**SA WG2 Meeting #143E S2-20xxxxx**

**24 February-09 March 2021, Elbonia (revision of S2-20xxxx)**

**Source: Ericsson (Rapporteur)**

**Title: FS\_eNPN moderated email discussion**

**Document for: Information**

**Agenda Item: TBD**

**Work Item / Release: FS\_eNPN / Rel-17**

*Abstract of the contribution: This contribution includes the moderated email discussions for the FS\_eNPN open issues.*

# 1. Introduction

More FS\_eNPN study time was requested to resolve the outstanding issues as listed in the TR cover sheet in S2-2009250.

To make the resolution of those open issues as smooth as possible and spend as little meeting time as possible on the study phase at SA#143E, this documents includes a request for companies to provide their opinion on the above mentioned open issues.

The result will be used as an input to a proposed conclusion at SA2#143E, and possibly we will target a working assumption at CC#1.

For each question the company should also include an opinion whether the eNPN WID should be updated with a resolution of the issue.

# 2. Issues

## KI#1-Q1: Additional SIB information for SNPN selection

TR conclusion in clause 8.1.4 includes an EN as:

Editor's note: Need for additional SIB information is FFS.

NOTE: There is already SIB information concluded for KI#1, se TR conclusion, i.e. EN is if there is any need for more SIB information beyond what is already concluded.

**Question**: Is there a need for additional SIB information for SNPN selection for UEs with an SNPN subscription of a Separate Entity?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | N | N | Current conclusion is sufficient to address all use cases {open, closed, restricted} type of deployments thus we do not see the need for any new SIB information. |
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## KI#1-Q2: Simultaneous connections for UEs with one subscription

The TR includes an empty conclusion clause "8.1.3 Conclusions for simultaneous data service from both V-SNPN and a separate entity owning the credentials (PLMN or SNPN)".

**Question**: Should simultaneous access, via separate PDU Sessions, to data services available via SNPN (LBO) and via Separate Entity (UPF in Separate Entity) be supported for UEs with one subscription?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | Yes | Yes |  |
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## KI#1-Q3: Credentials for SNPN service continuity

SA2 asked SA1 the following questions (in LS S2-2007828):

*Q1: support for access to (and related service continuity) for services provided by an SNPN separate from the serving SNPN (i.e. services provided by the SNPN that issued the UE's subscription). One example could be access to voice services provided by the SNPN.*

*In case these, or other service continuity requirements for SNPNs exists, SA2 would like to ask SA1 the following additional questions:*

*Q2: whether only PLMN credentials (and respective authentication methods) can be used to register to a target network (i.e. which may be an SNPN with or without credentials being owned by separate entities, or a PLMN), given the various service continuity scenarios.*

*Q3: whether in addition to PLMN credentials, also non-3GPP identities and credentials (and respective alternative authentication methods) can be used to register to a target network, given the various service continuity scenarios.*

NOTE: SA1 has not yet replied.

**Question A**: Should the standard support access to (and related service continuity for) services provided by an SNPN separate from the serving SNPN?

**Question B**: If answer to A is yes, what type of credentials should be supported e.g. PLMN only, or both PLMN and non-3GPP identities and credentials?

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| **Company name** | **Answer question A****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | Yes | Yes | 1) Mobility between serving SNPNs with service continuity should be supported.2) Mobility between serving SNPNs should be supported even with separate entity holding UE’s subscription.Service continuity should be supported for at least when using SNPN and/or separate credentials. (No view on the PLMN credential scenario). |
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## KI#1-Q4: AAA-S providing subscription information

TR conclusion in clause 8.1.1 includes an EN as:

Editor's note: It is FFS if the AAA server supports providing the subscription information needed for registration and session management procedure.

**Question**: Should it be possible for AAA-S to provide subscription information to SNPN?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | No | No | Subscriber data and session management services shall be provided by the UDM as defined in Rel16.Necessary information in the UDM can be provisioned by other means.Strongly against this approach as this introduces significant and unnecessary impact to 5G system procedures and invalidates (or duplicates) UDM functionalities. |
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## KI#1-Q5: Other UE ID than SUPI towards AAA

TR conclusion in clause 8.1.1 includes an EN as:

Editor's note: Need for and details of using a UE ID other than the SUPI are FFS.

**Question**: Is there a need to support other UE ID than SUPI towards AAA?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | No | No | It is sufficient to use SUPI/SUCI as identifier also for AAA based primary authentication. |
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## KI#1-Q6: Additional mechanisms to update list of preferred SNPNs

TR conclusion in clause 8.1.7 includes an EN as:

Editor's note: Need for additional mechanisms (e.g. URSP or new policy using UPU) to update the separate entity controlled prioritized list of preferred SNPNs in the UE is FFS.

**Question**: Should it be possible to use additional mechanisms (e.g. URSP or new policy using UPU) to update the separate entity controlled prioritized list of preferred SNPNs in the UE?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | No | No | No additional mechanism besides UPU or SoR is needed. |
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## KI#2-Q1: Continuity for single radio UE using N3IWF

In SA2#141E, a conclusion is agreed that single radio UE is able to achieve PDU session continuity by using the existing handover procedure between 3GPP access and non-3GPP access. Such conclusion is aligned with the statement in clause 5.30.2.7 and 5.30.2.8 in TS 23.501.

In SA2#142E, there was a debate regarding whether single radio UE is sufficient to fulfill the service continuity when using N3IWF. But no conclusion is agreed.

Service continuity defined in TS 23.501 is quoted as below:

**Service Continuity:** The uninterrupted user experience of a service, including the cases where the IP address and/or anchoring point change.

**Question**: With existing mechanism, is single radio UE sufficient to support service continuity of VIAPA service when using N3IWF?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | No | No | With N3IWF solution, some service disruption is inevitable as there is no HO prep phase or data forwarding supported between source and target. Dual radio is beneficial to avoid disruption but not mandatory for UE to support. 3GPP can highlight the constraints and leave it up to the market to decide based on the desired use case and the service offering expected. |
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## KI#2-Q2: Network trigger for UE to register to N3IWF

TR conclusion in clause 8.2 includes an EN as:

Editor's note: Whether the network trigger the UE register to the target network via N3IWF before it lose the radio coverage is FFS.

To shorten the time spent during the mobility procedure, it has been proposed to let network to indicate the UE to register to the target network via N3IWF, assuming the service subject to the mobility is accessible from DN of both source and target network.

**Question**: Should the standard support a network trigger for the UE to register to the target network via N3IWF before UE lose radio coverage?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | Yes | Yes | To reduce service disruption time (especially for single radio UE(s)), network trigger and network assistance for UE to move earlier and register with the target network will be beneficial. (However, I believe the Question should be corrected to remove “via N3IWF” as the registration in the target network need not be via N3IWF rather it can register directly via 3GPP access/NR gNB.) |
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## KI#2-Q3: Latency to resume a service provided by the overlay network

TR conclusion in clause 8.2 includes an EN as follows in relation to statement about improving the latency to resume a service provided by the overlay network:

Editor's note: Further details of the indication and the conditions for the 5GC sending the indication to NG-RAN is FFS, and whether existing QoS flow information can be used to derive whether it is preferred to release a UE to RRC-Inactive is FFS.

In order to address the paging aspect of the key issue, it has been proposed to keep UE stay in CM-CONNECTED in both underlay network and overlay network. The method to keep UE in CM-CONNECTED state in overlay network is agreed to use existing Rel-16 mechanisms. The method to keep UE in CM-CONNECTED state in underlay network is proposed to always release a UE to RRC-Inactive in the underlay network, if the UE has a connection to an overlay network via the user plane of the underlay network. But it is FFS regarding if it is necessary to keep UE in CM-CONNECTED state in underlay network for addressing the paging aspect of the key issue.

Further details of the indication and the conditions for the 5GC sending the indication to NG-RAN to decide whether it is preferred to release a UE to RRC-Inactive is FFS, and whether existing QoS flow information can be used to derive whether it is preferred to release a UE to RRC-Inactive is FFS.

**Question**: Is there a need to support additional mechanisms to improve the latency to resume a service provided by the overlay network?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | No | No | Strongly against this approach. RRC state transition shall be managed by RAN locally and not by overlay network. |
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## KI#2-Q4: New QoS notification information between NPN and PLMN

TR conclusion in clause 8.2 includes an EN as:

Editor's note: It is FFS if any new information is needed or not for the QoS notification between NPN and PLMN

Overlay network can act as an AF to subscribe "QoS Sustainability Analytics" provided by the NWDAF of the underlay network via NEF. So the overlay network is able to be notified if there is QoS degradation in the underlay network and take actions accordingly. The opposite way is also possible that the underlay network to subscriber "QoS Sustainability Analytics" from the overlay network.

**Question**: Is there a need to standardize new QoS notification information to enable VIAPA services between SNPN and PLMN?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | No | No |  |
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## KI#3-Q1: Support for IMS deployment scenarios – with IMS in Separate Entity

KI#1 architecture supports UEs accessing an SNPN by using credentials from a Separate Entity. IMS deployment scenarios when KI#1 architecture with credentials from a Separate Entity is supported by an SNPN needs to be understood, e.g. whether the Separate Entity can also support IMS.

**Question**: Should a deployment with an SNPN supporting KI#1 functionality and the Separate Entity providing also IMS be supported?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | Yes | No | This scenario has to be supported but we don’t see the need for additional specification work (beyond KI#1) to enable this. Existing IMS deployment scenarios should cover also this particular aspect. |
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## KI#3-Q2: Support for IMS deployment scenarios – separate IMS and access provider

SA1 answered in the LS in S2-2009531 the following to an SA2 question:

***For the question*** *if “The SNPN can have an SLA agreement with a third party (different Administrative Domain) IMS provider to provide IMS services”?*

***Answer:*** *Although there is no explicit SA1 requirement,* [*3GPP TS 22.228*](https://www.3gpp.org/DynaReport/22228.htm) *Annex B gives various examples how an IMS provider can have a relationship with Access Network Operator.*

The TS 22.228 Annex B states:

"*The IMS shall support at least the following operator's domain relationships:*

*…*

*a.2) Access network and the IMS it connects to, belong to different operators having an interconnection as shown in figure B.2.*

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**Question**: Should the IMS deployment scenario as described in TS 22.228 Annex B a.2 be described in TS 23.228?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | N | Y | The WID can be updated with a reference to TS 22.228 Annex B a.2. Annex of TS 23.228 should be updated only, if it is clear what the delta and add-on to stage 1 description is. |
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## KI#4-Q1: CP provisioning

TR conclusion in clause 8.4.1 includes an EN as:

Editor's note: SA WG3 feedback will need to be taken into account for including of the CP based provisioning.

KI#4 conclusions for " **Remote provisioning for SNPN credentials (Component 2 of KI#4)**" includes support for remote provisioning via CP as well as UP. However, there is an Editor's note stating "SA WG3 feedback will need to be taken into account for including of the CP based provisioning".

**Question**: Should CP provisioning be supported for SNPN?

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| **Company name** | **Answer****(Y/N)** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | No | No | There are too many opens in CP provisioning (architecture, procedures, message encoding), furthermore, it is quite complex in terms of system security aspects, placement of functions etc. With UP provisioning we have already a solution for remote provisioning available. |
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## KI#4-Q2: Selection of CP or UP

TR conclusion in clause 8.4.1 includes an EN as:

Editor's Note: How the network instructs the UE whether to use control plane or user plane provisioning is for FFS.

The logic of selecting either CP or UP provisioning for a specific UE, when both mechanisms are supported by the standard has not been concluded.

**Question**: If the standard support both CP and UP, how is a method selected?

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| **Company name** | **Answer****Not applicable** | **Should the WID be updated with a resolution of the issue?****(Y/N/)** | **Comments (optionally more details e.g. reasoning and what needs to be updated, if any)** |
| Nokia | UP should be the default solution | No | In general, this is not needed if CP provisioning is not supported at all. SNPN: CP provisioning shall not be supported in SNPN case. PNI-NPN: if both UP and CP are supported, UP provisioning support should be enabled by default. CP provisioning is supported only, if support is indicated separately by the network. |
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# 3. Summary

## 3.1 KI#1

## 3.2 KI#2

## 3.3 KI#3

## 3.4 KI#4

# 4. Proposed Way Forward