**SA WG2 Meeting #S2-140E S2-200xxxx**

**19 August - 2 September, 2020, Electronic (revision of S2-20xxxxx)**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **23.502** | **CR** |  | **rev** | **-** | **Current version:** | **16.5.1** |  |
|  |
| *For* ***HE******LP*** *on using this form: comprehensive instructions can be found at 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:***  | Addressing wording comments from IEEE LS response on TSN support  |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | SA2 |
|  |  |
| ***Work item code:*** | Vertical\_LAN |  | ***Date:*** | 2020-07-27 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *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. | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | The LS response from IEEE 802.1 task group includes a number of editorial or wording comments, which are addressed in this CR in order to have a clear specification and prevent inconsistencies and misalignment with IEEE.Update of the IEEE references. |
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| ***Summary of change:*** | Wording changes as proposed or pointed out in the IEEE LS response. |
|  |  |
| ***Consequences if not approved:*** | Comments from IEEE remain unaddressed, leading to unclear specification, misalignment with IEEE specifications or inconsistencies.  |
|  |  |
| ***Clauses affected:*** | 2, F.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:*** |  |

**\* \* \* \* Start of Change \* \* \* \***

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[3] IETF RFC 7296: "Internet Key Exchange Protocol Version 2 (IKEv2)".

[4] IETF RFC 5998: "An Extension for EAP-Only Authentication in IKEv2".

[5] IETF RFC 4282: "The Network Access Identifier".

[6] IETF RFC 4861: "Neighbor Discovery for IP version 6 (IPv6)".

[7] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[8] IETF RFC 4862: "IPv6 Stateless Address Autoconfiguration".

[9] 3GPP TS 38.300: "NR and NG-RAN Overall Description; Stage 2".

[10] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".

[11] 3GPP TS 23.335:"User Data Convergence (UDC); Technical realization and information flows; Stage 2".

[12] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol Specification".

[13] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[14] 3GPP TS 23.221: "Architectural requirements ".

[15] 3GPP TS 33.501: "Security Architecture and Procedures for 5G System".

[16] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[17] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[18] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[19] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository service for Policy Control Data and Structured Data; Stage 3".

[20] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System ".

[21] IETF RFC 4191: "Default Router Preferences and More-Specific Routes".

[22] 3GPP TS 23.122: "Non-Access-Stratum (NAS) functions related to Mobile Station in idle mode".

[23] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".

[24] 3GPP TS 23.203: "Policy and charging control architecture".

[25] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[26] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".

[27] OMA-TS-ULP-V2\_0\_3: "UserPlane Location Protocol".

[28] 3GPP TS 23.167: "IP Multimedia Subsystem (IMS) emergency sessions".

[29] 3GPP TS 23.271: "Functional stage 2 description of Location Services (LCS)".

[30] 3GPP TS 36.355: "LTE Positioning Protocol (LPP)".

[31] 3GPP TS 38.455: "NR Positioning Protocol A (NRPPa)".

[32] 3GPP TS 29.507: "Access and Mobility Policy Control Service; Stage 3".

[33] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[34] 3GPP TS 32.240: "Charging management; Charging architecture and principles".

[35] 3GPP TS 23.251: "Network sharing; Architecture and functional description".

[36] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".

[37] 3GPP TS 29.510: "5G System; Network function repository services; Stage 3".

[38] 3GPP TS 23.380: "IMS Restoration Procedures".

[39] 3GPP TS 32.421: "Telecommunication management; Subscriber and equipment trace; Trace concepts and requirements".

[40] IETF RFC 4555: "IKEv2 Mobility and Multihoming Protocol (MOBIKE)".

[41] 3GPP TS 24.502: "Access to the 3GPP 5G Core Network (5GCN) via Non-3GPP Access Networks (N3AN); Stage 3".

[42] 3GPP TS 32.290: "Services, operations and procedures of charging using Service Based Interface (SBI)".

[43] 3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode".

[44] 3GPP TS 38.304: "NR; User Equipment (UE) procedures in idle mode".

[45] 3GPP TS 32.255: "5G system; 5G data connectivity domain charging; Stage 2".

[46] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".

[47] 3GPP TS 29.513: "5G System; Policy and Charging Control signalling flows and QoS parameter mapping; Stage 3".

[48] IEEE Std 802.11-2016 (Revision of IEEE Std 802.11-2012): "IEEE Standard for Information technology - Telecommunications and information exchange between systems Local and metropolitan area networks - Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".

[49] IETF RFC 2410: "The NULL Encryption Algorithm and its use with IPsec".

[50] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services; Stage 2".

[51] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".

[52] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[53] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[54] 3GPP TS 23.222: "Functional architecture and information flows to support Common API Framework for 3GPP Northbound APIs; Stage 2".

[55] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[56] 3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".

[57] 3GPP TS 29.512: "5G System; Session Management Policy Control Service; Stage 3".

[58] 3GPP TS 29.525: "5G System; UE Policy Control Service; Stage 3".

[59] IETF RFC 6696: "EAP Extensions for the EAP Re-authentication Protocol (ERP)", July 2012.

[60] IETF RFC 5295: "Specification for the Derivation of Root Keys from an Extended Master Session Key (EMSK)", Aug. 2008.

[61] 3GPP TS 23.272: "Circuit Switched (CS) fallback in Evolved Packet System (EPS); Stage 2".

[62] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[63] 3GPP TS 29.561: "5G System; Interworking between 5G Network and external Data Networks; Stage 3".

[64] 3GPP TS 29.413: "Application of the NG Application Protocol (NGAP) to non-3GPP access".

[65] IEEE Std 802.1Qcc-2018: "IEEE Standard for Local and metropolitan area networks - Bridges and Bridged Networks - Amendment 31: Stream Reservation Protocol (SRP) Enhancements and Performance Improvements".

[66] IEEE Std 802.1Q-2018: "IEEE Standard for Local and Metropolitan Area Networks-Bridges and Bridged Networks".

[67] IEEE Std 802.1Qbv-2015: "IEEE Standard for Local and metropolitan area networks -- Bridges and Bridged Networks - Amendment 25: Enhancements for Scheduled Traffic".

[68] 3GPP TS 23.632: "User Data Interworking, Coexistence and Migration".

[69] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane nodes".

[70] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[71] 3GPP TS 32.256: "Charging Management; 5G connection and mobility domain charging; Stage 2".

[72] 3GPP TS 38.423: "NG-RAN; Xn Application Protocol (XnAP)".

**\* \* \* \* Start of Change \* \* \* \***

# F.2 5GS Bridge configuration

For 5GS integrating with fully-centralized model TSN network, the CNC provides TSN information to the AF.



Figure F.2-1: 5GS Bridge information configuration

1. CNC provides per-stream filtering and policing parameters according to IEEE 802.1Q [66] clause 8.6.5.1 to AF, and the AF uses them to derive TSN QoS information and related flow information. The CNC provides the forwarding rule to AF according to IEEE 802.1Q [66] clause 8.8.1. The TSN AF uses this information to identify the DS-TT MAC address of corresponding PDU session.

2. The AF determines the MAC address of a PDU Session based on the previous stored associations, then triggers an AF request procedure. The AF request includes the DS-TT MAC address of the PDU session.

 Based on the information received from the CNC, 5GS bridge delay information and the UE-DS-TT residence time, the TSN AF determines the TSN QoS information and TSC Assistance Container for one or more TSN streams and sends them to the PCF. The TSN AF also provides Service Data Flow Filter containing Flow description also includes Ethernet Packet Filters.

3. When PCF receives the AF request, the PCF finds the correct SMF based on the DS-TT MAC address of the PDU session and notifies the SMF via Npcf\_SMPolicyControl\_UpdateNotify message.

 After mapping the received TSN QoS parameters for TSN streams to 5GS QoS, the PCF triggers Npcf\_SMPolicyControl\_UpdateNotify message to update the PCC rule to the SMF. The PCC rule includes the Ethernet Packet Filters, the 5GS QoS profile along with TSC Assistance Container.

4. SMF may trigger the PDU Session Modification procedure to establish/modify a QoS Flow to transfer the TSN streams. During this procedure, the SMF provides the information received in PCC rules to the UPF via N4 Session Modification procedure.

 Upon reception of the TSC Assistance Container, the SMF determine the TSCAI for QoS flow and sends the TSCAI along with the QoS profile to the NG RAN.

5. If needed, the CNC provides additional information (e.g. the gate control list as defined in IEEE 802.1Qbv [67]) to the TSN AF.

6. The AF determines the MAC address of a PDU Session for the configured port based on the previous stored associations, this is used to deliver the Port Management information to the correct SMF that manages the port via PCF. The AF triggers an AF request procedure. The AF request includes the DS-TT MAC address (i.e. the MAC address of the PDU Session), TSN QoS Parameters, Port Management information Container and the related port number as defined in clause 5.28.3 of TS 23.501 [2]. The port number is used by SMF to decide whether the configured port is in DS-TT or NW-TT.

7. The PCF determines the SMF based on the MAC address received in the AF request, the PCF maps the TSN QoS information provided by the AF to PCC rules as described in clause 5.28.4 in TS 23.501 [2]. The PCF includes the TSC Assistance Container received from the AF with the PCC rules and forwards it to the SMF. The PCF transparently transports the received Port Management information Container and related port number to SMF via Npcf\_SMPolicyControl\_UpdateNotify message.

8a. If the SMF decides the port is on DS-TT based on the received port number, the SMF transports the received Port Management information Container to the UE/DS-TT in PDU Session Modification Request message.

8b. If the SMF decides the port is on NW-TT based on the received port number, the SMF transports the received Port Management information Container to the UPF/NW-TT in N4 Session Modification Request message. SMF provides the Ethernet Packet Filters as part of the N4 Packet Detection rule to the UPF/NW-TT.

If the UPF sends a Clock Drift Report to the SMF as described in clause 5.27.2 in TS 23.501 [2], the SMF adjusts the Burst Arrival Time and Periodicity from a TSN grandmaster clock to the 5G clock and sends the updated TSCAI to NG-RAN.

**\* \* \* \* End of Change \* \* \* \***