**3GPP SA WG2 Meeting #146E S2-2106802**

**Elbonia, August 16 -- 27 2021** (revision of S2-2105825)

**Source: Ericsson, Futurewei, Convida Wireless, Charter, China Unicom, ETRI; Cisco, China Mobile, Lenovo, Motorola Mobility, Qualcomm, ZTE, Philips, Intel, Matrixx, SHARP, InterDigital, LG Electronics, NEC, Samsung, OPPO, T-Mobile USA**

**Title: New SID: Study on enhanced support of Non-Public Networks phase 2**

**Document for: Information**

**Agenda Item: 9.1.4**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

# Title: Study on enhanced support of Non-Public Networks phase 2

## Acronym: FS\_eNPN\_ph2

## Unique identifier: ?

Potential target Release: Rel-18

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | X |  | X |  |
| **No** |  |  |  |  |  |
| **Don't know** | X |  | X |  | X |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a

|  |  |
| --- | --- |
|  | Feature |
|  | Building Block |
|  | *Work Task* |
| X | Study Item |

### 2.2 Parent Work Item

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| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
|  |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| 840024 | Study on enhanced support of Non-Public Networks | Antecedent Stage 2 study item |
| 900015 | Enhanced support of Non-Public Networks | Antecedent Stage 2 work item |
| 890023 | Study on 5G Networks Providing Access to Localized Services | Stage 1 study item |
| 920031 | 5G Networks Providing Access to Localized Services | Stage 1 work item |

**Dependency on non-3GPP (draft) specification**:

*{This section is to be typically used to identify the IETF dependencies. Delete the header "Dependency on non-3GPP (draft) specification:" if no such dependency.}*

## 3 Justification

Non-Public Network was introduced in Rel-16 with basic functions, and further enhanced in Rel-17 to enable wider cooperation between different networks/different entities to support use cases for NPN to provide access for UE that has no native credentials/subscriptions beforehand, as well as IMS and VIAPA related use cases.

Rel-17 FS\_eNPN study has concluded in total 4 key issues and progressed to the normative phase. But according to TR 23.700-07, there are yet two key issues not addressed in Rel-17 time frame, namely:

- Support for equivalent SNPNs

- Support of non-3GPP access for SNPN services

In addition, Rel-17 normative work eNPN has started according to the scope defined in eNPN WID, but also with outstanding issues to be addressed during the normative phase (see S2-2101121). It is TBD whether Rel-17 normative work is able to resolve all of them. Unresolved issues may lead to practical limitations of the Rel-17 eNPN features. For example, a PDU session anchored at the SNPN cannot be maintained during mobility when the UE accesses the SNPN using credentials owned by a Credentials Holder separate from the SNPN, which implies a lack of service continuity. Rel-17 has addressed basic UE onboarding functionality for 5GS, but a complete solution may be needed to address, for example when the relationship of the entities (e.g. Onboarding SNPN, Subscription Owner SNPN, Provisioning Server) involved during the onboarding process is not limited to a one to one relationship. In another example, control plane provisioning enables 3GPP network to have control of the full onboarding process, without relying on mechanism outside 3GPP and making the deployment of onboarding function more efficient. So, future investigation and study may be required to complete the aspects that cannot be solved in Rel-17 time frame.

Meanwhile, SA1 is progressing on new use cases and requirements which can be related to NPN e.g. in the study item 5G networks Providing Access to Localized Services (FS\_PALS). Normative SA1 work may generate new stage 1 requirements on NPN. Once the SA1 work stabilizes, the SA2 work should be aligned with the outcome of the SA1 work (referring to requirements from e.g. TS 22.261), e.g. to enable NPN as the hosting network providing the localized services.

SA1 already finished their Rel-18 study on evolution of IMS multimedia telephony service, i.e. FS\_MMTELin5G. As part of this requirement the next generation IMS will provide many real-time communication services such as real-time screen sharing, real-time visual interactive menu and Multimedia CLIP (Calling Line Identification Presentation) and COLP (Connected Line Identification Presentation). At the same time our existing IMS which provides voice centric services will be continued to exist. In the case of SNPN deployment where multiple independent IMS service providers are connected, it will be beneficial to enable a UE to be able to get this different type of service from both IMS service providers simultaneously.

## 4 Objective

The aim of this study is to investigate potential enhancements of 5GS that would enable broader use cases in relation with Non-Public Network.

The following aspects are in the scope of the study:

1. Support for enhanced mobility when involving SNPN:

a. Mobility between Equivalent SNPNs.

2. Support for non-3GPP access for SNPN.

3. Support for enhanced onboarding functionality:

a. Control Plane based remote provisioning.

NOTE: Whether to include Control Plane provisioning for SNPN in scope of the work is dependent on SA3.

b. Standardized way to provide Onboarding SNPN with the information of provisioning server for Control Plane and User Plane provisioning.

c. Onboarding SNPN (ON-SNPN) to support multiple provisioning servers and subscription owner SNPNs for selection when using Control Plane and User Plane provisioning.

4. Enable more efficient SNPN support for voice services.

a. Avoid the need for configuration of IMC in the UE e.g. credentials and IMPI/IMPU.

NOTE: Objective require co-operation with SA3.

5. Address new SA1 requirements (e.g. TS 22.261 requirements from PALS work) related to NPN e.g.:

a. Support of enabling Localized Services via a local hosting NPN e.g. by configuration of the local NPN via interaction with localized service provider.

b. Support for enabling UE to discover, select, access the local hosting NPN and the localized services via the hosting NPN with proper authorization.

- Support for both UE configuration for discovery and selection, and user manual selection.

c. Support for what, how and when services are accessed via a specific network e.g. via home network or via other network (e.g. local hosting NPN).

6. Support the capability for a UE in an SNPN getting services simultaneously from different IMS service providers.

7. Investigate what is needed to enable (S)NPN support for the following features:

a. 5G Proximity Services

b. 5G Location Services

c. 5G System Enhancements for Edge Computing

Estimated required time allocation per above objectives:

|  |  |  |
| --- | --- | --- |
| Objective | Study time: Sum 10.5 TUs | Normative time: Sum 7.5 TUs |
| 1 | 0.5 TU | 0.25 TU |
| 2 | 1 TU | 0.75 |
| 3 | 1.5 TU | 1 TU |
| 4 | 1 TU | 0.75 TU |
| 5 | 4 | 3 |
| 6 | 1 TU | 0.75 TU |
| 7 | 1.5 TU | 1 TU |

## 5 Expected Output and Time scale

|  |
| --- |
| **New specifications**  |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| Internal TR | 23.abc | *Study on enhanced support of Non-Public Networks phase 2* | *SA#96**June**2022(TBD)* | *SA#97**Sep**2022(TBD)* |  |

|  |
| --- |
| **Impacted existing TS/TR** |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
|  |  |  |  |

## 6 Work item Rapporteur(s)

Hedman, Peter, Ericsson, (peter . hedman @ ericsson . com)

## 7 Work item leadership

SA2

## 8 Aspects that involve other WGs

Potential security impact to be covered by SA3.

Potential charging and OAM impact to be covered by SA5.

## 9 Supporting Individual Members

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| --- |
| Supporting IM name |
| Charter |
| China Mobile |
| China Unicom |
| Cisco |
| Convida Wireless |
| Ericsson |
| ETRI |
| Futurewei |
| LG Electronics |
| Intel |
| InterDigital |
| Lenovo |
| NEC |
| Matrixx |
| Motorola Mobility |
| OPPO |
| Philips |
| Qualcomm |
| Samsung |
| SHARP |
| T-Mobile USA |
| ZTE |