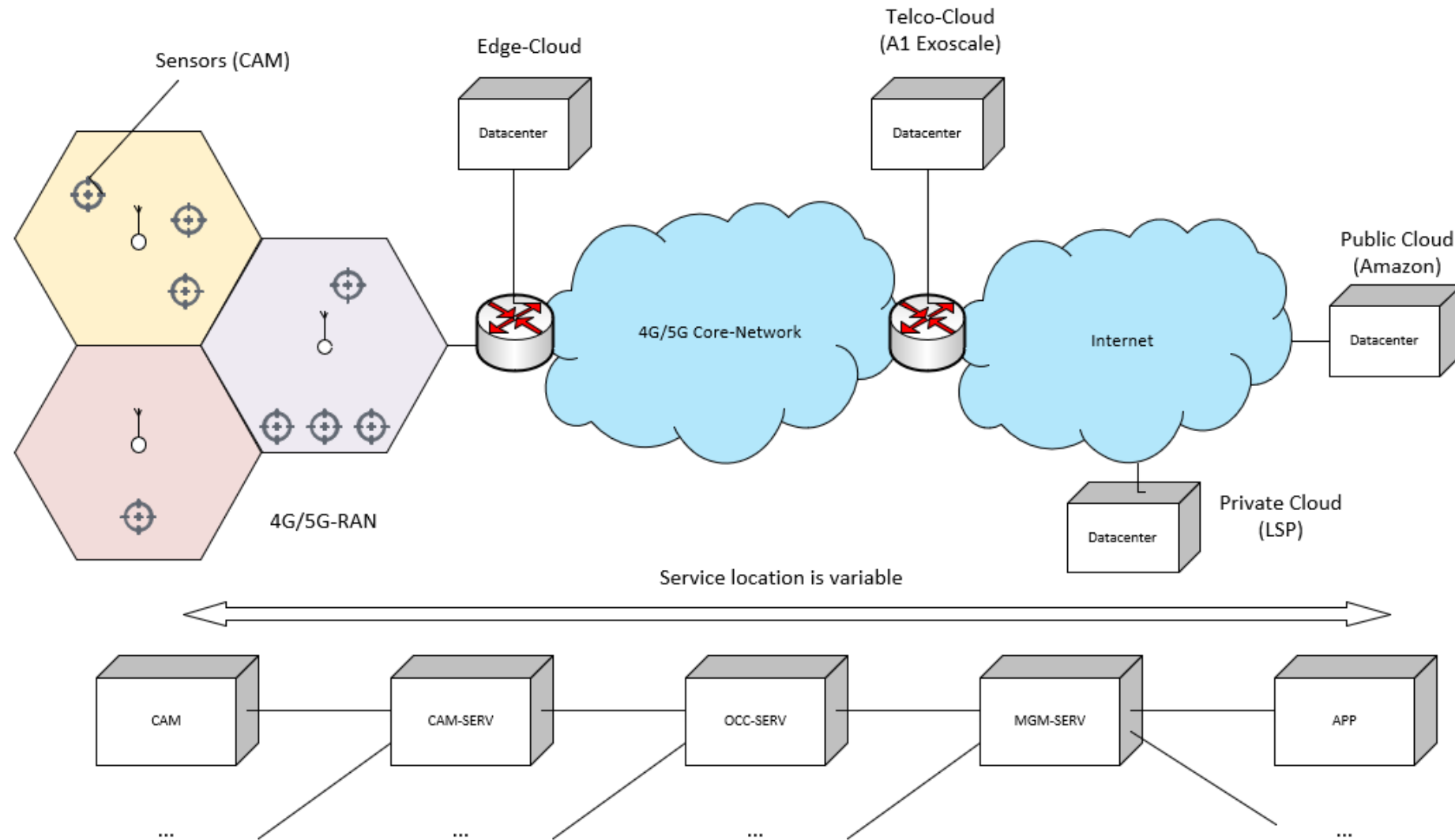
- Team
- Concept, Idea & Principle
- Physical Setup
- Web Services & Microservice Architecture
  - Camera Service
  - Occupation Service
  - Orchestration Service
  - Dashboard Service
  - Webapp Service

# Team

- Valentin Egger, BSc
- Dr. Markus Prosegger
- Dr. Klaus Raab
- Dipl.-Ing. Christoph Uran
- Dr. Helmut Wöllick (Project lead)

# Concept

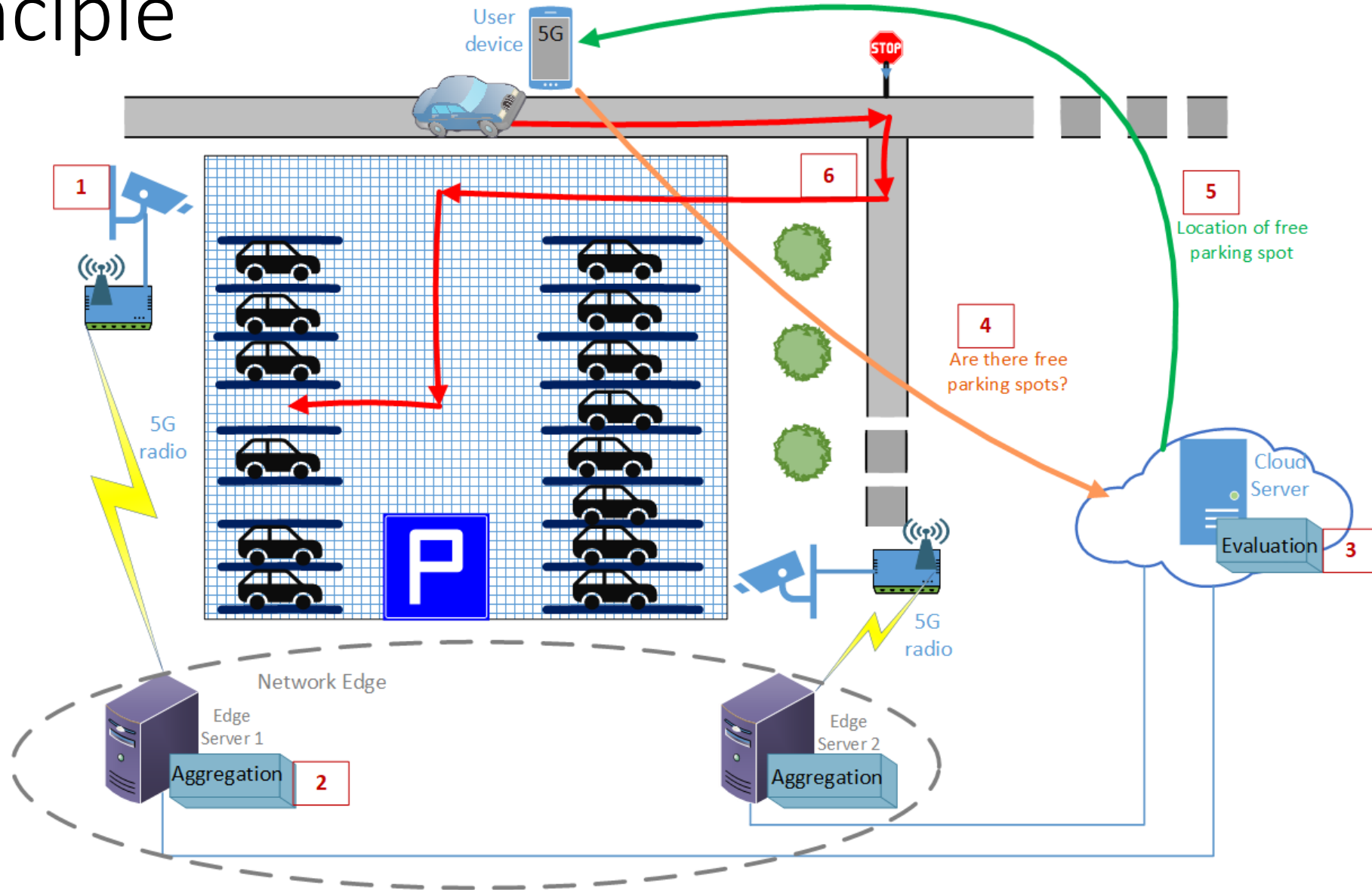
## Smart-City sensoric with variable services



# Idea

- Determine the status of parking spaces at the Lakeside Park
- Without having to process privacy critical data
- Visitors find parking spaces
  - Without long searching
  - Without losing time and getting stressed
- Solution
  - Get the route to a free parking space
  - Find a space close to the office entrance

# Principle



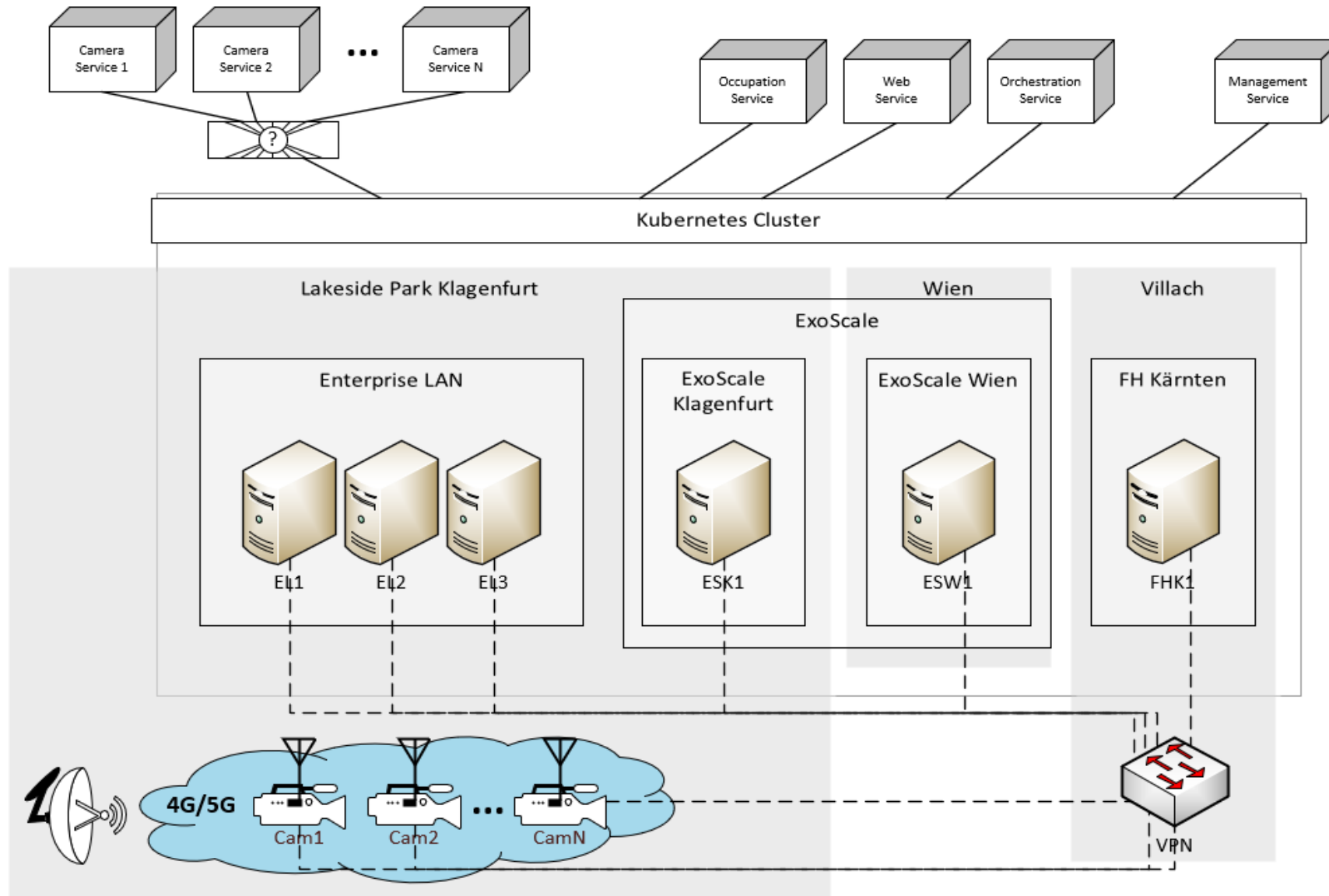
# Setup

- IP Cam
  - Amcrest Pro HD 1080p
  - Power over Ethernet
- “Blackbox”
  - Huawei LTE Stick
  - NanoPi
  - Power supply for
    - NanoPi and
    - IP Cam





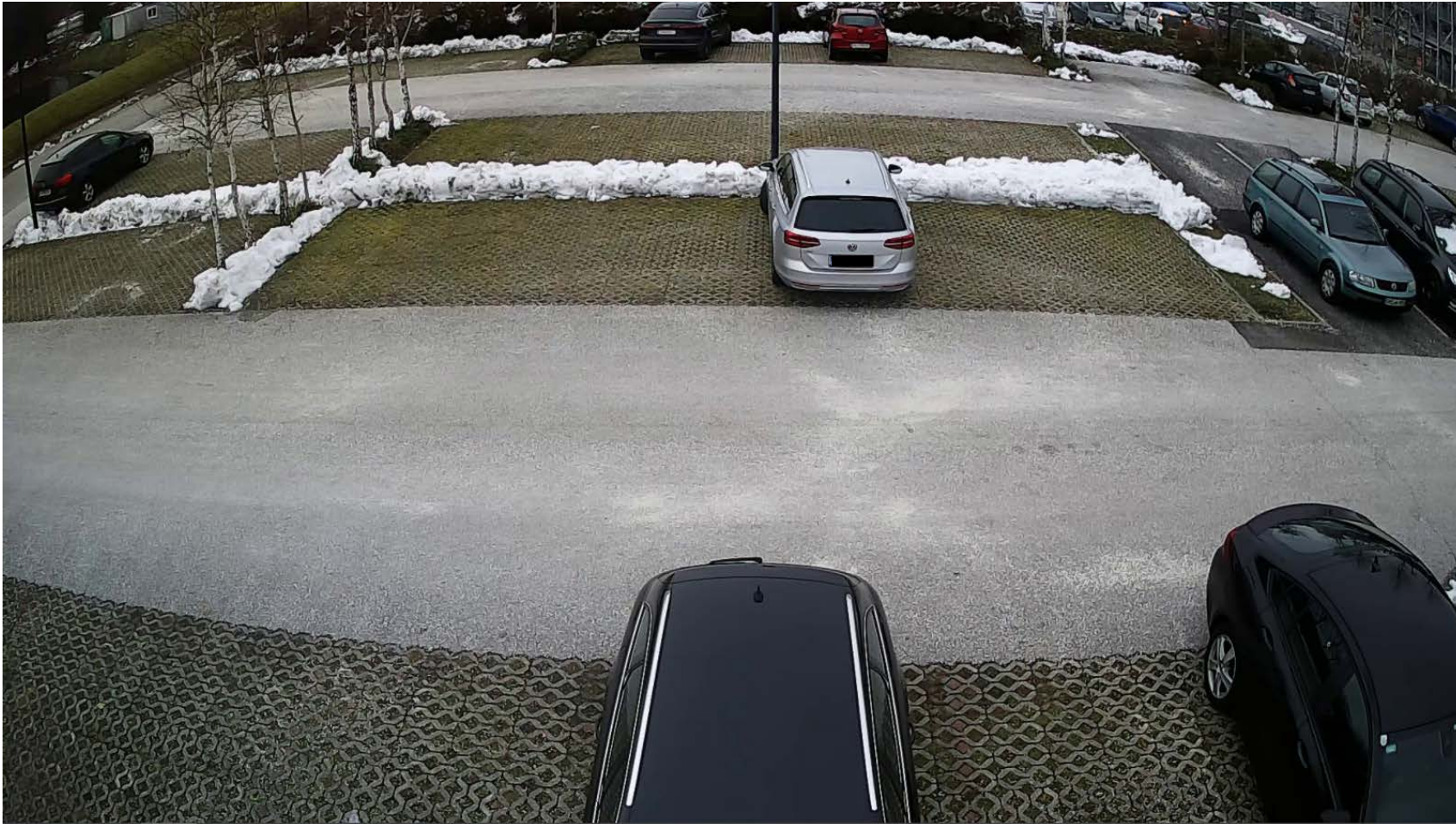
# Web Services & Microservice Architecture





# Camera Service

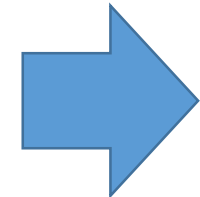
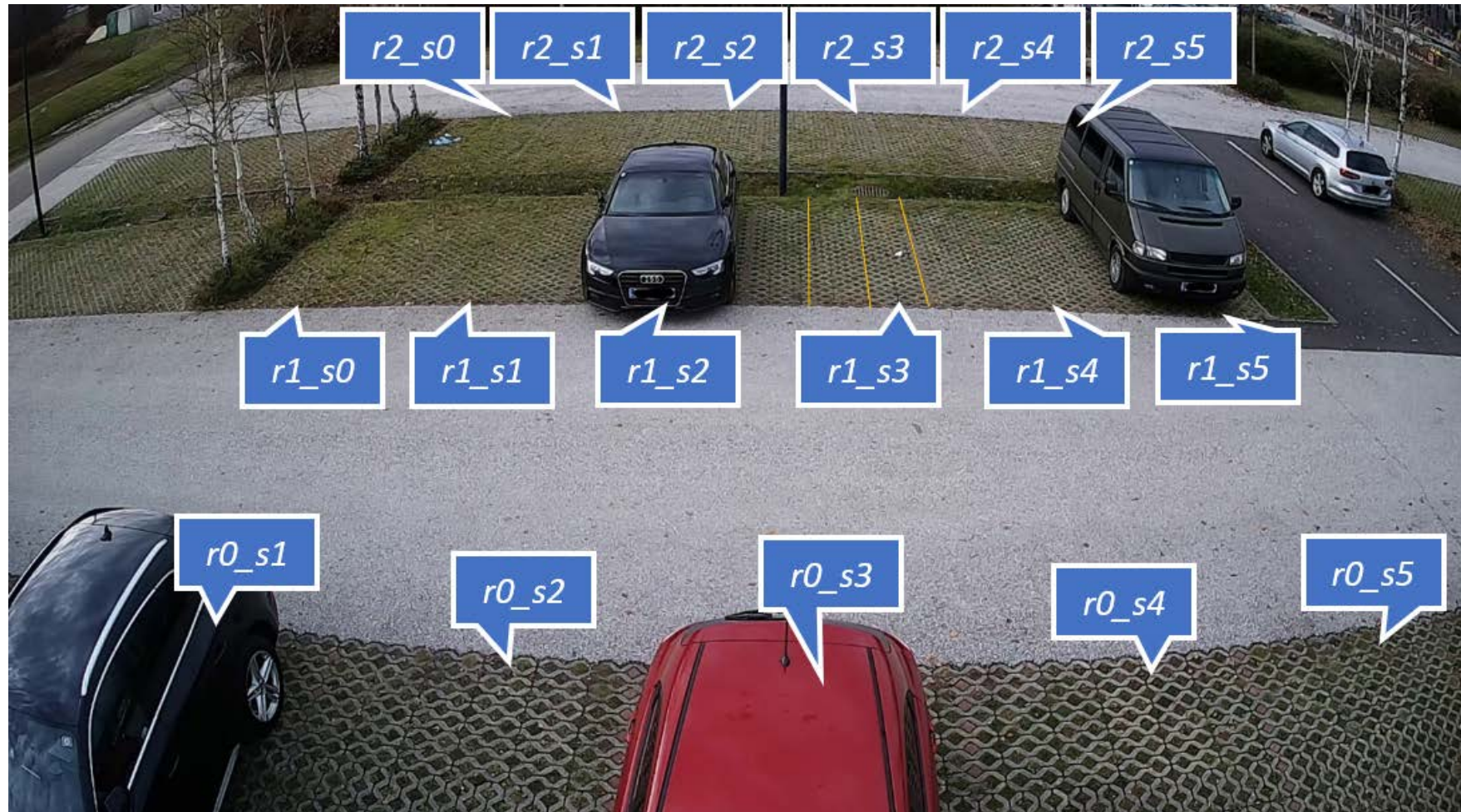
- <http://cam1.kubernetes.local:30801/v5/camera/jpg/full/all>





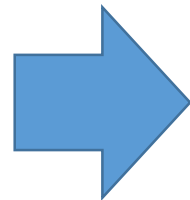
# Camera Service

- [http://cam1.kubernetes.local:30801/v5/camera/jpg/full/diff-r1\\_s3](http://cam1.kubernetes.local:30801/v5/camera/jpg/full/diff-r1_s3)



# Occupation Service

- <http://occupation.kubernetes.local:31800/v2/occupation/free>



```

▼ 2:
  name:      "r1_s2"
  lat:       46.61291392431473
  lon:       14.26462091679993
  occupied:   false
  metric:    2.1765321223954714
  error_code: 0
  error_message: null

▼ 3:
  name:      "r1_s3"
  lat:       46.61293373089571
  lon:       14.264623599008845
  occupied:   false
  metric:    1.7806292309223526
  error_code: 0
  error_message: null

▼ 4:
  name:      "r1_s4"
  lat:       46.61295445870525
  lon:       14.26462762232221
  occupied:   false
  metric:    1.8598243853736427
  error_code: 0
  error_message: null
  
```

Name of the  
parking space

GPS coordinates  
for navigation

Occupation status

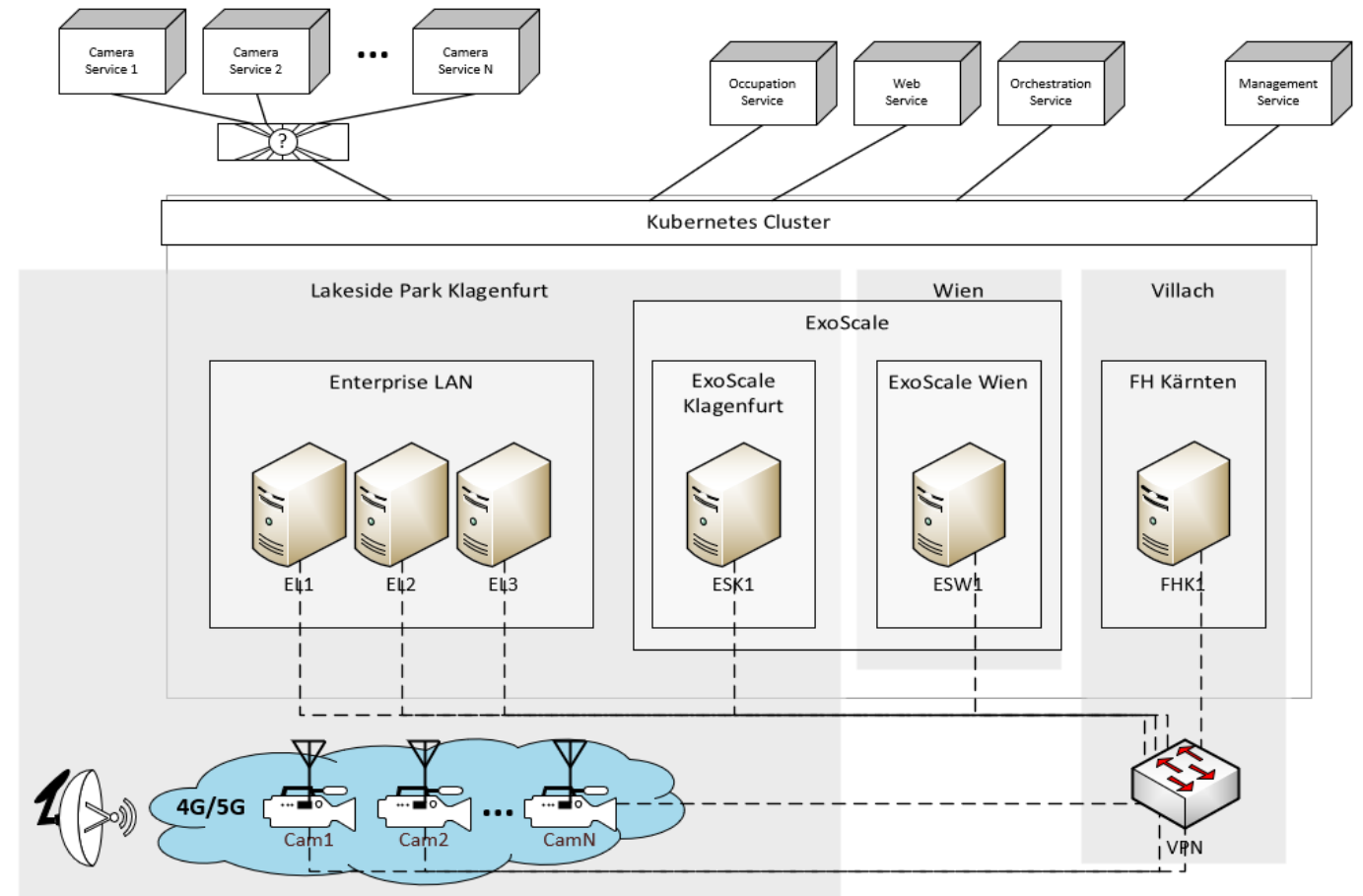
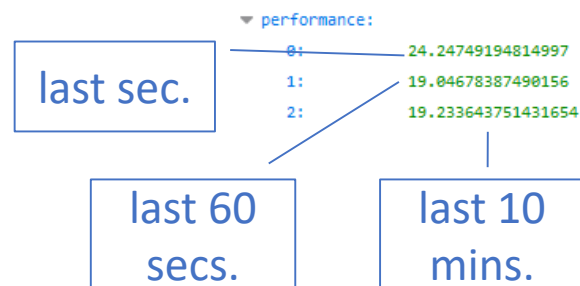
Occupation metric

Error fields

# Orchestration Service

- Orchestrates Camera Service based on
  - data sensitivity,
  - frame rate and
  - fictional costs

Camera Service  
Performance Metrics (fps)





# Webapp Service

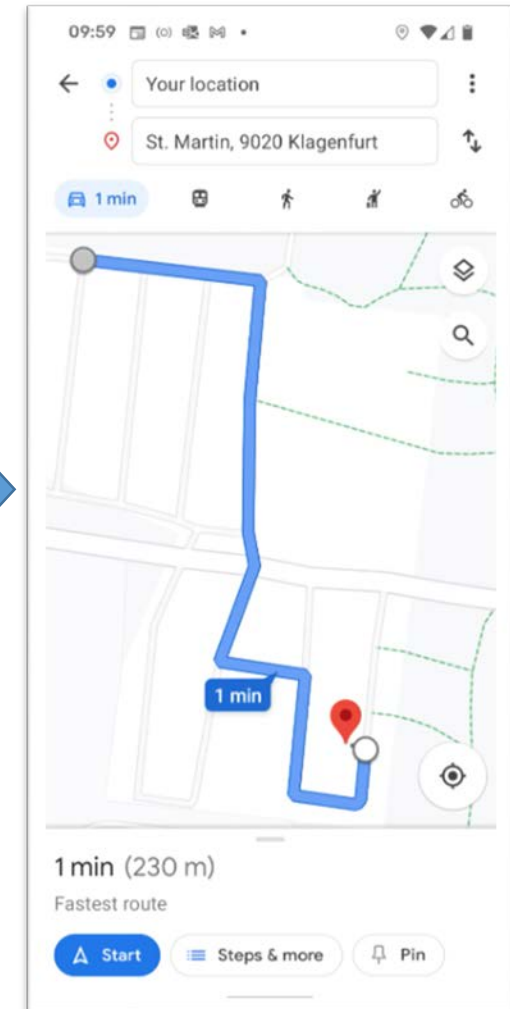
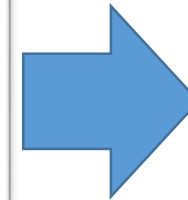
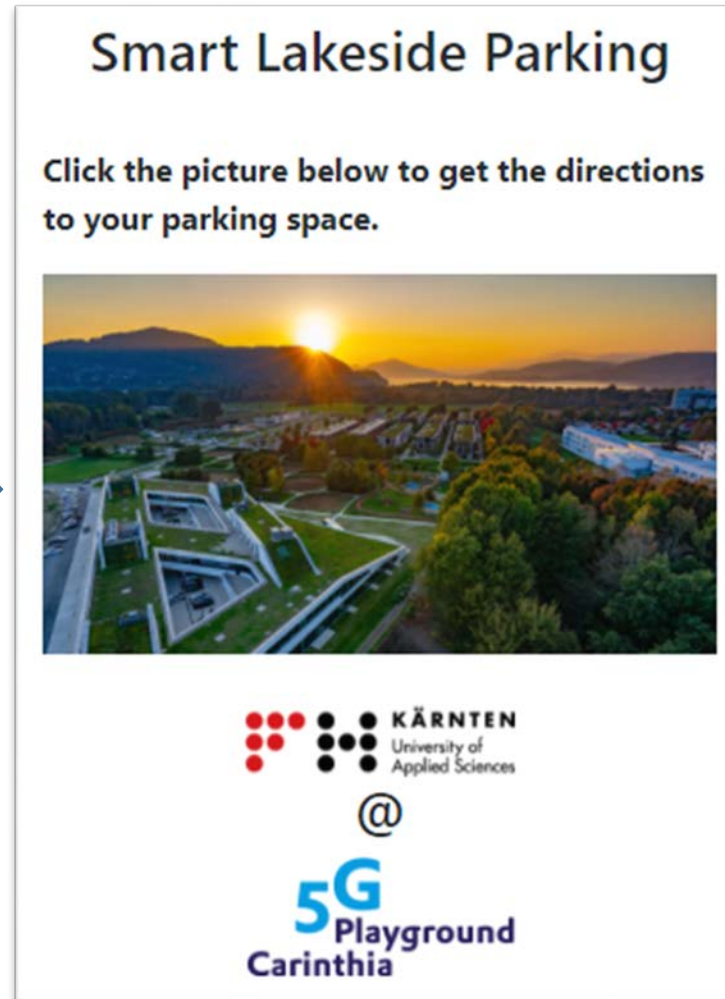
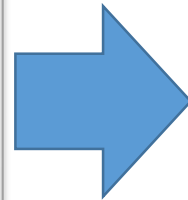
- <http://parking.fh-timing.com/static/index.html>

```

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# Thank you for your attention!

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