**3GPP TSG-SA1 Meeting #107 *S1-242482***

**Maastricht, The Netherlands, 19-23 Aug 2024** *(revision of S1-242320)*

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **22.261** | **CR** | **0801** | **rev** | **2** | **Current version:** | **19.7.0** |  |
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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 |  | Core Network | **X** |

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| ***Title:***  |  |
|  |  |
| ***Source to WG:*** | China Unicom, ZTE, OPPO, SK Telecom |
| ***Source to TSG:*** | SA1 |
|  |  |
| ***Work item code:*** | DINS |  | ***Date:*** | 2024-8-22 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-20 |
|  | *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 canbe 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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | Network sharing is always a key topic for releases such as 3GPP TS 23.251, TS 23.501 and TS 38.300. Indirect Network Sharing has been specified in the very recent R19 NetShare items, including the requirements for the general aspect, mobility management, network access control, regulation, and charging, referring to 3GPP TS 22.261 clause 6.21, and further work, e.g., SA2 TEI19\_NetShare.The CR intends to further explore the applicability of NetShare in disaster scenarios, especially in regions with explicit disaster requriements and/or where NetShare has already been deployed or is planned to be deployed.The CR also takes full account of the existing use case in TS 22.261 (clause 6.31), which discusses the minimization of service interruption associated with the disaster roaming during a disaster scenario, and its impact on the UE. |
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| ***Summary of change:*** | The following changes are visited:- Extend Indirect Network Sharing to support disaster condition.- Identify the new requirements applies to network sharing for disaster condition from existing NetShare and MINT.  |
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| ***Consequences if not approved:*** | The applicability and requirements of NetShare in disaster scenarios will not be covered in 5G. |
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| ***Clauses affected:*** | 6.21.1, 6.21.2.2 |
|  |  |
|  | **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:*** |  |

**\* \* \* \* Start of First Change \* \* \* \***

### 6.21.1 Description

The increased density of access nodes needed to meet future performance objectives poses considerable challenges in deployment and acquiring spectrum and antenna locations. RAN sharing is seen as a technical solution to these issues.

In RAN Sharing operations, NG-RAN resources can be used by multiple network operators. Indirect Network Sharingis one of the possible sharing methods.

In addition, Indirect Network Sharing can offer more options for an operator to provide services to UEs via Shared NG-RAN, when a Disaster Condition occurs in a geographic area, which causes the loss of its UEs’ previous network connection, until the Disaster Condition is not applicable anymore.

NOTE: This scenario assumes that NG-RAN and/or core network of at least one operator is unavailable but that the NG-RAN and core network of at least another operator is available in the disaster area. In case the affected operator has multiple core networks in different geographic areas, when a core network of that operator has broken down in the specific disaster area, the other core network from the different area can be used temporarily in this case.

During NG-RAN sharing, the security and privacy of shared networks, non-shared networks, and subscribers need to be maintained without negative effects. Especially in the case of Indirect Network Sharing, where the involvement of the core network of the hosting operator e.g. for signalling exchange between the users and the core network of the participating operator could cause exposure of the subscriber’s information to the hosting network, an extra scrutiny of the security mechanism is expected to avoid sharing the information that is not needed for the Indirect Network Sharing operation (e.g. network topology) and protect the information that is needed for the Indirect Network Sharing operation between the hosting operator and the participating operator.

**\* \* \* \* Start of Next Change \* \* \* \***

#### 6.21.2.2 Indirect network sharing

The 5G system shall be able to support Indirect Network Sharing between the Shared NG-RAN and one or more Participating NG-RAN Operators’ core networks, by means of the connection being routed through the Hosting NG-RAN Operator’s core network.

NOTE 1: Requirements of Indirect Network Sharing assume no impact on UE.

NOTE 2: For more information on Indirect Network Sharing see Annex I.

The following requirements apply to Indirect Network Sharing:

Indirect Network Sharing shall be transparent to the user.

NOTE 3: This requirement is aligned with the existing requirement in 3GPP TS 22.101 [6] clause 4.9.

The following existing service requirements related to network sharing in 3GPP TS 22.101 [6] apply:

- clause 4.2.1,

- clause 28.2.3, and

- clause 28.2.5.

Subject to regulatory requirements or operator policy, the 5G network shall support a PLMN operator to be made aware of the failure or recovery of NG-RAN and/or core network in other PLMN(s) in the same area when the Disaster Condition applies, or when the Disaster Condition is not applicable anymore.

Subject to regulatory requirements or operator policy, the 5G network shall support a PLMN operator to be made aware of the availability of other PLMN(s) as Hosting NG-RAN Operator(s) via Indirect Network Sharing in the same area when the Disaster Condition applies.

Subject to the agreement between the hosting and participating operator, the 5G system shall support a means to enable a UE of the Participating NG-RAN Operator to:

- access their subscribed PLMN services when accessing a Shared NG-RAN, and/or,

- obtain its subscribed services, including Hosted Services, of participating operator via a Shared NG-RAN.

NOTE 4: the above requirement is applicable to Disaster Condition via a Shared NG-RAN.

Based on operator policy, the 5G system shall support a mechanism to enable an authorized UE with a subscription to a Participating Operator to select and access a Shared NG-RAN.

Based on operator policy, the 5G system shall support access control for an authorized UE accessing a Shared NG-RAN and be able to apply differentiated access control for different Shared NG-RANs when more than one Shared NG-RAN are available for the Participating Operator to choose from.

Based on operator policy, the 5G network shall minimize network congestion caused by Indirect Network Sharing in disaster event.

NOTE 5: Population density in the different disaster area needs to be considered.

Based on operator policy, the 5G system shall enable the Participating Operator to provide steering information in order to assist a UE with access network selection amongst the Hosting Operator’s available Shared RAN(s).

The 5G system shall support service continuity for UEs that are moving between different Shared NG-RANs and/or between a Shared NG-RAN and a non-Shared NG-RAN networks.

The 5G system shall be able to provide a UE accessing a Shared NG-RAN network with positioning service in compliance with regulatory requirements.

Subject to regulatory requirements and mutual agreement between the participating operators and the hosting operator, the requirements to support regulatory services, e.g., PWS or emergency calls apply to Indirect Network Sharing.

In case of Indirect Network Sharing and subject to agreement between operators the 5G system shall enable the Shared NG-RAN of a hosting operator to provide services for inbound roaming users.

The 5G core network shall be able to support collection of charging information associated with a UE accessing a Shared NG-RAN using Indirect Network Sharing, which refers to the resource usage of hosting operator’s core network.

The 5G network shall be able to enable Indirect Network Sharing only when the Disaster Condition applies in a specific area and disable it when no longer applicable.

NOTE 6: It is assumed operators can have sharing agreement for disaster conditions in the area.

NOTE 7: It is assumed that during a disaster condition, previous network communication is temporarily disabled.

The 5G network shall be able to provide a means for a UE to return to the PLMN used prior to Indirect Network Sharing, when a Disaster Condition is no longer applicable.

The 5G network shall be able to collect charging information for a UE accessing a Shared NG-RAN using Indirect Network Sharing in Disaster Condition.

**\* \* \* \* End of Changes \* \* \* \***