Device Data Orchestration Using oneM2M

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solves key technological hurdles

T IoT Hub

1
Multiple platforms
Getting global transparency over connectivity across multiple platforms is cumbersome

2
Interfacing with legacy IT systems
Getting IoT data into enterprise software such as ERP systems (SAP) and achieving a unified frontend without second screens for IoT data can be very challenging

3
Lack of standardization for IoT solutions
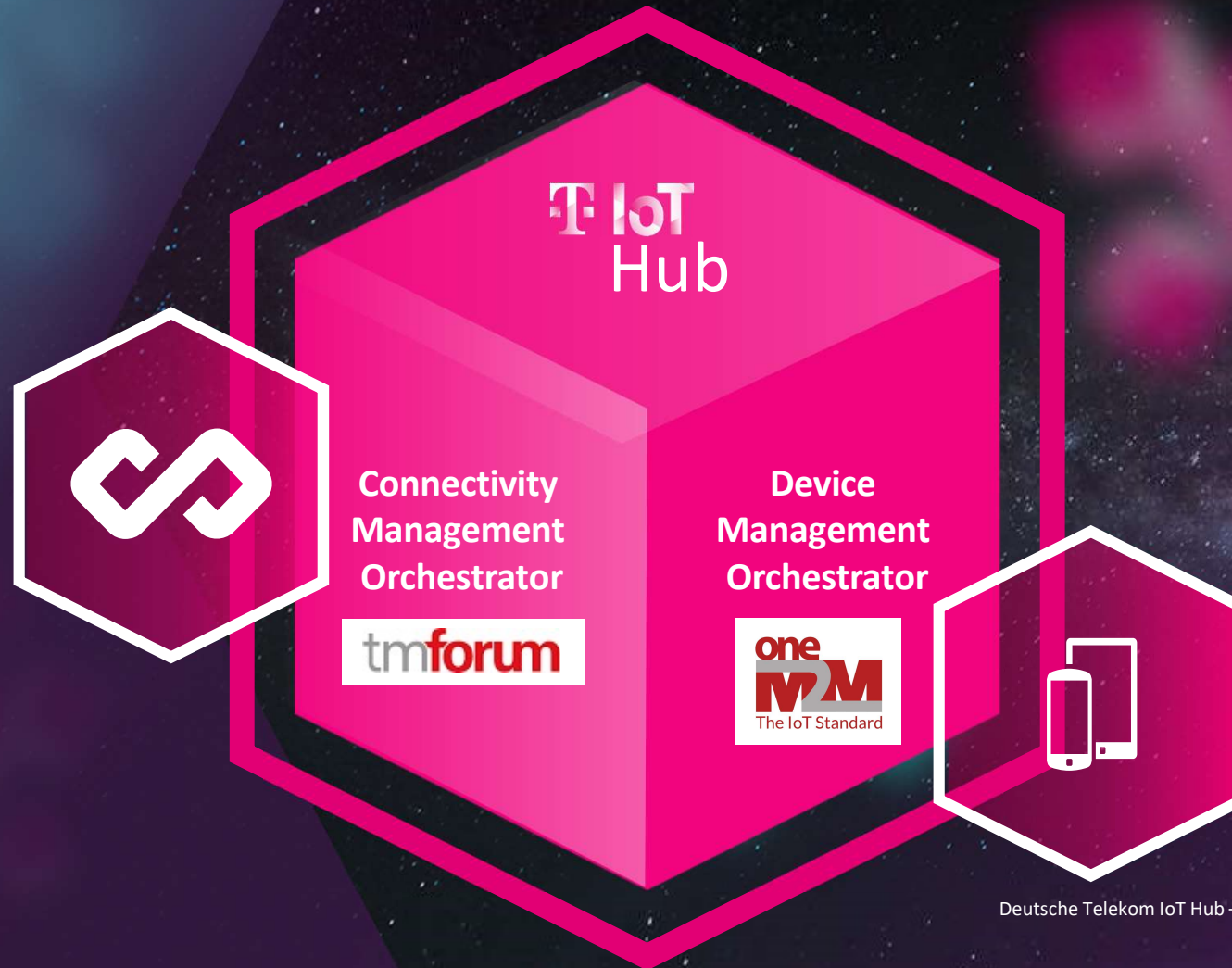Enterprises are often wary of adopting IoT solutions because of integration costs

4
Business intelligence and analytics can't easily ingest IoT data
Extracting business value from IoT data is difficult if business applications can't access it

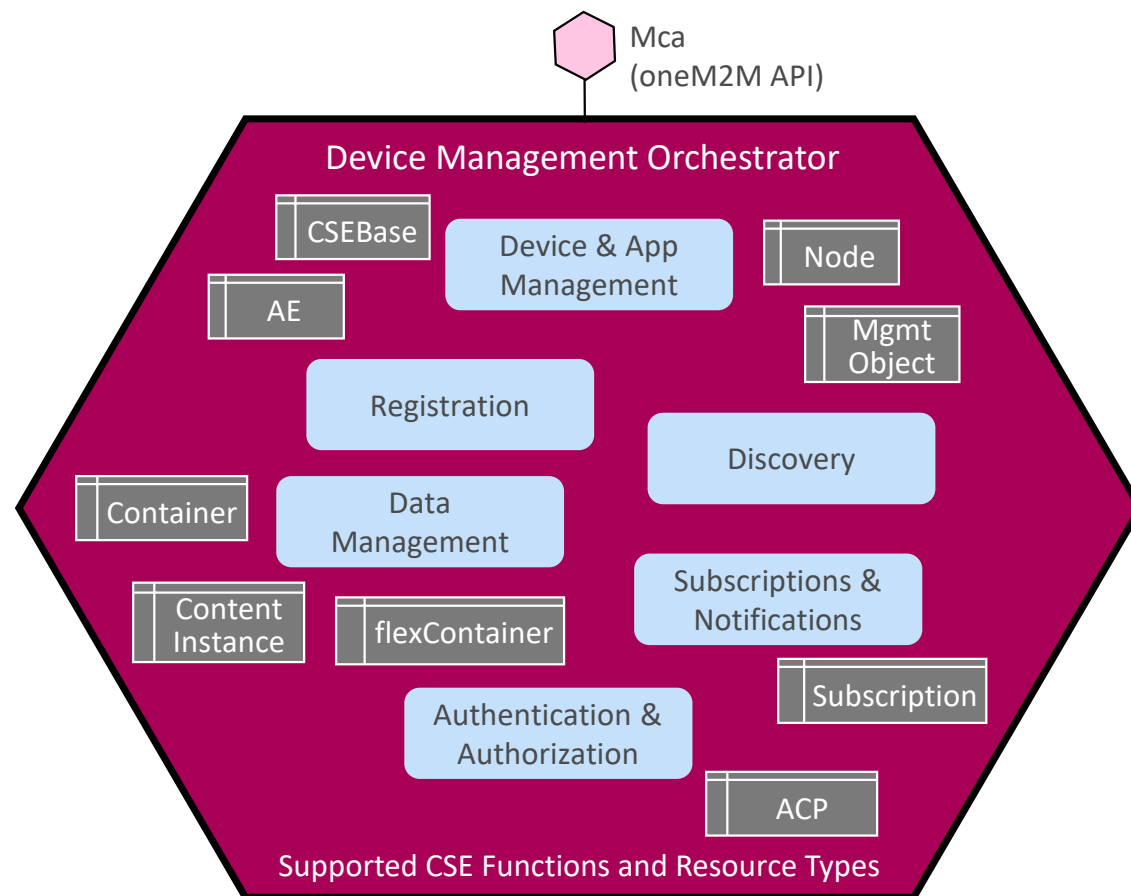**T IoT Hub** leverages standards to address IoT hurdles

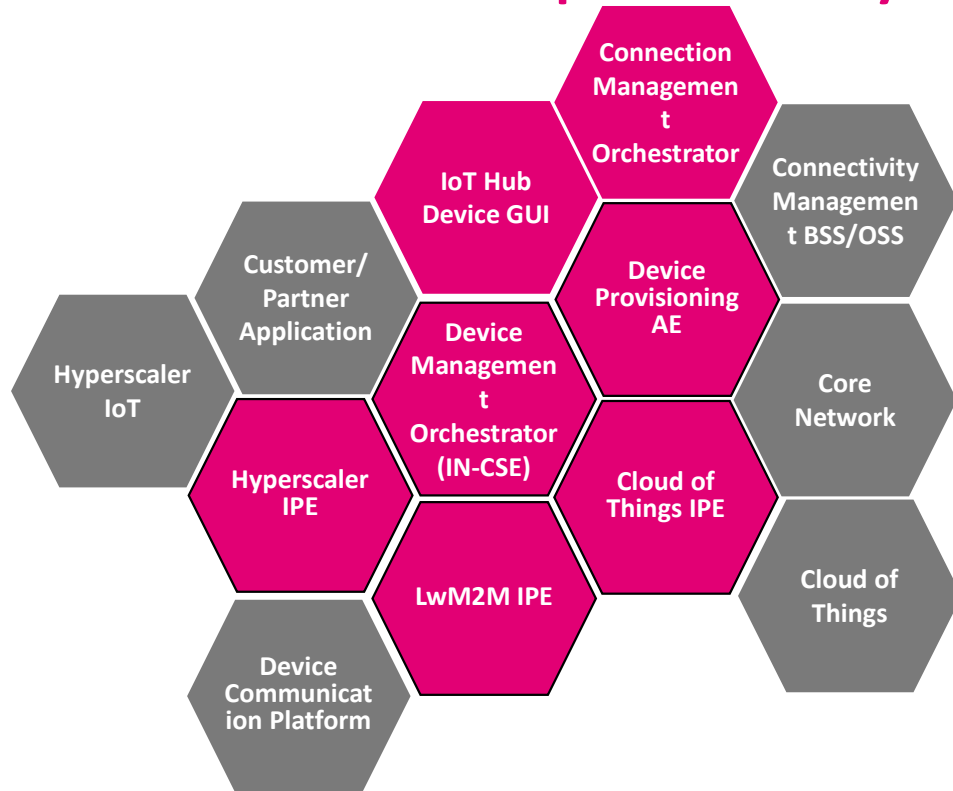# Device Management Orchestration using oneM2M

Highlights

- Implementation of a oneM2M Infrastructure-CSE as a Device Management Orchestrator (DMO) service

- Interoperability and data standardization layer for devices, platforms and applications

- Selected set of oneM2M resource types and functions to enrich Deutsche Telekom's IoT architecture to support customer use cases

- oneM2M Mca reference point with HTTP REST and JSON bindings, directly usable from native oneM2M devices and applications

- Integrated with and complementary to DT IoT Connectivity

Why oneM2M?

- Fit to purpose: Standard API and resources enable wide interoperability

- Design re-use: oneM2M architecture provide generic and flexible design building blocks

- Future ready: oneM2M broad and generic capability mappable to all platforms and device types

Mca
(oneM2M API)

Device Management Orchestrator

CSEBase

Device & App Management

Node

AE

Mgmt Object

Registration

Discovery

Container

Data Management

Subscriptions & Notifications

Content Instance

flexContainer

Subscription

Authentication & Authorization

ACP

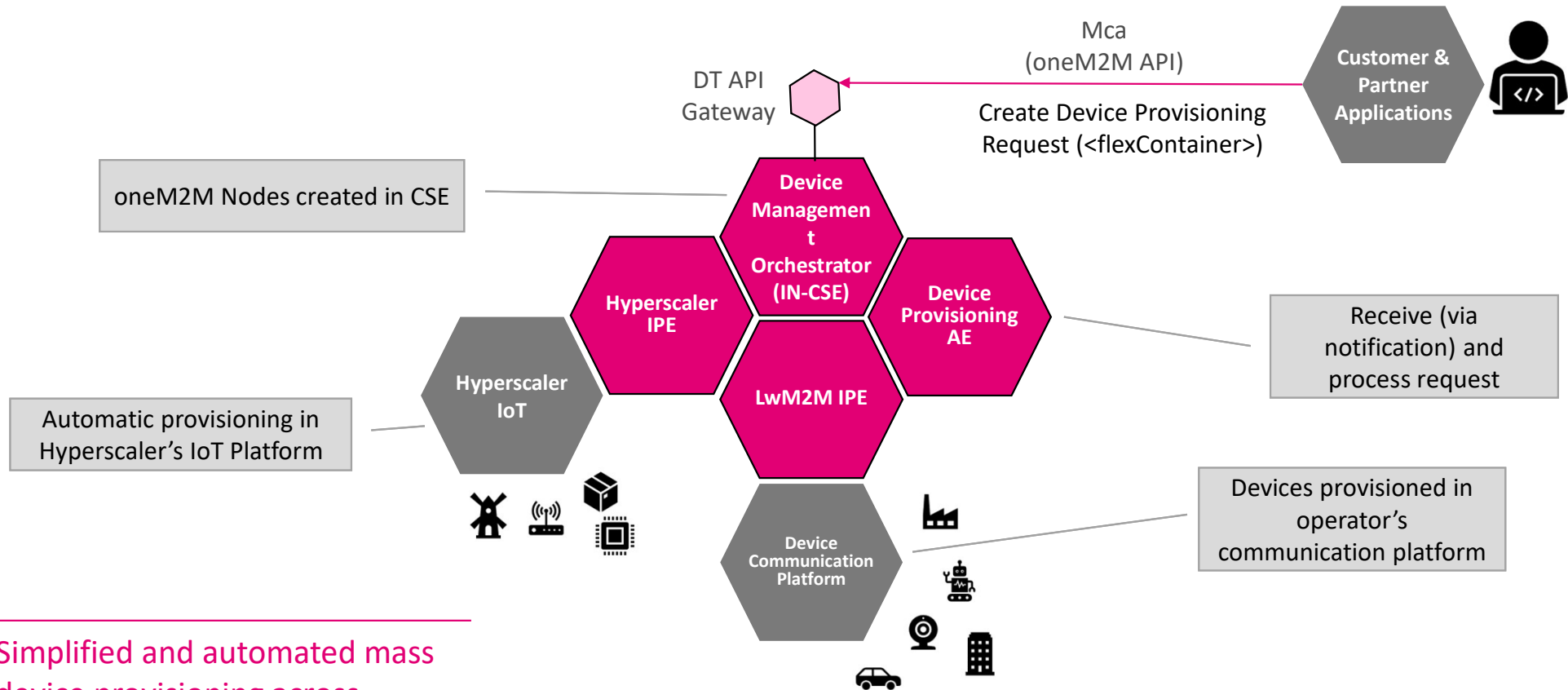Supported CSE Functions and Resource Types

IoT Hub Interoperability and Orchestration Ecosystem

- Out-of-the-box provisioning AE allowing automatic registration of devices in integrated platforms

- Out-of-the-box support for LwM2M devices with automatic data collection and mapping to oneM2M container structure

- Integration of network data from BSS/OSS systems to enrich device management and monitoring

- Development of applications bringing together device and connectivity aspects

- Additional adapters for integration with devices and other external platforms can be built outside of IoT Hub by vendors, partners and customers to support their own use cases

- Advanced ecosystem with device vendors and partners enabling semantic applications and solutions

oneM2M provides the architectural framework for DT IoT Hub Orchestration of IoT Device Data
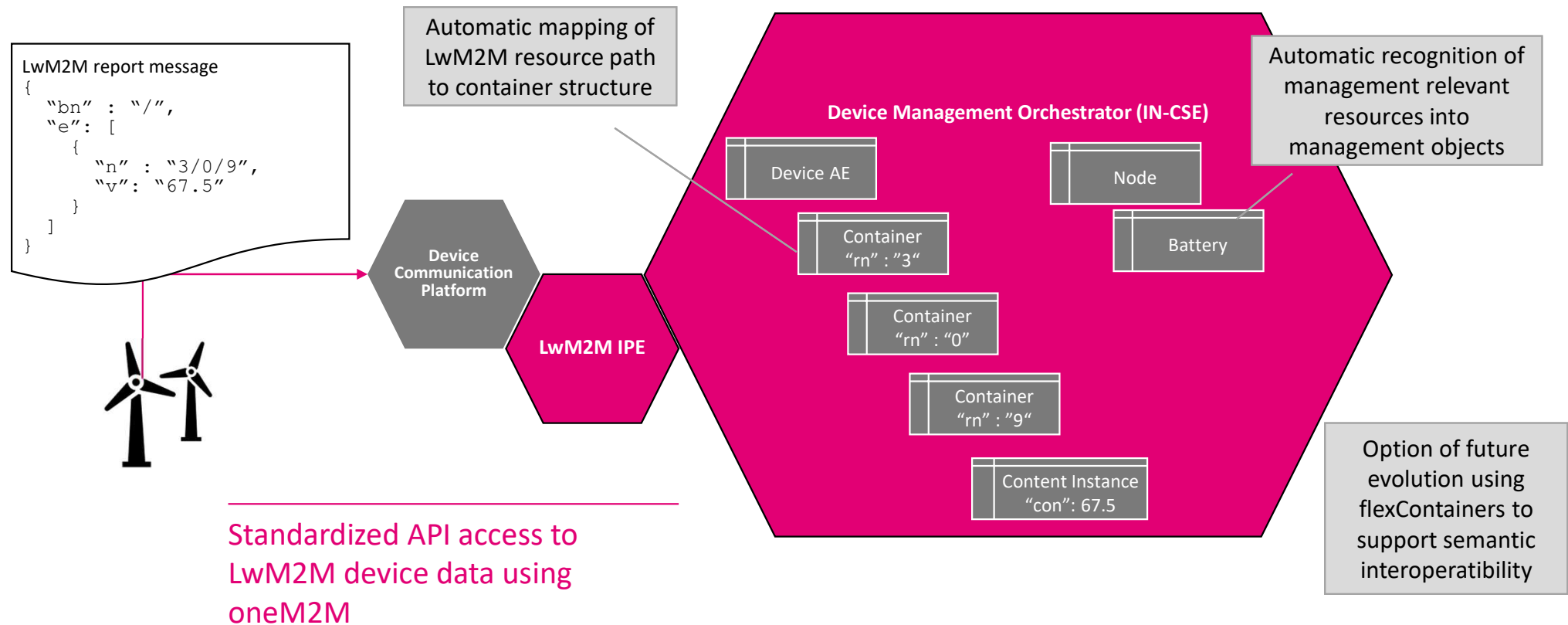
Of-the-shelf Applications: Device Provisioning

Mca (oneM2M API)

DT API Gateway

Create Device Provisioning Request (<flexContainer>)

Customer & Partner Applications

oneM2M Nodes created in CSE

Device Management Orchestrator (IN-CSE)

Hyperscaler IPE

Device Provisioning AE

LwM2M IPE

Hyperscaler IoT

Automatic provisioning in Hyperscaler's IoT Platform

Receive (via notification) and process request

Device Communication Platform

Devices provisioned in operator's communication platform

Simplified and automated mass device provisioning across multiple platforms

Of-the-Shelf Applications: Automatic Data Collection

LwM2M report message
```
{
    "bn" : "/",
    "e": [
        {
            "n" : "3/0/9",
            "v": "67.5"
        }
    ]
}
```

Automatic mapping of LwM2M resource path to container structure

Automatic recognition of management relevant resources into management objects

Device Communication Platform

LwM2M IPE

Device Management Orchestrator (IN-CSE)

Device AE

Node

Container "rn" : "3"

Battery

Container "rn" : "0"

Container "rn" : "9"

Content Instance "con": 67.5

Option of future evolution using flexContainers to support semantic interoperatibility

Standardized API access to LwM2M device data using oneM2M

Current Status & Next Steps

- Device Management Orchestrator (IN-CSE) productive with core functions and resource types

- oneM2M Mca available as REST API with Telco Grade Authentication, Authorization, Security and Multi-Tenancy

- Comprehensive live API documentation in Swagger UI

- Device provisioning AE and LwM2M data collection integrated with DT Device Communication Platform

- PoC Integrations with DT *Cloud of Things* and Hyperscaler (AWS)

- Further evolution based on an ecosystem of partners including device vendors, solution providers and network operators

We welcome partners to work together on an interoperability ecosystem. Come talk to us!

Thank You!

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