**3GPP TSG-CT WG1 Meeting #131-eC1-214260**

**E-meeting, 19-27 August 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **24.501** | **CR** | **3407** | **rev** | **1** | **Current version:** | **16.9.0** |  |
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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:*** |  | | | | | | | | | |
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| ***Source to WG:*** | ZTE | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GProtoc16 | | | | |  | ***Date:*** | | | 2021-08-20 |
|  |  | | | |  | |  | | |  |
| ***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 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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | As specified in clause 5.7.6.3 of TS 23.501, see NOTE 1:  " 5.7.6.3 Ethernet Packet Filter Set For Ethernet PDU Session Type, the Packet Filter Set shall support Packet Filters based on at least any combination of:  - Source/destination MAC address.  - Ethertype as defined in IEEE 802.3 [131].  - Customer-VLAN tag (C-TAG) and/or Service-VLAN tag (S-TAG) VID fields as defined in IEEE Std 802.1Q [98].  - Customer-VLAN tag (C-TAG) and/or Service-VLAN tag (S-TAG) PCP/DEI fields as defined in IEEE Std 802.1Q [98].  - IP Packet Filter Set, in the case that Ethertype indicates IPv4/IPv6 payload.  - Packet Filter direction.  **NOTE 1: The MAC address may be specified as address ranges.**  NOTE 2: A value left unspecified in a Packet Filter matches any value of the corresponding information in a packet.  "  Actually, MAC address range has already been supported on N7 and N4:   * TS 29.514 has supported (by C3-193469 Rel-16) MAC address range in EthFlowDescription in Npcf\_PolicyAuthorization based on clause 5.7.6.3 of TS 23.501. * MAC address range is supported in Ethernet Packet Filter IE in N4 rules (since R15).   Therefore, it proposes to introduce MAC address range in packet filter in QoS rule. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Define destination/source MAC address range type in the packet filter.  **Interoperability analysis**  The change is backward compatible.  The UE not supporting to recognize destination/source MAC address range type will treat it as a syntactically incorrect packet filter and the traffic with MAC addresses which should within the MAC address range may be transmitted on QoS flow of default QoS rule. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | MAC address range in packet filter is not supported in QoS rule which stage 2 requirement is not fulfilled. | | | | | | | | |
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| ***Clauses affected:*** | | 9.11.4.13 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

9.11.4.13 QoS rules

The purpose of the QoS rulesinformation element is to indicate a set of QoS rules to be used by the UE, where each QoS rule is a set of parameters as described in subclause 6.2.5.1.1.2:

a) for classification and marking of uplink user traffic; and

b) for identification of a QoS flow which the network is to use for a particular downlink user traffic.

NOTE: The UE needs to be aware of a QoS flow which the network is to use for a particular downlink user traffic e.g. to determine whether a resource is available for downlink media of a media stream of an SDP media description provided by the UE in an IMS session.

The QoS rules may contain a set of packet filters consisting of zero or more packet filters for UL direction, zero or more packet filters for DL direction, zero or more packet filters for both UL and DL directions or any combinations of these. The set of packet filters determine the traffic mapping to QoS flows.

The QoS rules information element is a type 6 information element with a minimum length of 7 octets. The maximum length for the information element is 65538 octets.

The QoS rulesinformation element is coded as shown in figure 9.11.4.13.1, figure 9.11.4.13.2, figure 9.11.4.13.3, figure 9.11.4.13.4 and table 9.11.4.13.1.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
|  | QoS rules IEI | | | | | | | | octet 1 |
|  | Length of QoS rules IE | | | | | | | | octet 2 |
|  | octet 3 |
|  | QoS rule 1 | | | | | | | | octet 4  octet u |
|  | QoS rule 2 | | | | | | | | octet u+1  octet v |
|  | … | | | | | | | | octet v+1  octet w |
|  | QoS rule n | | | | | | | | octet w+1  octet x |

**Figure 9.11.4.13.1: QoS rules information element**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 8 | 7 | 6 | 5 | | 4 | | 3 | 2 | 1 |  |
|  | QoS rule identifier | | | | | | | | | | octet 4 |
|  | Length of QoS rule | | | | | | | | | | octet 5 |
|  | octet 6 |
|  | Rule operation code | | | | DQR bit | | Number of packet filters | | | | octet 7 |
|  | Packet filter list | | | | | | | | | | octet 8\*  octet m\* |
|  | QoS rule precedence | | | | | | | | | | octet m+1\* |
|  | 0  Spare | Segregation | QoS flow identifier (QFI) | | | | | | | | octet m+2\* |

**Figure 9.11.4.13.2: QoS rule (u=m+2)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
|  | 0 | 0 | 0 | 0 | Packet filter identifier 1 | | | | octet 8 |
| Spare | | | |
|  | 0 | 0 | 0 | 0 | Packet filter identifier 2 | | | | octet 9 |
| Spare | | | |
|  | … | | | | | | | |  |
|  | 0 | 0 | 0 | 0 | Packet filter identifier N | | | | octet N+7 |
| Spare | | | |

**Figure 9.11.4.13.3: Packet filter list when the rule operation is "modify existing QoS rule and delete packet filters" (z=N+7)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
|  | 0 | 0 | Packet filter direction 1 | | Packet filter identifier 1 | | | | octet 8 |
| Spare | |
|  | Length of packet filter contents 1 | | | | | | | | octet 9 |
|  | Packet filter contents 1 | | | | | | | | octet 10  octet m |
|  | 0 | 0 | Packet filter direction 2 | | Packet filter identifier 2 | | | | octet m+1 |
| Spare | |
|  | Length of packet filter contents 2 | | | | | | | | octet m+2 |
|  | Packet filter contents 2 | | | | | | | | octet m+3  octet n |
|  | … | | | | | | | | octet n+1  octet y |
|  | 0 | 0 | Packet filter direction N | | Packet filter identifier N | | | | octet y+1 |
| Spare | |
|  | Length of packet filter contents N | | | | | | | | octet y+2 |
|  | Packet filter contents N | | | | | | | | octet y+3  octet z |

**Figure 9.11.4.13.4: Packet filter list when the rule operation is "create new QoS rule", or "modify existing QoS rule and add packet filters" or "modify existing QoS rule and replace all packet filters"**

**Table 9.11.4.13.1: QoS rules information element**

|  |
| --- |
| QoS rule identifier (octet 4)  The QoS rule identifier field is used to identify the QoS rule.  Bits  8 7 6 5 4 3 2 1  0 0 0 0 0 0 0 0 no QoS rule identifier assigned  0 0 0 0 0 0 0 1 QRI 1  to  1 1 1 1 1 1 1 1 QRI 255  The network shall not set the QRI value to 0.  QoS rule precedence (octet m+1)  The QoS rule precedence field is used to specify the precedence of the QoS rule among all QoS rules (both the signalled QoS rules as described in subclause 6.2.5.1.1.2 and the derived QoS rules as described in subclause 6.2.5.1.1.3) associated with the PDU session of the QoS flow. This field includes the binary coded value of the QoS rule precedence in the range from 0 to 255 (decimal). The higher the value of the QoS rule precedence field, the lower the precedence of that QoS rule is. For the "delete existing QoS rule" operation, the QoS rule precedence value field shall not be included. For the "create new QoS rule" operation, the QoS rule precedence value field shall be included.  The value 80 (decimal) is reserved.  Segregation bit (bit 7 of octet m+2) (see NOTE 1)  In the UE to network direction the segregation bit indicates whether the UE is requesting the network to bind service data flows described by the QoS rule to a dedicated QoS Flow and it is encoded as follows. In the network to UE direction this bit is spare.  Bit  7  0 Segregation not requested  1 Segregation requested  QoS flow identifier (QFI) (bits 6 to 1 of octet m+2) (see NOTE 1)  The QoS flow identifier (QFI) field contains the QoS flow identifier.  Bits  6 5 4 3 2 1  0 0 0 0 0 0 no QoS flow identifier assigned  0 0 0 0 0 1 QFI 1  to  1 1 1 1 1 1 QFI 63  The network shall not set the QFI value to 0.  For the "delete existing QoS rule" operation, the QoS flow identifier value field shall not be included. For the "create new QoS rule" operation, the QoS flow identifier value field shall be included.  DQR bit (bit 5 of octet 7)  The DQR bit indicates whether the QoS rule is the default QoS rule and it is encoded as follows:  Bit  5  0 the QoS rule is not the default QoS rule.  1 the QoS rule is the default QoS rule.  Rule operation code (bits 8 to 6 of octet 7) Bits 8 7 6  0 0 0 Reserved 0 0 1 Create new QoS rule  0 1 0 Delete existing QoS rule  0 1 1 Modify existing QoS rule and add packet filters  1 0 0 Modify existing QoS rule and replace all packet filters  1 0 1 Modify existing QoS rule and delete packet filters  1 1 0 Modify existing QoS rule without modifying packet filters  1 1 1 Reserved  Number of packet filters (bits 4 to 1 of octet 7)  The number of packet filters contains the binary coding for the number of packet filters in the packet filter list. The number of packet filters field is encoded in bits 4 through 1 of octet 7 where bit 4 is the most significant and bit 1 is the least significant bit. For the "delete existing QoS rule" operation and for the "modify existing QoS rule without modifying packet filters" operation, the number of packet filters shall be coded as 0. For the "create new QoS rule" operation and the "modify existing QoS rule and replace all packet filters" operation, the number of packet filters shall be greater than or equal to 0 and less than or equal to 15. For all other operations, the number of packet filters shall be greater than 0 and less than or equal to 15.  Packet filter list (octets 8 to m)  The packet filter list contains a variable number of packet filters.  For the "delete existing QoS rule" operation, the length of QoS rule field is set to one.  For the "delete existing QoS rule" operation and the "modify existing QoS rule without modifying packet filters" operation, the packet filter list shall be empty.  For the "modify existing QoS rule and delete packet filters" operation, the packet filter list shall contain a variable number of packet filter identifiers. This number shall be derived from the coding of the number of packet filters field in octet 7.  For the "create new QoS rule" operation and for the "modify existing QoS rule and replace all packet filters" operation, the packet filter list shall contain 0 or a variable number of packet filters. This number shall be derived from the coding of the number of packet filters field in octet 7.  For the "modify existing QoS rule and add packet filters" operation, the packet filter list shall contain a variable number of packet filters. This number shall be derived from the coding of the number of packet filters field in octet 7.  Each packet filter is of variable length and consists of  a packet filter direction (2 bits);  - a packet filter identifier (4 bits);  - the length of the packet filter contents (1 octet); and - the packet filter contents itself (variable amount of octets).  The packet filter direction field is used to indicate for what traffic direction the filter applies.  Bits  6 5  0 0 reserved  0 1 downlink only  1 0 uplink only  1 1 bidirectional (see NOTE)  The packet filter identifier field is used to identify each packet filter in a QoS rule. The least significant 4 bits are used. When the UE requests to "create new QoS rule", "modify existing QoS rule and replace all packet filters" or "modify existing QoS rule and add packet filters", the packet filter identifier values shall be set to 0.  The length of the packet filter contents field contains the binary coded representation of the length of the packet filter contents field of a packet filter. The first bit in transmission order is the most significant bit.  The packet filter contents field is of variable size and contains a variable number (at least one) of packet filter components. Each packet filter component shall be encoded as a sequence of a one octet packet filter component type identifier and a fixed length packet filter component value field. The packet filter component type identifier shall be transmitted first.  In each packet filter, there shall not be more than one occurrence of each packet filter component type. Among the "IPv4 remote address type" and "IPv6 remote address/prefix length type" packet filter components, only one shall be present in one packet filter. Among the "IPv4 local address type" and "IPv6 local address/prefix length type" packet filter components, only one shall be present in one packet filter. Among the "single local port type" and "local port range type" packet filter components, only one shall be present in one packet filter. Among the "single remote port type" and "remote port range type" packet filter components, only one shall be present in one packet filter. If the "match-all type" packet filter component is present in the packet filter, no other packet filter component shall be present in the packet filter and the length of the packet filter contents field shall be set to one.  The term local refers to the UE and the term remote refers to an external network entity.  Packet filter component type identifier Bits 8 7 6 5 4 3 2 1  0 0 0 0 0 0 0 1 Match-all type (see NOTE 2) 0 0 0 1 0 0 0 0 IPv4 remote address type 0 0 0 1 0 0 0 1 IPv4 local address type  0 0 1 0 0 0 0 1 IPv6 remote address/prefix length type 0 0 1 0 0 0 1 1 IPv6 local address/prefix length type 0 0 1 1 0 0 0 0 Protocol identifier/Next header type 0 1 0 0 0 0 0 0 Single local port type 0 1 0 0 0 0 0 1 Local port range type 0 1 0 1 0 0 0 0 Single remote port type  0 1 0 1 0 0 0 1 Remote port range type 0 1 1 0 0 0 0 0 Security parameter index type 0 1 1 1 0 0 0 0 Type of service/Traffic class type 1 0 0 0 0 0 0 0 Flow label type  1 0 0 0 0 0 0 1 Destination MAC address type 1 0 0 0 0 0 1 0 Source MAC address type 1 0 0 0 0 0 1 1 802.1Q C-TAG VID type 1 0 0 0 0 1 0 0 802.1Q S-TAG VID type 1 0 0 0 0 1 0 1 802.1Q C-TAG PCP/DEI type 1 0 0 0 0 1 1 0 802.1Q S-TAG PCP/DEI type 1 0 0 0 0 1 1 1 Ethertype type 1 0 0 0 1 0 0 0 Destination MAC address range type 1 0 0 0 1 0 0 1 Source MAC address range type  All other values are reserved.  The description and valid combinations of packet filter component type identifiers in a packet filter are defined in 3GPP TS 23.501 [8].  For "match-all type", the packet filter component shall not include the packet filter component value field.  For "IPv4 remote address type", the packet filter component value field shall be encoded as a sequence of a four octet IPv4 address field and a four octet IPv4 address mask field. The IPv4 address field shall be transmitted first.  For "IPv4 local address type", the packet filter component value field shall be encoded as defined for "IPv4 remote address type".  For "IPv6 remote address/prefix length type", the packet filter component value field shall be encoded as a sequence of a sixteen octet IPv6 address field and one octet prefix length field. The IPv6 address field shall be transmitted first.  For "IPv6 local address/prefix length type", the packet filter component value field shall be encoded as defined for "IPv6 remote address /prefix length".  For "protocol identifier/Next header type", the packet filter component value field shall be encoded as one octet which specifies the IPv4 protocol identifier or Ipv6 next header.  For "single local port type" and "single remote port type", the packet filter component value field shall be encoded as two octets which specify a port number.  For "local port range type" and "remote port range type", the packet filter component value field shall be encoded as a sequence of a two octet port range low limit field and a two octet port range high limit field. The port range low limit field shall be transmitted first.  For "security parameter index", the packet filter component value field shall be encoded as four octets which specify the IPSec security parameter index.  For "type of service/traffic class type", the packet filter component value field shall be encoded as a sequence of a one octet type-of-service/traffic class field and a one octet type-of-service/traffic class mask field. The type-of-service/traffic class field shall be transmitted first.  For "flow label type", the packet filter component value field shall be encoded as three octets which specify the IPv6 flow label. The bits 8 through 5 of the first octet shall be spare whereas the remaining 20 bits shall contain the IPv6 flow label.  For "destination MAC address type" and "source MAC address type", the packet filter component value field shall be encoded as 6 octets which specify a MAC address.  For "802.1Q C-TAG VID type", the packet filter component value field shall be encoded as two octets which specify the VID of the customer-VLAN tag (C-TAG). The bits 8 through 5 of the first octet shall be spare whereas the remaining 12 bits shall contain the VID.  For "802.1Q S-TAG VID type", the packet filter component value field shall be encoded as two octets which specify the VID of the service-VLAN tag (S-TAG). The bits 8 through 5 of the first octet shall be spare whereas the remaining 12 bits shall contain the VID.  For "802.1Q C-TAG PCP/DEI type", the packet filter component value field shall be encoded as one octet which specifies the 802.1Q C-TAG PCP and DEI. The bits 8 through 5 of the octet shall be spare, the bits 4 through 2 contain the PCP and bit 1 contains the DEI.  For "802.1Q S-TAG PCP/DEI type", the packet filter component value field shall be encoded as one octet which specifies the 802.1Q S-TAG PCP. The bits 8 through 5 of the octet shall be spare, the bits 4 through 2 contain the PCP and bit 1 contains the DEI.  For "ethertype type", the packet filter component value field shall be encoded as two octets which specify an ethertype.  For "destination MAC address range type", the packet filter component value field shall be encoded as a sequence of a 6 octet destination MAC address range low limit field and a 6 octet destination MAC address range high limit field. The destination MAC address range low limit field shall be transmitted first.  For "source MAC address range type", the packet filter component value field shall be encoded as a sequence of a 6 octet source MAC address range low limit field and a 6 octet source MAC address range high limit field. The source MAC address range low limit field shall be transmitted first. |
| NOTE 1: Octet m+2 shall not be included without octet m+1.  NOTE 2: The "Match-all type" packet filter component type identifier shall not be used with packet filter direction "downlink only". |

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