Digital Twin Workshop: Generalised Service Execution for Digital Twins

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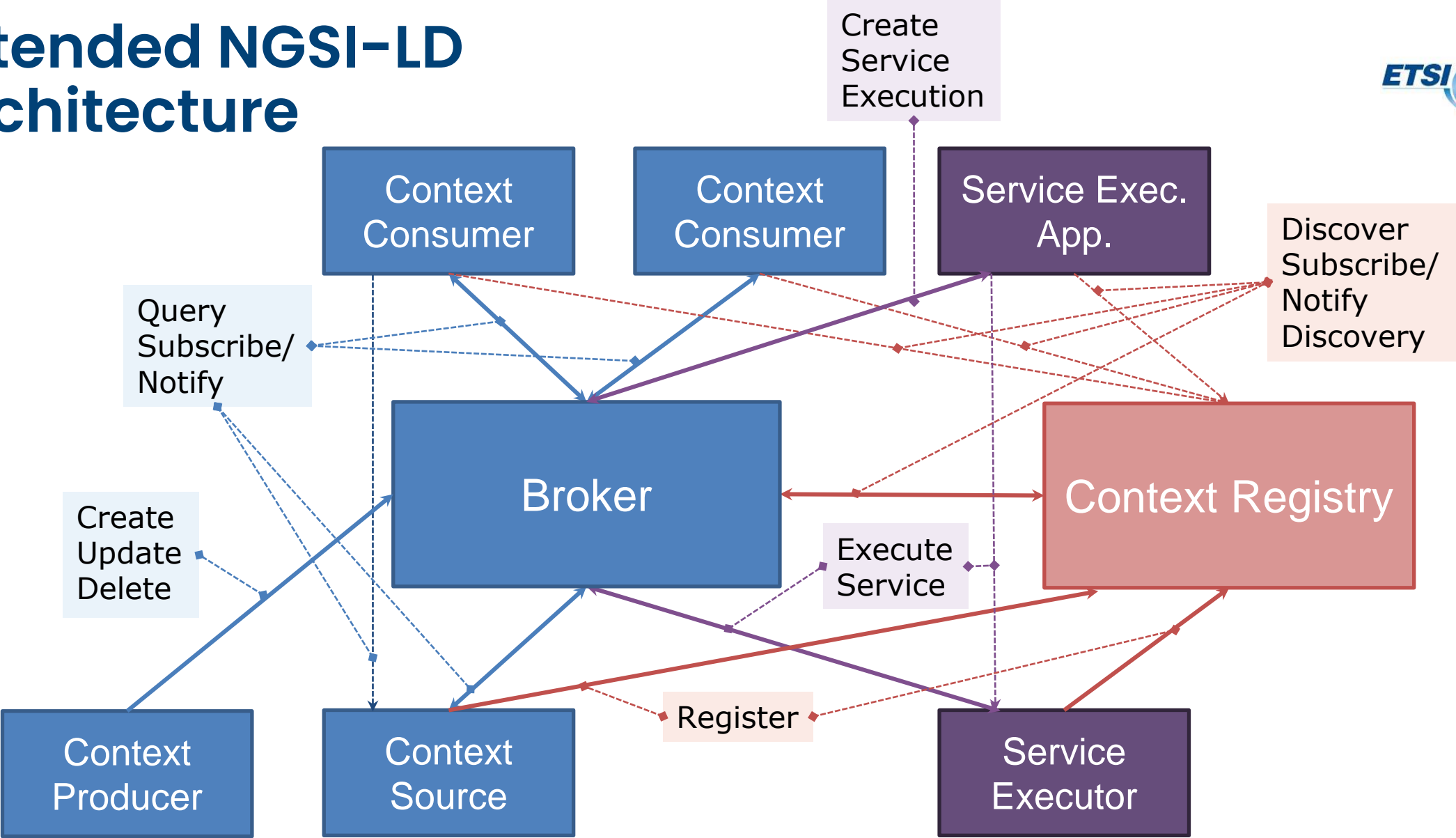ETSI ISG CIM

05/07/2022

Motivation

- Explicit representation of services is needed if **functionality** is to be **integrated** with Context Broker / Digital Twin system as opposed to being realized in external application logic.

- If multiple components are involved, **synchronization** between them has to be supported.

- System-internal support is needed to enforce **priorities**, e.g. in assisted driving a component handling safety critical situation needs higher priority than component optimizing fuel consumption.

- Support for **dependencies**, e.g. actions should only be taken if preconditions are met

Proposal

- Make **service execution explicit functionality** of NGSI-LD

- Functionality can then be used **to trigger Digital Twin functionalities** like diagnosis, prediction, simulation, prescription and actuation

- **Entities would have services** in addition to properties and relationships

- Applications explicitly **create service executions**

- Support for **event-triggered service execution**, considerably reducing delay

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Extended NGSI–LD Architecture

Solid arrows represent preferred interactions mediated via the Broker
Dashed arrows represent alternative interactions not involving the Broker

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Service Execution Interactions

Service Exec. App.

Broker

Context Registry

Service Executor

1) Create Service Request with Service Execution including the required parameters

5) Request Service Execution result

2) Find Service Executor that can do the Service Execution

3) Call Service Executor with relevant parameters

4) Update Service Execution instance with result

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