**3GPP SA WG2 Meeting #164S2-240xxxx**

**Maastricht, Netherlands, 19 – 23 August, 2024 (revision of S2-2407635)**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.502** | **CR** |  | **rev** | **1** | **Current version:** | **19.0.0** |  |
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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 | **x** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | ATSSS Rule Provisioning via 3GPP access to EPC | | | | | | | | | |
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| ***Source to WG:*** | NEC | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI19\_ARP3E | | | | |  | ***Date:*** | | | 2024-08-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | After the establishment of a MA PDU Session, the UE receives a prioritized list of ATSSS rules from the SMF. For MA PDU Session establishment with 3GPP access connected to EPC and non-3GPP access connected to 5GC, the ATSSS rules are provided from the PGW-C+SMF to the UE via SM NAS signalling over 5GC, but ATSSS rules are not provided via 3GPP access connected to EPC.  It is beneficial for ATSSS rule provisioning if ATSSS rules can be provided via 3GPP access to EPC from Rel-19. | | | | | | | | |
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| ***Summary of change:*** | | It’s proposed to add the feature of ATSSS Rule Provisioning via 3GPP access to EPC. | | | | | | | | |
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| ***Consequences if not approved:*** | | ATSSS rules can not be provided via 3GPP access connected to EPC. | | | | | | | | |
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| ***Clauses affected:*** | | 4.22.2.3.1, 4.22.2.3.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 is a draft CR. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* \* First change \* \* \* \*

#### 4.22.2.3 MA PDU Session establishment with 3GPP access connected to EPC and non-3GPP access connected to 5GC

##### 4.22.2.3.1 General

This clause applies to the case where, for a PDU Session, multi-access connectivity via both EPC (over 3GPP access) and 5GC (over non-3GPP access) is supported and allowed in the UE and network. In this case, multi-access connectivity using ATSSS via both 3GPP access to EPC and non-3GPP access to 5GC may be provided as described in this clause.

For this scenario, the general principles for ATSSS as described in clause 5.32 of TS 23.501 [2] apply, with the additions provided in this clause 4.22.2.3.

A Multi-Access PDU Session may be extended with user-plane resources via an associated PDN Connection on 3GPP access in EPC. This enables a scenario where a MA PDU Session can simultaneously be associated with user-plane resources on 3GPP access network connected to EPC and non-3GPP access connected to 5GC. Such a PDN Connection in EPS would thus be associated with multi-access capability in the UE and PGW-C+SMF.

NOTE: To the MME and SGW this is a regular PDN Connection and the support for ATSSS is transparent to MME and SGW.

The UE may operate in either single-registration mode or dual-registration mode in 3GPP access. Irrespective of whether the UE operates in single-registration mode or dual-registration mode in 3GPP access, it is assumed that the UE supports simultaneous registrations for non-3GPP access in 5GC and 3GPP access in EPC.

The ATSSS rules are provided from the PGW-C+SMF to the UE via SM NAS signalling over 5GC, as described in clause 5.32.2 of TS 23.501 [2]. ATSSS rules may be provided via the EPC.

When a UE establishes a MA PDU Session in 5GS, the UE indicates whether it supports 3GPP access leg over EPC. Based on the UE capability, the SMF determines whether the non-3GPP access should be released or not when the MA PDU Session is moved to EPS as described in clause 4.22.6.2.

After the establishment of a MA PDU Session and setting up user-plane resources in 3GPP access in EPC and non-3GPP access in 5GC, the UE distributes the uplink traffic across the two access networks as described in clause 5.32.1 of TS 23.501 [2]. Similarly, the PDU Session Anchor UPF performs distribution of downlink traffic across the two access networks as described in clause 5.32.1 of TS 23.501 [2].

The PMF protocol may be used via any user plane connection, i.e. via 3GPP access in EPC or non-3GPP access in 5GC.

The PCF functionality to support ATSSS, as described in clause 5.32.1 of TS 23.501 [2] and TS 23.503 [20] applies also in the case of interworking with EPC.

When the 3GPP access leg of a MA PDU Session using both 3GPP and non-3GPP access connected to 5GC is transferred to EPC, the PDU Session continues to work as a MA PDU Session using E-UTRAN/EPC and non-3GPP access connected to 5GC, as described in clause 4.22.6.

##### 4.22.2.3.2 PDN Connections and Multi Access PDU Sessions

When the UE wants to request a new PDN Connection in EPC and wants to use this PDN Connection as user-plane resource associated with a MA PDU Session:

- The UE requests establishment of a new PDN Connection when the UE is registered via 3GPP access in EPS using PDN Connection Establishment procedure. The UE provides via PCO to PGW-C+SMF the following information:

- An indication that the PDN Connection is requested to be associated with a MA PDU Session

- The UE's ATSSS capabilities as described in clause 5.32.2 of TS 23.501 [2] (i.e. whether the UE is capable of supporting the ATSSS-LL functionality, the MPTCP functionality, the MPQUIC functionality, or any combination of them).

- The MME may select a PGW-C+SMF as described in TS 23.401 [13] and clause 4.11.0a.4.

NOTE 1: The selection of PGW-C+SMF in the correct 5GC slice requires the same mapping between EPC and 5GC slices as required for single-access PDU sessions. In order to select an ATSSS capable PGW-C+SMF it is assumed that the operator deployment ensures that all PGW-C+SMF(s) configured to support the specific APN in this network slice are also capable to support ATSSS. There is however no assumption that all PGW-U+UPFs need to support ATSSS, since PGW-C+SMF can make a selection of PGW-U+UPF taking the multi-access properties into account.

- The PGW-C+SMF determines based its capabilities whether the request can be accepted. The PCF decides whether the multi-access connectivity is allowed or not based on operator policy and subscription data, as described in clause 4.22.2. The PGW-C+SMF provides the following information in the PCO/ePCO to the UE:

- An indication whether the request for using the PDN Connection for MA-PDU Session is accepted or not.

- If the UE has indicated that it is capable of supporting the MPTCP functionality and/or the MPQUIC functionality and the PGW-C+SMF accepts to activate the MPTCP functionality and/or the MPQUIC functionality, then the network provides MPTCP proxy information and/or MPQUIC proxy information to the UE, as described in clause 5.32.2 of TS 23.501 [2].

- UE Measurement Assistance Information (as described in clause 5.32.2 of TS 23.501 [2]).

- ATSSS rules if the UE has indicated that it is capable of supporting the ATSSS rule provisioning via 3GPP Access connected to EPC.

After the PDN Connection establishment:

- If the UE registers to 5GC and wants to add non-3GPP user-plane resources, then the UE shall send a PDU Session Establishment Request over this access containing a "MA PDU Request" indication as described in clause 5.32.2 of TS 23.501 [2].

NOTE 2: Adding the PDU Session connectivity and user plane resources over non-3GPP access in 5GS allows the PGW-C+SMF to provide ATSSS rules to the UE.

- If the UE registers via non-3GPP access in EPC, the UE shall not trigger PDN Connection establishment to add non-3GPP/EPC access to the MA PDU Session.

When the UE wants to request a new MA PDU Session in 5GC/non-3GPP access, the description in clause 5.32.2 of TS 23.501 [2], applies. After the MA PDU Session establishment in 5GS/non-3GPP access, the description in clause 5.32.2 of TS 23.501 [2], applies with the following additions:

- If the UE is registered to EPC and wants to add user-plane resources on 3GPP access over EPC, then the UE shall send a PDN Connection Establishment Request over this access containing a "handover" indication and include a "MA PDU Request" indication in the PCO as well as the PDU Session ID of the existing MA PDU Session on non-3GPP access over 5GC.

- When the UE deregisters from the EPC access (but remains registered on the 5GC access), the MME will notify the PGW-C+SMF that the PDN Connection is released, as described in TS 23.401 [13]. The SMF can then notify the UPF that the access type has become unavailable.

In order to support EPS interworking when Ethernet type PDN Connection is not supported in EPS, the UE may use non-IP type PDN Connection when the UE establishes a PDN Connection in EPS as an added 3GPP access leg of an Ethernet type MA PDU Session. In this case, the UE and SMF shall locally associate the PDN Connection as an Ethernet type PDU Session as described in TS 23.501 [2]. When Ethernet type PDN Connection is not supported in EPS, the UE does not request to establish a PDN Connection with "MA PDU Request" indication before the UE registers to 5GS and establishes MA PDU Session over non-3GPP access.

A UE that has an established MA-PDU session over non-3GPP access in 5GC and 3GPP access in EPS, may be able to use EN-DC for the 3GPP access leg.

Depending on the RAT types supported by the UE, the PDN connection may also be handed over to 3GPP access in 5GC. For a UE supporting both E-UTRAN/EPC access and NG-RAN/5GC access, the user plane resources for 3GPP access may be moved between E-UTRAN/EPC access and NG-RAN/5GC access as described in clause 5.17.2 of TS 23.501 [2]. The PDU Session and User Plane resources active over non-3GPP/5GC access are not affected by such inter 3GPP access RAT change.

\* \* \* \* End of changes \* \* \* \*