**3GPP TSG- Meeting #9**

**, Japan, - 23rd May 2025**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** | **5** | **Current version:** |  |  |
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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:***  |  |
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| ***Source to WG:*** | Apple, Ericsson, T-Mobile USA, Charter Communications |
| ***Source to TSG:*** | SA2 |
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| ***Work item code:*** |  |  | ***Date:*** | 08 |
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| ***Category:*** | F |  | ***Release:*** |  |
|  | *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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | The NOTE 3 in clause 5.37.3.1 states that enabling a QoS flow for ECN marking for L4S can be triggered dynamically based on detection of packet with ECT(1) or CE marking. A clarification that this detection can make use of the existing N4 session management procedures between SMF and UPF is required |
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| ***Summary of change:*** | In 5.37.3.1, a new NOTE 4 is added. The NOTE explains the detection of L4S traffic, reporting from the UPF are performed using the traffic detection and usage reporting procedure between SMF and UPF.  |
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| ***Consequences if not approved:*** | Existing reference in NOTE 3 about enabling a QoS Flow for ECN marking for L4S based on the dynamic detection of L4S traffic is incomplete. It is also prone to multiple interpretations and does not provide the reader with a clear understanding of how the procedure can be carried out. The lack of clarity about this procedure may prevent the feature to be fully realized in deployments.  |
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| ***Clauses affected:*** | 5.37.3.1 |
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|  | **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 ...  |
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| ***Other comments:*** |  The procedure for dynamic enabling of QoS Flow for ECN marking for L4S upon detection of L4S traffic is also feasible for Rel-18 network deployments.  |
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| ***This CR's revision history:*** |  |

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| First Change |

#### 5.37.3.1 General

L4S (Low Latency, Low Loss and Scalable Throughput) is described in IETF RFC 9330 [159], IETF RFC 9331 [160] and IETF RFC 9332 [161]. It exposes congestion information by marking ECN bits in the IP header of the user IP packets between the UE and the application server to trigger application layer rate adaptation.

In 5G System, ECN marking for L4S may be supported. ECN marking for L4S is enabled on a per QoS Flow basis in the uplink and/or downlink direction and may be used for GBR and non-GBR QoS Flows. In the case of 3GPP access, ECN marking for the L4S in the IP header is supported in either the NG-RAN (see clause 5.37.3.2 and TS 38.300 [27]), or in the PSA UPF (see clause 5.37.3.3). In the case of untrusted/trusted non-3GPP access, ECN marking for L4S in the IP header is supported in the N3IWF/TNGF (see clause 5.37.3.4, clause 6.2.9 and clause 6.2.9A).

NOTE 1: Based on operator's network configuration and policies, SMF decides whether NG-RAN or PSA UPF based ECN marking for L4S is used.

In the case of ECN marking for L4S by PSA UPF, the NG-RAN is instructed to perform congestion information monitoring and report to the PSA UPF the congestion information (i.e. a percentage of packets that UPF uses for ECN marking for L4S) of the QoS Flow on UL and/or DL directions via GTP-U header extension to PSA UPF and accordingly, the PSA UPF may mark the UL and/or DL direction packets of the QoS Flow.

NOTE 2: As for any QoS Flow, QoS rules in the UE and PDRs in the PSA UPF control which packets are bound to the L4S enabled QoS flow. The Packet Filter Set in the QoS rule or PDR can use packet filter(s) in clause 5.7.6.2 (e.g. match packets with ECT(1) or CE (See RFC 9331 [160]) together with IP 5 tuple) to steer traffic to an L4S enabled QoS Flow.

NOTE 3: A QoS Flow may be enabled with ECN marking for L4S requirement e.g. statically when a PDU session is established based on configuration in SMF or PCF, or dynamically based on detection of the L4S traffic or by requests by an AF.

NOTE 4: For enabling ECN marking for L4S based on dynamic detection of L4S traffic, SMF instructs UPF (as described in 5.4.11 of TS 29.244 [65] for Application Reporting) to detect L4S traffic (e.g. match packets with ECT(1) or CE (See RFC 9331 [160]) in the IP header) on a QoS Flow. Upon receiving report from UPF, the SMF establishes another QoS Flow enabled for L4S, executing the actions defined in clause 5.7.1.5 (as if a PCC rule enabling L4S is processed) such that the detected L4S traffic is now mapped to the newly established QoS Flow.

NOTE 5: To support this functionality, the UE needs to support L4S feedback as described in IETF RFC 9330 [159], which is not in the scope of 3GPP.

When serving PSA UPF or NG-RAN is changed e.g. due to inter-NG-RAN handover or PSA UPF relocation, target NG-RAN and target PSA UPF, if supported, should continue to perform ECN marking for L4S for the QoS Flow. However, if not available (i.e. ECN marking for L4S is not supported in both, target NG-RAN and target PSA UPF), AF should be notified that ECN marking for L4S can no longer be performed if ECN marking for L4S had been enabled for the QoS Flow based on AF request. When ECN marking for L4S is supported again either in target NG-RAN or in target PSA UPF, AF should be notified that ECN marking for L4S can be performed again if ECN marking for L4S had been enabled for the QoS Flow based on AF request.

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| End of changes |