**3GPP TSG-SA3 Meeting #78-LI-e-c *s3i200439r1***

**Online, , 11th Aug 2020 - 12th Aug 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **33.127** | **CR** | **0086** | **rev** | **1** | **Current version:** | **16.4.0** |  |
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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:*** | One PDU session connects to only one DN | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | SA3-LI (OTD) | | | | | | | | | |
| ***Source to TSG:*** | SA3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LI16 | | | | |  | ***Date:*** | | | 2020-08-12 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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 can be 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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
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| ***Reason for change:*** | | Annex A.3 incorrectly shows that a single PDU session can connect to two different DNs (i.e., DN-1 and DN-2). According to the 3rd paragraph of Clause 5.6.4.2 of TS 23.501 as well as Figures 5.6.4.2-1, 5.6.4.3-1, and 5.6.4.3-2, a single PDU session can only connect to one DN. Annex A.3 needs to be corrected to align with TS 23.501. In addition, Clause 6.2.3.6 should be clarified to reflect this one PDU session – one DN principle. | | | | | | | | |
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| ***Summary of change:*** | | Modification of clause A.3 to correctly show a PDU session connecting to a single DN even with multiple different access points to that same DN. Also updates Clause 6.2.3.6 to reflect this one PDU session – one DN principle. | | | | | | | | |
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| ***Consequences if not approved:*** | | Misalignment with SA2 architecture requirements. | | | | | | | | |
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| ***Clauses affected:*** | | 6.2.3.6, A.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 Changes

Start of First Change

6.2.3.6 Network topologies

The SMF shall provide the IRI-POI functions in the following network topology cases:

* Non-roaming case.
* Roaming case, in VPLMN.
* Roaming case, in HPLMN.
* Non-3GPP access case, in the PLMN where N3IWF resides.

When the target UE has multiple PDU sessions active, the generation and delivery of xCC for each PDU session shall be done independently, each with separate correlation information.

When a target UE's PDU session involves multiple Data Network (DN) connections (i.e., multiple connections to the same DN as described in clause A.3), the generation and delivery of xCC shall be done in such a way that:

* All applicable user plane packets are captured and delivered.
* Duplicate delivery of CC is suppressed to the extent possible.

A PDU session may involve more than one UPFs. In that case, the CC-TF present in the SMF shall determine which UPF(s) is (are) more suitable to provide the CC-POI functions adhering to the above two requirements. Furthermore, independent of which UPF is used to generate the xCC, the CC delivered from the MDF3 shall be correlated to the IRI messages related to the PDU session.

End of First Change

Start of Second Change

A.3 Multiple DN connections in a PDU session

A.3.1 General

According to 3GPP TS 23.501 [2], a PDU session can involve multiple UPFs, but regardless of how many UPFs are involved in the session, the session only connects to a single DN through one or more DN connections (i.e., connections to the same DN).

When a PDU session involves multiple UPFs, the interception of user plane packets can be done in two ways:

* At one UPF (branching UPF) through which all the user plane packets pass through.
* At anchor UPFs.

When the second approach is chosen with branching UPF being one of the anchor UPFs, redundant delivery of CC should be avoided.

In a non-roaming scenario, the IRI-POI present in UDM also provide the LI functions.

A.3.2 Topology view for a non-roaming scenario

The overall network configurations to illustrate the LI with multiple DN connections (to the same DN) in a PDU session is illustrated in figure A.3-1 and A.3-2.

The 5G core system is shown using the service-based representation (as shown in TS 23.501 [2]) with the use of point-to-point LI system.



**Figure A.3-1: Network topology showing CC-POI at one UPF**

The IRI-POIs present in the AMF, MME, UDM, SMSF and SMF deliver the xIRI to the MDF2 and CC-POI present in the branching UPF (shown as UPF-1) on the common path to both DN connections delivers the xCC to the MDF3. The MDF3 address to CC-POI present in UPF-1 is provided by the CC-TF present in the SMF over LI\_T3 reference point. In this view, all user plane packets pass through UPF-1.

The LIPF present in the ADMF provisions the IRI-POIs present in the NFs with the intercept related data. The LI\_X1 interfaces between the LIPF and the UPF is to monitor the user plane data.



**Figure A.3-2: Network topology showing CC-POI at two UPFs**

The IRI-POIs present in the AMF, MME, UDM, SMSF and SMF deliver the xIRI to the MDF2. In this example, there is a branching UPF (UPF-B), an anchor UPF for the DN (UPF-A1) and another anchor UPF for the same DN (UPF-A2). The second approach (i.e. CC interception at the anchor UPFs) mentioned in A.3.1 is used to provide the CC interception. The UPF-A1 delivers the xCC generated from the user plane packets that flow from UE to the DN via UPF-A1 to the MDF3. The CC-POI present in the UPF-A2 delivers the xCC generated from the user plane packets that flow UE to the DN via UPF-A2 to the MDF3. The MDF3 address in the CC-POIs present in UPF-1 and UPF-2 are provided by the CC-TF present in the SMF over LI\_T3 reference point.

The LIPF present in the ADMF provisions the IRI-POIs present in the NFs with the intercept related data. The LI\_X1 interfaces between the LIPF and the UPFs are to monitor the user plane data.

NOTE: In some cases, the branching UPF may be merged with one of the anchor UPFs. In this case care needs to be taken to avoid duplication of xCC e.g. by intercepting only on the external N6 interface of each anchor UPF.

End of Second Change

End of All Changes