5G System and Service Providers (SP)
New Services
Data-centric approach

to

LF Edge Akraino
API TSC Sub-committee

Ike Alisson,
Akraino Documentation Sub-committee TSC Chair

2021-02-19 Rev PA10 Akraino wiki

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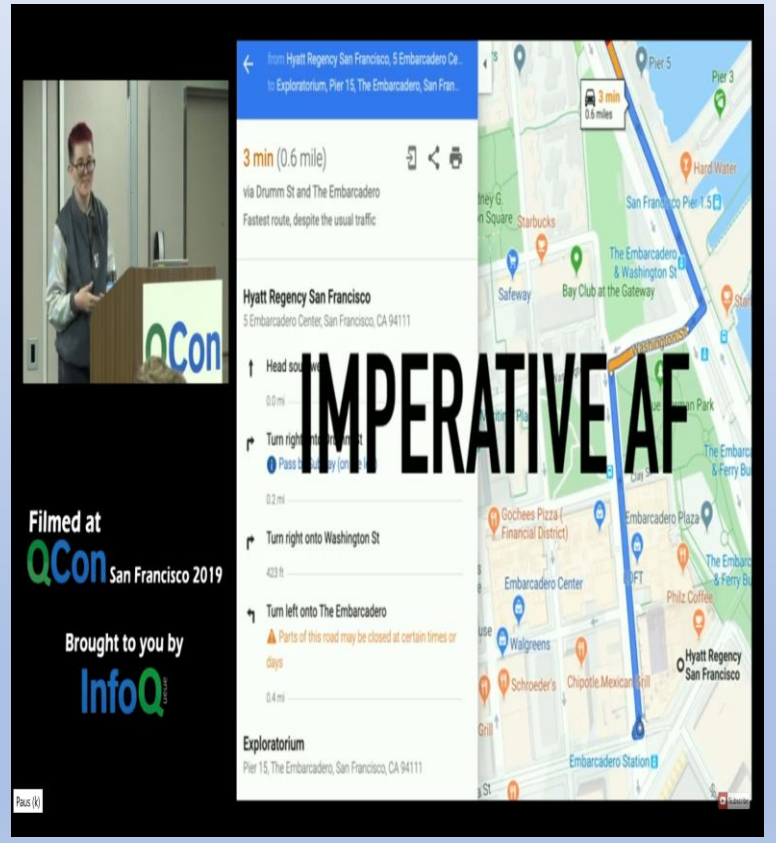
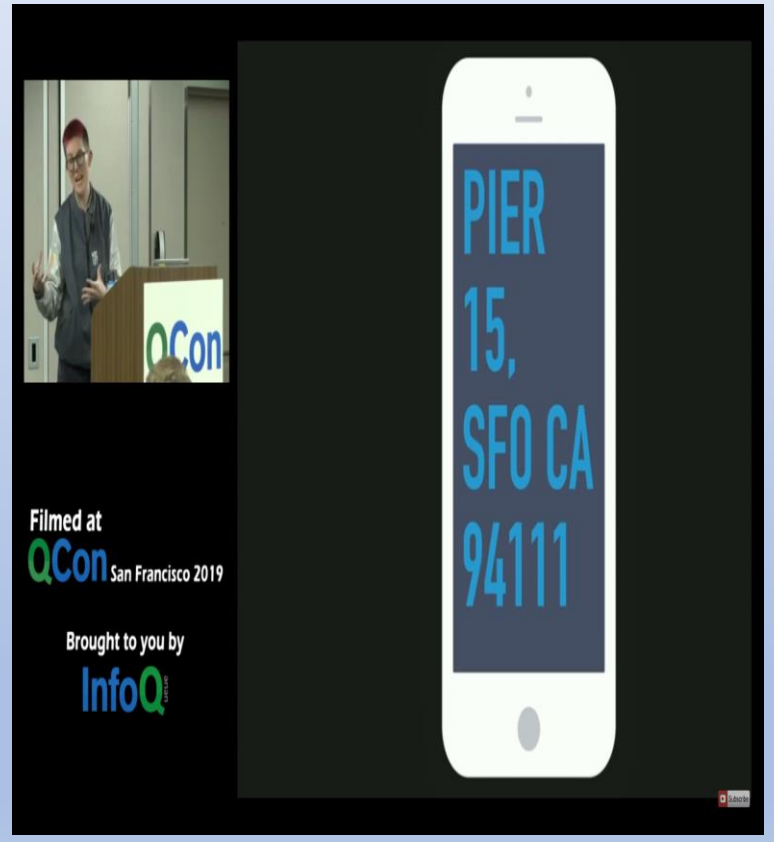
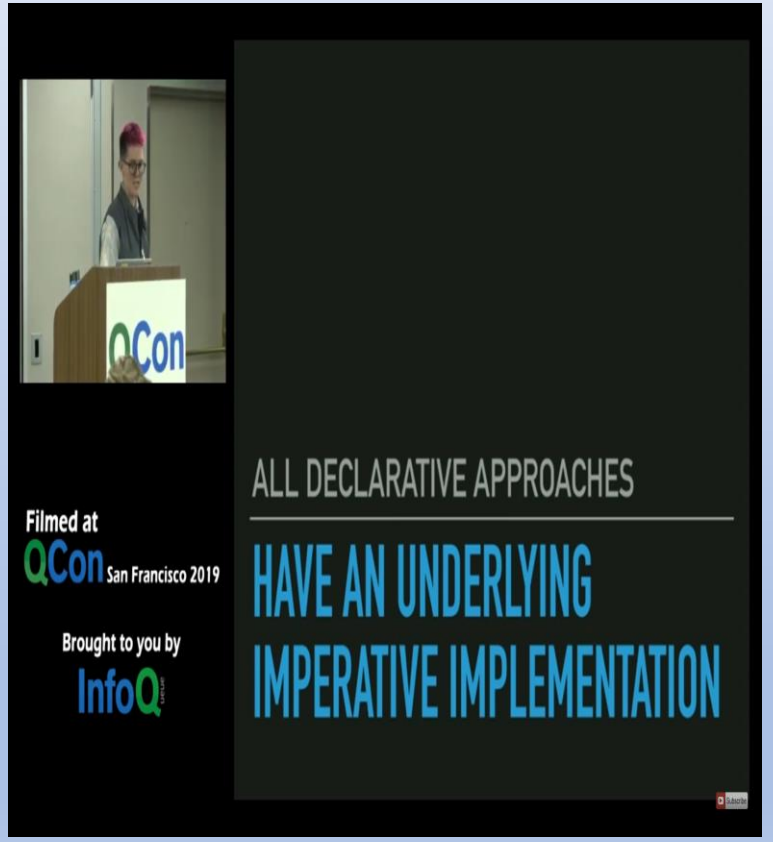


2. Declarative



3. All Declarative Approaches have Imperative Implementation



1. Declarative APIs & YAML - 4

Declarative Kubernetes Lifecycle Management with Kubernetes Cluster API v1alpha1

Kubernetes Declarative API

Cluster API is a Declarative API Specification.

Cluster API is the API Specification that helps provide **Uniform and Consistent Management for Kubernetes Clusters** regardless of the underlying Infrastructure.

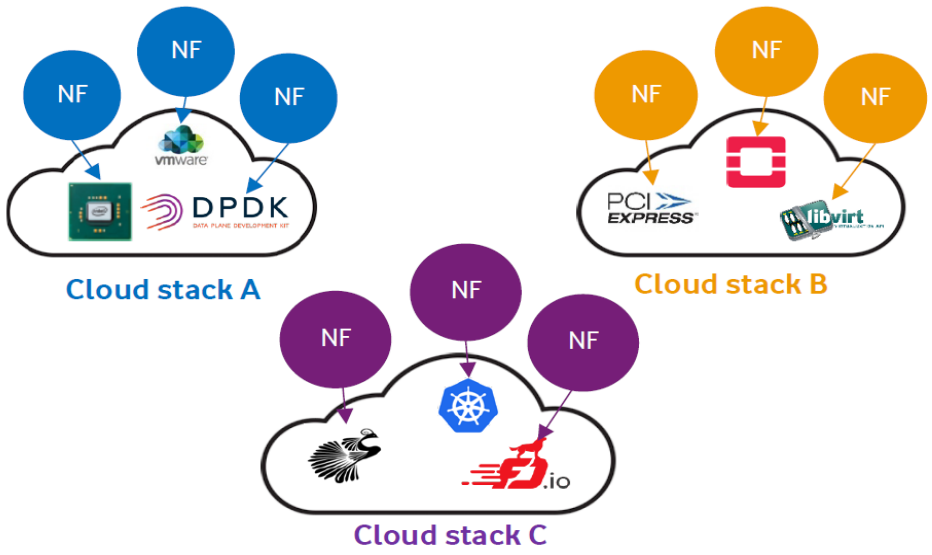
For v1alpha1, the API comprises 5 Custom Resource Definitions (CRDs):

1. Cluster,
2. Machine,
3. Machine Set,
4. Machine Deployment, and
5. Machine Class. Kubernetes

Cluster API Lays the Groundwork for Declarative Kubernetes Lifecycle Management with v1alpha1, May 2019

1. Declarative APIs & YAML - 4b

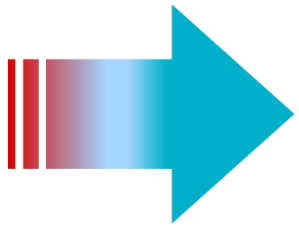
Anuket | Problem Statement



Many combinations

=

silo deployments



NF Vendor A

NF Vendor B

NF Vendor C

Cloud native VNFs

Infrastructure Abstraction

(Common Shared Infrastructure)

- ✓ Reduced TCO
- ✓ Consistent Operating Model
- ✓ Better Utilized Infrastructure
- ✓ Scalable
- ✓ Easy to automate
- ✓ Unified Verification and Testing

1. Declarative APIs & YAML - 6

ETSI ISG MEC
World Class Standards

5.3 Provision of an OpenAPI definition

An ETSI ISG MEC GS defining a RESTful MEC service API should provide a supplementary description file (or supplementary description files) compliant to the OpenAPI specification [i.14], which inherently include(s) a definition of the data structures of the API in JSON schema or YAML format. A description file is machine readable facilitating content validation and autocreation of stubs for both the service client and server. A link to the specific repository containing the file(s) shall be provided. All API repositories can be accessed from https://forge.etsi.org. The file (or files) shall be informative. In case of a discrepancy between supplementary description file(s) and the underlying specification, the underlying specification shall take precedence.

5.4 Documentation of the API data model

5.4.1 Overview

Clause 5.4 and its clauses specify provisions for API data model documentation for ETSI ISG MEC GSs defining RESTful MEC service APIs. Clause 5 in annex D provides a related data model template.

The data model shall be defined using a tabular format as described in the following clauses. The name of the data type shall be documented appropriately in the heading of the clause and in the caption of the table, preferably as defined in clause 5.2.2 and in annex D.

1. Declarative APIs & YAML - 7

What is APIs YAML: Machine Readable Specification

YAML 1.2 is a superset of JSON (JavaScript Object Notation) with some built-in advantages, e.g.

YAML can

- Self-reference,
- **Support Complex Datatypes,**
- Embed Block Literals,
- Support comments, and more.

YAML tends to be more readable than JSON.

Access Context Manager documentation

Access Context Manager allows enterprises to configure access levels which map to a policy defined on request attributes. Learn more

Guides

Quickstart

Creating a basic access level

Managing access levels

IAM Roles for Administering Access Context Manager

Creating an access policy

Reference

Access level attributes

Example YAML for an access level

Custom access level specification

REST API

RPC API

Resources

Quotas and limits

Release Notes

Pricing

Release Requirements / REQ-329

Guilin-R7 - Support for Intent-based Network

Clone++ Export

Details

Type:	Epic	Status:	DONE
Priority:	High	Resolution:	Done
Affects Version/s:	None	Fix Version/s:	Guilin Release
Labels:	None		
Epic Name:	Intent-based Network		
Requirement Type:	Requirement (DEPRECATED)		
PoC:	PoC		
TSC Priority:	4		
Arch Review:	Not yet performed		
Scope Status:	Original Scope		
T-Shirt Size:	XL		
M1 Scorecard:	Green		
M1 Approval:	GO		
M2/3 Scorecard:	Green		
M2/3 Approval:	GO		
M4 Scorecard:	Green		
M4 Approval:	GO		

People

Assignee:	Huang ZongHe
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Dates

Created:	20/May/20 2:29 AM
Updated:	06/Jan/21 8:56 AM
Resolved:	02/Dec/20 8:32 AM

MEF and TM Forum Collaborate on Open APIs for Service Automation

Media Contact:
Ashley Schulte
Connect2 Communications for MEF
MEF@connect2comm.com

MEF and TM Forum align to bring consistency and ease-of-use to standardized APIs for inter-provider services

Los Angeles, 7 October 2020 – MEF and TM Forum have completed initial efforts to ensure that both organizations are aligned to use open standard APIs to automate inter-provider services for digital transformation. This collaboration will help service providers accelerate their transition from operating within limited ecosystems/islands to being integral players in a worldwide federation of networks supporting on-demand digital services across multiple providers.

TM Forum and MEF have specifically aligned on the following:

- TM Forum is developing Domain Context Specialization Guidelines that enable MEF LSO Sonata APIs to conform to TM Forum Open API standards.
- TM Forum API tooling is now being used by MEF to build the set of LSO Sonata APIs.
- LSO Sonata API product payloads work in alignment with TM Forum API standards using a polymorphic approach.
- The organizations have established a framework for ongoing collaboration.

1. 5G NF as a Service "Producer" and "Consumer" (+ Intent)

2. 5G NDL - Network Data Layer - separation of the 5G "Compute" in NFs implementation into VNFs & PNFs related

(NF) Application Context from (NF) Application Business Logic

Management Services (MnS)

An Management Service (MnS) offers Capabilities for Management and Orchestration of Network and Service.

The entity producing an MnS is called **MnS Producer.**

The entity consuming an MnS is called **MnS Consumer.**

An MnS provided by an MnS Producer can be consumed by any entity with appropriate Authorisation and Authentication.

An MnS Producer offers its services via a Standardized Service Interface composed of individually specified MnS Components.

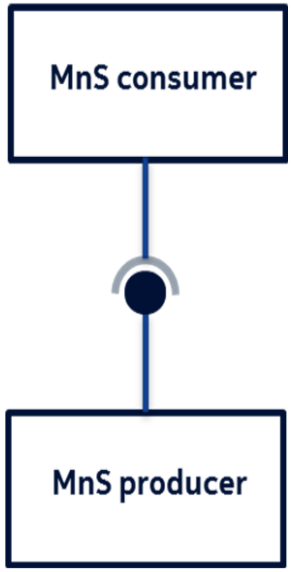


Figure 4.1.1: MnS producer and MnS consumer

- Intent from Communication Service Provider (Intent-CSP)
- Intent from Network Operator (Intent-NOP)

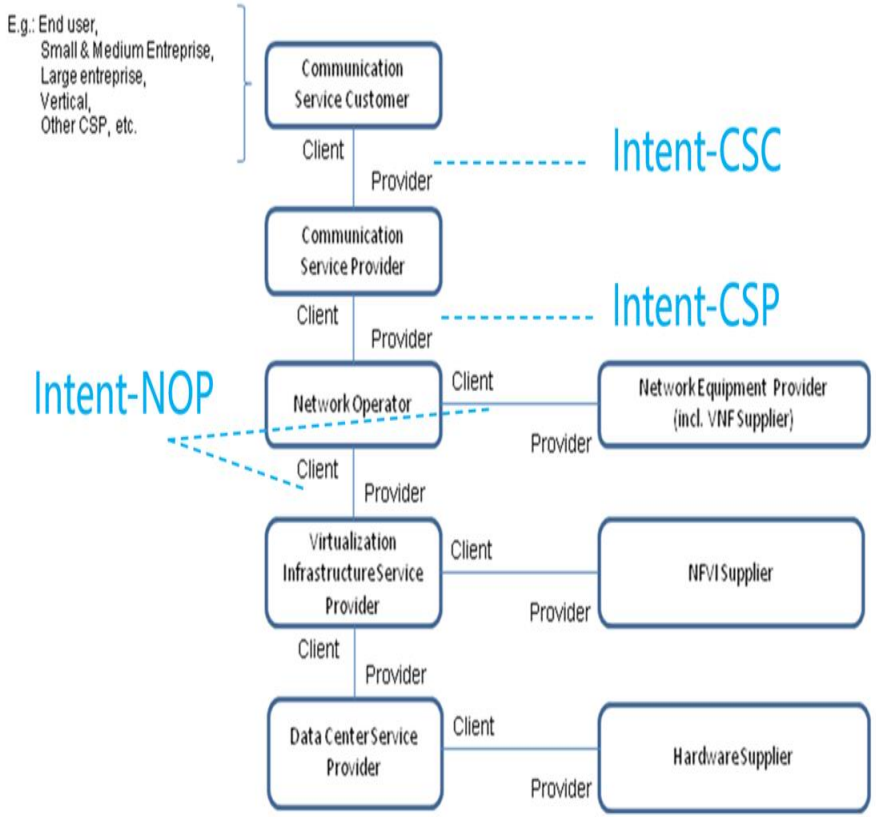


Figure 4.1.2.4-1: Concept for utilization of intent

4.1.2.5 Intent driven Management Service (MnS) interactions with 3GPP management functions

The following figure shows the interaction of intent driven management service (MnS) with management functions.

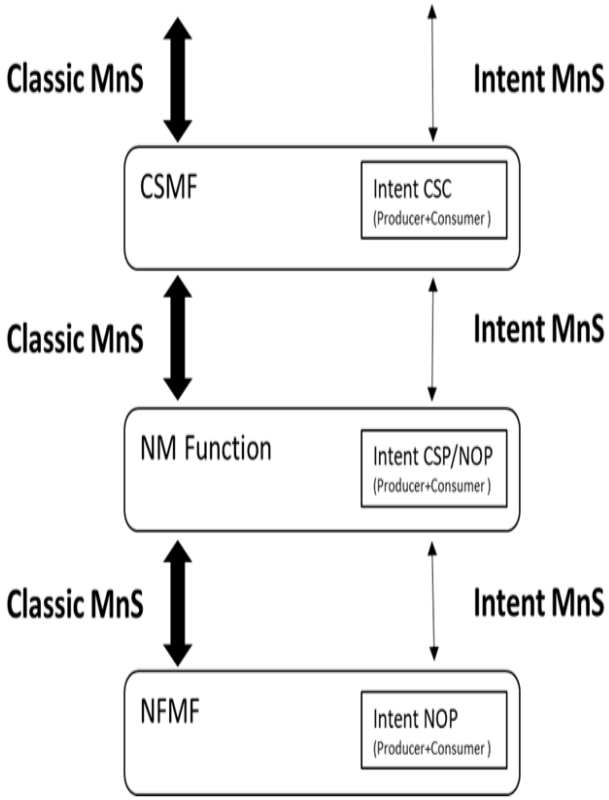


Figure 4.1.2.5.1: The intent driven management service (MnS) vs classic MnS

2. **5G NDL - Network Data Layer** - separation of the 5G "Compute" from "Storage" via 5G UDM in NFs implementation into VNFs & PNFs related

(NF) Application Context (Unstructured Data in UDSF)

from

(NF) Application Business Logic (Structured Data in UDR)

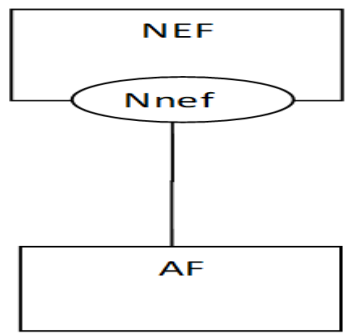
3GPP 5G NAPS -Northbound Application Program Interfaces (APIs) - 1

5G NAPS Reference model

The NEF Northbound Interface resides between the NEF and the AF.

It specifies RESTful APIs that allow the AF to access the Services and Capabilities provided by 3GPP Network Entities and securely exposed by the NEF.

An AF can get services from multiple NEFs, and an NEF can provide services to multiple AFs.



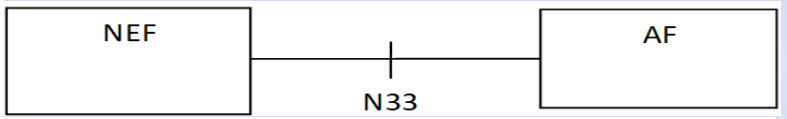


Fig. Reference Architecture for the Nnef Service SBI & Reference Point representation

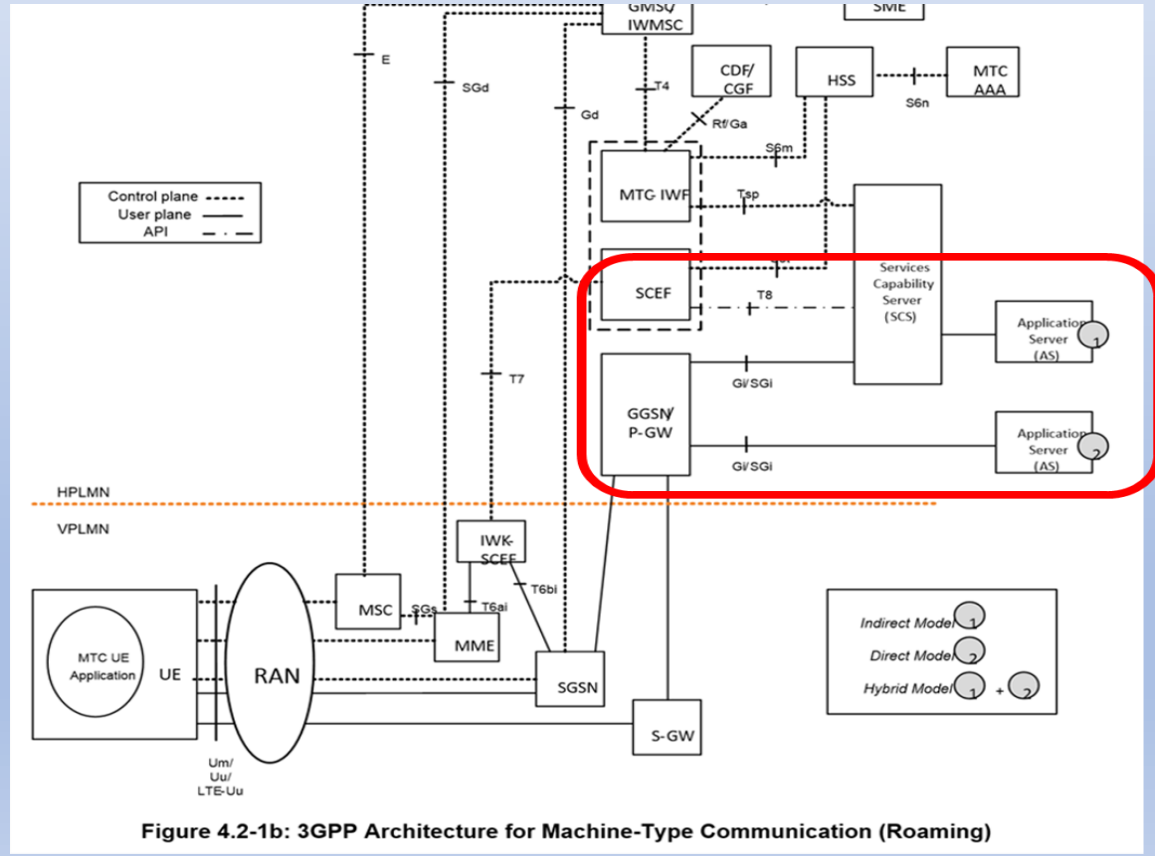


Figure 4.2-1b: 3GPP Architecture for Machine-Type Communication (Roaming)

3GPP 5G Rel. 18 SEES and FMSS NAPS to 5G Subscriber -2

"The Operator shall be able to provide to a 3rd Party Service Provider secure and chargeable access to the Exposed Services/Capabilities i.e. to Authenticate, Authorize and Charge the 3rd Party entities."

MNO can allow the API access of an 3rd Party entity by taking into account the 5GS Subscriber-based check.

Possibility of utilizing those APIs can be open directly to the 5GS subscriber. MNOs need to be cautious of securing its 5GS Subscribers' Privacy.

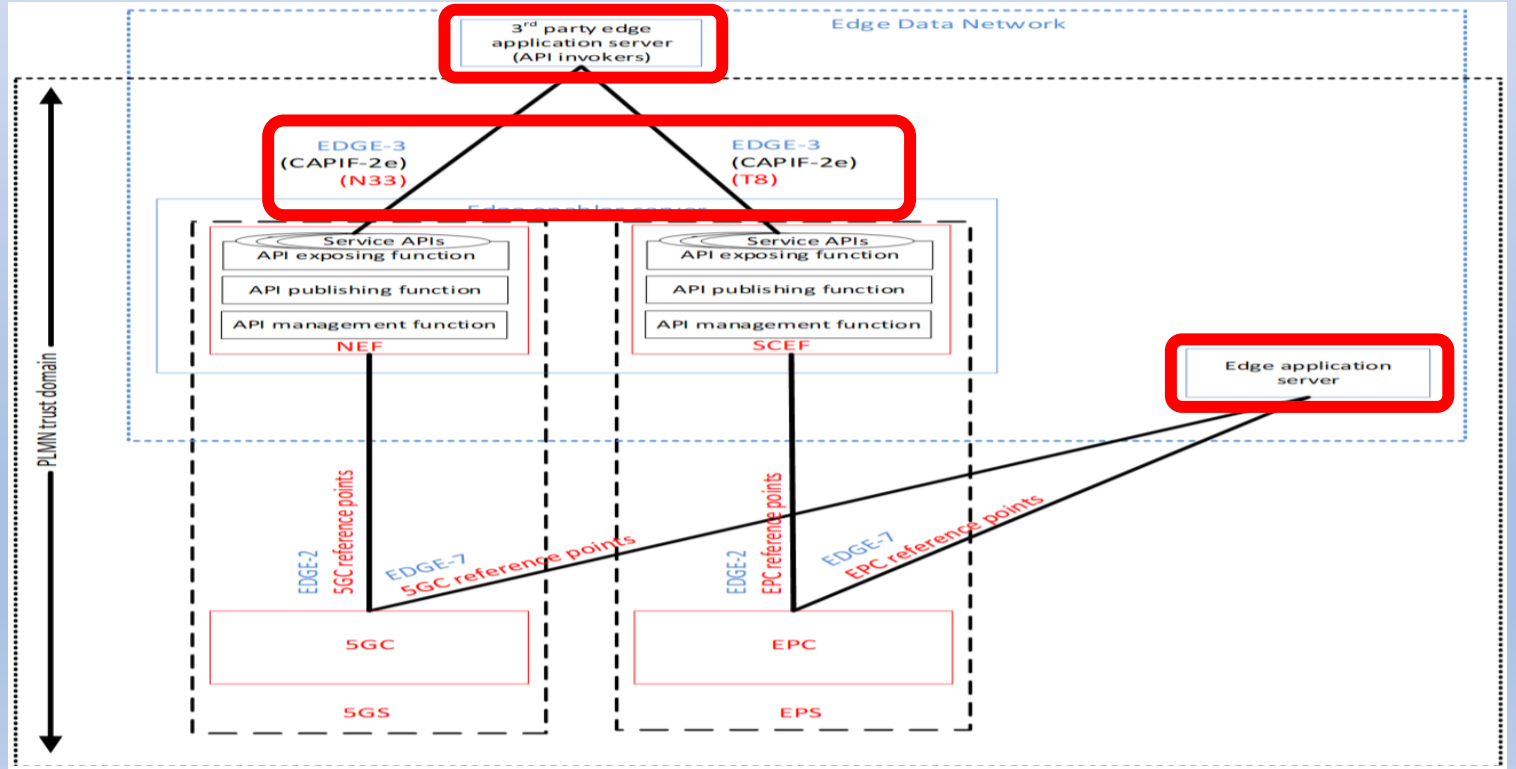


Figure 7.10.1.4.-1: EES and EAS direct interaction with 3GPP Core Network

GSMA Operator Platform (OP) Telco Edge Proposal

User to Network Interface - UNI

User-Network Interface (UNI): enables the User Client (UC) hosted in the UE to communicate with the OP.

1. The primary function of the UNI is to enable a User Client to interact with the OP, to enable the matching of an Application Client with an Application Instance on a Cloudlet.

2. User Client should be capable of being implemented on User Equipment SW, e.g. as an SDK or OS add-on.

3. The UNI shall allow the User Client to discover the existence of an Edge Cloud service.

4. The OP's UNI shall allow the User client registration process with the Operator Platform SRM.

Federation Broker Role for Federation and Platform Interconnection

GSMA

Operator Platform Telco Edge Proposal
Version 1.0
22 October 2020

1.3 Reference Architecture

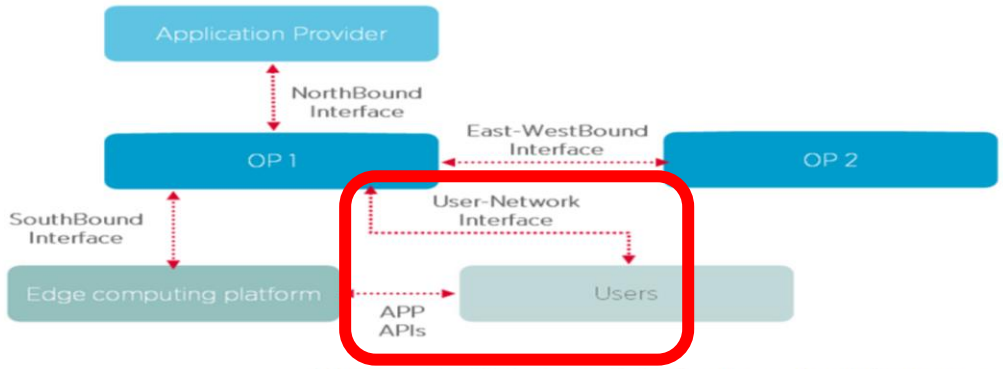


Figure 1: High-Level Reference Architecture

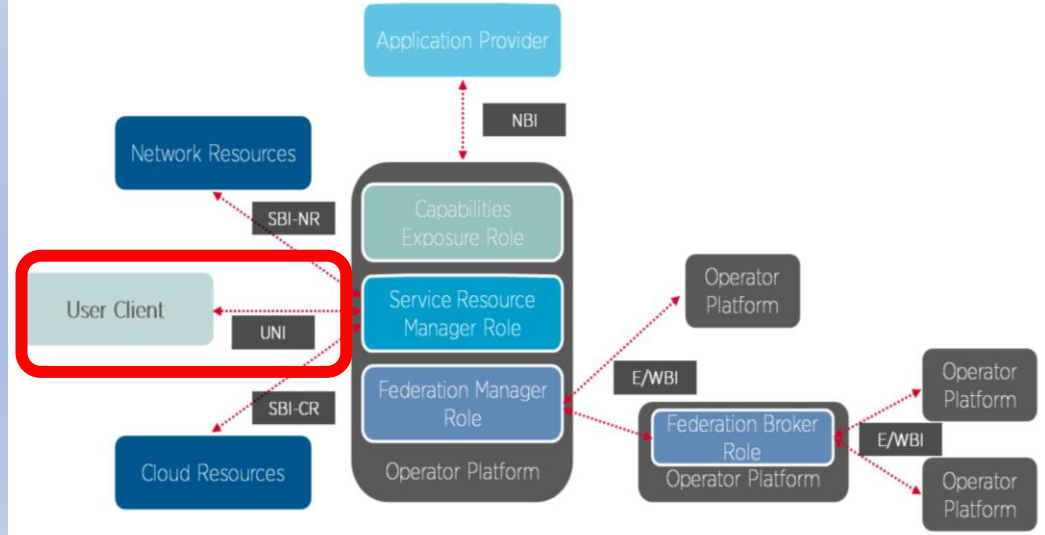


Figure 2: OP Roles and Interfaces Reference Architecture

ETSI MEC use of Federaion Broker enabling Edge Services across MEC System

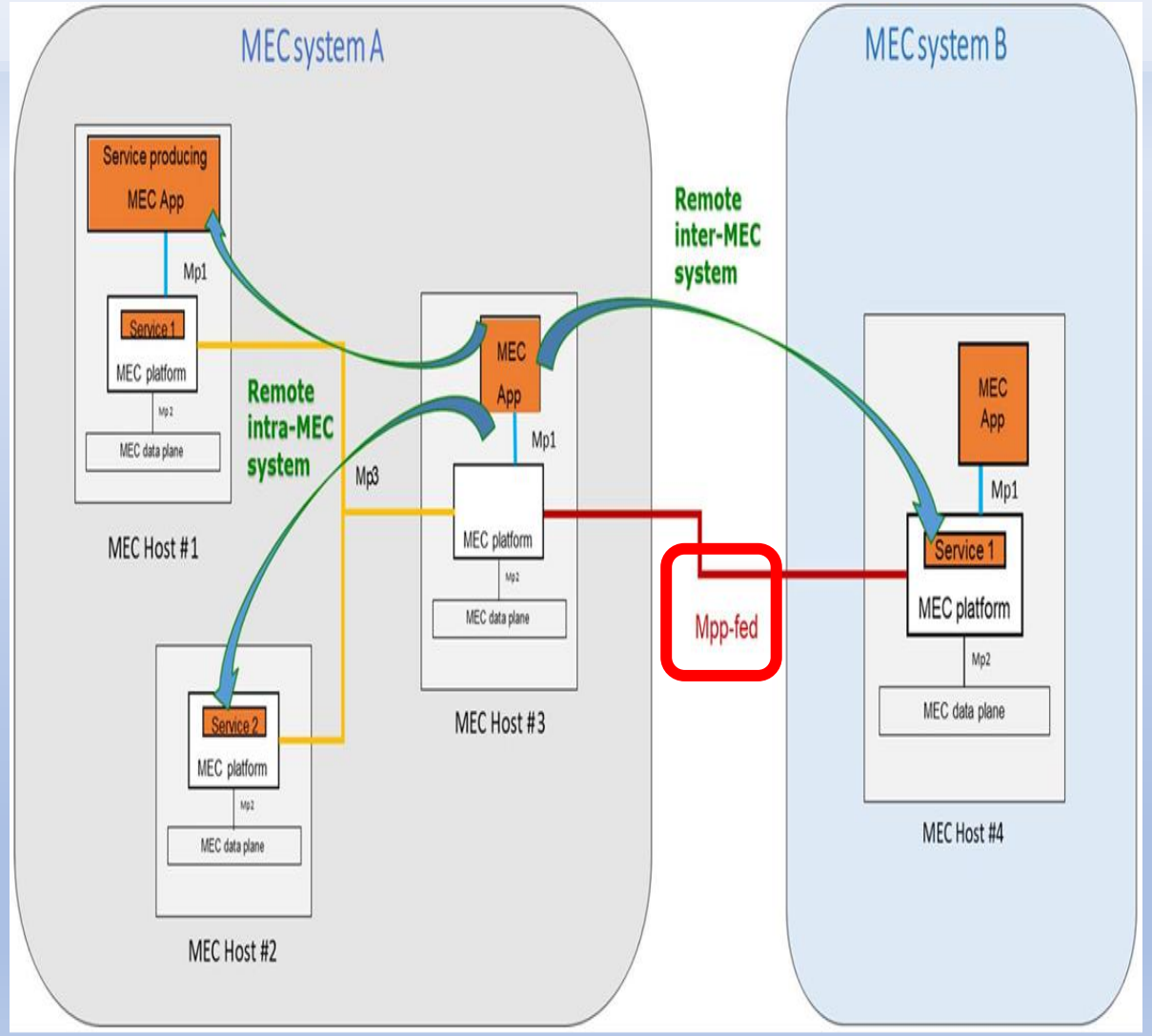


Fig. 6.5.2-1: MEC Federation Scenario enabling Edge Service consumption across MEC Systems.

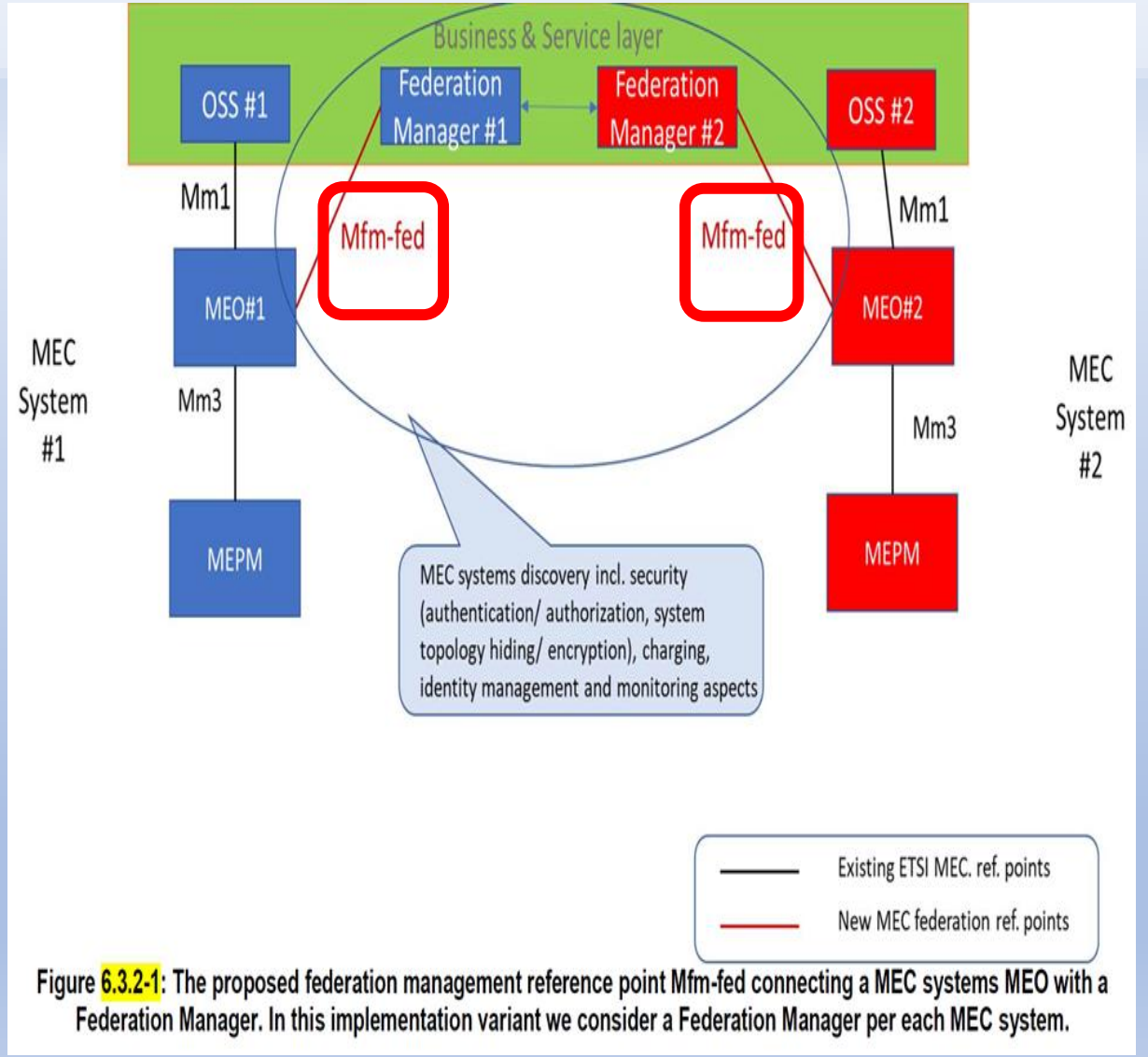


Figure 6.3.2-1: The proposed federation management reference point Mfm-fed connecting a MEC systems MEO with a Federation Manager. In this implementation variant we consider a Federation Manager per each MEC system.

NBI for E2E Service Management in ETSI ZSM

Figure 4-2 illustrates the set of technology domains considered in the present document. In deployments, there may be additional technology domains. Clause 6 documents the Northbound Interfaces of Management domains based on different technologies.

The NBIs of the E2E Service Management domain are to be defined.

One candidate: TM Forum Interfaces.

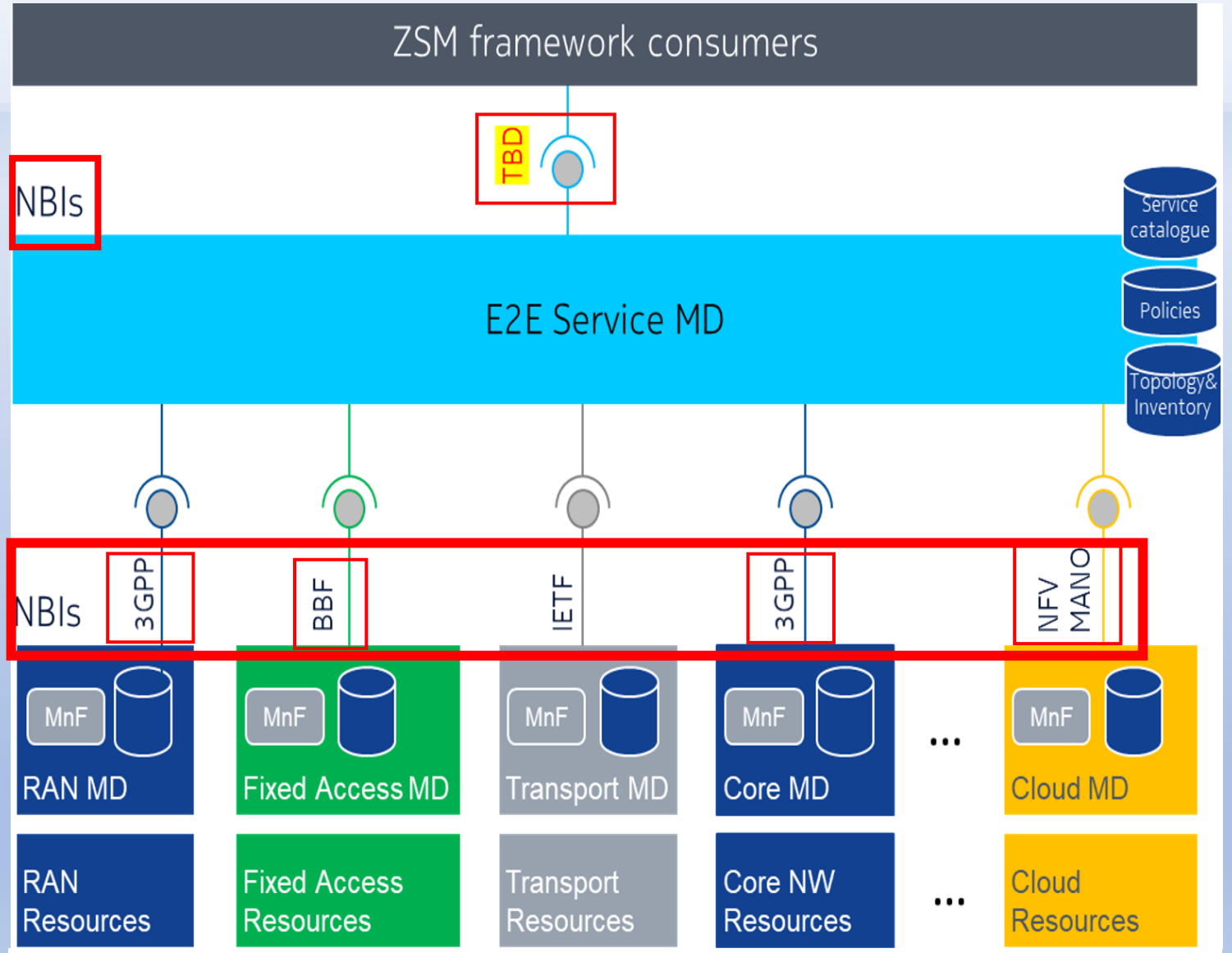


Figure 4-2: Domain NBIs consumed during the Management of the Lifecycle of E2E Services

oneM2M Service Layer (SL) - Horizontal Architecture providing a Common Framework for IoT,

oneM2M has identified a **Set of Common Functionalities**, that are **applicable to all the IoT domains**.

Think of these functions as a large toolbox with special tools to solve a number of IoT problems across many different domains. The oneM2M CSFs are applicable to different IoT UCs in different industry domains.

oneM2M has standardized how these Functions are being executed, i.e. is has defined Uniform APIs to access these Functions.

Figure 6.2.0-1 shows a grouping of these Functions into a few different scopes.

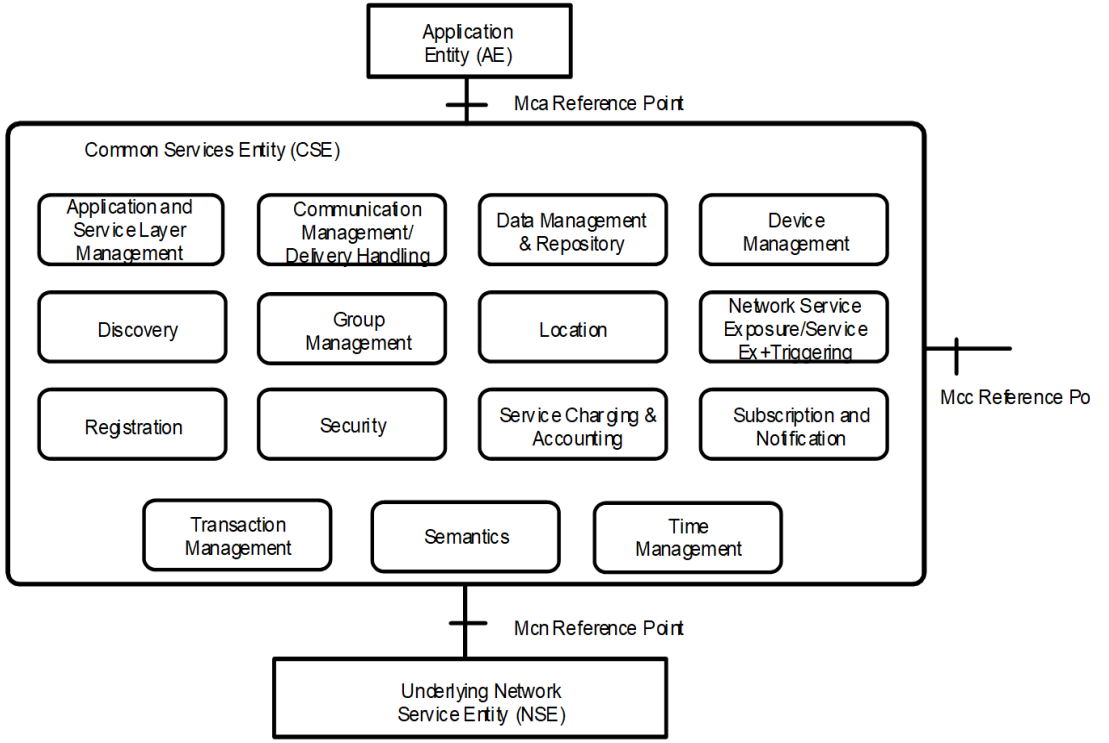


Fig. 6.2.0-1: Common Service Functions

SAREF - Smart Applications REFerence Ontology

SAREF is the Reference Ontology for Smart Applications and contains recurring concepts that are used in several Domains. SAREF has a close relation with the oneM2M Base Ontology, for which a mapping is defined in clause 5.

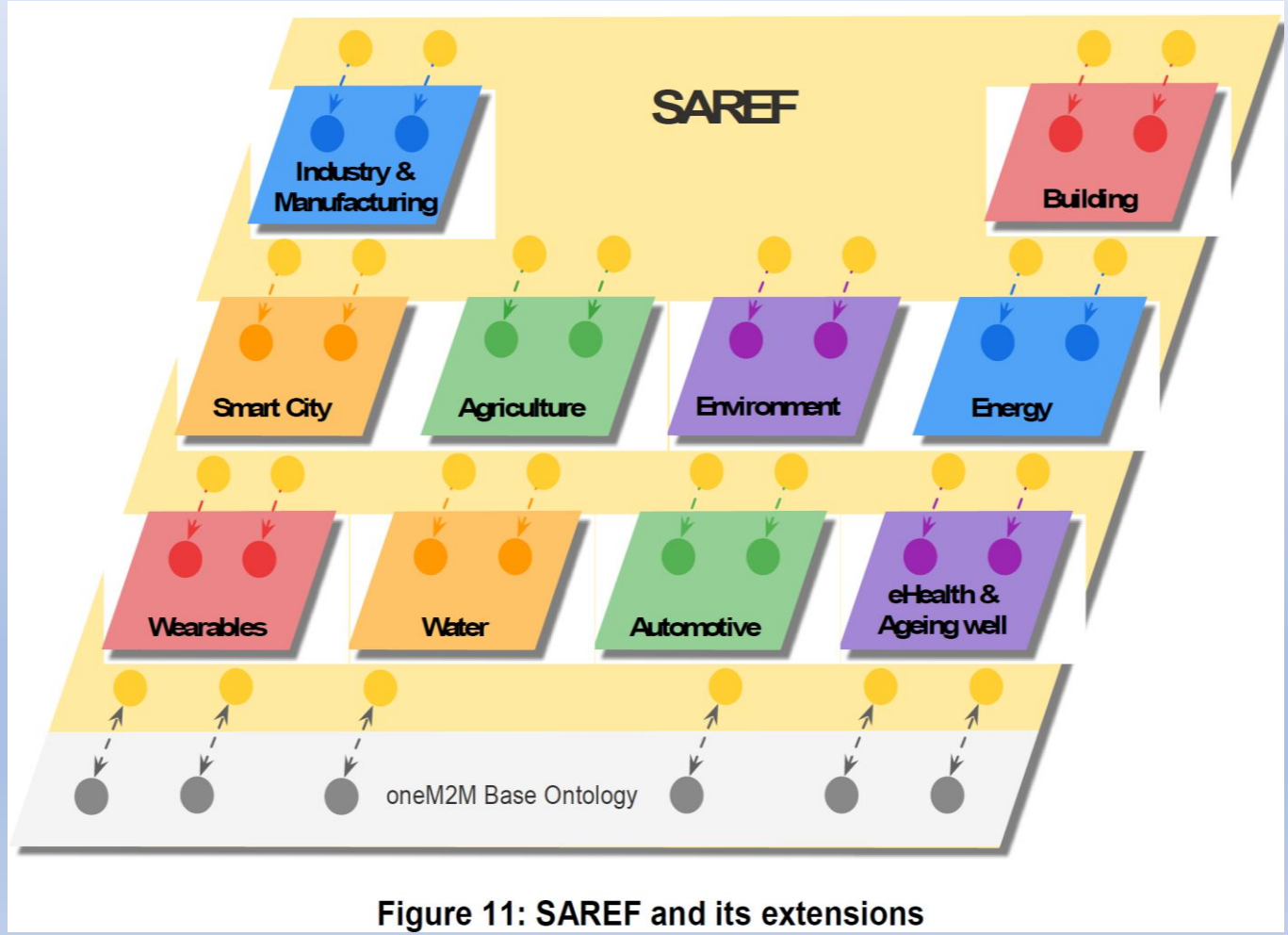


Figure 11: SAREF and its extensions

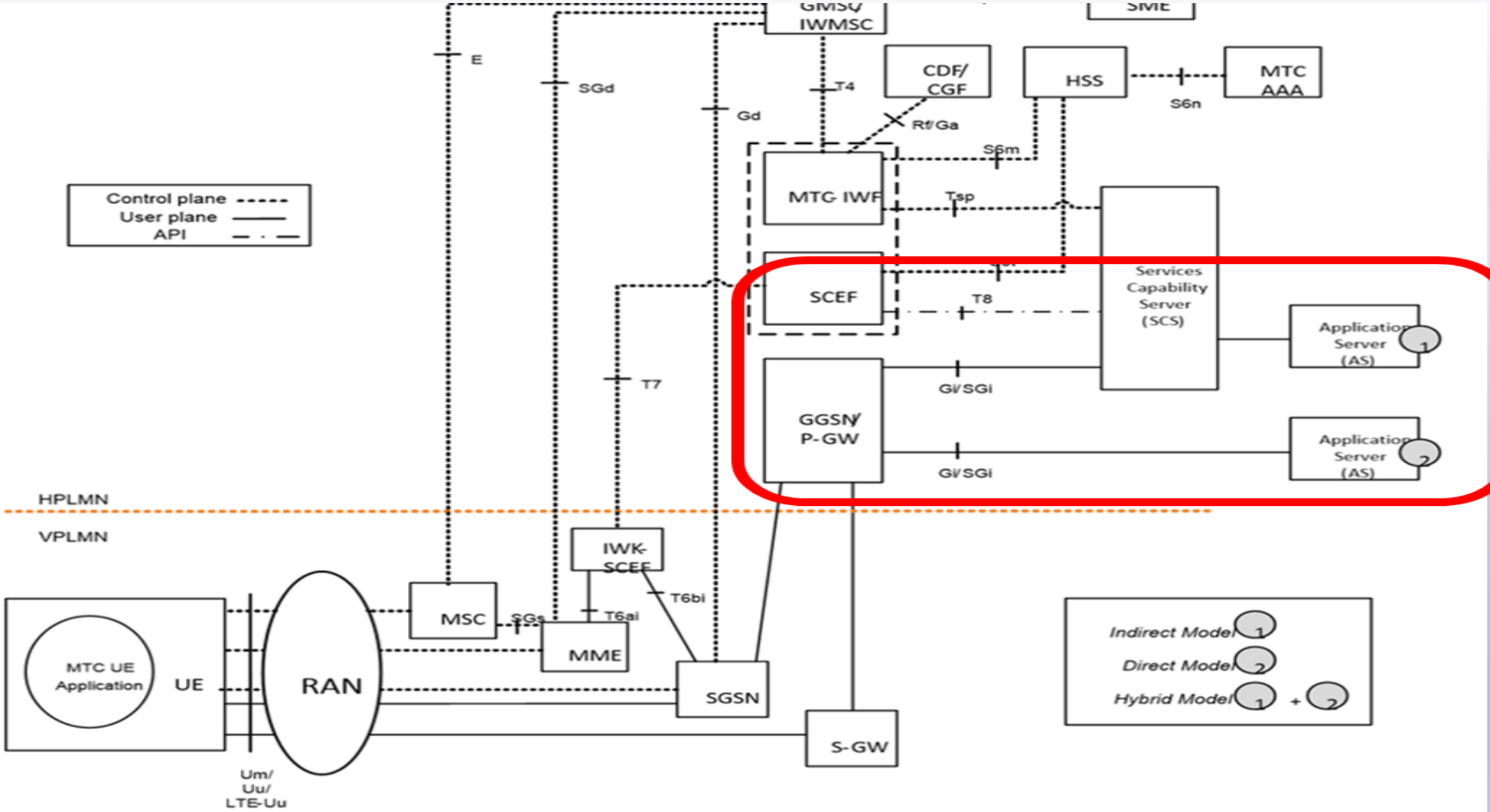


Figure 4.2-1b: 3GPP Architecture for Machine-Type Communication (Roaming)

Standardised SST values

Standardized SST values provide a way for establishing global interoperability for slicing so that PLMNs can support the roaming use case more efficiently for the most commonly used Slice/Service Types.

The SSTs which are standardised are in the following Table 5.15.2.2-1.

Table 5.15.2.2-1 - Standardised SST values

Slice/Service type	SST value	Characteristics
eMBB	1	Slice suitable for the handling of 5G enhanced Mobile Broadband.
URLLC	2	Slice suitable for the handling of ultra- reliable low latency communications.
MIoT	3	Slice suitable for the handling of massive IoT.
V2X	4	Slice suitable for the handling of V2X services.

NOTE: The support of all standardised SST values is not required in a PLMN. Services indicated in this table for each SST value can also be supported by means of other SSTs.

3GPP 5G SCEF/SCS for IoT Platform integrated with IoT SL across 10 UCs - 1

Functional mapping between 3GPP and oneM2M

Figure 5.2-1 shows an Architecture and Functional mapping for the 3GPP Trust Domain which describes how oneM2M Functional Entities may access Features and Services that are exposed by 3GPP.

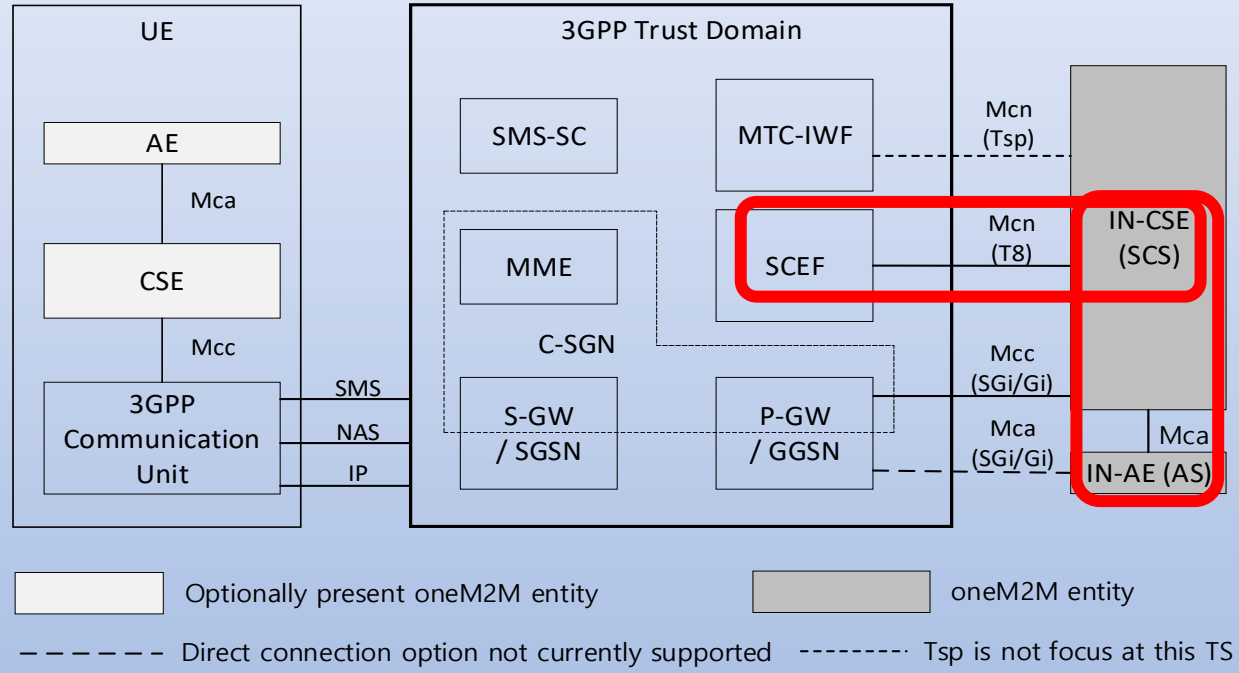


Figure 5.2-1: oneM2M Interfaces to the underlying 3GPP Network

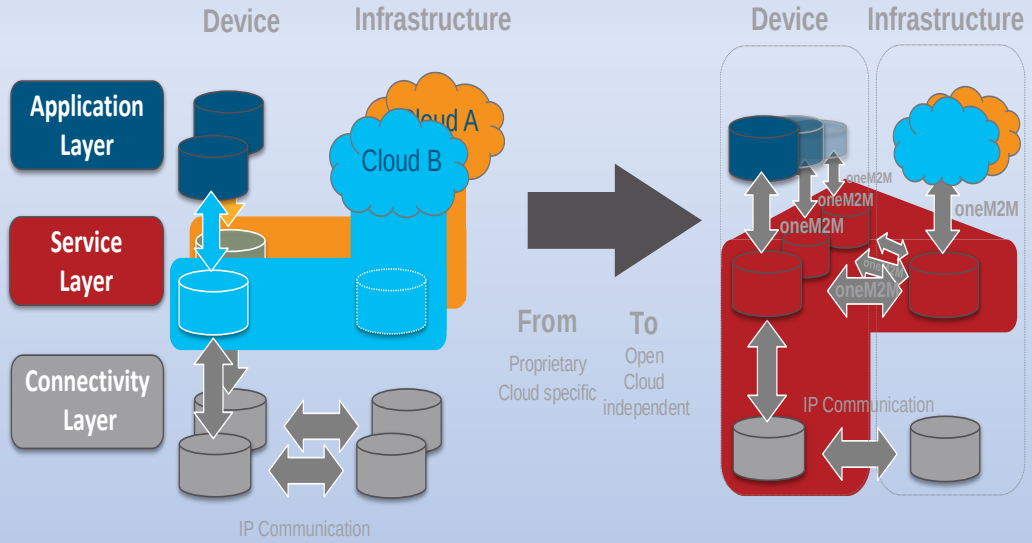


Figure 5.1.1-3: Cloud provider independent

Several implementation options for the placement of the oneM2M IN-CSE relative to the SCEF and the underlying 3GPP network are envisioned. In all implementations, the SCEF always resides within 3GPP domain.

In some options the IN-CSE and the SCEF are deployed by a MNO and are both part of the operator domain. In other options the SCEF is part of the 3GPP domain and the IN-CSE is not part of the operator domain.

In all options, services within the IN-CSE may access the network services that are exposed by the SCEF via the T8 reference point APIs.

Table 1: 5G User Equipment (UE) Service Access Identities Configuration

Access Identity number	UE configuration
0	UE is not configured with any parameters from this table
1 (NOTE 1)	UE is configured for Multimedia Priority Service (MPS).
2 (NOTE 2)	UE is configured for Mission Critical Service (MCS).
3	UE for which Disaster Condition applies (note 4)
4-10	Reserved for future use
11 (NOTE 3)	Access Class 11 is configured in the UE.
12 (NOTE 3)	Access Class 12 is configured in the UE.
13 (NOTE 3)	Access Class 13 is configured in the UE.
14 (NOTE 3)	Access Class 14 is configured in the UE.
15 (NOTE 3)	Access Class 15 is configured in the UE.

NOTE 1: Access Identity 1 is used by UEs configured for MPS, in the PLMNs where the configuration is valid. The PLMNs where the configuration is valid are HPLMN, PLMNs equivalent to HPLMN, and visited PLMNs of the home country.
Access Identity 1 is also valid when the UE is explicitly authorized by the network based on specific configured PLMNs inside and outside the home country.

NOTE 2: Access Identity 2 is used by UEs configured for MCS, in the PLMNs where the configuration is valid. The PLMNs where the configuration is valid are HPLMN or PLMNs equivalent to HPLMN and visited PLMNs of the home country. Access Identity 2 is also valid when the UE is explicitly authorized by the network based on specific configured PLMNs inside and outside the home country.

NOTE 3: Access Identities 11 and 15 are valid in Home PLMN only if the EHPLMN list is not present or in any EHPLMN. Access Identities 12, 13 and 14 are valid in Home PLMN and visited PLMNs of home country only. For this purpose, the home country is defined as the country of the MCC part of the IMSI.

NOTE 4: The configuration is valid for PLMNs that indicate to potential Disaster Inbound Roamers that the UEs can access the PLMN. See clause 6.31.

Table 3: Performance Requirements for High Data Rate and Traffic Density Scenarios

	Scenario	Experienced data rate (DL)	Experienced data rate (UL)	Area traffic capacity (DL)	Area traffic capacity (UL)	Overall user density	Activity factor	UE speed	Coverage
1	Urban macro	50 Mbit/s	25 Mbit/s	100 Gbit/s/km^2 (note 4)	50 Gbit/s/km^2 (note 4)	10 000/km^2	20 %	Pedestrians and users in vehicles (up to 120 km/h	Full network (note 1)
2	Rural macro	50 Mbit/s	25 Mbit/s	1 Gbit/s/km^2 (note 4)	500 Mbit/s/km^2 (note 4)	100/km^2	20 %	Pedestrians and users in vehicles (up to 120 km/h	Full network (note 1)
3	Indoor hotspot	1 Gbit/s	500 Mbit/s	15 Tbit/s/km^2	2 Tbit/s/km^2	250 000/km^2	note 2	Pedestrians	Office and residential (note 2) (note 3)
4	Broadband access in a crowd	25 Mbit/s	50 Mbit/s	[3,75] Tbit/s/km^2	[7,5] Tbit/s/km^2	[500 000]/km^2	30 %	Pedestrians	Confined area
5	Dense urban	300 Mbit/s	50 Mbit/s	750 Gbit/s/km^2 (note 4)	125 Gbit/s/km^2 (note 4)	25 000/km^2	10 %	Pedestrians and users in vehicles (up to 60 km/h)	Downtown (note 1)
6	Broadcast-like services	Maximum 200 Mbit/s (per TV channel)	N/A or modest (e.g. 500 kbit/s per user)	N/A	N/A	[15] TV channels of [20 Mbit/s] on one carrier	N/A	Stationary users, pedestrians and users in vehicles (up to 500 km/h)	Full network (note 1)
7	High-speed train	50 Mbit/s	25 Mbit/s	15 Gbit/s/train	7,5 Gbit/s/train	1 000/train	30 %	Users in trains (up to 500 km/h)	Along railways (note 1)
8	High-speed vehicle	50 Mbit/s	25 Mbit/s	[100] Gbit/s/km^2	[50] Gbit/s/km^2	4 000/km^2	50 %	Users in vehicles (up to 250 km/h)	Along roads (note 1)
9	Airplanes connectivity	15 Mbit/s	7,5 Mbit/s	1,2 Gbit/s/plane	600 Mbit/s/plane	400/plane	20 %	Users in airplanes (up to 1 000 km/h)	(note 1)

NOTE 1: For users in vehicles, the UE can be connected to the network directly, or via an on-board moving base station.
NOTE 2: A certain traffic mix is assumed; only some users use services that require the highest data rates [2].
NOTE 3: For interactive audio and video services, for example, virtual meetings, the required two-way end-to-end latency (UL and DL) is 2-4 ms while the corresponding experienced data rate needs to be up to 8K 3D video [300 Mbit/s] in uplink and downlink.
NOTE 4: These values are derived based on overall user density. Detailed information can be found in [10].
NOTE 5: All the values in this table are targeted values and not strict requirements.

Table 5: UE to Satellite Propagation Delay

	UE to satellite Delay [ms]		One-Way Max propagation delay [ms]
	Min	Max	
LEO	3	15	30
MEO	27	43	90
GEO	120	140	280

Table 6: Performance Requirements for Satellite Access

Scenario	Experienced data rate (DL)	Experienced data rate (UL)	Area traffic capacity (DL) (note 1)	Area traffic capacity (UL) (note 1)	Overall user density	Activity factor	UE speed	UE type
Pedestrian (note 2)	[1] Mbit/s	[100] kbit/s	1,5 Mbit/s/km^2	150 kbit/s/km^2	[100]/km^2	[1,5] %	Pedestrian	Handheld
Public safety	[3,5] Mbit/ss	[3,5] Mbit/s	TBD	TBD	TBD	N/A	100 km/h	Handheld
Vehicular connectivity (note 3)	50 Mbit/s	25 Mbit/s	TBD	TBD	TBD	50 %	Up to 250 km/h	Vehicle mounted
Airplanes connectivity (note 4)	360 Mbit/s/ plane	180 Mbit/s/ plane	TBD	TBD	TBD	N/A	Up to 1000 km/h	Airplane mounted
Stationary	50 Mbit/s	25 Mbit/s	TBD	TBD	TBD	N/A	Stationary	Building mounted
Narrowband IoT connectivity	[2] kbit/s	[10] kbit/s	8 kbit/s/km^2	40 kbit/s/km^2	[400]/km2	[1] %	[Up to 100 km/h]	IoT

Note 1: Area capacity is averaged over a satellite beam.
Note 2: Data rates based on Extreme long-range coverage target values in clause 6.17.2. User density based on rural area in Table 7.1-1.
Note 3: Based on Table 7.1-1
Note 4: Based on an assumption of 120 users per plane 15/7.5 Mbit/s data rate and 20 % activity factor per user
Note 5: All the values in this table are targeted values and not strict requirements.
Note 6: Performance requirements for all the values in this table should be analyzed independently for each scenario.

Table 7: Performance Requirements for Highly Reliable Machine Type Communication

Profile	Characteristic parameter					Influence quantity					
	Communication service availability: target value in %	Communication service reliability (Mean Time Between Failure)	End-to-end latency: maximum	Bit rate	Direction	Message Size [byte]	Transfer Interval	Survival Time	UE speed (km/h)	# of UEs connection	Service Area
Medical monitoring (note 2)	> 99,9999	<1 year (>> 1 month)	< 100 ms	< 1 Mbit/s	Uplink	~ 1000	50 ms	Transfer Interval	< 500	10/km^2 to 1000/km^2	Country wide including rural areas and deep indoor. (note 1)

NOTE 1: "deep indoor" term is meant to be places like e.g. elevators, building's basement, underground parking lot, …

NOTE 2: These performance requirements aim energy-efficient transmissions performed using a device powered with a 3.3V battery of capacity < 1000 mAh that can last at least 1 month without recharging and whereby the peak current for transmit operations stays below 50 mA.

Latency needs to support example Use Cases (UCs) from Vertical Industries

Services/ Use cases	Automotive use cases	Transport, logistics, IoT use cases	Health and wellness, smart cities use cases	Media and entertainment
Description	Expand detectable range beyond on board sensor capability by sharing views or detected objects among traffic participants, coordinate trajectories among vehicles, sharing coarse driving intention, real-time remote operation of vehicles	Real-time sensing, reporting, feedback, control, remote, asset tracking, monitoring; context-aware services, recommendations at shopping mall, airport	Live video feed (4K, 8K, 3D for remote healthcare (consultation, monitoring) and assisted surgery, real-time commands to control medical devices for treatment (e.g. medication, surgery); remote monitoring, surveillance and guidance for citizens and law enforcement officers.	Media production services based on aggregation of various media feeds at servers; real-time peer-to-peer or server-client sharing of data (object information) for collaborative gaming, live streaming at live events
Latency	For mid/long-term environment modelling (dynamic high-definition digital map update): Not critical (100 ms end-to-end) For short term environment modelling (sensor sharing): <20 ms end-to-end For cooperation (coordinated control): - <3 ms end-to-end for platooning , - <10 ms end-to-end for cooperative manoeuvres , - <100 ms end-to-end for coarse driving intention For remote vehicle operation: 10-30 ms end-to-end	For massive connectivity for time-critical sensing and feedback: <30 ms end–to-end. For remote drone operation and cooperative farm machinery: 10-30 ms end-to-end Real-time control for discrete automation: ≤1 ms end-to-end	For real-time video/ telepresence/augmented reality for remote healthcare and assisted surgery, for monitoring and guidance (smart cities): 100 ms end-to-end Real-time command and control for remote medication and surgery: 10-100 ms end-to-end For smart grid: - <5 ms end-to-end for transmission/grid backbone, - <50 ms end-to-end for distribution/grid backhaul, Time-critical sensing and feedback for smart cities: 30 ms end-to-end	For live streaming in crowded areas, services for media production, augmented reality for collaborative gaming etc.: 20 ms end–to-end

Main SCEF Capabilities

A) Applying AAA to the 3rd Party/Enterprises API's use (and in particular Accounting)
- vital for Charging & therein new revenues) for the Enterprise (SCS/AS) use of the API (dedicated SCEF T8 interface)

B) Use of Externa Id (e.g "name-of-device@domain.com").
- no need/requirement to use the UE MSISDN as an Id, enhancement/improvement of Security.

C) NIDD (Non IP Data Delivery) Capability
- extending the NAS Protocol to communicate from the UE via MME and SCEF with the SCS/AS and avoid using resource demanding IP Protocol for sending small data messages over the Control Plane (CP).

D) New Services Capabilities
- **e.g.** functions such as "Network Configuration Parameters" enabling Enterprises SCS/AS to use the Network Functions e.g. for UE **PSM** (*Power Save Mode*), **DRX** (*Discontinuous Reception*), **TAU** (less *Tracking Area Updates*).

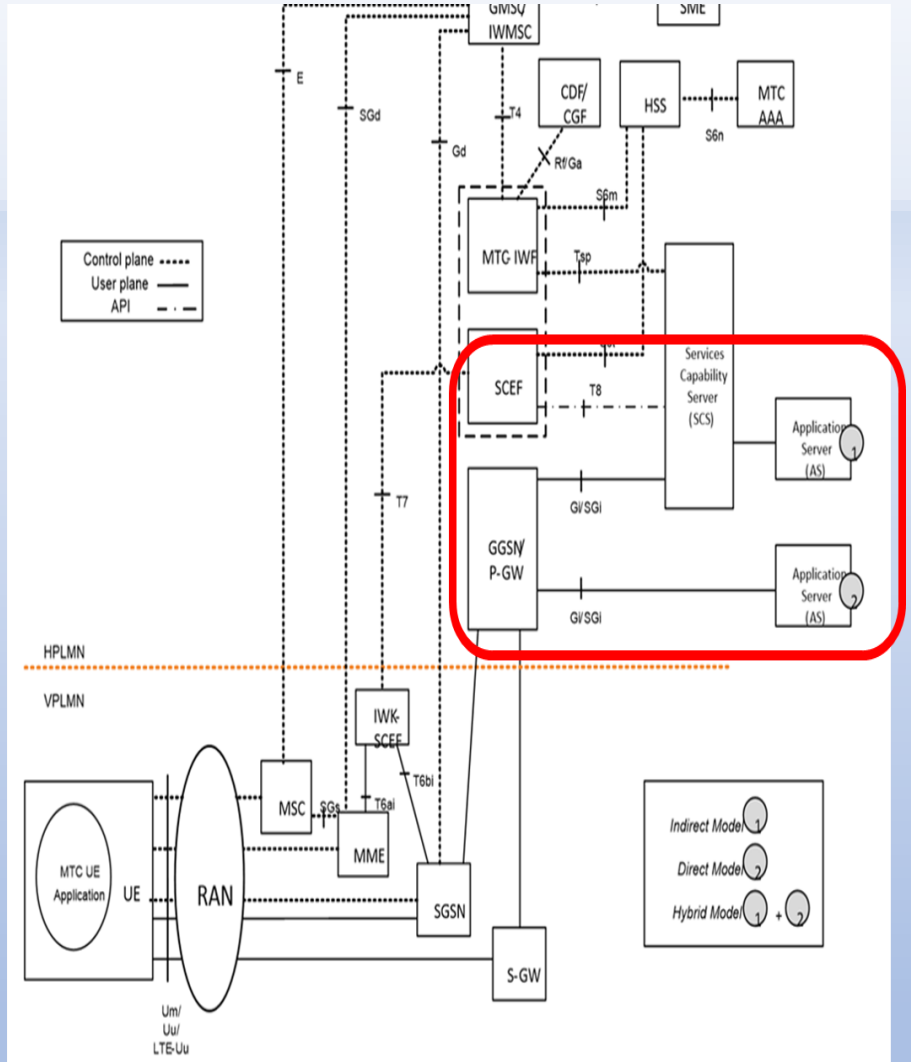


Figure 4.2-1b: 3GPP Architecture for Machine-Type Communication (Roaming)

oneM2M Service Layer (SL) - Horizontal Architecture providing a Common Framework for IoT,

Fig 5.1-1: oneM2M Layered Model

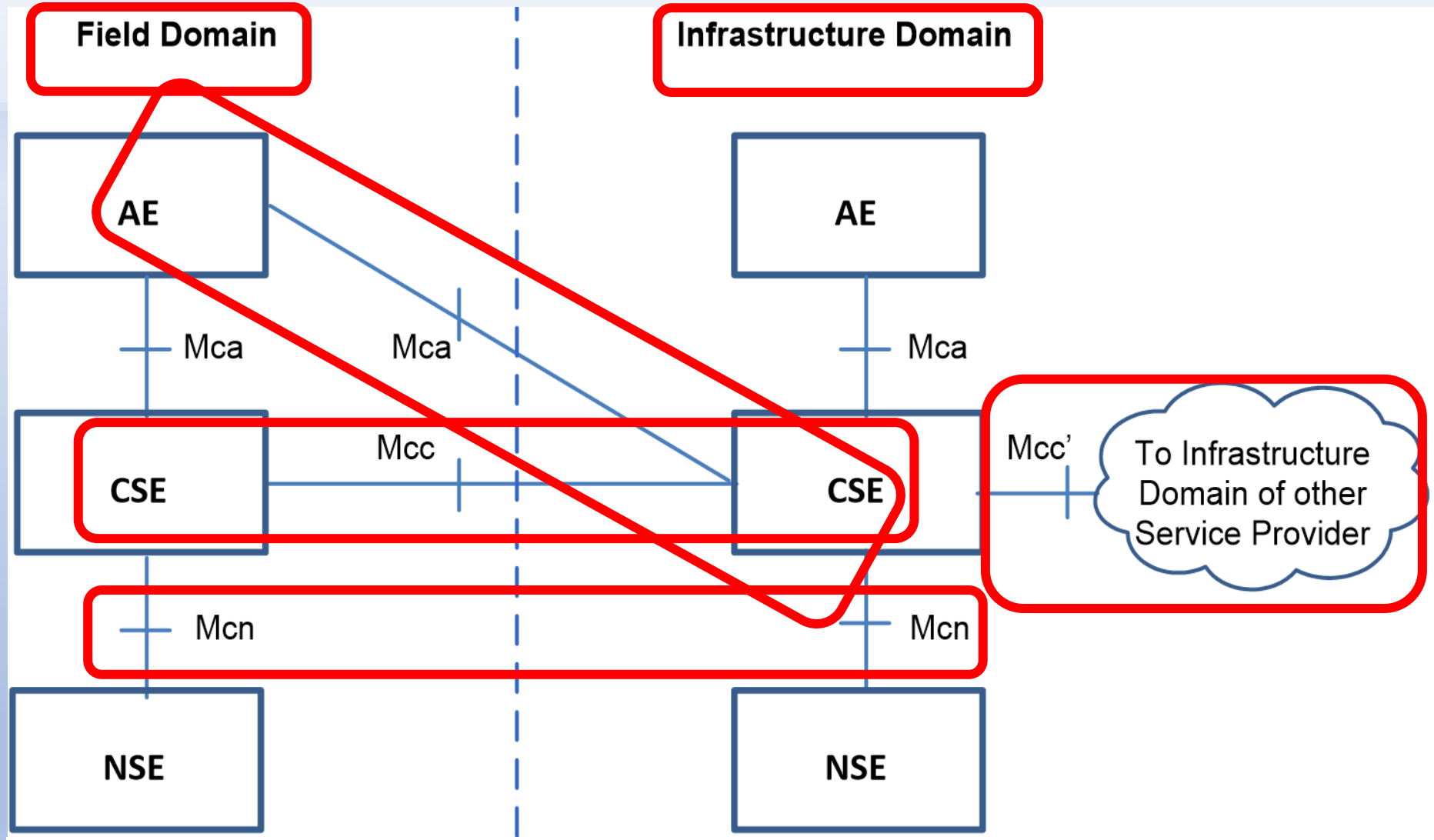


Figure 5.2.1-1: oneM2M Functional Architecture

Semantic discovery in presence of a "network" of M2M Service Providers (M2MSPs)

Ontologies and their OWL representations are used in oneM2M to provide syntactic and semantic interoperability of the oneM2M System with External Systems.

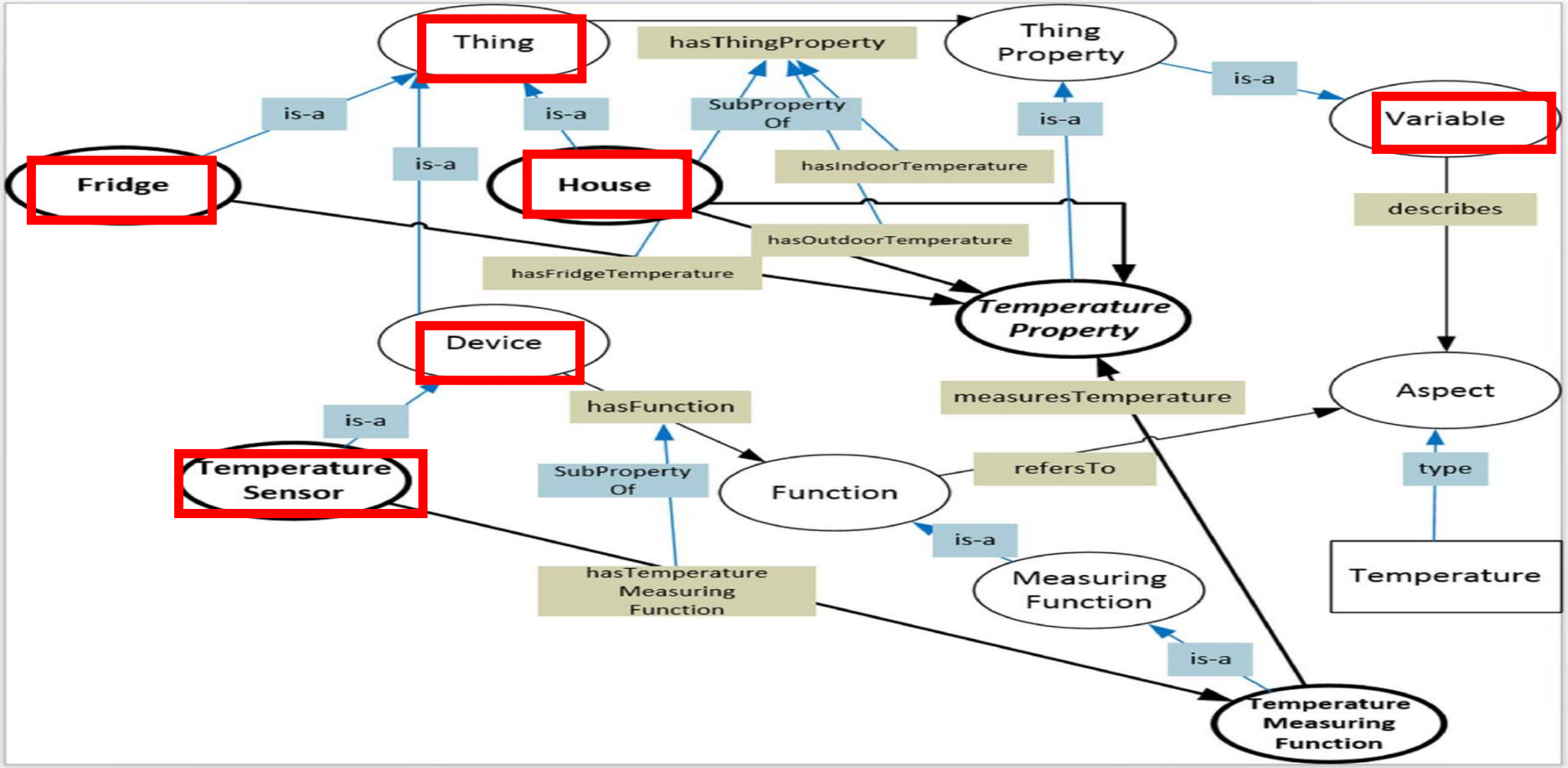
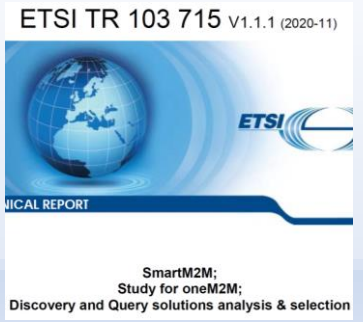


Figure 5.4.1-1: Example of mapping on the oneM2M Base Ontology



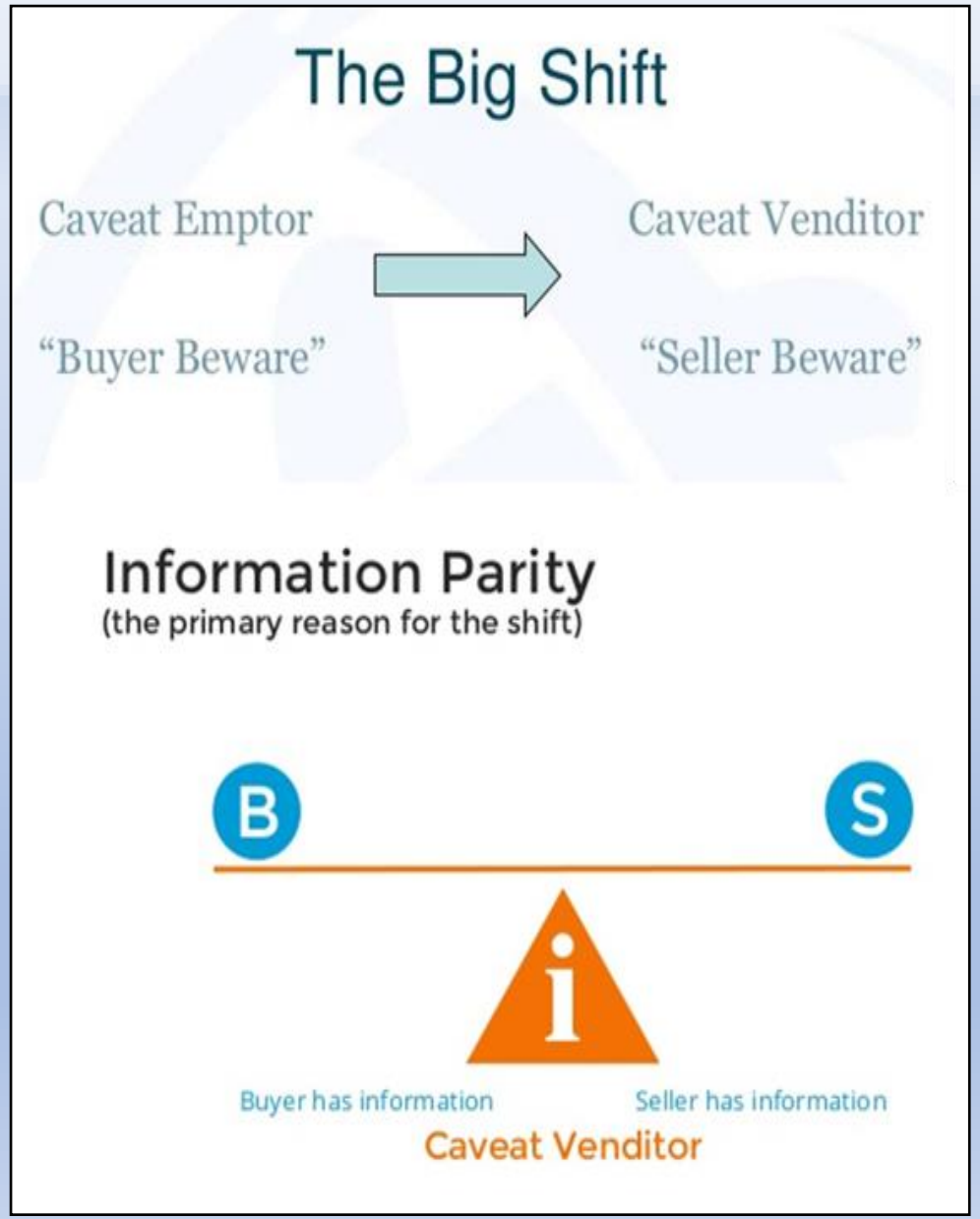
Commercial

Ref 3GPP TS 23.222 & TS 29.222 CAPIF for NAPS Rel 16 & 17, Dec 2020: 24,16

The Big Shift - from "Caveat Emptor" to "Caveat Venditor" - 1

THE MARKET FOR "LEMONS":
QUALITY UNCERTAINTY AND THE
MARKET MECHANISM *

GEORGE A. AKERLOF



When Information is Ubiquitous:

shift from **Information Inequality** to **Information Paritiy**

No longer enough

just to be able to Answer to Questions on Product/Solution/ Services

and/or present Platforms, Solutions, Services, Standards ...

Ref.: D.Pink, D-ve, 2012

Summary A - Video presentations:

1. "My APIs are the best". They are proprietary, but they are the best".

2. Repeating the mistakes done in the past while deploying New Technologies without changing the Business Framework

3. "Products are Packages of Emphasis from Technologies on the rise".

Comments, Remarks, Questions?