**3GPP SA WG2 Meeting #165 *S2-2408640***

**Hyderabad, India, Oct 14 – 18, 2024**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **23.501** | **CR** | **5612** | **rev** | **-** | **Current version:** | **19.0.0** |  |
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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 |  | Radio Access Network |  | Core Network | **X** |

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| --- |
|  |
| ***Title:***  | Support differentiated QoS handling for multiplexed media flows |
|  |  |
| ***Source to WG:*** | Nokia, NTT DOCOMO |
| ***Source to TSG:*** | SA2 |
|  |  |
| ***Work item code:*** | XRM\_Ph2 |  | ***Date:*** | 2024-10-04 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-19 |
|  | *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)* |
|  |  |
| ***Reason for change:*** | The specification of XRM\_Ph2 conclusions on KI#4. Support differentiated QoS handling for multiplexed media flows. |
|  |  |
| ***Summary of change:*** | Following enhancements are introduced: * 5GSM Core Network Capability includes the UE capability to handle additional packet filters.
* IP Packet Filter Set is extended with additional packet filters.
* 5.37.x new clause to describe differentiated QoS handling for multiplexed media flows.
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|  |  |
| ***Consequences if not approved:*** | Differntiated QoS handling for multiplexed media flows is not supported. |
|  |  |
| ***Clauses affected:*** | 2, 5.4.4b, 5.7.6.2, 5.37.1, 5.37.x (new),  |
|  |  |
|  | **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 \* \* \* \*

# 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 22.261: "Service requirements for next generation new services and markets; Stage 1".

[3] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[4] 3GPP TS 23.203: "Policies and Charging control architecture; Stage 2".

[5] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS); Stage 2".

[6] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface: Stage 3".

[7] IETF RFC 7157: "IPv6 Multihoming without Network Address Translation".

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

[9] IETF RFC 2131: "Dynamic Host Configuration Protocol".

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

[11] ITU‑T Recommendation I.130: "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

[12] ITU‑T Recommendation Q.65: "The unified functional methodology for the characterization of services and network capabilities".

[13] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS): Stage 3".

[14] Void.

[15] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[16] 3GPP TS 22.173: "IMS Multimedia Telephony Service and supplementary services; Stage 1".

[17] 3GPP TS 23.122: "Non-Access-Stratum (NAS) functions related to Mobile Station in idle mode".

[18] 3GPP TS 23.167: "3rd Generation Partnership Project; Technical Specification Group Services and Systems Aspects; IP Multimedia Subsystem (IMS) emergency sessions".

[19] 3GPP TS 23.003: "Numbering, Addressing and Identification".

[20] IETF RFC 7542: "The Network Access Identifier".

[21] 3GPP TS 23.002: "Network Architecture".

[22] 3GPP TS 23.335: "User Data Convergence (UDC); Technical realization and information flows; Stage 2".

[23] 3GPP TS 23.221: "Architectural requirements".

[24] 3GPP TS 22.153: "Multimedia priority service".

[25] 3GPP TS 22.011: "Service Accessibility".

[26] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[27] 3GPP TS 38.300: "NR; NR and NG-RAN Overall Description".

[28] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol Specification".

[29] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[30] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".

[31] 3GPP TS 37.340: "Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Multi-connectivity; Stage 2".

[32] 3GPP TS 23.214: "Architecture enhancements for control and user plane separation of EPC nodes; Stage 2".

[33] 3GPP TS 22.101: "3rd Generation Partnership Project; Technical Specification Group Services and Systems Aspects; Service aspects; Service principles".

[34] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".

[35] 3GPP TS 33.126: "Lawful Interception Requirements".

[36] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".

[37] 3GPP TS 22.280: "Mission Critical Services Common Requirements (MCCoRe); Stage 1".

[38] 3GPP TS 23.379: "Functional architecture and information flows to support Mission Critical Push To Talk (MCPTT); Stage 2".

[39] 3GPP TS 23.281: "Functional architecture and information flows to support Mission Critical Video (MCVideo); Stage 2".

[40] 3GPP TS 23.282: "Functional architecture and information flows to support Mission Critical Data (MCData); Stage 2".

[41] 3GPP TS 32.240: "Charging management; Charging architecture and principles".

[42] 3GPP TS 38.401: "NG-RAN Architecture description".

[43] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".

[44] IETF RFC 4960: "Stream Control Transmission Protocol".

[45] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System".

[46] 3GPP TS 23.041: "Public Warning System".

[47] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[48] 3GPP TS 24.502: "Access to the 5G System (5GS) via non-3GPP access networks; Stage 3".

[49] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[50] 3GPP TS 38.304: "NR; User Equipment (UE) procedures in idle mode".

[51] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[52] 3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode".

[53] Void.

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

[55] 3GPP TS 23.271: "Functional stage 2 description of Location Services (LCS)".

[56] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

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

[58] 3GPP TS 29.510: "5G System: Network function repository services; Stage 3".

[59] 3GPP TS 29.502: "5G System: Session Management Services: Stage 3".

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

[61] 3GPP TS 23.380: "IMS Restoration Procedures".

[62] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[63] 3GPP TS 23.292: "IP Multimedia Subsystem (IMS) centralized services; Stage 2".

[64] 3GPP TS 23.222: "Functional architecture and information flows to support Common API Framework for 3GPP Northbound APIs".

[65] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane Nodes; Stage 3".

[66] 3GPP TS 32.421: "Telecommunication management; Subscriber and equipment trace; Trace concepts and requirements".

[67] 3GPP TS 32.290: "5G system; Services, operations and procedures of charging using Service Based Interface (SBI)".

[68] 3GPP TS 32.255: "5G Data connectivity domain charging; Stage 2".

[69] 3GPP TS 38.306: "NR; User Equipment -UE) radio access capabilities".

[70] 3GPP TS 36.306: "Evolved Universal Terrestrial Radio Access -E-UTRA); User Equipment -UE) radio access capabilities".

[71] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[72] Void.

[73] IETF RFC 2865: "Remote Authentication Dial In User Service (RADIUS)".

[74] IETF RFC 3162: "RADIUS and IPv6".

[75] 3GPP TS 29.281: "General Packet Radio System (GPRS) Tunnelling Protocol User Plane (GTPv1-U)".

[76] 3GPP TS 26.238: "Uplink streaming".

[77] 3GPP TR 26.939: "Guidelines on the Framework for Live Uplink Streaming (FLUS)".

[78] International Telecommunication Union (ITU), Standardization Bureau (TSB): "Operational Bulletin No. 1156"; http://handle.itu.int/11.1002/pub/810cad63-en (retrieved October 5, 2018).

[79] 3GPP TS 28.533: "Management and orchestration; Architecture framework".

[80] 3GPP TS 24.250: "Protocol for Reliable Data Service; Stage 3".

[81] IETF RFC 8684: "TCP Extensions for Multipath Operation with Multiple Addresses".

[82] IETF RFC 8803: "0-RTT TCP Convert Protocol".

[83] IEEE Std 802.1CB-2017: "IEEE Standard for Local and metropolitan area networks-Frame Replication and Elimination for Reliability".

[84] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[85] WiFi Alliance Technical Committee, Hotspot 2.0 Technical Task Group: "Hotspot 2.0 (Release 2) Technical Specification".

[86] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[87] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".

[88] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".

[89] CableLabs DOCSIS MULPI: "Data-Over-Cable Service Interface Specifications DOCSIS 3.1, MAC and Upper Layer Protocols Interface Specification".

[90] BBF TR-124 issue 5: "Functional Requirements for Broadband Residential Gateway Devices".

[91] BBF TR-101 issue 2: "Migration to Ethernet-Based Broadband Aggregation".

[92] BBF TR-178 issue 1: "Multi-service Broadband Network Architecture and Nodal Requirements".

[93] BBF TR-456 issue 2: "AGF Functional Requirements".

[94] BBF WT-457: "FMIF Functional Requirements".

Editor's note: The reference to BBF WT-457 will be revised when finalized by BBF.

[95] Void.

[96] Void.

[97] IEEE Std 802.1AB-2016: "IEEE Standard for Local and metropolitan area networks -- Station and Media Access Control Connectivity Discovery".

[98] IEEE Std 802.1Q-2022: "IEEE Standard for Local and metropolitan area networks--Bridges and Bridged Networks".

[99] 3GPP TS 38.423: "NG-RAN; Xn Application Protocol (XnAP)".

[100] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)".

[101] 3GPP TS 29.274: "Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3".

[102] 3GPP TS 23.632: "User Data Interworking, Coexistence and Migration; stage 2".

[103] 3GPP TS 29.563: "5G System (5GS); HSS services for interworking with UDM; Stage 3".

[104] IEEE Std 802.1AS-2020: "IEEE Standard for Local and metropolitan area networks--Timing and Synchronization for Time-Sensitive Applications".

[105] 3GPP TS 22.104: "Service requirements for cyber-physical control applications in vertical domains".

[106] 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".

[107] IEEE Std 1588-2008: "IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems".

[108] 3GPP TS 28.552: "Management and orchestration; 5G performance measurements".

[109] 3GPP TS 24.193: "Access Traffic Steering, Switching and Splitting; Stage 3".

[110] 3GPP TS 24.526: "User Equipment (UE) policies for 5G System (5GS); Stage 3".

[111] 3GPP TS 22.186: "Enhancement of 3GPP support for V2X scenarios; Stage 1".

[112] 3GPP TR 38.824: "Study on physical layer enhancements for NR ultra-reliable and low latency case (URLLC)".

[113] IEEE: "Guidelines for Use of Extended Unique Identifier (EUI), Organizationally Unique Identifier (OUI), and Company ID (CID)", https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/tutorials/eui.pdf.

[114] 3GPP TS 32.256: "Charging Management; 5G connection and mobility domain charging; Stage 2".

[115] 3GPP TS 33.210: "Network Domain Security (NDS); IP network layer security".

[116] 3GPP TS 38.415: "PDU Session User Plane Protocol".

[117] 3GPP TS 24.535: "Device-side Time-Sensitive Networking (TSN) Translator (DS-TT) to network-side TSN Translator (NW-TT) protocol aspects; Stage 3".

[118] 3GPP TS 32.274: "Charging Management; Short Message Service (SMS) charging".

[119] 3GPP TS 23.008: "Organization of subscriber data".

[120] 3GPP TS 38.314: "NR; Layer 2 measurements".

[121] 3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support Vehicle-to-Everything (V2X) services".

[122] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[123] 3GPP TS 32.254: "Charging management; Exposure function Northbound Application Program Interfaces (APIs) charging".

[124] 3GPP TS 33.535: "Authentication and Key Management for Applications based on 3GPP credentials in the 5G System (5GS)".

[125] 3GPP TS 38.410: "NG-RAN; NG general aspects and principles".

[126] IEEE Std 1588: "IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems", Edition 2019.

[127] ST 2059-2:2015: "SMPTE Standard - SMPTE Profile for Use of IEEE-1588 Precision Time Protocol in Professional Broadcast Applications".

[128] 3GPP TS 23.304: "Proximity based Services (ProSe) in the 5G System (5GS)".

[129] 3GPP TS 23.247: "Architectural enhancements for 5G multicast-broadcast services".

[130] 3GPP TS 23.548: "5G System Enhancements for Edge Computing; Stage 2".

[131] IEEE Std 802.3: "Ethernet".

[132] 3GPP TS 29.561: "5G System; Interworking between 5G Network and external Data Networks; Stage 3".

[133] 3GPP TS 29.513: "Policy and Charging Control signalling flows and QoS parameter mapping; Stage 3".

[134] 3GPP TS 23.558: "Architecture for enabling Edge Applications (EA)".

[135] 3GPP TS 26.501: "5G Media Streaming (5GMS); General description and architecture".

[136] 3GPP TS 23.256: "Support of Uncrewed Aerial Systems (UAS) connectivity, identification and tracking; Stage 2".

[137] GSMA NG.116: "Generic Network Slice Template".

[138] IETF RFC 3948: "UDP Encapsulation of IPsec ESP Packets".

[139] 3GPP TS 24.539: "5G System (5GS); Network to TSN translator (TT) protocol aspects; Stage 3".

[140] 3GPP TS 33.220: "Generic Authentication Architecture (GAA); Generic bootstrapping architecture".

[141] 3GPP TS 33.223: "Generic Authentication Architecture (GAA); Generic Bootstrapping Architecture (GBA) Push function".

[142] 3GPP TS 23.540: "Technical realization of Service Based Short Message Service; Stage 2".

[143] 3GPP TS 38.321: "NR; Medium Access Control (MAC) protocol specification".

[144] 3GPP TS 29.525: "5G System; UE Policy Control Service; Stage 3".

[145] 3GPP TS 29.505: "5G System; Usage of the Unified Data Repository Services for Subscription Data; Stage 3".

[146] IEEE Std P802.1Qdj-d1.3: "IEEE Draft Standard for Local and metropolitan area networks - Bridges and Bridged Networks - Amendment XX: Configuration Enhancements for Time-Sensitive Networking".

[147] Void.

[148] 3GPP TS 28.557: "Management and orchestration; Management of Non-Public Networks (NPN)".

[149] 3GPP TS 28.541: "Management and orchestration; 5G Network Resource Model (NRM)".

[150] IETF RFC 8655: "Deterministic Networking Architecture".

[151] IETF RFC 8343: "A YANG Data Model for Interface Management".

[152] IETF RFC 8344: "A YANG Data Model for IP Management".

[153] IETF RFC 7224: " IANA Interface Type YANG Module".

[154] IETF draft-ietf-detnet-yang: "Deterministic Networking (DetNet) YANG Model".

Editor's note: The reference to draft-ietf-detnet-yang will be revised to RFC when finalized by IETF.

[155] IETF RFC 6241: "Network Configuration Protocol (NETCONF)".

[156] IETF RFC 8040: "RESTCONF Protocol".

[157] IETF RFC 8939: "Deterministic Networking (DetNet) Data Plane: IP".

[158] IETF RFC 5279: "A Uniform Resource Name (URN) Namespace for the 3rd Generation Partnership Project (3GPP)".

[159] IETF RFC 9330:"Low Latency, Low Loss, Scalable Throughput (L4S) Internet Service: Architecture".

[160] IETF RFC 9331: "Explicit Congestion Notification (ECN) Protocol for Very Low Queuing Delay (L4S)".

[161] IETF RFC 9332: "Dual-Queue Coupled Active Queue Management (AQM) for Low Latency, Low Loss, and Scalable Throughput (L4S)".

[162] IETF RFC 6603: "Prefix Exclude Option for DHCPv6-based Prefix Delegation".

[163] IETF RFC 8415: "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)".

[164] ITU‑T Recommendation G.810: "Definitions and terminology for synchronization networks".

[165] 3GPP TS 38.470: "NG-RAN; F1 general aspects and principles".

[166] IETF RFC 9000: "QUIC: A UDP-Based Multiplexed and Secure Transport".

[167] IETF RFC 9001: "Using TLS to Secure QUIC".

[168] IETF RFC 9002: "QUIC Loss Detection and Congestion Control".

[169] IETF RFC 9221: "An Unreliable Datagram Extension to QUIC".

[170] IETF RFC 9298: "Proxying UDP in HTTP".

[171] IETF RFC 9114: "Hypertext Transfer Protocol Version 3 (HTTP/3)".

[172] IETF RFC 9297: "HTTP Datagrams and the Capsule Protocol".

[173] IETF RFC 9220: "Bootstrapping WebSockets with HTTP/3".

[174] draft-ietf-quic-multipath: "Multipath Extension for QUIC".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

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[176] 3GPP TS 28.531: "Management and orchestration; Provisioning".

[177] 3GPP TS 23.434: "Service Enabler Architecture Layer for Verticals (SEAL); Functional architecture and information flows".

[178] IEEE Std 802.1CBdb-2021: "Amendment 2: Extend Stream Identification Functions".

[179] 3GPP TS 26.522: "5G Real-time Media Transport Protocol Configurations".

[180] 3GPP TS 23.586: "Architectural Enhancements to support Ranging based services and Sidelink Positioning".

[181] 3GPP TS 23.542: "Application layer support for Personal IoT Network".

[182] IETF RFC 8415: "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)".

[183] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[184] 3GPP TS 23.289: "Mission Critical services over 5G System; Stage 2".

[185] IETF RFC 3550: "RTP: A Transport Protocol for Real-Time Applications".

[186] IETF RFC 3711: "The Secure Real-time Transport Protocol (SRTP)".

[187] IETF RFC 6184: "RTP Payload Format for H.264 Video".

[188] IETF RFC 7798: "RTP Payload Format for High Efficiency Video Coding (HEVC) ".

[189] IETF RFC 8285: "A General Mechanism for RTP Header Extensions".

[190] 3GPP TS 28.405: "Quality of Experience (QoE) measurement collection; Control and configuration".

[191] 3GPP TS 37.355: " LTE Positioning Protocol (LPP)".

[192] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".

[193] IETF RFC 3168: "The Addition of Explicit Congestion Notification (ECN) to IP".

[194] 3GPP TS 33.503: "Security Aspects of Proximity based Services (ProSe) in the 5G System (5GS)".

[x1] IETF RFC 5761: “Multiplexing RTP Data and Control Packets on a Single Port”.

[x2] IETF RFC 5764: “Datagram Transport Layer Security (DTLS) Extension to Establish Keys for the Secure Real-time Transport Protocol (SRTP)”.

[x3] IETF RFC 7983: “Multiplexing Scheme Updates for Secure Real-time Transport Protocol (SRTP) Extension for Datagram Transport Layer Security (DTLS)”.

[x4] IETF RFC 8872: “Guidelines for Using the Multiplexing Features of RTP to Support Multiple Media Streams”.

[x5] IETF RFC 8843: “Negotiating Media Multiplexing Using the Session Description Protocol”.

[x6] IETF RFC 9443: “Multiplexing Scheme Updates for QUIC”.

\* \* \* \* Next change \* \* \* \*

### 5.4.4b UE 5GSM Core Network Capability handling

The UE 5GSM Core Network Capability is included in PDU Session Establishment/Modification Request.

The UE shall indicate in the UE 5GSM Core Network Capability whether the UE supports:

- "Ethernet" PDU Session Type supported in EPC as PDN Type "Ethernet";

- Reflective QoS;

- Multi-homed IPv6 PDU Session (only if the Requested PDU Type was set to "IPv6" or "IPv4v6");

- ATSSS capability (as referred to clause 5.32.2);

- Transfer of Port Management Information containers;

- Support for secondary DN authentication and authorization over EPC (as referred to clause 5.17.2.5);

- Support of additional Packet Filter for differentiated QoS handling in the uplink of multiplexed media flows into a single UDP/IP traffic flow (as referred to clause 5.7.6.2).

The 5GSM Core Network Capability is transferred, if needed, from V-SMF to H-SMF during PDU Session Establishment/Modification procedure.

After the first inter-system change from EPS to 5GS for a PDU session established in EPS, the 5GSM Core Network Capability is also included in the PDU Session Modification if the Reflective QoS and/or Multi-homed IPv6 PDU Session is present.

\* \* \* \* Next change \* \* \* \*

#### 5.7.6.2 IP Packet Filter Set

For IP PDU Session Type, the Packet Filter Set shall support Packet Filters based on at least any combination of:

- Source/destination IP address or IPv6 prefix.

- Source / destination port number.

- Protocol ID of the protocol above IP/Next header type.

- Type of Service (TOS) (IPv4) / Traffic class (IPv6) and Mask.

- Flow Label (IPv6).

- Security parameter index.

- Packet Filter direction.

NOTE 1: A value left unspecified in a Packet Filter matches any value of the corresponding information in a packet.

NOTE 2: An IP address or Prefix can be combined with a prefix mask.

NOTE 3: Port numbers can be specified as port ranges.

NOTE 4: Type of Service (IPv4)/Traffic class (IPv6) can be used to define packet filters for DSCP and ECN as described in RFC 3168 [193].

- Additional Packet Filter Setfor the media flows that are transported in (S)RTP, (S)RTCP and other associated protocols that are multiplexed into a single UDP/IP traffic flow as specified in RFC 5761 [x1], RFC 5764 [x2], RFC 7983 [x3], RFC 8872 [x4], RFC 8843 [x5] and RFC 9443 [x6], based on at least any combination of:

- Synchronization Source (SSRC).

- Payload Type (PT).

- RTP-M header fields.

- Media Identification (MID) header fields

Editor's note: It is up to stage 3 to decide if the existing IP Packet Filter Set shall be extended with additional Packet Filters or a new IE shall be used.

\* \* \* \* Next change \* \* \* \*

### 5.37.1 General

This clause provides an overview of 5GS functionalities for support of XR services (AR/VR applications) and interactive media services that require high data rate and low latency communication, e.g. cloud gaming and tactile/multi-modal communication services according to service requirements documented in TS 22.261 [2]. The standardized 5QI characteristics for such interactive services are provided in Table 5.7.4-1 and TSCAI is used to describe the related traffic characteristics as defined in clause 5.27.2. Further enhancements for these interactive media services are as follows:

- The 5GS may support QoS policy control for multi-modal traffic, see clause 5.37.2.

- The 5GS may support network information exposure which can be based on ECN markings for L4S, see clause 5.37.3 or 5GS exposure API, see clause 5.37.4.

- The 5GS may support PDU Set based QoS handling including PDU Set identification and marking, see clause 5.37.5.

- The 5GS may ensure that the UL and DL packets together meet the requested round trip delay and also update the delay for UL and DL considering QoS monitoring results, see clause 5.37.6.

- The 5GS may perform per-flow Packet Delay Variation (PDV) monitoring and policy control according to AF provided requirements, see clause 5.37.7.

- The 5GC may provide traffic assistance information to the NG-RAN to enable Connected mode DRX power saving, see clause 5.37.8.

- The 5GS may support traffic detection and differentiated QoS Flow mapping for multiplexed media flows in the same transport connection, see clause 5.37.x.

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### 5.37.x Traffic detection and differentiated QoS Flow mapping for multiplexed media flows

The applications may transport their media flows multiplexed into a single transport layer traffic flow. In that case, an additional Packet Filter Set that includes application layer fields is used together with the IP Packet Filter Set for the identification of each media stream.

The additional Packet Filter Set is specific to the set of application protocols multiplexed into the transport layer traffic flow. For the media flows that are transported in (S)RTP, (S)RTCP and other associated protocols that are multiplexed into a single UDP/IP traffic flow as described in RFC 5761 [x1], RFC 5764 [x2], RFC 7983 [x3], RFC 8872 [x4], RFC 8843 [x5] and RFC 9443 [x6] the additional Packet Filter Set is specified in clause 5.7.6.2.

The AF may provide individual QoS requirements for each individual protocol or RTP media flow within the multiplexed data flows and additional Packet filters associated with them within the flow description information in the “AF session with the required QoS” procedure specified in clause 4.15.6.6 in TS 23.502 [3].

The AF may provide the flow description information and the associated QoS requirements either:

- for each multiplexed media flow in separate “AF session with the required QoS” procedures, or

- for two or more multiplexed media flows combined in a single “AF session with the required QoS” procedure. In this case the flow description information for the multiplexed media streams are correlated using the same Multi-modal Service ID for the media flows as described in clause 5.37.2.

The media flows that require different QoS treatment can be mapped to distinct QoS Flows. If the AF does not provide any QoS requirement for the media flows or it provides the same QoS requirement, then the media flows can be mapped to the same QoS Flow.

A UE supporting the additional Packet Filter Set shall indicate this to the SMF at PDU Session establishment and the SMF provides this UE capability information to the PCF. The PCF may consider the UE capability for the additional Packet Filter Set when providing the PCC rules to the SMF.

The SMF provides additional Packet Filter Set to the UPF in the N4 rules, and to the UE in the QoS Rules. If supported by the UE, the UE uses the additional Packet Filter, along rest of the Packet Filter Set, for QoS Flow mapping.

\* \* \* \* End of changes \* \* \* \*