

THE BMW GROUP EDGE PLATFORM

ON DEMAND FUNCTIONALITY FOR MANUFACTURING

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Open Edge Computing



**TODAY'S TALK IS ABOUT PROVIDING INNOVATION IN THE
HETEROGENEOUS DOMAIN OF LARGE SCALE MANUFACTURING.**



FOR SEVERAL MANUFACTURING AREAS, EDGE IS A NECESSARY COMPLEMENT TO CLOUD COMPUTING.

BMW Group „CLOUD FIRST” Strategy, but...

Control Loops /
Latency



Peripheral
Devices




Preprocessing /
Throughput



Data
Privacy



BMW HAS A GLOBAL NETWORK OF MANUFACTURING SITES.



31 Manufacturing Sites Worldwide

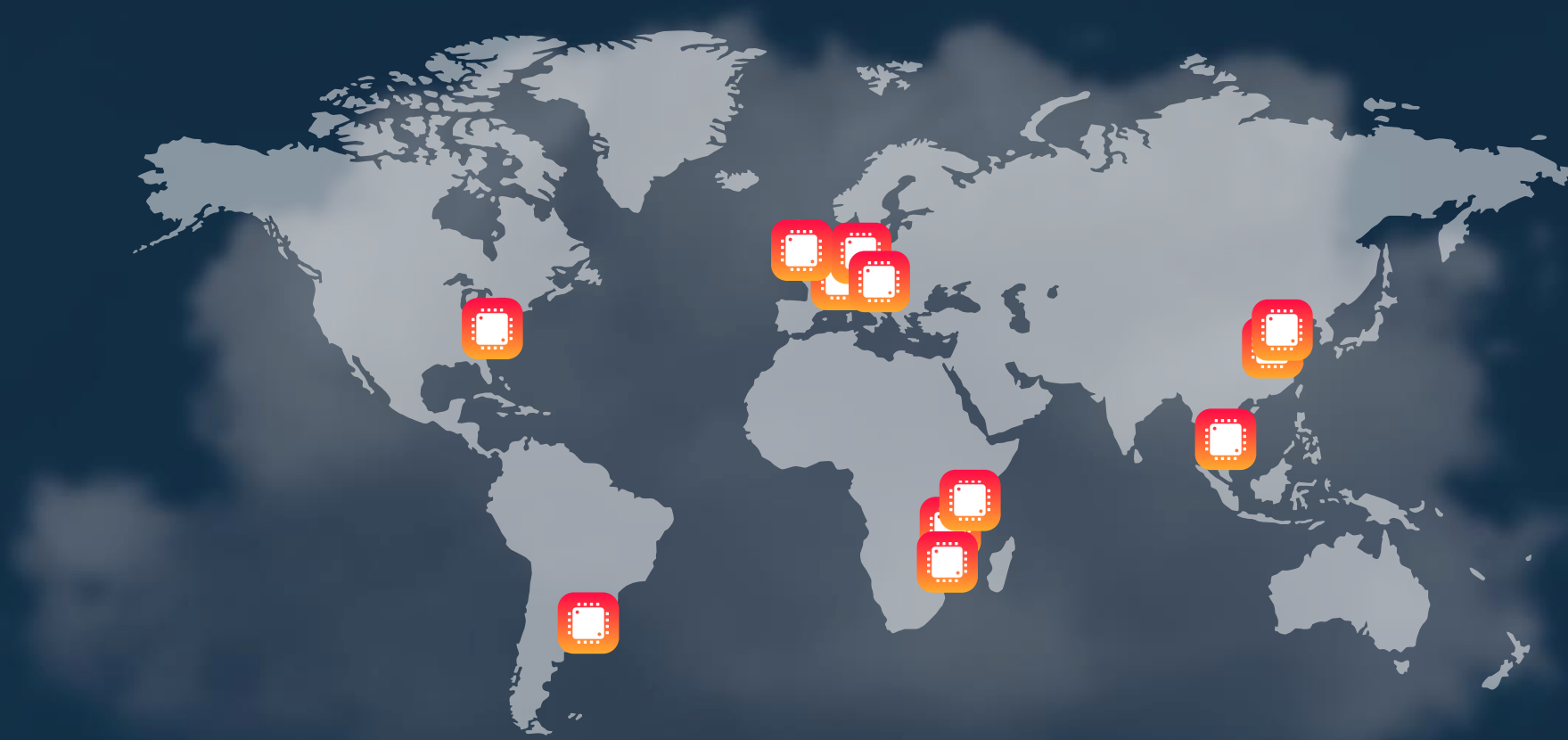


2.3 Mio. Vehicles per Year
87+ different Models



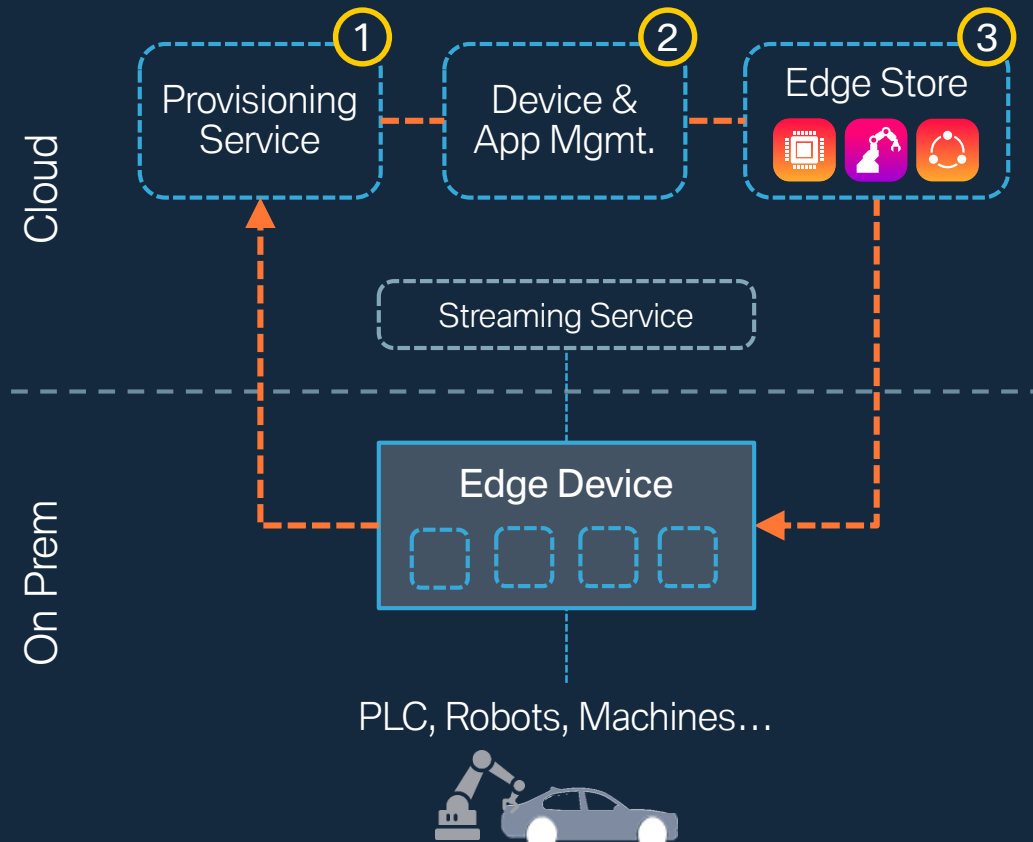
~70k Employees in Manufacturing

GOAL: DEVELOP A PLATFORM TO GET EDGE APPLICATIONS
RAPIDLY TO ALL MANUFACTURING SITES.



THE BMW GROUP EDGE PLATFORM ENABLES STANDARDIZED ON-DEMAND FUNCTIONALITY IN SELF-SERVICE.

IT Target Architecture „2030“



Edge Platform Features



Focus: Self-Service!

Demo Time

1

Setup Edge Device

Zero Touch & Provisioning Service



Zero Touch & Provisioning Service



**Find edge applications and
manage your edge devices.**

Login


App Overview


Device Overview

Search


PSS.NEXT

TA-170



The PSS.NEXT edge app is part of the production control system (PSS) in the mechanical manufacturing (TA) of the BMW Group.



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OPC UA Connector

IoT Platform Enabling



The OPC UA Connector manages the cloud connectivity of PLCs and devices via OPC UA on the shop floor.



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BVIS - Website Viewer

IoT Platform Enabling



The BVIS App lets connect displays to the "Bauteil Varianten Informationssystem".



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Agathe

OtD Streaming Service



Agathe is a simple, stable and reliable system that enables messaging between SAP systems (ERP and S / 4) and Kafka.



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Add Your Own Application



App Overview



Device Overview

Search

Type	Manufacturer	Model Number	Host Name	Location	Status	Provisioning Status
	AAEON				Connected	Provisioned
	AAEON				Disconnected	Unprovisioned
	AAEON				Disconnected	Unprovisioned
	AAEON				Disconnected	Unprovisioned

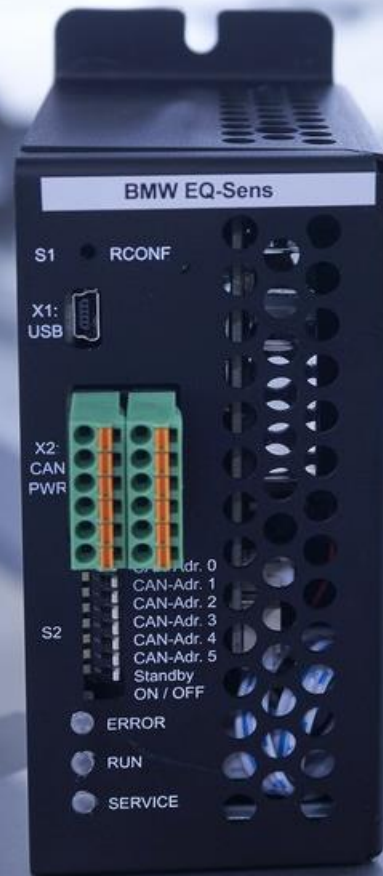
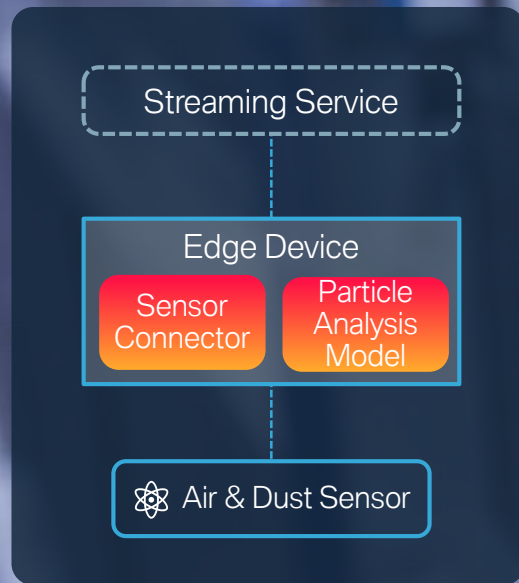
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Add New Device

Use Cases

(Apps)

ENVIRONMENT & DUST ANALYSIS ON EDGE.



AUTONOMOUS TRANSPORT SYSTEMS WITH **EDGE COMMUNICATION** TO DOORS AND LOADING MACHINES.

ATS Fleet Management

Streaming Service

Edge Device

Protocol
Gateway
(OPC UA)

Door
Control

PLC



AI BASED VEHICLE QUALITY INSPECTION ON EDGE.

AI Quality Inspection Suite

Streaming Service

Edge Device

Camera
Drivers

Vision
Model

Cameras



PRODUCTION MONITOR CONNECTION TO PLANNING SYSTEMS.

Production Planning System

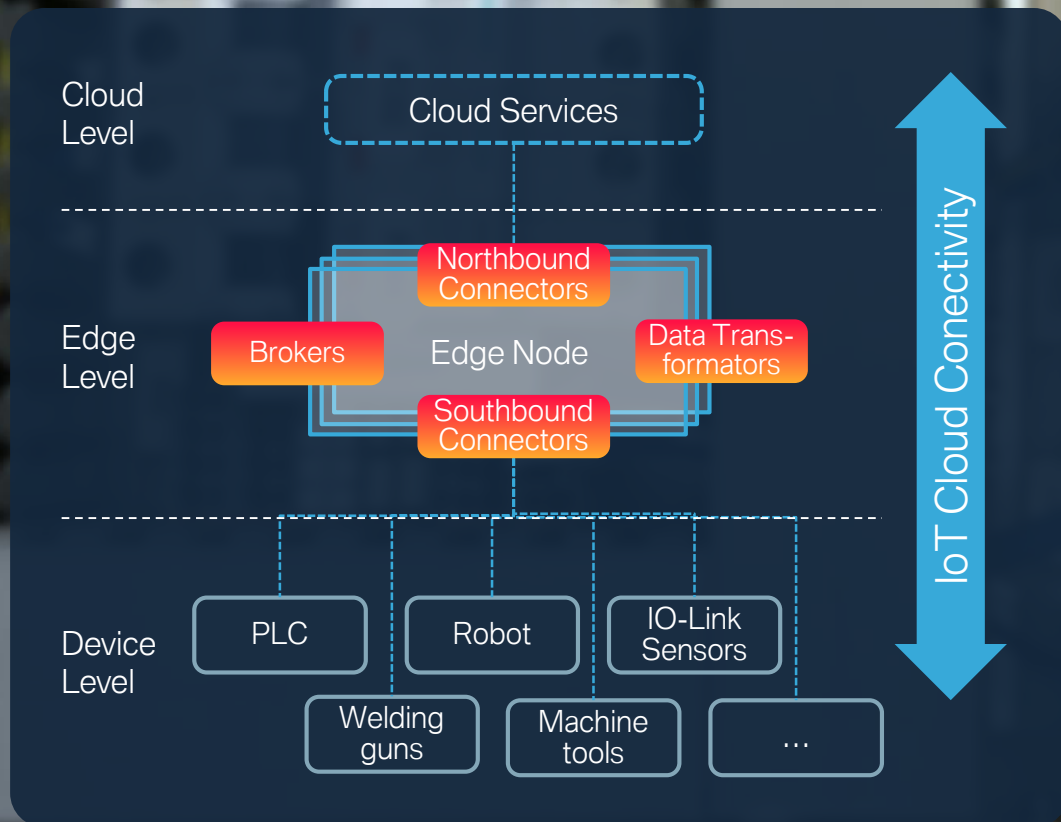
Edge Device

Display
Software

Monitor



THE MOST IMPORTANT USE CASE ON EDGE: MACHINE CONNECTIVITY



COMMUNICATION FACTS

Breadth and Width

- 1000 – 3000 #
communication partners per factory
- Partially **centrally** computed (plant container platform), partially with **edge devices**
- 0.1 MB/s – 50 MB/s
throughput p. device – use case dependent
- 5 ms – 100 ms
latency – use case dependent

5G usage **in manufacturing**

- 99% of machinery connected via cable
- 5G usage would need machinery retrofit (-> costs, advantage?)
- Currently focused on use cases:
 - Mobile robotics
 - Mobile devices
 - AR/VR
 - Smart building
- Currently multiple 5G test benches in Germany and China -> still early stage

GLOBAL EXCHANGE IN THE



OPEN MANUFACTURING
PLATFORM

Members

ABInBev

**BMW
GROUP**

 **BOSCH**

 Microsoft



 **accenture**

Capgemini 

Cognizant

 **faurecia**

 **FORCAM**
the open factory

NorCom

OPTIMAL+
is now 


pwc

 **Red Hat**

 **REPLY**

 **SIEMENS
Healthineers**

optimizel 

SUPPLYON

SYMBIO


wandelbots

1st White Paper



Dec. 2020

Insights Into
Connecting Industrial
IoT Assets

2nd White Paper



May 2021

Edge Computing in
the Context of
Manufacturing

IMAGES AND ICONS CONTRIBUTION



made by Pixel Perfect - flaticon.com/authors/pixel-perfect



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from VectorLogoZone, GPL



from Material Design, Apache 2.0

Thank you!

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