**SA WG2 Meeting SA2#144-e S2-2102862r02**

**12 - 16 April, 2021, Electronic meeting**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.503** | **CR** | **0568** | **rev** | **-** | **Current version:** | **17.0.0** |  |
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| *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:*** | Multimedia Priority Service (MPS) Phase 2 support for Data Transport Service | | | | | | | | | |
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| ***Source to WG:*** | Perspecta Labs, CISA ECD, Verizon, AT&T, T-Mobile USA, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | MPS2 | | | | |  | ***Date:*** | | | April 06 2021 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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. | | | | | | | | *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)*  *Rel-17 (Release 17)* | |
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| ***Reason for change:*** | | This CR corrects one of the Release 17 MPS for DTS requirements. The following correction is proposed:  From:  “The PCF shall inform the AF that it successfully acted upon the MPS for Data Transport Service invocation/revocation request.”  To:  “The PCF shall inform the AF of the success or failure of the MPS for Data Transport Service invocation/revocation request.”  Although intent is perhaps understood with the existing requirement, there are a few possible interpretation problems:   1. The existing requirement suggests that the PCF always sends a success message, potentially even if the modification was not successful. This was not intended. 2. The existing requirement could also imply that the system keeps on retrying more times than possibly desirable until it is successful, while the system is coping with congestion. This was also not intended.   To overcome these and perhaps other misunderstandings or unintended behaviors, the revised requirement indicates that the PCF can report success or failure to the AF as the outcome of the requested QoS Flow modification(s). It is up to implementation on how to act on these indications. | | | | | | | | |
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| ***Summary of change:*** | | Corrected one requirement in clause 6.1.3.11. | | | | | | | | |
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| ***Consequences if not approved:*** | | Incorrect/unintended system behavior. | | | | | | | | |
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| ***Clauses affected:*** | | 6.1.3.11 | | | | | | | | |
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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:*** | |  | | | | | | | | |

*FIRST CHANGE*

#### 6.1.3.11 Multimedia Priority Service support

Multimedia Priority Services (MPS) is defined in TS 23.501 [2], TS 23.502 [3] and in TS 23.228 [5], utilising the architecture defined for 5GS.

Subscription data for MPS is provided to PCF through the N36/Nudr. To support MPS service, the PCF shall subscribe to changes in the MPS subscription data for Priority PDU connectivity service. Dynamic invocation for MPS provided from an AF using the Priority indicator over N5/Npcf takes precedence over the MPS subscription.

ARP and/or 5QI may be modified. It shall be possible to override the default Priority Level associated with the standardized 5QI.

For dynamic invocation of MPS service, the PCF shall generate the corresponding PCC rule(s) with the ARP and 5QI parameters as appropriate for the prioritized service, as defined in TS 23.501 [2].

Whenever one or more AF sessions of an MPS service are active within the same PDU Session, the PCF shall ensure that the ARP priority level of the QoS Flow for signalling as well as the QoS Flow associated with the default QoS rule is at least as high as the highest ARP priority level used by any authorized PCC rule belonging to an MPS service. If the ARP pre-emption capability is enabled for any of the authorized PCC rules belonging to an MPS service, the PCF shall also enable the ARP pre-emption capability for the QoS Flow for signalling as well as the QoS Flow associated with the default QoS rule.

In the case of IMS MPS, in addition to the above, the following QoS Flow handling applies:

- At reception of the indication from subscription information that the IMS Signalling Priority is set for the PDU Session or at reception of service authorization from the P-CSCF (AF) including an MPS session indication and the service priority level as defined in TS 23.228 [5], the PCF shall (under consideration of the requirement described in clauses 5.16.5 and 5.22.3 in TS 23.501 [2]) modify the ARP in all the PCC rules that describe the IMS signalling traffic to the value appropriate for IMS Multimedia Priority Services, if upgrade of the QoS Flow carrying IMS Signalling is required. To modify the ARP of the QoS Flow associated with the default QoS rule the PCF shall modify the Authorized default 5QI/ARP.

- When the PCF detects that the P-CSCF (AF) released all the MPS sessions and the IMS Signalling Priority is not set for the PDU Session the PCF shall consider changes of the requirement described in clauses 5.16.5 and 5.22.3 in TS 23.501 [2] and modify the ARP in all PCC rules that describe the IMS signalling traffic to an appropriate value according to PCF decision. The PCC rules bound to the QoS Flow associated with the default QoS rule have to be changed accordingly.

NOTE 1: To keep the PCC rules bound to this QoS Flow, the PCF can either modify the ARP of these PCC rules accordingly or set the Bind to QoS Flow associated with the default QoS rule.

The Priority PDU connectivity service targets the ARP and/or 5QI of the QoS Flows, enabling the prioritization of all traffic on the same QoS Flow.

For non-MPS service, the PCF shall generate the corresponding PCC rule(s) as per normal procedures (i.e. without consideration whether the MPS Priority PDU connectivity service is active or not), and shall upgrade the ARP/5QI values suitable for MPS when the Priority PDU connectivity service is invoked. When the Priority PDU connectivity service is revoked, the PCF shall change the ARP/5QI values modified for the Priority PDU connectivity service to appropriate values according to PCF decision.

The PCF shall, at the activation of the Priority PDU connectivity service:

- modify the ARP of PCC rules installed before the activation of the Priority PDU connectivity service to the ARP as appropriate for the Priority PDU connectivity service under consideration of the requirement described in clause 5.16.5 of TS 23.501 [2]; and

- if modification of the 5QI of the PCC rule(s) is required, modify the 5QI of the PCC rules installed before the activation of the Priority PDU connectivity service to the 5QI as appropriate for this service.

The PCF shall, at the deactivation of the Priority PDU connectivity service modify any 5QI and ARP value to the value according to the PCF policy decision.

For PCC rules modified due to the activation of Priority PDU connectivity service:

- modify the ARP to an appropriate value according to PCF decision under consideration of the requirement described in clauses 5.16.5 and 5.22.3 in TS 23.501 [2]; and

- if modification of the 5QI of PCC rule(s) is required, modify the 5QI to an appropriate value according to PCF decision.

MPS for Data Transport Service enables the prioritization of all traffic on the QoS Flow associated with the default QoS rule and other QoS Flows upon AF request. The QoS modification to the QoS Flow associated with the default QoS rule and other QoS Flows is done based on operator policy and regulatory rules by means of local PCF configuration.

NOTE 2: If no configuration is provided, MPS for Data Transport Service applies only to the QoS Flow associated with the default QoS rule.

Upon receipt of an MPS for Data Transport Service invocation/revocation request from the UE, the AF authorizes the request. Subsequently, the AF forwards the MPS for Data Transport Service request to the PCF and indicates to the PCF whether the request is for invoking or revoking MPS for Data Transport Service. The PCF will respond to the AF indicating that it received the AF request. The PCF shall not perform any subscription check for MPS for Data Transport Service requests.

The PCF shall, at the invocation/revocation of MPS for Data Transport Service perform the same steps as described above for the activation/deactivation of the Priority PDU connectvitiy service.

NOTE 3: To keep the PCC rules bound to the QoS Flow associated with the default QoS Rule, the PCF can either modify the ARP/QCI of these PCC rules accordingly or set the PCC rule attribute Bind to QoS Flow associated with the default QoS rule.

The PCF shall inform the AF of the success or failure of the MPS for Data Transport Service invocation/revocation request, when the AF subscribed to the MPS for Data Transport Service outcome event as defined in clause 6.1.3.18. If the PDU Session is deactivated for other reasons that an AF request, the PCF shall notify the AF by deleting the N5 session context.

For MPS for Data Transport Service, the AF may also request an SDF for priority signaling between the UE and the AF, where the AF includes the Priority indicator over N5/Npcf, in order to enable the PCF to set appropriate QoS values for the QoS Flow.

*SECOND AND LAST CHANGE*

#### 6.1.3.18 Event reporting from the PCF

The AF may subscribe/unsubscribe to notifications of events from the PCF for the PDU Session to which the AF session is bound. Alternatively, a PCF for the UE may subscribe/unsubscribe to notifications from the PCF for the PDU Session of this UE.

The events that can be subscribed by the AF and by the PCF for the UE are listed in Table 6.1.3.18-1.

Table 6.1.3.18-1: Events relevant for reporting from the PCF

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Event | Description | Conditions for reporting | Availability for Rx PDU Session (NOTE 2) | Availability for N5 per PDU Session | Availability for Bulk Subscription  (NOTE 1) | Availability for N43 per SUPI, DNN, S-NSSAI | Availability for N5 per UE |
| PLMN Identifier Notification  (NOTE 5) | The PLMN identifier or SNPN identifier where the UE is currently located. | AF | Yes | Yes | Yes | No | No |
| Change of Access Type | The Access Type and, if applicable, the RAT Type of the PDU Session has changed. | AF | Yes | Yes | Yes | No | No |
| EPS fallback | EPS fallback is initiated | AF | Yes | Yes | No | No | No |
| Signalling path status | The status of the resources related to the signalling traffic of the AF session. | AF | Yes | Yes | No | No | No |
| Access Network Charging Correlation Information | The Access Network Charging Correlation Information of the resources allocated for the AF session. | AF | Yes | Yes | No | No | No |
| Access Network Information Notification | The user location and/or timezone when the PDU Session has changed in relation to the AF session. | AF | Yes | Yes | No | No | No |
| Reporting Usage for Sponsored Data Connectivity | The usage threshold provided by the AF has been reached; or the AF session is terminated. | AF | Yes | Yes | No | No | No |
| Service Data Flow deactivation | The resources related to the AF session are released. | AF | Yes | Yes | No | No | No |
| Resource allocation outcome | The outcome of the resource allocation related to the AF session. | AF | Yes | Yes | No | No | No |
| MPS for Data Transport Service outcome | The outcome of the QoS update for MPS for Data Transport Service | AF | Yes | Yes | No | No | No |
| QoS targets can no longer (or can again) be fulfilled | The QoS targets can no longer (or can again) be fulfilled by the network for (a part of) the AF session. | AF | No | Yes | No | No | No |
| QoS Monitoring parameters | The QoS Monitoring parameter(s) (e.g. UL packet delay, DL packet delay or round trip packet delay) are reported to the AF according to the QoS Monitoring reports received from the SMF. | AF | No | Yes | No | No | No |
| Out of credit | Credit is no longer available. | AF | Yes | Yes | No | No | No |
| Reallocation of credit | Credit has been reallocated after the former Out of credit indication. | AF | Yes | Yes | No | No | No |
| 5GS Bridge information Notification  (NOTE 3) | 5GS Bridge information that has been received by PCF from SMF. | AF | No | Yes | No | No | No |
| Notification on outcome of service area coverage change | The outcome of the request of service area coverage change. | AF | No | No | Yes | No | Yes |
| Start of application traffic detection and  Stop of application traffic detection | The start or the stop of application traffic has been detected. | PCF | No | No | No | Yes  (NOTE 4) | No |
| Satellite backhaul category change | The satellite backhaul category (i.e. GEO, MEO, LEO, non-satellite) has changed | AF | No | Yes | Yes | No | No |
| NOTE 1: Additional parameters for the subscription as well as reporting related to these events are described in TS 23.502 [3].  NOTE 2: Applicability of Rx is described in Annex C.  NOTE 3: 5GS Bridge information is described in clause 6.1.3 UE-DS-TT Residence Time is only provided if a DS-TT port is detected.  NOTE 4: Bulk subscription is implicit. NOTE 1 does not apply.  NOTE 5: For a PDU Session established over a SNPN, the combination of the PLMN id and the NID identifies the SNPN. | | | | | | | |

If an AF requests the PCF to report the PLMN identifier where the UE is currently located, then the PCF shall provide the PLMN identifier or the SNPN identifier to the AF if available. Otherwise, the PCF shall provision the corresponding PCC rules, and the Policy Control Request Trigger to report PLMN change to the SMF. The PCF shall, upon receiving the PLMN identifier or the SNPN identifier from the SMF forward this information to the AF, including the PLMN Id and if available the NID.

If an AF requests the PCF to report on the change of Access Type, the PCF shall provide the corresponding Policy Control Request Trigger to the SMF to enable the report of the Change in Access Type to the PCF. The PCF shall, upon reception of information about the Access Type the user is currently using and upon indication of change of Access Type, notify the AF on changes of the Access Type and forward the information received from the SMF to the AF. The change of the RAT Type shall also be reported to the AF, even if the Access Type is unchanged. For MA PDU Session the Access Type information may include two Access Type information that the user is currently using.

If an AF requests the PCF to report on the signalling path status, for the AF session, the PCF shall, upon indication of removal of PCC Rules identifying signalling traffic from the SMF report it to the AF.

If an AF requests the PCF to report Access Network Charging Correlation Information, the PCF shall provide to the AF the Access Network Charging Correlation Information, which allows to identify the usage reports that include measurements for the Service Data Flow(s), once the Access Network Charging Correlation Information is known at the PCF.

If an AF requests the PCF to report Access Network Information (i.e. the User Location Report and/or the UE Timezone Report) at AF session establishment, modification or termination, the PCF shall set the Access Network Information report parameters in the corresponding PCC rule(s) and provision them together with the corresponding Policy Control Request Trigger to the SMF. For those PCC rule(s) based on preliminary service information the PCF may assign the 5QI and ARP of the QoS Flow associated with the default QoS rule to avoid signalling to the UE. The PCF shall, upon receiving an Access Network Information report corresponding to the AF session from the SMF, forward the Access Network Information as requested by the AF (if the SMF only reported the serving PLMN identifier or the SNPN identifier to the PCF, as described in clause 6.1.3.5, the PCF shall forward it to the AF). For AF session termination the communication between the AF and the PCF shall be kept alive until the PCF report is received.

If an AF requests the PCF to report the Usage for Sponsored Data Connectivity, the PCF shall provision the corresponding PCC rules, and the Policy Control Request Trigger to the SMF. If the usage threshold provided by the AF has been reached or the AF session is terminated, the PCF forwards such information to the AF.

If an AF requests the PCF to report the Service Data Flow deactivation, the PCF shall report the release of resources corresponding to the AF session. The PCF shall, upon being notified of the removal of PCC Rules corresponding to the AF session from the SMF, forward this information to the AF. The PCF shall also forward, if available, the reason why the resources are released, the user location information and the UE Timezone.

If an AF requests the PCF to report the Resource allocation outcome, the PCF shall report the outcome of the resource allocation of the Service Data Flow(s) related to the AF session. The AF may request to be notified about successful or failed resource allocation. In this case, the PCF shall instruct the SMF to report the successful resource allocation trigger (see clause 6.1.3.5). If the SMF has notified the PCF that the resource allocation of a Service Data Flow is successful and the currently fulfilled QoS matches an Alternative QoS parameter set (as described in clause 6.2.2.1), the PCF shall also provide to the AF the QoS reference parameter corresponding to the Alternative QoS parameter set referenced by the SMF.

If an AF requests the PCF to report the MPS for Data Transport Service outcome, the PCF shall instruct the SMF to report the outcome of the QoS modification request. The SMF shall report back to the PCF and the PCF shall report the outcome to the AF.

If an AF requests the PCF to report when the QoS targets can no longer (or can again) be fulfilled for a particular media flow, the PCF shall set the QNC indication in the corresponding PCC rule(s) that includes a GBR or delay critical GBR 5QI value and provision them together with the corresponding Policy Control Request Trigger to the SMF. At the time, the SMF notifies that GFBR can no longer (or can again) be guaranteed for a QoS Flow to which those PCC Rule(s) are bound, the PCF shall report to the AF the affected media flow and provides the indication that QoS targets can no longer (or can again) be fulfilled. If additional information is received with the notification from SMF (see clause 5.7.2.4 of TS 23.501 [2]), the PCF shall also provide to the AF the QoS reference parameter corresponding to the Alternative QoS parameter set referenced by the SMF. If the SMF has indicated that the lowest priority Alternative QoS parameter set cannot be fulfilled, the PCF shall indicate to the AF that the lowest priority QoS reference of the Alternative Service Requirements cannot be fulfilled.

If the AF has subscribed to be notified of the QoS Monitoring information, the PCF further sends the QoS Monitoring report to the AF.

If an AF requests the PCF to report on the Out of credit event for the associated service data flow(s), the PCF shall inform the AF (when it gets informed by the SMF) that credit is no longer available for the services data flow(s) related to the AF session together with the applied termination action.

If an AF requests the PCF to report on the Reallocation of credit event for the associated service data flow(s), the PCF shall inform the AF (when it gets informed by the SMF) that credit has been reallocated after credit was no longer available and the termination action was applied for the service data flow(s) related to the AF session.

If an AF requests the PCF to report on the event of the 5GS Bridge information Notification, for the AF session, the PCF shall, request the SMF to report on the trigger of 5GS Bridge information available as described in the clause 6.1.3.5. Upon reception of the 5GS Bridge information, the PCF forwards this information to the TSN AF.

If the AF requests the PCF to report on the outcome of the service area coverage change, the PCF reports the outcome of the service area coverage change to the AF and notifies the current service area coverage to the AF. The subscription may also be implicit. In this case there may be bulk subscription, either for an Internal-Group-Id or for any UE. In order to prevent massive notifications to the AF, the request for any UE is associated to a specific Application Id or DNN, S-NSSAI. For bulk subscription, when the AF request includes an expiration time, the PCF stops reporting to the AF when the expiration time is reached.

A request to report Start of application traffic detection and Stop of application traffic detection triggers the reporting when the PCF receives start of application traffic detection event or stop of application traffic detection event from SMF. The reception of a subscription to this event triggers the setting of the corresponding Policy Control Request Trigger to SMF, if not already subscribed.

If an AF requests the PCF to report on the change of satellite backhaul, category (i.e. GEO, MEO, LEO, non-satellite) the PCF shall provide the corresponding Policy Control Request Trigger to the SMF to enable the report of the Change in Satellite backhaul category to the PCF. The PCF shall, upon reception of information about the Satellite backhaul category the user is currently using and upon indication of change of Satellite backhaul category, notify the AF on changes of the Satellite backhaul category and forward the information received from the SMF to the AF.

*END OF CHANGES*