**3GPP TSG-SA5 Meeting #133eS5-205254**

**e-meeting, 12 – 21 October 2020**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v11.4* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **28.530** | **CR** | **0033** | **rev** | **-** | **Current version:** | **16.3.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network | **X** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Decouple communication service and network slice | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | EMA5SLA | | | | |  | ***Date:*** | | | 2020-09-28 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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-12 (Release 12) Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The purpose of defining a network slice is not limited to offering a specific communication service, but may include operational efficiencies, providing PNI-NPNs, and any number of other reasons.  However, network slice is tightly coupled with communication service, or even mixed the two concepts in some places of the specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Update network slice related description to focus on network slice concept itself without coupling with communication service. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Limit deployment options and implementation of network slice | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.1.7, 4.4.1, 4.8 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |

|  |
| --- |
| **Start of 1st modification** |

### 4.1.7 Network slices as NOP internals

In the "network slices as NOP internals" model, network slices are not part of the NOP service offering and hence are not visible to its customers. However, the NOP, to provide support to communication services, may decide to deploy network slices, e.g. for internal network optimization purposes. This model allows CSC to use the network as the end user or optionally allows CSC to monitor the service status (assurance of the SLA associated with the internally offered network slice).

The CSP should be able to provide the service status information (e.g. service performance, fault information, traffic data, etc) to CSC via the management exposure interface.

Figure 4.1.7.1 illustrates an example on how network slices can be utilized to deliver communication services:

a) A network slice is used as NOP internal, and CSP delivers communication services to end customers (CSC).

b) The CSC should be able to monitor the network and service status information (e.g. service performance, fault information, traffic data, etc.) provided by CSP.

DN

NF

NF

Network Slice

Network view

Management view

CSP

NOP

CSC

offer

Figure 4.1.7.1: Examples of network slice as NOP internals

NOTE: In Figure 4.1.7.1, NS represents network slice, CS represents communication service

|  |
| --- |
| **End of 1st modification** |

|  |
| --- |
| **Start of 2nd modification** |

## 4.4 Managed network slice concepts

### 4.4.1 General

From a management point of view a network slice is complete in the sense that it includes all the network function instances, with their supporting resources, to provide service for certain business purpose (e.g. to support a certain set of communication services, provide PNI-NPNs, etc. in NSaaS model) or operational efficiencies purpose (e.g. to optimize operator internal O&M procedures in network slice as NOP internals model). In other words, the network slice is complete because it completely satisfies the associated SLS.

The following concepts are related to network slicing management:

a. Services which are supported by network slices (services whose service level requirements are satisfied by the SLS associated with the network slices).

b. Network slice subnet instances and networks composed of PNF, VNF or both and offered as network slices.

c. Network function (PNFs, VNFs) grouped into network slice subnets.

d. Resources which support the network (e.g. virtualized resource, non-virtualized resource)

The management aspects of the network slice are represented by management of the CN part, and AN part which are directly managed by the 3GPP management system, and management of non-3GPP part which is not directly managed by the 3GPP management system. The non-3GPP part includes TN parts. The 3GPP management system provides the network slice requirements to the corresponding management systems of those non-3GPP parts, e.g. the TN part supports connectivity within and between CN and AN parts. For the TN part, the 3GPP management system provides the TN topology requirements and individual TN links' QoS attributes requirements to the TN management system.

The 3GPP management system maintains the network topology and the related QOS requirements.



Figure 4.4.1.1: Example of a network slice

|  |
| --- |
| **End of 2nd modification** |

|  |
| --- |
| **Start of 3rd modification** |

## 4.8 Roles related to 5G networks and network slicing management

In the context of next generation networks, responsibilities regarding operations have to be clearly defined and assigned to roles. The roles related to 5G networks and network slicing management include:

- Communication Service Customer (CSC): Uses communication services.

- Communication Service Provider (CSP): Provides communication services. Designs, builds and operates its communication services. The CSP provided communication service can be built with or without network slice.

- Network Operator (NOP): Designs, builds and operates networks and provides related services, including network services and network slices.

- Network Equipment Provider (NEP): Supplies network equipment to network. For sake of simplicity, VNF Supplier is considered here as a type of Network Equipment Provider. This can be provided also in the form of one or more appropriate VNF(s).

- Virtualization Infrastructure Service Provider (VISP): Provides virtualized infrastructure services. Designs, builds and operates its virtualization infrastructure(s). Virtualization Infrastructure Service Providers may also offer their virtualized infrastructure services to other types of customers including to Communication Service Providers directly, i.e. without going through the Network Operator.

- Data Centre Service Provider (DCSP): Provides data centre services. Designs, builds and operates its data centres.

- NFVI Supplier: Supplies network function virtualization infrastructure to its customers.

- Hardware Supplier: Supplies hardware.

Depending on actual scenarios:

- each role can be played by one or more organizations simultaneously;

- an organization can play one or several roles simultaneously (for example, a company can play CSP and NOP roles simultaneously).

Communication Service Customer

Communication Service Provider

Network Operator

Virtualization Infrastructure Service Provider

Client

E.g.: End user,

Small & Medium Entreprise,

Large entreprise,

Vertical,

Other CSP, etc.

Provider

Client

Client

Provider

Provider

Data Center Service Provider

Client

Provider

Network Equipment Provider

(incl. VNF Supplier)

NFVI Supplier

Hardware Supplier

Client

Provider

Client

Provider

Client

Provider

Figure 4.8.1: High-level model of roles

In case of Network Slice as a Service (NSaaS) (cf. clause 4.1.6), the Communication Service Provider (CSP) role can be refined into NSaaS Provider (NSaaSP) role – or, in short, Network Slice Provider (NSP) - and the Communication Service Customer (CSC) role can be refined into NSaaS Customer (NSaaSC) role – or, in short, Network Slice Customer (NSC). A NSC can, in turn, offer its own communication services to its own customers, being thus CSP at the same time. A tenant might take the role of a NSC.

|  |
| --- |
| **End of 3rd modification** |