**SA WG2 Meeting #143eS2-2100075r05**

**Feb 24th – March 9th, 2021 ; Elbonia (revision of S2-2100075)**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **23.501** | **CR** | **2527** | **rev** | **1** | **Current version:** | **16.7.0** |  |
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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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | MA PDU sessions with connectivity over E-UTRAN/EPC and non-3GPP access to 5GC |
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| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, Deutsche Telekom, Ericsson, InterDigital, LG Electronics |
| ***Source to TSG:*** | S2 |
|  |  |
| ***Work item code:*** | ATSSS\_Ph2 |  | ***Date:*** | 2021-01-18 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | As explained in the objectives of ATSSS\_Ph2 WID in SP-200977b) Support for UEs to establish MA PDU Sessions with a 3GPP access leg over EPC and a non-3GPP access leg over 5GC, according to the conclusions in TR 23.700-93, clause 8.3. |
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| ***Summary of change:*** | The text currently in R16 23.316 § 4.12.3 describing the feature as applicable only to 5G RG is now moved to 23.501 § 5.32 and adapted to:- apply to any UE and over and non-3GPP access;- support Ethernet PDU Session type (for non 5G RG) as documented in TR 23.700-93, clause 8.3. |
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| ***Consequences if not approved:*** | No support for UEs to establish MA PDU Sessions with a 3GPP access leg over EPC and a non-3GPP access leg over 5GC |
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| ***Clauses affected:*** | 5.32.1 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 23.316 CR 2056 + TS 23.502 CR 2589 |
| ***affected:*** |  | **x** |  Test specifications |  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications |  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** | R01:* Changes within § 5.32.7.X have beeen removed as it is now in a companion 23.502 CR 2589
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*FIRST CHANGE*

### 5.32.1 General

The ATSSS feature is an optional feature that may be supported by the UE and the 5GC network.

The ATSSS feature enables a multi-access PDU Connectivity Service, which can exchange PDUs between the UE and a data network by simultaneously using one 3GPP access network and one non-3GPP access network and two independent N3/N9 tunnels between the PSA and RAN/AN. The multi-access PDU Connectivity Service is realized by establishing a Multi-Access PDU (MA PDU) Session, i.e. a PDU Session that may have user-plane resources on two access networks. This assumes both 3GPP access and non-3GPP access are allowed for the S-NSSAI of the PDU Session

The UE may request a MA PDU Session when the UE is registered via both 3GPP and non-3GPP accesses, or when the UE is registered via one access only.

After the establishment of a MA PDU Session, and when there are user-plane resources on both access networks, the UE applies network-provided policy (i.e. ATSSS rules) and considers local conditions (such as network interface availability, signal loss conditions, user preferences, etc.) for deciding how to distribute the uplink traffic across the two access networks. Similarly, the UPF anchor of the MA PDU Session applies network-provided policy (i.e. N4 rules) and feedback information received from the UE via the user-plane (such as access network Unavailability or Availability) for deciding how to distribute the downlink traffic across the two N3/N9 tunnels and two access networks. When there are user-plane resources on only one access network, the UE applies the ATSSS rules and considers local conditions for triggering the establishment or activation of the user plane resources over another access.

The type of a MA PDU Session may be one of the following types defined in clause 5.6.1: IPv4, IPv6, IPv4v6, and Ethernet. In this release of the specification, the Unstructured type is not supported. The clause 5.32.6.2.1 and the clause 5.32.6.3.1 below define what Steering Functionalities can be used for each supported type of a MA PDU Session.

The handling of 3GPP PS Data Off feature for MA PDU Session is specified in clause 5.24.

The ATSSS feature can be supported over any type of access network, including untrusted and trusted non-3GPP access networks (see clauses 4.2.8 and 5.5), wireline 5G access networks (see clause 4.2.8), etc., as long as a MA PDU Session can be established over this type of access network.

In this Release of the specification, a MA PDU Session using IPv6 multi-homing (see clause 5.6.4.3) or UL Classifier (see clause 5.6.4.2) is not specified.

In this Release of the specification, support for ATSSS assumes SMF Service Areas covering the whole PLMN or that a MA PDU Session is released over both accesses when the UE moves out of the SMF Service Area.

If the UE, due to mobility, moves from being served by a source AMF supporting ATSSS to a target AMF not supporting ATSSS, the MA PDU Session is released as described in TS 23.502 [3].

NOTE: Deployment of ATSSS that is homogeneous per PLMN or network slice enables consistent behaviour. In the case of non-homogenous support of ATSSS in a PLMN/slice (i.e. some NFs in a PLMN/slice may not support ATSSS), MA PDU Sessions can be released due to UE mobility.

A Multi-Access PDU Session may for the 3GPP access use user-plane resources of an associated PDN Connection on 3GPP access in EPC instead of the 3GPP access to 5GC. 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 use of ATSSS with EPS interworking may apply to Ethernet and IP-based PDU Session and PDN Connection types;

NOTE 1: A MA PDU Session with one 3GPP access connected to 5GC and one non-3GPP access connected to EPC is not supported.

NOTE 2: Co-existence with NBIFOM is not defined. It is assumed that NBIFOM and the multi-access connectivity described in this clause are not deployed in the same network.

NOTE 3: To the MME and SGW this is a regular PDN Connection and the support for ATSSS is transparent to MME and SGW.

NOTE 4: Support of ATSSS with EPS interworking can apply to Ethernet PDU Session / PDN Connection only when the UE and the network support both Ethernet PDU Session type and Ethernet PDN Connection type;

This support of Multi-Access PDU Sessions using for the 3GPP access user-plane resources of an associated PDN Connection instead of the 3GPP access to 5GC is further defined in TS 23.502 [3].

The following clauses specify the functionality that enables ATSSS.

*NEXT CHANGE (4)*

*END OF CHANGES*