**3GPP TSG-SA5 Meeting #143-e *S5-223278rev1***

**e-meeting, 9th – 17th May 2022** Revision of S5-20xxxx

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **32.255** | **CR** | **0398** | **rev** | **1** | **Current version:** | **16.11.0** |  |
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| *For* [***HELP***](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:***  | Correction on the trigger type for QBC |
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| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | TEI16, 5GS\_Ph1-DCH |  | ***Date:*** | 2022-04-26 |
|  |  |  |  |  |
| ***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](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:*** | The trigger type in the Roaming Charging Profile is set by the CHF for QBC, which should be only applicable for the QoS flow level of QBC Trigger, specified in the Table 5.2.1.6.1 Default Chargeable events in SMF for QBC. If the PDU session level of QBC trigger is set by CHF via Roaming Charging Profile, the corresponding triggers of FBC will be affected. The proposal suggests to specify the trigger set via Roaming Charging Profile, in oder to avoid the impaction on the FBC. |
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| ***Summary of change:*** | Clarify the trigger type for QBC. |
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| ***Consequences if not approved:*** | The trigger type description is unclear.  |
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| ***Clauses affected:*** | 6.2.1.4 |
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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 ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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| **First change** |

#### 5.2.1.6 QoS flow Based Charging

QoS flow Based Charging allows the SMF to collect charging information related to data volumes per PDU session, categorized per QoS Flow. QBC doesn't support quota management.

The user can be identified by SUPI.

For a given PDU session, QBC shall be performed by the SMF within the same charging session used for Flow Based Charging. For the case where QBC is performed from SMF in VPLMN, Flow Based Charging is not applicable and there is no possibility to have quota management for the PDU Session. For the case where QBC is performed from SMF in HPLMN, FBC can be performed or not performed at the same time according to operator's policy.

The SMF categorizes the volume within PDU session by QoS Flow identified by QoS Flow Identifier (QFI).

The amount of data counted for the QoS Flow shall be the user plane payload at the UPF.

Table 5.2.1.6.1 summarizes the set of default trigger conditions and their category which shall be supported by the SMF in QBC. For "immediate report" category, the table also provides the corresponding Charging Data Request [Initial, Update, Termination] message sent from SMF towards the CHF.

Table 5.2.1.6.1: Default Chargeable events in SMF for QBC

| Chargeable event | Trigger level | Default category | CHF allowed to change category  | CHF allowed to enable and disable | Message when "immediate reporting" category |
| --- | --- | --- | --- | --- | --- |
| Start of PDU session | PDU session  | Immediate | Not Applicable | Not Applicable | Charging Data Request [Initial] |
| Start of a QoS Flow | QoS Flow  | Deferred | Not Applicable | Not Applicable | Charging Data Request [Update] |
| **Change of Charging conditions** |
| QoS change | QoS Flow | Deferred | Yes | Yes |
| GFBR guaranteed status change | QoS Flow | Deferred | Yes | Yes |
| User Location change | PDU session | Deferred | Yes | Yes |
| Serving Node change | PDU session | Deferred | Yes | Yes |
| Change of UE presence in Presence Reporting Area(s) | PDU session | Deferred | Yes | Yes |
| Change of 3GPP PS Data off Status | PDU session | Deferred | Yes | Yes |
| Tariff time change | PDU session | Deferred | No | No |
| UE time zone change | PDU session | Immediate | Yes | Yes |
| PLMN change | PDU session | Immediate | Yes | Yes |
| RAT type change | PDU session | Immediate | Yes | Yes |
| Session-AMBR change | PDU session | Immediate | Yes | Yes |
| Addition of UPF  | PDU session | Immediate | Yes | Yes |
| Removal of UPF  | PDU session | Immediate | Yes | Yes |
| Handover cancel | PDU session | Immediate | Yes | Yes |
| Handover start | PDU session | Immediate | Yes | Yes |
| Handover complete | PDU session | Immediate | Yes | Yes |
| **Limit per PDU session** |
| Expiry of data time limit per PDU session | PDU session | Immediate | No | Yes |
| Expiry of data volume limit per PDU session | PDU session | Immediate | No | Yes |
| Expiry of data event limit per PDU session | PDU session | Immediate | No | Yes |
| Expiry of limit of number of charging condition changes | PDU session | Immediate | No | Yes |
| **Limit per QoS Flow** |
| Expiry of data time limit per QoS Flow | QoS Flow  | Deferred | Yes | Yes |
| Expiry of data volume limit per QoS Flow | QoS Flow  | Deferred | Yes | Yes |
| **Others**  |
| End of QoS Flow | QoS Flow  | Deferred | Yes | Yes |
| Management intervention | PDU session | Immediate | No | No |
| End of PDU session  | PDU session | Immediate | No | No | Charging Data Request [Termination] |
| Abort request is received from the CHF | PDU session | Immediate | No | No |
| NOTE 1: If GFBR guaranteed status change is enabled, SMF needs to ensure the request for the notification from the access network (i.e. 3GPP RAN) when the GFBR can no longer (or can again) be guaranteed for a QoS Flow during the lifetime of the QoS Flow.NOTE 2: The columns CHF allowed to change category, and CHF allowed enable and disable are only applicable for the PDU session establishment, for other cases they are not applicable. |

The default "Limit" trigger conditions, are trigger thresholds configured in the Charging Characteristics applied to the PDU session for QBC. It shall be possible for the CHF to override these default triggers when providing Charging Data Response [Initial], either to disable the triggers, or to enable triggers new thresholds value.

For QBC the following details of chargeable events and corresponding actions in the SMF are defined in Table 5.2.1.6.2:

Table 5.2.1.6.2: Chargeable events and their related actions in SMF for QBC

| Chargeable event | Conditions | SMF action |
| --- | --- | --- |
| Start of PDU session |  | Charging Data Request [Initial] . |
| Start of a QoS Flow | Start of the QoS Flow associated with the default QoS rule | Charging Data Request [Update]. |
| Start of a QoS Flow | Start new counts with time stamps. |
| End of a QoS Flow |  | Close the counts with time stamps for the QoS flows |
| End of PDU session  |  | Charging Data Request [Termination]Close the counts with time stamps |
| Change of charging condition in the SMF (e.g. QoS change, Session-AMBR change, user location change, Radio access type change, PLMN change, Serving Node change, UE Time Zone change, change of UE presence in Presence Reporting Area(s), change of 3GPP PS Data Off status, GFBR guaranteed status change) | If the corresponding trigger is enabled | Close the counts and start new counts with time stamps for all active QoS flows. |
| If the corresponding trigger is enabled and the category is set to "immediate reporting" | Charging Data Request [Update]. |
| Handover start | If the corresponding trigger is enabled | Close the counts with time stamps and start start new counts with time stamps. |
| If the corresponding trigger is enabled and the category is set to "immediate reporting" | Charging Data Request [Update]. |
| Handover cancel | If the corresponding trigger is enabled | Close the counts with time stamps and start new counts with time stamps. |
| If the corresponding trigger is enabled and the category is set to "immediate reporting" | Charging Data Request [Update]. |
| Handover complete | If the corresponding trigger is enabled | Close the counts with time stamps and start new counts with time stamps for active QoS flows. |
| If the corresponding trigger is enabled and the category is set to "immediate reporting" | Charging Data Request [Update] |
| Addition of UPF | If the corresponding trigger is enabled | Start new counts with time stamps for the added UPF. |
| If the corresponding trigger is enabled and the category is set to "immediate reporting"  | Charging Data Request [Update]. |
| Removal of UPF | If the corresponding trigger is enabled | Close the counts with time stamps for the removed UPF |
| If the corresponding trigger is enabled and the category is set to "immediate reporting"  | Charging Data Request [Update]. |
| Expiry of time limit per QoS Flow | If the corresponding trigger is enabled | Close the counts with time stamps. |
| If the category is set to "immediate reporting" | Charging Data Request [Update] |
| If the QoS Flow is still active | Start new counts with time stamps |
| Expiry of data volume limit per QoS Flow | If the corresponding trigger is enabled | Close the counts with time stamps |
| If the category is set to "immediate reporting" | Charging Data Request [Update] |
| If the QoS Flow is still active | Start new counts with time stamps |
| Expiry of time limit per PDU session | If the corresponding trigger is enabled | Close the counts with time stamps for all QoS flows. |
| If the category is set to "immediate reporting" | Charging Data Request [Update] |
| If the PDU session is still active | Start new counts with time stamps for all active QoS flows |
| Expiry of data volume limit per PDU session | If the corresponding trigger is enabled | Close the counts with time stamps for all QoS flows. |
| If the category is set to "immediate reporting" | Charging Data Request [Update] |
| If the PDU session is still active | Start new counts with time stamps for all active QoS flows |
| Expiry of a limit of number of charging condition changes per PDU session | If the corresponding trigger is enabled | Close the counts with time stamps for all QoS flows. |
| If the category is set to "immediate reporting" | Charging Data Request [Update] |
| If the PDU session is still active | Start new counts with time stamps for all active QoS flows |
| Management intervention |  | Charging Data Request [Update]Close the counts with time stamps for all QoS Flows |
| If the PDU session is still active | Start new counts with time stamps |
| Abort |  | Charging Data Request [Termination]Close the counts with time stamps |

The CDR generation mechanism processed by the CHF upon receiving Charging Data Request [Initial, Update, Termination] issued by the SMF for these chargeable events in QBC, is specified in clause 5.2.3.

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| **Next change** |

#### 6.2.1.4 Definition of roaming QBC information

Roaming QBC specific charging information used for 5G data connectivity charging is provided within the Roaming QBC Information.

The detailed structure of the Roaming QBC Information can be found in table 6.2.1.4.1.

Table 6.2.1.4.1: Structure of Roaming QBC Information

|  |  |  |
| --- | --- | --- |
| Information Element | Category | Description |
| Multiple QFI container | OC | This field holds a list of QFI containers. It may have multiple occurrences |
| Triggers | OC | This field holds the reason for closing the QFI unit container. |
| Trigger Timestamp | OC | This field holds the timestamp of the trigger. |
| Time | OC | This field holds the amount of used time. |
| Total Volume | OC | This field holds the amount of used volume in both uplink and downlink directions. |
| Uplink Volume | OC | This field holds the amount of used volume in uplink direction. |
| Downlink Volume | OC | This field holds the amount of used volume in downlink direction. |
| Local Sequence Number | M | This field holds a QFI data container sequence number |
| QFI Container information | OC | This field holds the QFI data container information defined in clause 6.2.1.5 |
| UPF ID | OC | This field holds the UPF identifier used to identify the UPF when reporting the usage for the UPF. |
| Roaming Charging Profile | OC | This field holds the Roaming Charging Profile associated to the PDU session for roaming QBC. |
| Trigger  | OC | This field holds the trigger applicable to QBC.This field has multiple occurrences |
| Trigger type | OC | This field holds the chargeable event defined in table 5.2.1.6.1. |
| Trigger category | OC | This field holds the trigger category (i.e. immediate or deferred reporting) |
| Time Limit | OC | This field holds the limit value in seconds when the trigger type is "Expiry of data time limit" |
| Volume Limit | OC | This field holds the limit value in octets when the trigger type is "Expiry of data volume limit" |
| Max Number of charging condition changes | OC | This field holds the limit value when the trigger type is "Expiry of limit of number of charging condition changes" |
| Partial record method | OC | This field holds the method uses by the CHF for partial record closure: default or Individual.  |

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| **End of change** |