**3GPP TSG- Meeting #**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

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| ***Title:*** |  | | | | | | | | | |
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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
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| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | As declared in the S6-221483, the architecture for NSCALE service will be documented in TS 23.434, while the detailed procedures will be considered in the new TS 23.435. The update of the NSCE functional model is needed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Update the NSCE functional model and related descriptions | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The NSCE functional model is not aligned, consequence some of the procedures in TS 23.435 would not be supported correctly | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 16.2， 16.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* First Change \* \* \* \*

# **2 References**

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 22.104: "Service requirements for cyber-physical control applications in vertical domains".

[3] 3GPP TS 23.379: "Functional architecture and information flows to support Mission Critical Push To Talk (MCPTT); Stage 2".

[4] 3GPP TS 23.280: "Common functional architecture to support mission critical services; Stage 2".

[5] 3GPP TS 23.281: "Functional architecture and information flows to support Mission Critical Video (MCVideo); Stage 2".

[6] 3GPP TS 23.282: "Functional architecture and information flows to support Mission Critical Data (MCData); Stage 2".

[7] 3GPP TS 23.286: "Application layer support for V2X services; Functional architecture and information flows".

[8] 3GPP TS 23.222: "Functional architecture and information flows to support Common API Framework for 3GPP Northbound APIs; Stage 2".

[9] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[10] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[11] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[12] 3GPP TS 23.303: "Proximity-based services (ProSe); Stage 2".

[13] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".

[14] 3GPP TS 23.002: "Network Architecture".

[15] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[16] 3GPP TS 23.468: "Group Communication System Enablers for LTE (GCSE\_LTE); Stage 2".

[17] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description".

[18] 3GPP TS 23.203: "Policy and charging control architecture".

[19] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System; Stage 2".

[20] 3GPP TS 26.348: "Northbound Application Programming Interface (API) for Multimedia Broadcast/Multicast Service (MBMS) at the xMB reference point".

[21] 3GPP TS 29.214: "Policy and charging control over Rx reference point".

[22] 3GPP TS 29.468: "Group Communication System Enablers for LTE (GCSE\_LTE); MB2 Reference Point; Stage 3".

[23] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".

[24] IETF RFC 6733 (October 2012): "Diameter Base Protocol".

[25] ETSI TS 102 894-2 (V1.2.1): "Intelligent Transport Systems (ITS); Users and applications requirements; Part 2: Applications and facilities layer common data dictionaryMultimedia Broadcast/Multicast Service (MBMS); Protocols and codecs".

[26] ETSI TS 102 965 (V1.4.1): "Intelligent Transport Systems (ITS); Application Object Identifier (ITS-AID); Registration".

[27] ISO TS 17419: "Intelligent Transport Systems - Cooperative systems - Classification and management of ITS applications in a global context".

[28] 3GPP TS 26.346: "Multimedia Broadcast/Multicast Service (MBMS); Protocols and codecs".

[29] 3GPP TS 33.434: "Service Enabler Architecture Layer (SEAL); Security aspects for Verticals".

[30] 3GPP TS 29.549: "Service Enabler Architecture Layer for Verticals (SEAL); Application Programming Interface (API) specification; Stage3".

[31] 3GPP TS 23.285: "Architecture enhancements for V2X services".

[32] IETF RFC 7252: "The Constrained Application Protocol (CoAP)".

[33] IETF RFC 8323: "CoAP (Constrained Application Protocol) over TCP, TLS, and WebSockets".

[34] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[35] IEEE Std 802.1Qcc-2018: "Standard for Local and metropolitan area networks - Bridges and Bridged Networks - Amendment: Stream Reservation Protocol (SRP) Enhancements and Performance Improvements".

[36] IEEE 802.1Q-2018: "IEEE Standard for Local and Metropolitan Area Networks—Bridges and Bridged Networks".

[37] IEEE Std 802.1CB-2017: "Frame Replication and Elimination for Reliability".

[38] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[x] 3GPP TS 23.435: "Procedures for Network Slice Capability Exposure for Application Layer Enablement Service".

[y] 3GPP TS 28.531: "Management and orchestration; Provisioning".

[z] 3GPP TS 28.533: "Management and orchestration; Architecture framework".

[m] 3GPP TS 28.530: "Management and orchestration; Concepts, use cases and requirements".

\* \* \* Next Change \* \* \* \*

## **3.2 Abbreviations**

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

5GS 5G System

5GVN 5G Virtual Network

CAPIF Common API Framework for northbound APIs

CNC Centralized Network Configuration

CRUDN Create, Retrieve, Update, Delete and Notify

EPC Evolved Packet Core

GPSI Generic Public Subscription Identifier

LWP Light-weight Protocol

NEF Network Exposure Function

NR New Radio

PCC Policy and Charging Control

SCEF Service Capability Exposure Function

SEAL Service Enabler Architecture Layer for Verticals

TSC Time Sensitive Communication

TSN Time Sensitive Networking

VAL Vertical Application Layer

NOP Network Operator

NSaaS Network Slice as a Service

\* \* \* Next Change \* \* \* \*

## 16.2 Functional model

### 16.2.1 General

The functional model for the network slice capability enablement is based on the generic functional model specified in clause 6.2. It is organized into functional entities to describe a functional architecture which addresses the support for network slice capability enablement aspects for vertical applications. Since the slicing is a feature which considers the Uu interfaces, only the on-network functional model is specified in this clause.

### 16.2.2 Functional model description

Figure 16.2.2-1 depicts the network slice capability enablement architecture in the non-roaming case, using the reference point representation showing how various entities interact with each other.



Figure 16.2.2-1: Architecture for network slice capability enablement – reference points representation

The network slice capability enablement client communicates with the network slice capability enablement server over the NSCE-UU reference point. The network slice capability enablement client provides the support for network slice capability enablement functions to the VAL client(s) over NSCE-C reference point. The VAL server(s) communicates with the network slice capability enablement server over the NSCE-S reference point. It is assumed that the network slice capability enablement server is deployed at the 5G system domain. The network slice capability enablement server, acting as AF, may communicate with the 5G Core Network functions via NEF (N33) reference point (for interactions with PCF, NSACF, etc.), or interacting with PCF directly via N5, if permitted. The network slice capability enablement server may interact with OAM system over NSCE-OAM reference point, as consumer in both NSaaS and NoP model defined in the clause 4.1.6 and 4.1.7 TS 28.530[m] (for Network Slice Provisioning capabilities, Performance Assurance, Fault Supervision etc.).

NOTE: Whether the NSCE-OAM reference point can be realized by consuming the services exposed by EGMF as defined in TS 28.533[z] or via the CAPIF directly is being studied in SA5.

Figure 16.2.2-2 illustrates the architecture for interconnection between NSCE servers.

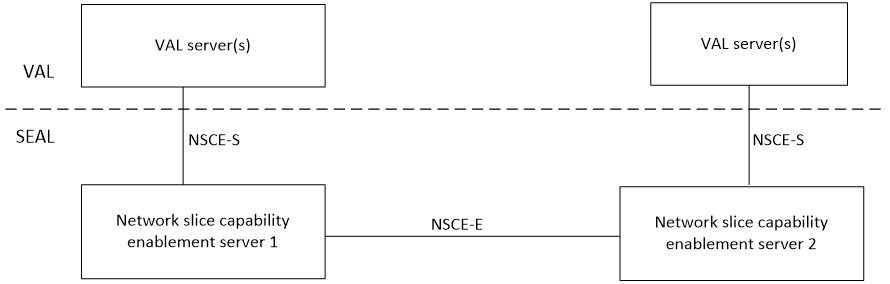


Figure 16.2.2-2: Interconnection between NSCE servers

The NSCE server could interact with another NSCE server over NSCE-E reference point.

### 16.2.3 Functional entities description

#### 16.2.3.1 General

The functional entities for network slice capability enablement SEAL service are described in the following subclauses.

#### 16.2.3.2 Network slice capability enablement server

The network slice capability enablement server functional entity provides the application layer enablement of the network slicing aspects to support the VAL applications. Such enablement supports the network slice related operations such as the mapping or migration of one or more vertical applications to one or more network slices (from a set of network slices, as provided by the 3GPP network system) as described in procedure in clauses 16.3.2.3 and 16.3.2.4. More operations are described in TS 23.435[x].

#### 16.2.3.3 Network slice capability enablement client

The network slice capability enablement client functional entity acts as the application client for the slice enablement. The network slice capability enablement client interacts with the network slice capability enablement server to trigger network slice related operations such as adaptation due to an application requirement change. This trigger may be due to an application QoS requirement change, a service operation change. The NSCE client may receive a network slice related notification such as network slice / DNN re-mapping notification from the NSCE server. The NSCE client may optionally notify the VAL client on the network slice / DNN re-mapping.

### 16.2.4 Reference points description

#### 16.2.4.1 General

The reference points for the functional model for network slice capability enablement are described in the following subclauses.

#### 16.2.4.2 NSCE-UU

The interactions related to network slice capability enablement functions between the network slice capability enablement server and the network slice capability enablement client are supported by NSCE-UU reference point. This reference point utilizes Uu reference point as described in 3GPP TS 23.501 [10].

#### 16.2.4.3 NSCE-C

The interactions related to network slice capability enablement functions between the VAL client(s) and the network slice capability enablement client within a VAL UE are supported by the NSCE-C reference point. The NSCE client may receive application requirement change, application client information (such as its KQI) over NSCE-C. Further, the NSCE client may provide a notification on the network slice adaptation upon successful adaptation of the slice to application mapping.

#### 16.2.4.4 NSCE-S

The interactions related to network slice capability enablement functions between the VAL server(s) and the network slice capability enablement server are supported by the NSCE-S reference point. This reference point is an instance of CAPIF-2 reference point as specified in 3GPP TS 23.222 [8].This reference point supports network slice capability exposure such as: application layer slice lifecycle management, fault diagnosis, slice API configuration and mapping, QoS verification, slice performance analytics exposure etc which are specified in TS 23.435[x].

#### 16.2.4.5 N33

The reference point N33 supports the interactions between the network slice capability enablement server and the NEF and is specified in 3GPP TS 23.501 [10]. N33 is used for the network-based mechanism for slice re-mapping, where NSCE server acting as AF influences the URSP rules for the application traffic per UE by providing a guidance on the route selection parameters (including the S-NSSAI and DNN mapping), as specified in TS23.502 clause 4.15.6.10, TS 23.503 clause 6.6.2.2, TS 23.548 clause 6.2.4.

#### 16.2.4.6 NSCE-E

The interactions between the NSCE servers are generically referred to as NSCE‑E reference point. This reference point supports information collection from other NSCE servers.

#### 16.2.4.7 NSCE-OAM

The interface between the NSCE server and the OAM system are generically referred to as NSCE-OAM reference point. This reference point supports provioning of management service as defined in clause 6.1, TS 28.531[y] exposed by EGMF defined in TS 28.533[z]..

\* \* \* Next Change \* \* \* \*

## 16.3 Procedures and information flows for network slice capability enablement

### 16.3.1 General

This subclause describes the procedure for network slice adaptation while more procedures for network slice API configuration and translation, automatic application layer network slice management etc are defined in TS 23.435[x].