**3GPP TSG-SA WG1 Meeting #98e S1-draft221103**

**Electronic Meeting, 9 – 19 May 2022** *(revision of S1-22xxxx)*

**Source: vivo,** **China Unicom**

**pCR Title: Pseudo-CR on use case of mobility for non-N2 shared network**

**Draft Spec: 3GPP TR 22.851v0.0.0**

**Agenda item: 7.5**

**Document for: Approval**

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*Abstract: introduce the mobility scenarios and potential requirements for the non-N2 shared network in TR22.851.*

**1. Introduction**

Study FS\_netshare aims to study use cases and potential requiremnts for the non-N2 shared network.

**2. Reason for Change**

Mobility scenarios and potential requirements needs to be discussed and agreed for the non-N2 shared network.

**3. Conclusions**

none

**4. Proposal**

It is proposed to agree the following changes to 3GPP TR 22.851.

\* \* \* First Change \* \* \* \*

### 5.A.1 Description

It is worth mentioning that 5G networks have been designed to provide shared facilities at the beginning of the deployment. This means that if the 4G network has independent E-UTRAN coverage and shared E-UTRAN coverage at the same time, there will be more than one operator's wireless access technology simultaneously supporting coverages:

- Independent E-UTRAN coverage,

- Shared E-UTRAN coverage,

- Independent 5G NR coverage,

- Shared 5G NR coverage.

Therefore, interoperability with existing technologies needs to be considered when introducing non-N2 network sharing.

### 5.A.2 Pre-conditions

1. It is assumed that, OP1’s home network uses the same PLMN-ID for both 4G and 5G; and OP2’s home network uses same PLMN-ID for both 4G and 5G network. Only OP1’s 5G RAN is "shared" with Participating Operator 2.

NOTE: The home 4G and 5G network of OP1 and OP2 may be deployed with independent and shared wireless access technology.

1. Both operators agree to share the network with non-N2 direct connection between the shared radio access network and the Participating Operator's core network.

3. PLMN-ID of shared RAN: Different from home PLMN-IDs of OP1 and OP2.

4. Potential scenario1: OP1 shared 5G network may overlap with OP2’s 4G home network; may ALSO overlap with OP2’s 5G home network (e.g. at OP1’s border).

following coverage scenarios are possible:

- OP1-5G (shared) only.

- OP1-5G (shared) + OP2-4G (e.g. OP1 5G preferred for UE of OP2).

- OP1-5G (shared) + OP2-5G (e.g. OP2-5G preferred for UE of OP2).

- OP2 5G only.

NOTE: OP2 UE should stay on OP1 shared network, if UE preferred OP1 5G, unless OP2-5G is available.

1. Potential scenario2: OP1 shared 5G network may overlap with OP2’s 4G home network (e.g. at OP1 border); may ALSO overlap with OP2’s 5G home network (e.g. at OP1 border).

NOTE: The overlap between OP2’s 4G and 5G home network happen in the border.

Editor’s NOTE: Mobility instructions need to be added in the Annex.

Further:

1.UE may subscribe to OP2’s home PLMN.

2.UE may register successfully to OP1’s shared 5G network.

### 5.A.3 Service Flows



1. OP2\_4G
2. OP2\_5G
3. OP2\_5G
4. OP1\_5G
5. OP1\_5G
6. OP1\_5G

②

①

Figure 5.A.3-1: Non-N2 shared network mobility scenario

The UE moves between the OP1’s shared 5G network and the OP2’s home network.

NOTE 1: OP1\_5G is OP1’s shared 5G network, with non-N2 direct connection between the shared radio access network and the Participating Operator's core network.

NOTE 2: OP2\_5G is OP2’s home network, may be MOCN networks or independent network.

NOTE 3: OP2\_4G is OP2’s home network, may be a MOCN network or independent network.

Scenario 1: shared 5G - > home (OP2)5G

-UE with or without services, and moves from shared network to home 5G network. As shown as ① in figure, that is OP1\_5G(shared) - > OP2\_5G.

Scenario 2: shared 5G - > home (OP2) 4G

-UE with or without services, and moves from shared network to home 4G network. As shown as ② in figure, that is OP1\_5G(shared) - > OP2\_4G.

Scenario 3: home (OP2) 4G - > shared 5G

-UE with or without services, and moves from home 4G network to shared network. As shown as ② in figure, that is OP2\_4G - > OP1\_5G(shared) ; for voice call, UE may quickly accesses to the shared 5G.

Scenario 4: home (OP2) 5G - > shared 5G

-UE with or without services, and moves from home 5G network to the shared network. As shown as ① in Figure, that is OP2\_5G - > OP1\_5G(shared) ; .

More details of mobility is shown in the table 5.A.3-1.

Table 5.A.3-1: Mobility for non-N2 network sharing

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scenario** | **1 (OP1-**5G **shared**  **- > OP2-5G)** | **2 (OP1-**5G **shared- > OP2-4G)**  **[no OP2-5G]** | **3 (OP2-4G**  **- > OP1-**5G **shared)**  **[no OP2-5G]** | **4 (OP2-5G - > OP1-**5G **shared)** |
| a) I-PLMN sel | Yes | No | No | No |
| b) I-PLMN cell resel | Yes (via ePLMN + I-freq priority) | Yes (via ePLMN), only at OP1 border | Yes (via PLMN + IRAT priority) | Yes (via ePLMN), only at OP2 border |
| c) I-PLMN HO | Yes (via ePLMN) | Yes (via ePLMN), only at OP1 border | Yes (via ePLMN) | Yes (via ePLMN), only at OP2 border |

### 5.A.4 Post-conditions

### 5.A.5 Existing feature partly or fully covering use case functionality

SA1 has performed various studies on mobility and network sharing in previous releases, where related normative stage 1 requirements are introduced in 3GPP TS 22.101 [x1] and 22.261[x3].

3GPP TS 22.261 [x3] introduces requirements of Diverse mobility management, stated as follows:

*The 5G system shall support inter- and/or intra- access technology mobility procedures within 5GS with minimum impact to the user experience (e.g. QoS, QoE).*

3GPP TS 22.101 [x1] introduces requirements of mobility of network sharing, stated as follows:

*It shall be possible to support different mobility management rules, service capabilities and access rights as a function of the home PLMN of the subscribers.*

### 5.A.6 Potential New Requirements needed to support the use case

[PR 5.A.6-001] Mobility shall be supported if a user crosses the border between the shared network managed by Hosting operator and the Participating Operator’s home network.

\* \* \* Next Change \* \* \* \*

<Proposed change in revision marks>

\* \* \* Next Change \* \* \* \*

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