**3GPP TSG-CT WG1 Meeting #133-eC1-21abcd**

**E-meeting, 11-19 November 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.193** | **CR** | **0065** | **rev** | **4** | **Current version:** | **17.2.0** |  |
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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:*** | Updates to threshold values | | | | | | | | | |
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| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | ATSSS\_Ph2 | | | | |  | ***Date:*** | | | 2021-11-17 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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 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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
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| ***Reason for change:*** | | 3GPP TS 23.501 has been updated with regards to the threshold values so that the threashold values are applied when there is no autonomous load-balance indicator or UE-assistance indicator (see clause 6.1.3.20 of TS 23.503).  **Changes from agreed version 2 at CT1#132-e:**  - Cover sheet updates are done to reflect the changes agreed under the summary of change field; and  - a note is added indicating that it is an abnormal case that the network provides both threshold values and steering mode inicator in an ATSSS rule to consider the agreed CR in S2-2107831 in SA2#147e. | | | | | | | | |
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| ***Summary of change:*** | | The case of no having UE-assistance indicator is added so that if the steering mode is defined as load balancing and neither autonomous load-balance operation nor UE assistance operation is allowed, or the steering mode is priority based, then the UE and the UPF use the provided threshold values on both 3GPP access and non-3GPP access. | | | | | | | | |
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| ***Consequences if not approved:*** | | The specification is not aligned with stage 2 requirements. | | | | | | | | |
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| ***Clauses affected:*** | | 6.1.3.1 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 23.501 CR3250 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
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| ***This CR's revision history:*** | | Version 2 (in C1-216085) was agreed at CT1#132-e.  Version 3 only updates the cover sheet of the agreed CR.  Version 4 adds a NOTE because of S2-2107831. | | | | | | | | |

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

#### 6.1.3.1 Definition of ATSSS rules

The ATSSS rules are defined in 3GPP TS 23.501 [2] and is set of one or more ATSSS rules, where a rule is composed of:

a) an ATSSS rule ID identifying the individual ATSSS rule;

b) an ATSSS rule operation identifying whether the ATSSS rule is added to or deleted from the set of ATSSS rules;

c) a precedence value of the ATSSS rule identifying the precedence of the ATSSS rule;

d) a traffic descriptor matching a service data flow (SDF); and

e) an access selection descriptor including:

1) a steering functionality:

A) MPTCP, the UE steers the SDF by using the MPTCP functionality; or

B) ATSSS-LL functionality, the UE steers the SDF by using the ATSSS-LL functionality;

NOTE 1: If the included steering functionality is not supported by the UE, the UE ignores this ATSSS rule, and proceeds with the evaluation of the ATSSS rule with the next smallest precedence, if available.

2) a steering mode:

A) active-standby, the UE steers the SDF by using the active access if the active access is available. If the active access is not available and the standby access is available, the UE steers the SDF by using the standby access;

B) smallest delay, the UE steers the SDF by using the access network with the smallest RTT. If there is only one access available, the UE steers the SDF by using the available access. This steering mode is only applicable to non-GBR SDF;

C) load balancing, the UE steers the SDF across both the 3GPP access and the non-3GPP access with a given precentage if both accesses are available. If there is only one access available, the UE steers the SDF by using the available access. This steering mode is only applicable to non-GBR SDF; or

D) priority based, the UE steers the SDF over the access with high priority unless the access with high priority is congested or unavailable, when the UE steers the SDF over both the access with high priority and the access with low priority. This steering mode is only applicable to non-GBR SDF;

3) optionally, a steering mode additional indicator:

A) load balancing percentages adjustment operation (LBPAO):

- autonomous load-balance operation, this operation is only applicable to load balancing steering mode. With this operation, the UE may ignore the information provided in the steering mode information (i.e. percentages of the SDF traffic transmitted over 3GPP access and non-3GPP access), and that the UE may autonomously determine its own percentages for traffic splitting, in a way that maximizes the aggregated bandwidth in the uplink direction. The UPF may apply a similar behaviour in the downlink direction; or

- UE assistance operation, this operation is only applicable to load balancing steering mode. With this operation, the UE may decide how to distribute the UL traffic of the matching SDF based on the UE's internal state (e.g. when the UE is in the special internal state such as lower battery level) and inform the UPF how it decided to distribute the UL traffic of the matching SDF by performing UE assistance data provisioning procedure as specified in clause 5.4.8.

NOTE 2: The UE is expected to determine its own percentages for traffic splitting by performing measurements across both the 3GPP access and the non-3GPP access.

4) threshold values include one maximum RTT value or one maximum packet loss rate value or both. The threshold values are only used when the steering mode is indicated as load balancing priority based.

NOTE 3: The threshold values and the LBPAO set with either "autonomous load-balancing operation is allowed" or "UE assistance operation is allowed" in the steering mode additional indicator cannot exist at the same time in an ATSSS rule.

The UE and the UPF use the provided threshold values on both 3GPP access and non-3GPP access as follows:

A) for the load balancing steering mode,

i) if the maximum RTT value or the maximum packet loss rate value of the MA PDU session in an access exceeds the indicated value, the UE and the UPF reduce the amount of traffic sent over that access and they send traffic over the other access; and

ii) if both the maximum RTT value and the maximum packet loss rate value of the MA PDU session for both accesses do not exceed the provided threshold values, the UE and the UPF steer the SDF traffic across both the 3GPP access and non-3GPP access as indicated by the steering information of the ATSSS rule; and

B) for the priority based steering mode, the UE and the UPF use the maximum RTT value or the maximum packet loss rate value or both to detect when an access of an MA PDU session is congested. If the maximum RTT value or the maximum packet loss rate value in an access of the MA PDU session exceeds the indicated value, the UE and the UPF may send some traffic over the other access, i.e. the UE splits the SDF traffic over both the access with high priority and the access with low priority.

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