

# Smart Parking with LoRaWAN

A real IoT Showcase in Frankfurt, Germany

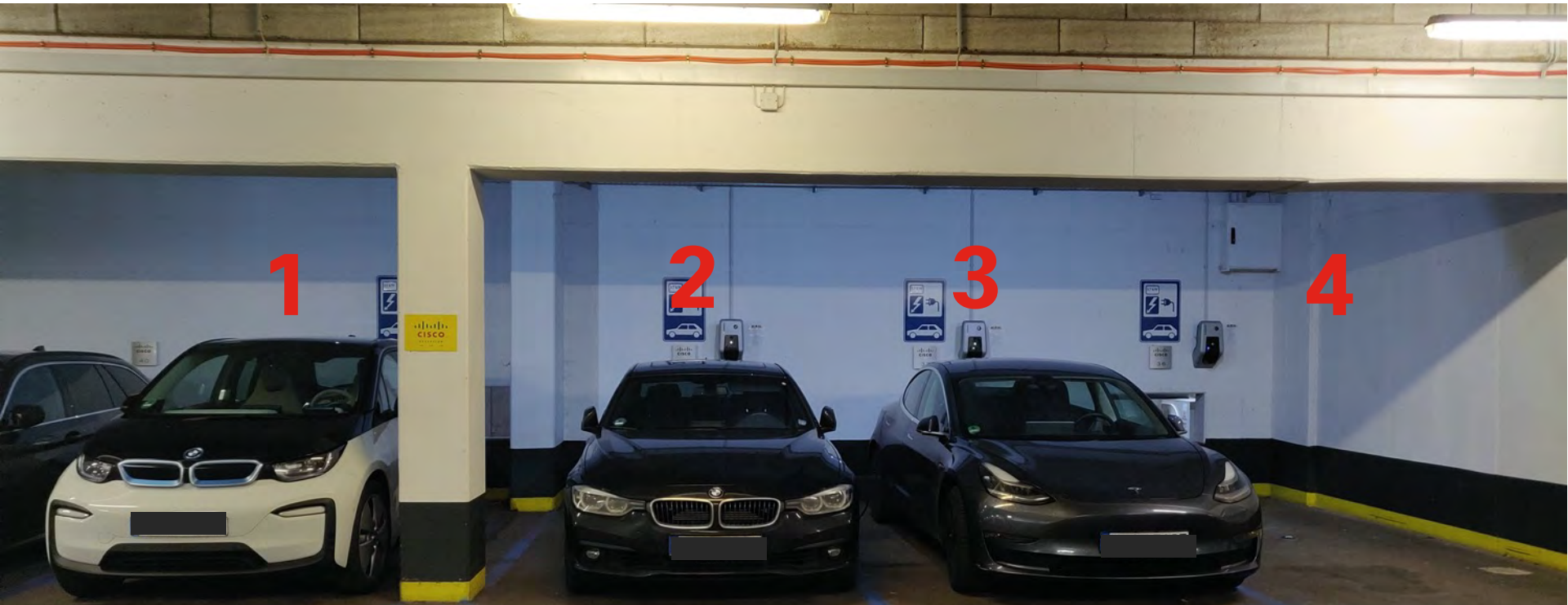
Florian Pachinger, Developer Advocate  
@flopachinger



# Agenda

- Demo Time!
- LoRaWAN Technology
- Smart Parking Use-Case in Detail
  - LoRaWAN Setup
  - Device Management
  - Back-end (Python, InfluxDB, Grafana)
- Recap

# 4x Parking Spaces for Electric Cars



Cisco Office Frankfurt, Germany

# The Problem

Too less spaces

Parking Spaces are often occupied

Additional Work

Asking manually all drivers via a Webex Teams room when a parking space is available again

No Insights

The drivers do not know if they can re-charge their car



# Solution: Web-dashboard with real-time data of the parking spaces



Frankfurt E-Parking

Live Status

History

Technical Infos

About

## Current E-Parking Status in the Cisco Frankfurt-Office

P1 (11kW) is available!

P2 (3,7kW) is available!

P3 (3,7kW) is available!

P4 (3,7kW) is available!

Last Update (UTC+1): Sunday, 29.03.2020 19:00

# Solution: Web-dashboard with historical data about parking spaces and processes



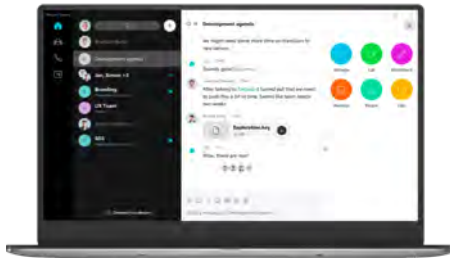
# Solution: Proactive & reactive Webex Teams bot

Today



ParkingBot FK33 20.02.20, 13:19

**ALL** parking spaces are now **OCCUPIED**



ParkingBot FK33 11:18

Only **ONE** parking space is still **available now**



You 11:20



You 11:21

ParkingBot /c



ParkingBot FK33 11:21

## FKF3 E-Parking Status

**P1 - OCCUPIED**

**P2 - OCCUPIED**

**P3 - OCCUPIED**

**P4 - EMPTY**



The background is a dark blue field filled with numerous small, semi-transparent squares and dots. These elements are scattered across the frame, with a higher concentration of larger squares in the upper left and lower right corners. The colors of these elements include various shades of blue, green, yellow, orange, and red, creating a vibrant, pixelated effect.

How is this done?





LoRaWAN Parking Sensor

# Frankfurt E-Parking Architecture



LoRa Parking Sensors



Cisco IXM  
LoRa Gateway



Industrial  
Router 829



LTE

Activity Thingpark  
Enterprise (SaaS)

MQTT  
Broker

Python-Script

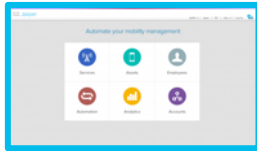
Apache  
Webserver

Database  
(InfluxDB)

Dashboard  
(Grafana)



Webex Teams Bot



Cisco Control Center  
(SIM-card management)



IoT Field Network Director  
(Device Management)

# What is LoRaWAN?



# What is LoRaWAN?

A disruptive wireless technology for low data rate secure communication



**RF unlicensed  
spectrum**



**Long Distance  
Connectivity**



**Low  
Data Rate**



**Low Power  
Solution**



Gas and Water Meters



Smart Parking



## Measure



Customer Satisfaction Survey

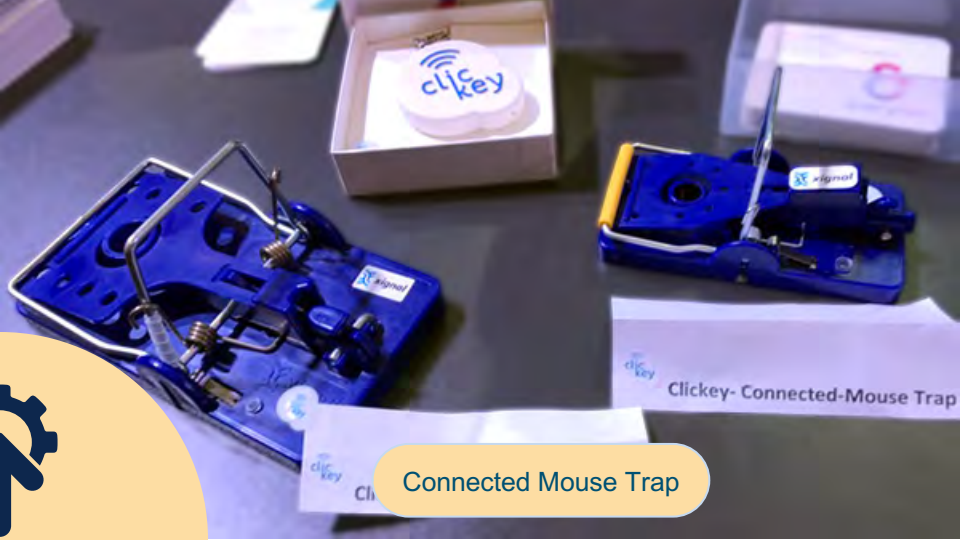


Cold Chain Tracking





Optimize Waste Collection



Connected Mouse Trap



Report  
Events



Physical Security



Optimize operations and reduce busy  
time to improve business efficiency





LoRaWAN Parking Sensor

# Setup LoRaWAN



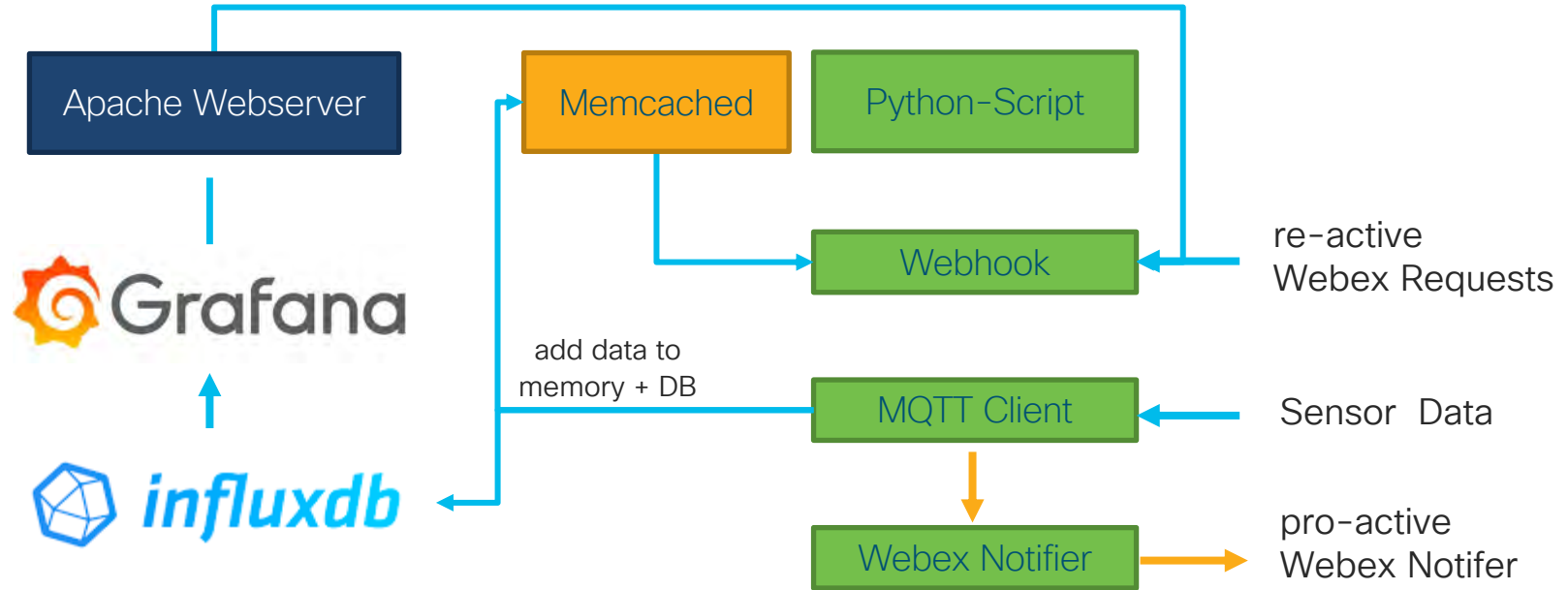
# Device Management





# Back-End

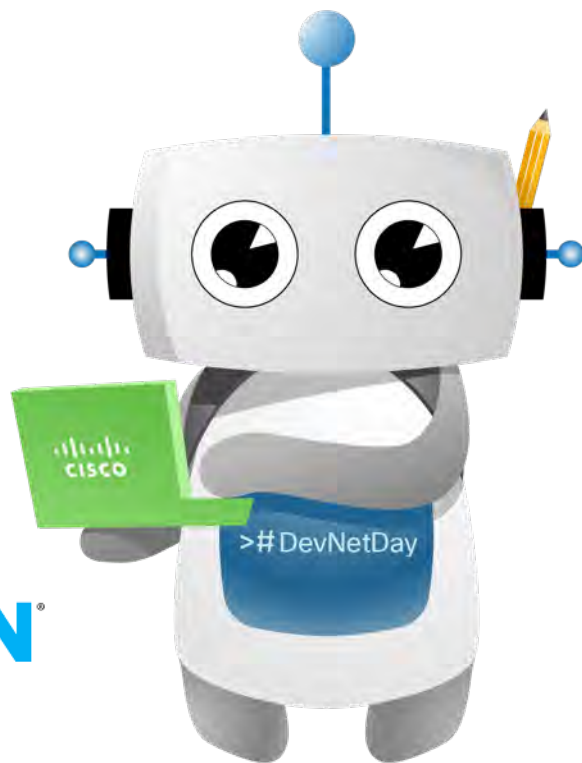
# Back-End Architecture



Cent OS Linux

# Thank you! Explore More here:

- DevNet Website – [developer.cisco.com](https://developer.cisco.com)
- Cisco Solution for LoRaWAN – [cisco.com](https://cisco.com)







# Possibilities

#CiscoLive | #DevNetDay