**3GPP TSG-SA5 Meeting #132e *S5-204193rev2***

**e-meeting 17th 28th August 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **28.530** | **CR** | **0029** | **rev** | **2** | **Current version:** | **16.2.0** |  |
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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 | **x** | Core Network | **x** |

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| ***Title:*** | Rel-16 CR TS 28.530 corrections | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | NEC Europe Ltd; Ericsson | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI16 | | | | |  | ***Date:*** | | | 2020-08-06 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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)* | |
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| ***Reason for change:*** | | Repeated english language grammar mistakes relating to the use or article “an” instead of “a”. The article “an” is mistakenly used instead of “a” for network slice subnet and network slice instance terms. Figures 4.1.6.1 in clause 4.1.6 and Figure 4.1.7.1 in clause 4.1.7 use wrong term, i.e., NSI instead of NS. | | | | | | | | |
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| ***Summary of change:*** | | 1. Correct english grammar mistakes by changing “an” to “a” articles when referring to network slice subnet and network slice instance terms. 2. Correction to Figures 4.1.6.1 and 4.1.7.1 to changes NSI to NS. | | | | | | | | |
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| ***Consequences if not approved:*** | | Confusion due to inaccurate use of english grammar and terms in figures. | | | | | | | | |
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| ***Clauses affected:*** | | 4.1.6, 4.1.7, 4.4.1, 4.5 | | | | | | | | |
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|  | | **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:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| **Start of 1st modification** |

### 4.1.6 Network Slice as a Service (NSaaS)

Network Slice as a Service (NSaaS) can be offered by a CSP to its CSC in the form of a service. This service allows CSC to use the network slice as the end user or optionally allows CSC to manage the network slice as manager via management interface exposed by the CSP. In turn, these CSC can play the role of CSP and offer their own services (e.g. communication services) on top of the network slice obtained from the CSP. For example, a network slice customer can also play the role of NOP and could build their own network containing the network slice obtained from the CSP as a "building block". In this model, both CSP offering NSaaS and CSC consuming NSaaS have the knowledge of the existence of network slices. Depending on service offering, CSP offering NSaaS may impose limits on the NSaaS management capabilities exposure to the CSC, and the CSC can manage the network slice according to NSaaS management capabilities exposed and agreed upon limited level of management by the CSP.

The NSaaS offered by the CSP could be characterized by certain properties (capabilities to satisfy service level requirements), e.g.

- radio access technology,

- bandwidth,

- end-to-end latency,

- reliability,

- guaranteed / non-guaranteed QoS,

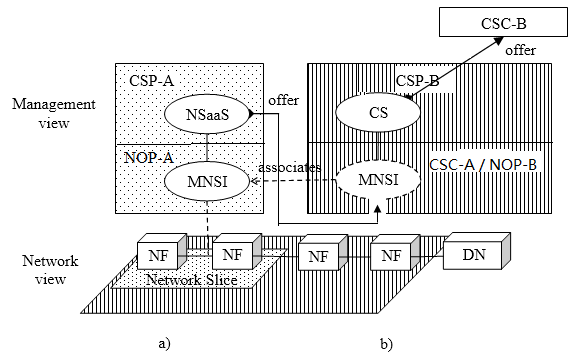
- security level, etc.

Figure 4.1.6.1 illustrates some examples on how network slices can be utilized to deliver communication services, including network slice as a Service. For simplicity this figure omits the details of how NFs are being managed and does not show their groupings into network slice subnet:

a) A Network Slice as a Service (NSaaS) is provided to CSC-A by CSP-A. Unlike the communication service delivered to end customers, in NSaaS, the offered service is the actual network slice.

b) CSC-A can use the network slice obtained from CSP-A to support own Communication Services or may add additional network functions to the obtained NSaaS and offer the resulting combination as a new network slice to CSP-B. In this case, CSC-A plays the role of NOP-B and builds his own network. The network slice obtained by CSC-A from CSP-A becomes a "building block" or a network slice subnet of CSC-A in its role of NOP-B. The NOP-B (a.k.a. CSC-A) combines this network slice subnet with other network slice subnets and offers the new network slice subnet as network slice to CSP-B.

c) CSP-B can use the network slice obtained from CSC-A / NOP-B to deliver communication services to its end customers (as CSC-B).



NS

NS

Figure 4.1.6.1: Examples of Network Slice as a Service (NSaaS) being utilized to deliver communication services to end customers

NOTE: In Figure 4.1.6.1, NS represents network slice, CS represents communication service

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| **Start of 2nd modification** |

### 4.1.7 Network slices as NOP internals

In the "network slices as NOP internals" model, network slices are not part of the CSP service offering and hence are not visible to CSCs. 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

a)

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

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| **Start of 3rd 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 managed function instances, with their supporting resources, to provide a certain set of communication services to serve a certain business purpose. 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

## 4.5 Network slice subnet concepts

The network slice subnet represents a group of network functions (including their corresponding resources) that form part or complete constituents of a network slice. The grouping of the network functions allows the management of each group of network functions to be conducted independently of the network slice.

The network slice subnet concepts include the following aspects:

- A network slice subnet constituent may include Managed Function(s) and other constituent network slice subnet(s).

- A network slice subnet may be shared by two or more network slices, this is called a shared constituent of network slice. This sharing may be direct or indirect. The direct sharing implies that the network slice subnet is offered as network slice multiple times. The indirect sharing implies that the network slice subnet is either a constituent of a network slice subnet shared by two or more network slices, or is shared by two or more network slice subnet(s) which are in turn offered as different network slices.

- A network slice subnet may be shared by two or more network slice subnet(s), this is also called a shared constituent of network slice subnet. The sharing may be direct or indirect. The direct sharing implies that network slice subnet is a constituent of two or more network slice subnets. The indirect sharing implies that network slice subnet is a constituent of a shared network slice subnet.

- A network slice subnet that is dedicated to one network slice and is not shared as a constituent by two or more network slice subnet(s) is called a non-shared network slice subnet.

- A network slice subnet may contain instances of CN Managed Functions only, or instances of AN Managed Functions only, or any combination thereof.

- A network slice subnet may additionally have information representing a set of links with capacities to provide connection between managed functions. This information is also known as TN requirements of the network slice subnet.

- The resources used, and whose management aspects are represented by a network slice subnet comprise physical and logical resources. In case of virtualization, virtualized resources may be used.

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| **End of modifications** |