**3GPP TSG-CT WG1 Meeting #141eC1-232164r01**

**Online 17– 21 April 2023**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **24.193** | **CR** | **0117** | **rev** | **-** | **Current version:** | **18.1.0** |  |
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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:***  | Resolve the EN on MPQUIC functionality indicated on untrusted non-3GPP leg |
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| ***Source to WG:*** | ZTE, Xiaomi |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | ATSSS\_Ph3 |  | ***Date:*** | 2023-04-10 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-18 |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | In clause 5.3a.2, the EN on "the case for support of MPQUIC functionality will be added later on" can be resolved based on the newly added combinations of steering functionalities as specified in clause 5.32.6 of TS 23.501. |
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| ***Summary of change:*** | Editoroal corrections: the style of bullet 1) under c) and the NOTE 2 in clause 5.3.1; and remove the duplicated "shall" in clause 5.3a.4.Remove the first EN in clause 5.3a.2 and add the bullets to specify the UE shall set the ATSSS request information field of ATSSS\_REQUEST Notify payload to "MPQUIC functionality with any steering mode and ATSSS-LL functionality with only active-standby steering mode supported", " MPQUIC functionality with any steering mode and ATSSS-LL functionality with any steering mode supported ", "MPTCP functionality with any steering mode, MPQUIC functionality with any steering mode, and ATSSS-LL functionality with only active-standby steering mode supported", or "MPTCP functionality with any steering mode, MPQUIC functionality with any steering mode, and ATSSS-LL functionality with any steering mode supported" based on its support of MPQUIC functionality combined with other steering functionalities. |
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| ***Consequences if not approved:*** | Unresolved EN remains. |
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| ***Clauses affected:*** | 5.3.1, 5.3a.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:*** |  |

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

### 5.3.1 UE establishing a PDN connection as a user-plane resource of an MA PDU session to be established

In order to establish a PDN connection as a user-plane resource of an MA PDU session to be established, the UE shall initiate the UE requested PDN connectivity procedure according to 3GPP TS 24.301 [10].

In the PDN CONNECTIVITY REQUEST message or, when applicable, in the ESM INFORMATION RESPONSE message, of the UE requested PDN connectivity procedure:

a) the UE shall set the request type to "initial request" as specified in 3GPP TS 24.301 [10];

NOTE 1: According to 3GPP TS 24.301 [10], a newly generated PDU session ID is included in the protocol configuration options IE or the extended protocol configuration options IE of the PDN CONNECTIVITY REQUEST message with the request type "initial request".

b) the UE shall set the PDN Type IE to "IPv4", "IPv6", "IPv4v6" or "Ethernet"; and

c) in the protocol configuration options or extended protocol configuration options IE of the PDN CONNECTIVITY REQUEST message, the UE shall include the ATSSS request PCO parameter. In the ATSSS request PCO parameter:

1) if the UE supports ATSSS Low-Layer functionality with any steering mode (i.e., any steering mode allowed for ATSSS Low-Layer functionality) as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS-ST field to "ATSSS Low-Layer functionality with any steering mode supported";

NOTE 2: The ATSSS Low-Layer functionality cannot be used together with the redundant steering mode. When the UE indicates that it is capable of supporting the ATSSS Low-Layer functionality with any steering mode, it implies that the UE supports the ATSSS Low-Layer functionality with any steering mode except the redundant steering mode.

2) if the UE supports MPTCP functionality with any steering mode and ATSSS-LL functionality with only active-standby steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS-ST field to "MPTCP functionality with any steering mode and ATSSS-LL functionality with only active-standby steering mode supported";

3) if the UE supports MPTCP functionality with any steering mode and ATSSS-LL functionality with any steering mode (i.e., any steering mode allowed for ATSSS-LL) as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS-ST field to "MPTCP functionality with any steering mode and ATSSS-LL functionality with any steering mode supported";

4) if the UE supports MPQUIC functionality with any steering mode and ATSSS-LL functionality with only active-standby steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS-ST field to "MPQUIC functionality with any steering mode and ATSSS-LL functionality with only active-standby steering mode supported";

5) if the UE supports MPQUIC functionality with any steering mode and ATSSS-LL functionality with any steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS-ST field to "MPQUIC functionality with any steering mode and ATSSS-LL functionality with any steering mode supported";

6) if the UE supports MPTCP functionality with any steering mode, MPQUIC functionality with any steering mode and ATSSS-LL functionality with only active-standby steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS-ST field to "MPTCP functionality with any steering mode, MPQUIC functionality with any steering mode and ATSSS-LL functionality with only active-standby steering mode supported"; or

7) if the UE supports MPTCP functionality with any steering mode, MPQUIC functionality with any steering mode and ATSSS-LL functionality with any steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS-ST field to "MPTCP functionality with any steering mode, MPQUIC functionality with any steering mode and ATSSS-LL functionality with any steering mode supported".

Upon receipt of an ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message of a default EPS bearer context activation procedure as a response to the PDN CONNECTIVITY REQUEST message as specified in 3GPP TS 24.301 [10], the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message containing the extended protocol configuration options IE with the ATSSS response with the length of two octets PCO parameter:

a) the UE shall consider that the MA PDU session is established based on parameters from the default EPS bearer context of the PDN connection, as follows:

1) the PDN type of the default EPS bearer context shall be mapped to the PDU session type of the MA PDU session as follows:

i) if the PDN type is "IPv4", the PDU session type is set to "IPv4";

ii) if the PDN type is "IPv6", the PDU session type is set to "IPv6";

iii) if the PDN type is "IPv4v6", the PDU session type is set to "IPv4v6"; or

iv) if the PDN type is "Ethernet", the PDU session type is set to "Ethernet";

2) the PDN address of the default EPS bearer context shall be mapped to PDU address of the MA PDU session;

3) the APN of the default EPS bearer context shall be mapped to the DNN of the MA PDU session;

4) the PDU session identity of the MA PDU session shall be set to the PDU session identity included by the UE in the Protocol configuration options IE or Extended protocol configuration options IE in the PDN CONNECTIVITY REQUEST message;

5) the S-NSSAI of the MA PDU session shall be set to the S-NSSAI included by the network in the Protocol configuration options IE or Extended protocol configuration options IE in the ACTIVATE DEFAULT EPS BEARER REQUEST message, if the PDN connection is a non-emergency PDN connection;

6) the SSC mode of the MA PDU session shall be set to "SSC mode 1";

7) state of the PDU session shall be set to PDU SESSION ACTIVE; and

8) the ESM cause of the default EPS bearer context, if any, shall be mapped to the 5GSM cause of the MA PDU session as follows:

i) if the ESM cause is #50 "PDN type IPv4 only allowed", the 5GSM cause of the MA PDU session is set to #50 "PDU session type IPv4 only allowed"; or

ii) if the ESM cause is #51 "PDN type IPv6 only allowed", the 5GSM cause of the MA PDU session is set to #51 "PDU session type IPv6 only allowed";

 and that the PDN connection is established as a user-plane resource of the MA PDU session;

b) if the network steering functionalities information is included in the ATSSS response with the length of two octets PCO parameter, the UE shall use the network steering functionalities information; and

c) if the measurement assistance information is included in the ATSSS response with the length of two octets PCO parameter, the UE shall use the measurement assistance information.

Upon receipt of:

a) a PDN CONNECTIVITY REJECT message as a response to the PDN CONNECTIVITY REQUEST message as specified in 3GPP TS 24.301 [10]; or

b) an ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message of a default EPS bearer context activation procedure as a response to the PDN CONNECTIVITY REQUEST message as specified in 3GPP TS 24.301 [10] without the extended protocol configuration options IE containing the ATSSS response with the length of two octets PCO parameter;

the UE shall consider that the MA PDU session is not established and the PDN connection is not established as a user-plane resource of the MA PDU session.

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

### 5.3a.2 UE establishing a PDN connection over untrusted non-3GPP access network as a user-plane resource of an MA PDU session to be established

In order to establish a PDN connection over untrusted non-3GPP access network as a user-plane resource of an MA PDU session to be established, the UE shall initiate the IPsec tunnel establishment procedure using the IKEv2 protocol according to 3GPP TS 24.302 [17].

In the IKE\_AUTH request message to the ePDG:

a) the UE shall provide an indication about Attach Type, which indicates Initial Attach as specified in 3GPP TS 24.302 [17]; and

NOTE 1: According to 3GPP TS 24.302 [17], a newly generated PDU session ID is included in N1\_MODE\_CAPABILITY Notify payload.

b) the UE shall include ATSSS\_REQUEST Notify payload as specified in clause 8.2.9.20 of 3GPP TS 24.302 [17] and:

1) if the UE supports ATSSS Low-Layer functionality with any steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS request information field of the ATSSS\_REQUEST Notify payload to "ATSSS Low-Layer functionality with any steering mode supported";

2) if the UE supports MPTCP functionality with any steering mode and ATSSS-LL functionality with only active-standby steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS request information field of ATSSS\_REQUEST Notify payload to "MPTCP functionality with any steering mode and ATSSS-LL functionality with only active-standby steering mode supported";

3) if the UE supports MPTCP functionality with any steering mode and ATSSS-LL functionality with any steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS request information field of ATSSS\_REQUEST Notify payload to "MPTCP functionality with any steering mode and ATSSS-LL functionality with any steering mode supported";

4) if the UE supports MPQUIC functionality with any steering mode and ATSSS-LL functionality with only active-standby steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS request information field of ATSSS\_REQUEST Notify payload to "MPQUIC functionality with any steering mode and ATSSS-LL functionality with only active-standby steering mode supported";

5) if the UE supports MPQUIC functionality with any steering mode and ATSSS-LL functionality with any steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS request information field of ATSSS\_REQUEST Notify payload to "MPQUIC functionality with any steering mode and ATSSS-LL functionality with any steering mode supported";

6) if the UE supports MPTCP functionality with any steering mode, MPQUIC functionality with any steering mode, and ATSSS-LL functionality with only active-standby steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS request information field of ATSSS\_REQUEST Notify payload to "MPTCP functionality with any steering mode, MPQUIC functionality with any steering mode, and ATSSS-LL functionality with only active-standby steering mode supported"; or

7) if the UE supports MPTCP functionality with any steering mode, MPQUIC functionality with any steering mode, and ATSSS-LL functionality with any steering mode as specified in clause 5.32.6 of 3GPP TS 23.501 [2], the UE shall set the ATSSS request information field of ATSSS\_REQUEST Notify payload to "MPTCP functionality with any steering mode, MPQUIC functionality with any steering mode, and ATSSS-LL functionality with any steering mode supported".

Upon receipt of IKE\_AUTH response message as specified in 3GPP TS 24.302 [17] containing the ATSSS\_RESPONSE Notify payload:

a) the UE shall consider that the MA PDU session is established based on parameters in the IKE\_AUTH response message, as follows:

1) the PDN type shall be mapped to the PDU session type of the MA PDU session as follows:

i) if the CFG\_REPLY contains the INTERNAL\_IP4\_ADDRESS attribute, the PDU session type is set to "IPv4";

ii) if the CFG\_REPLY contains the INTERNAL\_IP6\_SUBNET attribute or INTERNAL\_IP6\_ADDRESS attribute, the PDU session type is set to "IPv6"; or

iii) if the CFG\_REPLY contains the INTERNAL\_IP4\_ADDRESS attribute and INTERNAL\_IP6\_SUBNET attributes, or the INTERNAL\_IP4\_ADDRESS attribute and INTERNAL\_IP6\_ADDRESS attribute, the PDU session type is set to "IPv4v6";

NOTE 2: PDN connections with PDN type "Ethernet" or PDN type "non-IP" are not supported over ePDG.

2) the PDN address shall be mapped to PDU address of the MA PDU session;

3) the APN of the PDN connection shall be mapped to the DNN of the MA PDU session;

4) the PDU session identity of the MA PDU session shall be set to the PDU session identity included by the UE in the PDU Session ID field of the N1\_MODE\_CAPABILITY Notify payload in the IKE\_AUTH request message;

5) the S-NSSAI of the MA PDU session shall be set to the S-NSSAI included by the network in the S-NSSAI Value field of the N1\_MODE INFORMATION Notify payload in the IKE\_AUTH response message, if the PDN connection is a non-emergency PDN connection;

6) the SSC mode of the MA PDU session shall be set to "SSC mode 1";

7) state of the PDU session shall be set to PDU SESSION ACTIVE; and

8) the Private Notify Message Status Types, if received, shall be mapped to the 5GSM cause of the MA PDU session as follows:

i) if a PDN\_TYPE\_IPv4\_ONLY\_ALLOWED Notify payload is received, the 5GSM cause of the MA PDU session is set to #50 "PDU session type IPv4 only allowed"; or

ii) if a PDN\_TYPE\_IPv6\_ONLY\_ALLOWED Notify payload is received, the 5GSM cause of the MA PDU session is set to #51 "PDU session type IPv6 only allowed";

 and that the PDN connection over untrusted non-3GPP access network is established as a user-plane resource of the MA PDU session;

b) if the network steering functionalities information is included in the ATSSS response information field of the ATSSS\_RESPONSE Notify payload, the UE shall use the network steering functionalities information; and

c) if the measurement assistance information is included in ATSSS response information field of the ATSSS\_RESPONSE Notify payload, the UE shall use the measurement assistance information.

Editor's note [WI: ATSSS\_Ph3, CR#0102]: Whether ATSSS rules need to be included in ATSSS\_RESPONSE Notify payload is FFS.

If the UE receives:

a) a IKE\_AUTH response message including a Notify payload with a Private Notify Message Type as specified in clause 7.2.2.2 of 3GPP TS 24.302 [17]; or

b) no IKE\_AUTH response message including the ATSSS\_RESPONSE Notify payload;

the UE shall consider that the MA PDU session is not established and the PDN connection over untrusted non-3GPP access network is not established as a user-plane resource of the MA PDU session.

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

### 5.3a.4 Release of user-plane resource(s)

For an MA PDU session which has a PDN connection over untrusted non-3GPP access network established as a user-plane resource, if:

a) the UE needs to release the PDN connection over untrusted non-3GPP access network established as a user-plane resource of the MA PDU session, the UE shall use the tunnel disconnection procedure as specified in clause 7.2.4 of 3GPP TS 24.302 [17]; or

b) the UE needs to release the user-plane resources, if any, established on 3GPP access of the MA PDU session, the UE shall initiate the UE-requested PDU session release procedure as specified in clause 6.4.3.2 of 3GPP TS 24.501 [6] by sending the PDU SESSION RELEASE REQUEST message to the network.

For an MA PDU session which has a PDN connection over untrusted non-3GPP access network established as a user-plane resource, if:

a) the ePDG needs to release the PDN connection over untrusted non-3GPP access network established as a user-plane resource of the MA PDU session, the ePDG shall use the tunnel disconnection procedure as specified in clause 7.4.3 of 3GPP TS 24.302 [17]; or

b) the network needs to release the user-plane resources, if any, established on 3GPP access of the MA PDU session, the network shall initiate the network-requested PDU session release procedure as specified in clause 6.3.3.2 of 3GPP TS 24.501 [6] by sending the PDU SESSION RELEASE COMMAND message to the UE.

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