**3GPP TSG-SA Meeting #116 *S3-242061***

Jeju Island, S. Korea 20-24 May 2024 revision of S3-XXXX

**Source:** **Cisco, Intel**

**Title:** **Study on Security Aspects of Interconnect of SNPN**

**Document for: Approval**

**Agenda Item: 6**

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: Security Aspects of Interconnect of SNPN

Acronym: FS\_ ISN \_Sec

Unique identifier:

Potential target Release: Rel-19

# 1 Impacts

{For Normative work, identify the anticipated impacts. For a Study, identify the scope of the study}

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

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
| X | Study |
|  | Normative – Stage 1 |
|  | Normative – Stage 2 |
|  | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |  |  |  |
| --- | --- | --- | --- |
| 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 /Study Items (if any) | | |
| Unique ID | Title | Nature of relationship |
| 990053 | Study on Interconnect of SNPN | Related stage-1 Rel-19 3GPP SA1 work item |
|  |  |  |
|  |  |  |

# 3 Justification

SA1 completed a study on the interconnect of SNPN (FS\_ISN), which resulted in the addition of requirements to support stand-alone non-public network (SNPN) cellular hotspots in TS 22.261. The security aspects of FS\_ISN and their impact on the architecture will be covered in SA3. More specifically, the following topics require SA3 coordination as per potential security impact:

Interconnectivity -: With the increasing adoption of SNPNs, there is a growing need to facilitate seamless interconnectivity among many SNPNs and SNPN Credential Providers (a.k.a, Credentials Holder (CH): refer to NOTE below). This requires a scalable and secure mechanism for SNPNs to interconnect without preconfigured information about each other's IP addresses.

NOTE: Stage1 defines SNPN Credential Provider as "Entity within the 5G system that creates and manages identity information and provides **authentication** services for those identities for the purpose of accessing a SNPN. The SNPN Credential Provider can also **authorize** access to a non-public network for a subscriber associated with an identity handled by this SNPN Credential Provider. Stage 2 defines Credentials Holder as " Entity which **authenticates** and **authorizes** access to an SNPN separate from the Credentials Holder."

OpenRoaming Integration: Integrating OpenRoaming architecture into 3GPP SNPN architecture necessitates reviewing security mechanisms to ensure secure authentication and authorization between user devices, Identity Providers (IdPs), and Access Network Providers (ANPs).

Scalability and Signalling: The potential for a significant increase in SNPN deployments poses challenges regarding signaling scalability and the management of signaling connections between SNPNs and CHs. This includes supporting short-lived signaling connections and minimizing firewall and border gateway configurations.

Cross-Domain Security: The current cross-certification approach for cross-domain security in 5GS may not scale effectively for SNPNs. A study is required to explore alternative solutions that secure connections between CHs and SNPNs in a scalable manner.

Identity Verification: SNPNs need a scalable mechanism to determine how to connect to a CH capable of verifying the identity of users attempting to connect to the SNPN, especially in scenarios where the SNPN may not have an established relationship with the CH.

Notifications: CHs need a scalable mechanism to securely notify events to an SNPN, especially in scenarios where the CH may not have an established relationship with the SNPN.

# 4 Objective

Based on the above justification, the following objectives will be studied based on the related Rel-19 work:

WT#1: Study and propose mechanisms that enable SNPNs to interconnect with many CHs = in a scalable and secure manner.

* Study solutions to support scalable and secure signaling between SNPNs and CHs, including managing short-lived signaling connections.
* Study a scalable mechanism for SNPNs to connect to CHs capable of verifying user identities, considering scenarios with no pre-established relationships between SNPNs and CHs.
* Study a scalable mechanism for CHs to securely notify events to SNPNs, considering scenarios with no pre-established relationships between SNPNs and CHs

## TU estimates and dependencies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Work Task ID | TU Estimate  (Study) | TU Estimate  (Normative) | RAN Dependency  (Yes/No/Maybe) | Inter Work Tasks Dependency  Editor’s Note: This column should highlight if WT#x is self-contained, or is dependent on completion of other WTs |
| WT#1 | 1.5 | 0.5 | No | WT#1 is self-contained |

Total TU estimates for the study phase: 1.5

Total TU estimates for the normative phase: 0.5

Total TU estimates: 2.0

# 5 Expected Output and Time scale

***{If this WID covers both stage 2 and stage 3, clearly indicate the different completion dates.}***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| New specifications {One line per specification. Create/delete lines as needed} | | | | | |
| Type | TS/TR number | Title | For info  at TSG# | For approval at TSG# | Rapporteur |
| Internal TR | TBD | Security Aspects of Interconnect of SNPN | SA#106  (Dec 2024) | SA#107  (Mar 2025) | TBD |
|  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} | | | |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
|  |  |  |  |
|  |  |  |  |

# 6 Work item Rapporteur(s)

TBD

# 7 Work item leadership

SA3

# 8 Aspects that involve other WGs

Stage 3 aspects covered by CT WGs. Potential interaction with SA2 WG for architecture aspects.

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Cisco |
| Intel |
| Peraton Labs |
| CISD |
| Samsung |
|  |
| CableLabs |
| Google |
| ETRI |
| Lenovo |
|  |
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