



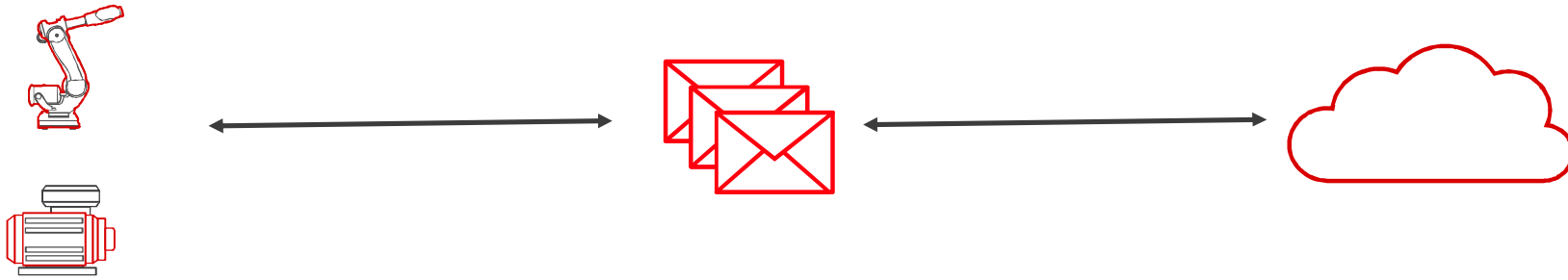
APRIL 12TH, 2018 /MIKE KIREEV/ ABB EV INFRASTRUCTURE PRODUCT GROUP

It's not only about the vehicle

Different approaches in integrating EV chargers into e-Mobility infrastructure

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Classical IoT system



Magnitude of devices are publishing
(and subscribing to) messages

Messages are transmitted and received
using protocols designed for
publish/subscribe mechanism and
reducing network bandwidth requirements
(e.g. AMQP, MQTT)

Data is stored, analyzed and acted upon

Specifics of IoT applications

Designed for big scale of similar devices

- Gather big amounts of data for processing and analysis
- Devices are not constantly addressed back and often addressed in unified way
 - In case of rare or exceptional situation: adjustment is needed if measurement is out of range
 - For changing configuration

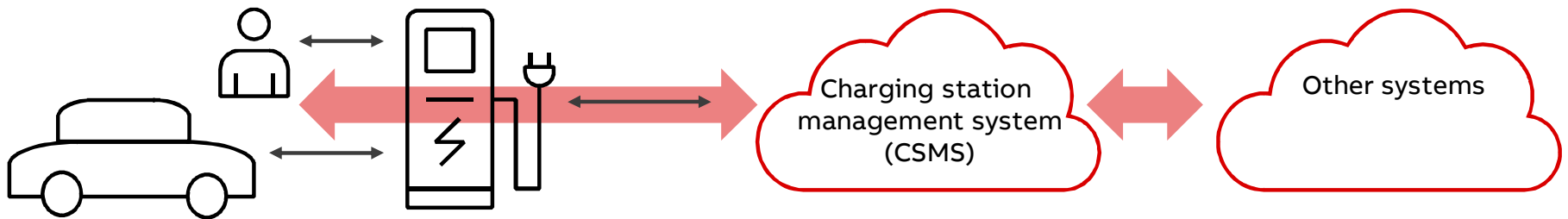
Typical examples of IoT systems

1. Distributed energy resources (DER) asset management: e.g. solar and wind electrical farms
2. Factory or plant equipment monitoring
3. Building and home automation

Is charger an IoT device?

For the most IoT devices interaction is not going beyond device itself.

Contrary to this EV charger is used as **gateway to provide interaction for another actors**: driver and vehicle.



This adds different requirements related to providing explicit session between actors and other systems. It does not fully fit in IoT domain.

Transactions and sessions

From this point of view charger is more like ATM or automated connected POS (point of sale)

- Need not only authorize itself towards CSMS, but provide authorization capabilities for other actors to grant services
- Often it needs explicitly maintain session -> not publish/subscribe
- This sessions are handled as transactions – not IoT case

Charger could be seen as an IoT device!

We should not fully deny IoT approach to manage EV chargers

Chargers could be a quite complicated devices and would benefit from using IoT approach for

- Remote monitoring and diagnostic
- Remote configuration and service
- Gathering data for analysis

Approach: use combination of both

- Transactional approach for charging handling
- IoT approach for asset management

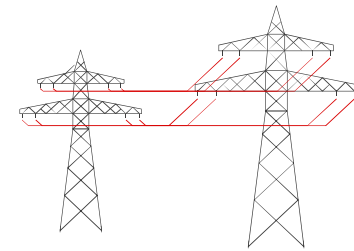
Need for grid integration

Wait! There is something else. What about charger as a load on the electricity grid?

As for many other electricity consumers there is a need to control this load for grid stability and other purposes.

Specifics:

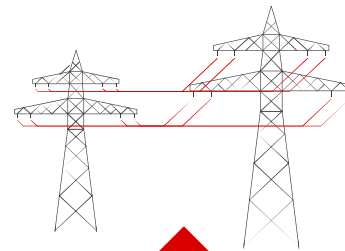
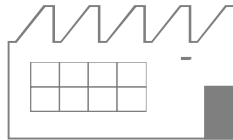
- Normally initiated by a 3rd party, not CSMS but DSO, Utility or local EMS



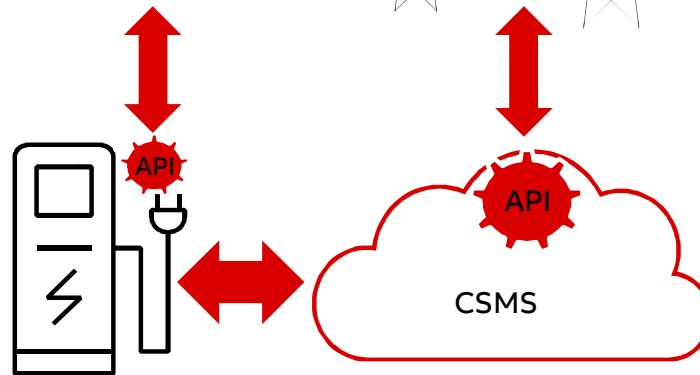
API for Demand - Response

API is standard approach to integrate with 3rd parties

- Local energy management system
- Building management system



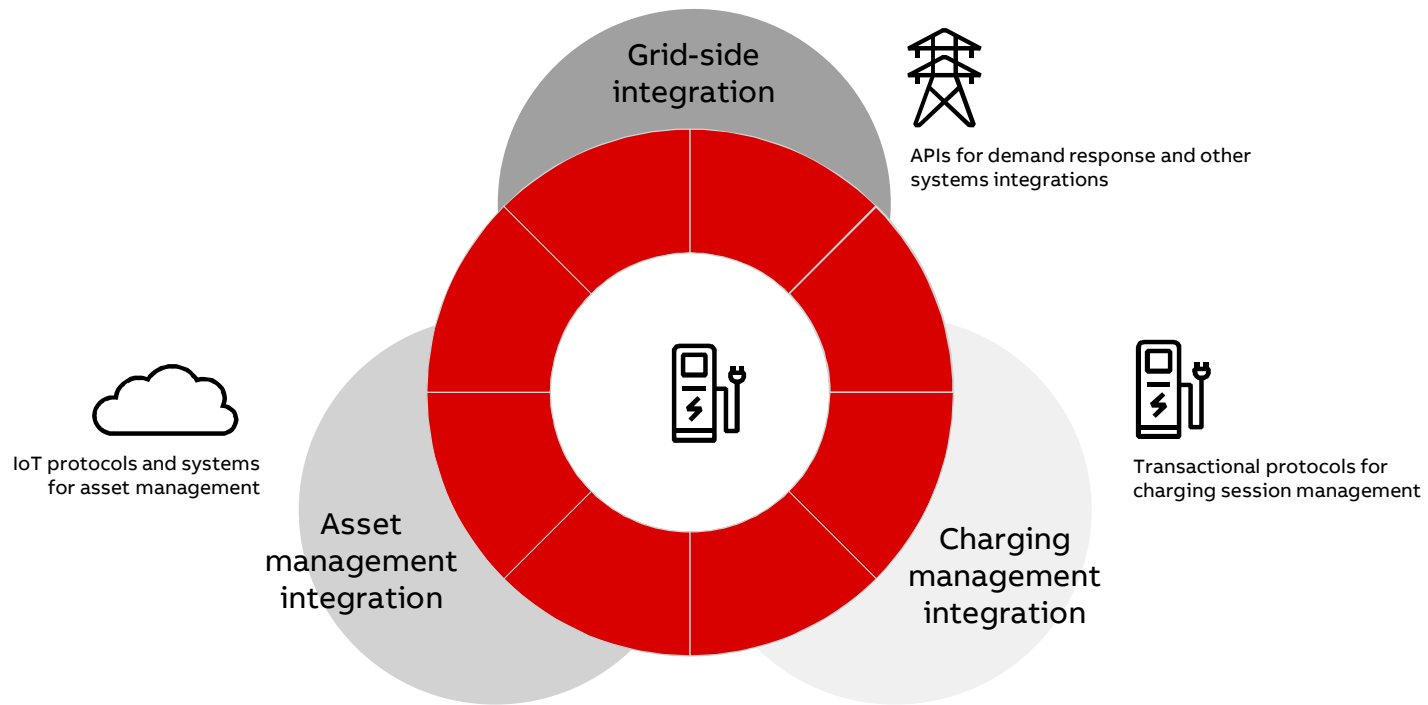
- DSO
- Utility



It could be provided from the charger directly or from CSMS – depending on the use case

Integration of an EV charger into infrastructure

Different solutions for different cases



Flexibility of implementation

2 edge cases

Transactional communication, IoT communication and API could be combined in one link or implemented completely separately



CSMS is single point of contact for charger.
Link between charger and CSMS should satisfy all 3 cases
All integrations are done with CSMS.

Separate link for every type of communication
API directly on the charger



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