**3GPP TSG-SA WG2 Meeting #156-e *S2-2304649r05***

**April 17th – 21st, 2023, Electronic (revision of S2-230xxxx)**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **23.502** | **CR** | **4045** | **rev** | **-** | **Current version:** | **18.1.1** |  |
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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:***  | Procedures update to support policy control enhancements for multi-modal flows  |
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| ***Source to WG:*** | China Telecom, Nokia, Nokia Shanghai Bell, Huawei, Ericsson, Samsung, China Mobile, Tencent, LG Electronics, ZTE |
| ***Source to TSG:*** | SA2 |
|  |  |
| ***Work item code:*** | XRM |  | ***Date:*** | 2023-04-07 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-18 |
|  | *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)* |
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| ***Reason for change:*** | As agreed in SA2#155 meeting, 3GPP TS 23.501 and TS 23.503 version 18.1.0 include policy control enhancements to support multi-modal services. To align with the KI#1&KI#2 conclusions in TR 23.700-60, AF should provide new requirements and parameters to 5GC, and the related procedures need to be updated. |
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| ***Summary of change:*** | Removing the EN |
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| ***Consequences if not approved:*** | The KI#1&KI#2 conclusions could not be correctly reflected in specification. |
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| ***Clauses affected:*** | 4.15.6.6 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 23.501 CR TS 23.503 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:*** |  |

\* \* \* \* 1st change \* \* \* \*

4.15.6.6 Setting up an AF session with required QoS procedure

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**Figure 4.15.6.6-1: Setting up an AF session with required QoS procedure**

1. The AF sends a request to reserve resources for an AF session using Nnef\_AFsessionWithQoS\_Create request message (UE address, AF Identifier, Flow description information or External Application Identifier, QoS Reference or individual QoS parameters, PDU Set QoS parameters, Protocol Description, Alternative Service Requirements (as described in clause 6.1.3.22 of TS 23.503 [20]), DNN, S-NSSAI) to the NEF. Optionally, QoS monitoring requirements and Multi-modal Service ID can be included in the AF request. Optionally, a period of time or a traffic volume for the requested QoS can be included in the AF request. The AF may, instead of a QoS Reference, provide one or more of the following individual QoS parameters: Requested 5GS Delay (optional), Requested Priority (optional), Requested Guaranteed Bitrate, Requested Maximum Bitrate, Maximum Burst Size and Requested Packet Error Rate. Regardless of whether the AF request is formulated using a QoS Reference or individual QoS parameters, the AF may also provide one or more of the following parameters that describe the traffic characteristics: flow direction, Burst Arrival Time at UE (uplink) or UPF (downlink), Periodicity, Time domain, Survival Time, Capability for BAT adaptation or BAT Window, Periodicity Range. The AF may also provide an RT Latency Indication. The optional Alternative Service Requirements provided by the AF shall either contain QoS References or Requested Alternative QoS Parameter Set(s) in a prioritized order as described in clause 6.1.3.22 of TS 23.503 [20].

NOTE 1: For multi-modal flows related to multiple UEs, multiple UE-specific AF requests are used, and the AF provided information to NEF) is the same as single UE case (as defined in clause 5.37.2 of TS 23.501 [2]).

2. The NEF assigns a Transaction Reference ID to the Nnef\_AFsessionWithQoS\_Create request. The NEF authorizes the AF request and may apply policies to control the overall amount of QoS authorized for the AF. If the authorisation is not granted, all steps (except step 5) are skipped and the NEF replies to the AF with a Result value indicating that the authorisation failed.

 The NEF determines whether to invoke the TSCTSF or to directly contact the PCF. This determination may use the presence of a QoS Reference or individual QoS parameters in the AF request. The determination may also use the AF identifier or the presence of AF provided parameters that describe the traffic characteristics. The determination may also be based on operator configuration, e.g. SLA between operator and application provider.

NOTE 2: The NEF can determine whether the TSCTSF needs to be involved based on the DNN/S-NSSAI for the AF session according to the SLA.

 If the NEF determines not to invoke the TSCTSF, then steps 3, 4, 5, 6, 7, 8 are executed, otherwise, steps 3a, 3b, 4a, 4b, 5, 6a, 7a, 7b, 8 are executed.

3. If the NEF determines to contact the PCF directly without invoking the TSCTSF, the NEF uses the UE address to discover the PCF from the BSF. The NEF forwards received parameters to the PCF in the Npcf\_PolicyAuthorization\_Create request. Any optionally received period of time or traffic volume mapped and forwarded as sponsored data connectivity information (as defined in TS 23.503 [20]).

 If the AF is considered to be trusted by the operator, the AF uses the Npcf\_PolicyAuthorization\_Create request message to interact directly with PCF to request reserving resources for an AF session.

3a. If the NEF determines to invoke the TSCTSF, the NEF forwards received parameters in the Ntsctsf\_QoSandTSCAssistance\_Create request message to the TSCTSF. Any optionally received period of time or traffic volume is mapped and forwarded as sponsored data connectivity information (as defined in TS 23.503 [20]).

 If the AF is considered to be trusted by the operator, the AF uses the Ntsctsf\_QoSandTSCAssistance\_Create request message to interact directly with TSCTSF to request reserving resources for an AF session.

 A TSCTSF address may be locally configured (a single TSCTSF per DNN/S-NSSAI) in the NEF, PCF and trusted AF. Alternatively, the NEF uses the AF Identifier to determine the DNN/S-NSSAI and uses the DNN/S-NSSAI to discover the TSCTSF from the NRF.

3b. The TSCTSF determines whether it has an AF session with a PCF for the given UE address. In this case the TSCTSF sends a Npcf\_PolicyAuthorization\_Update request message to the PCF and forwards the received parameters after executing the adjustment and mapping actions described below.

 If the TSCTSF does not have an AF-session for a given UE address, the TSCTSF discovers the PCF and a Npcf\_PolicyAuthorization\_Create request message to the PCF.

 If the TSCTSF receives a Requested 5GS Delay, the TSCTSF calculates a Requested PDB by subtracting the UE-DS-TT Residence Time (either provided by the PCF or pre-configured at TSCTSF) from the Requested 5GS Delay and sends the Requested PDB to the PCF instead of the Requested 5GS Delay. If the TSCTSF receives any of the following parameters: flow direction, Burst Arrival Time, Periodicity, Time domain, Survival Time, Capability for BAT adaptation or BAT Window, Periodicity Range from the NEF, the TSCTSF determines the TSC Assistance Container and sends it to the PCF instead of these parameters.

4. For requests received from the NEF in step 3, the PCF determines whether the request is authorized and notifies the NEF if the request is not authorized.

 If the request is authorized, the PCF derives the required QoS parameters of the PCC rule based on the information provided by the NEF and determines whether this QoS is allowed (according to the PCF configuration) and notifies the result to the NEF. If the AF is considered to be trusted by the operator, the PCF sends the Npcf\_PolicyAuthorization\_Create response message directly to AF.

 If the PCF receives the individual QoS parameters instead of QoS Reference, the PCF determines a 5QI that matches the individual QoS parameters as described in clause 6.1.3.22 of TS 23.503 [20]. It also sets the GBR and MBR for the PCC rule according to the requested values. The PCF may use the Requested Priority from the AF to determine Priority Level as defined in clause 5.7.3.3 of TS 23.501 [2]. Requested individual QoS parameter values supersede default values for the 5QI.

 If the PCF receives the RT Latency Indication described in clause 6.1.3.22 of TS 23.503 [20], the PCF executes Uplink-Downlink Transmission Coordination as described in clause 5.37.7 of TS 23.501 [2].

 If the PCF receives PDU Set QoS parameters described in clause 5.7.7 of TS 23.501 [2], the PDU Set QoS parameters are applied as described in clause 6.1.3.22 of TS 23.503 [20].

 In addition, if the Alternative Service Requirements are provided, the PCF derives the Alternative QoS parameter set(s) in the same way from the one or more QoS Reference parameters or the Requested Alternative QoS Parameter Set(s) contained in the Alternative Service Requirements keeping the same prioritized order (as defined in clause 6.1.3.22 of TS 23.503 [20]).

NOTE 3: The PCF derived Alternative QoS parameter set(s) for the PCC rule are subsequently used to establish Alternative QoS Profile(s). The Alternative QoS Profile parameters provided to the NG-RAN are specified in clause 5.7.1.2a of TS 23.501 [2].

For multi-modal flows, the PCF derives the required QoS parameters in the PCC rules and generates the QoS monitoring requirements policy for each media flow, based on the information provided by the NEF. If the PCF determines that the SMF needs updated policy information, the PCF issues a Npcf\_SMPolicyControl\_UpdateNotify request with updated policy information about the PDU Session as described in the PCF initiated SM Policy Association Modification procedure in clause 4.16.5.2.

4a. For requests received from the TSCTSF in step 3b, the PCF determines whether the request is authorized and notifies the TSCTSF if the request is not authorized.

 If the request is authorized, the PCF derives the required QoS parameters of the PCC rule in the same way it is described in step 4 based on the information provided by the TSCTSF and determines whether this QoS is allowed (according to the PCF configuration) and notifies the result to the TSCTSF.

 If the PCF determines that the SMF needs updated policy information, the PCF issues a Npcf\_SMPolicyControl\_UpdateNotify request with updated policy information about the PDU Session as described in the PCF initiated SM Policy Association Modification procedure in clause 4.16.5.2.

 If the PCF receives a subscription for the 5GS Bridge/Router information from the TSCTSF, if the PCF does not have the 5GS Bridge/Router information for the PDU Session, the PCF uses the PCF initiated SM Policy Association Modification procedure as described in clause 4.16.5.2 to subscribe for 5GS Bridge/Router information event from the SMF. Once the PCF has the 5GS Bridge/Router information, the PCF notifies the TSCTSF for the 5GS Bridge/Router information (including the UE-DS-TT Residence Time).

4b. The TSCTSF sends a Ntsctsf\_QoSandTSCAssistance\_Create response message (Transaction Reference ID, Result) to the NEF. Result indicates whether the request is granted or not.

 If the AF is considered to be trusted by the operator, the TSCTSF sends the Ntsctsf\_QoSandTSCAssistance\_Create response message directly to AF.

5. The NEF sends a Nnef\_AFsessionWithQoS\_Create response message (Transaction Reference ID, Result) to the AF. Result indicates whether the request is granted or not.

6. The NEF shall send a Npcf\_PolicyAuthorization\_Subscribe message to the PCF to subscribe to notifications of Resource allocation status and may subscribe to other events described in clause 6.1.3.18 of TS 23.503 [20].

6a. The TSCTSF shall send a Npcf\_PolicyAuthorization\_Subscribe message to the PCF to subscribe to notifications of Resource allocation status and may subscribe to other events described in clause 6.1.3.18 of TS 23.503 [20].

 The TSCTSF that receives Capability for BAT adaptation or BAT Window in step 3a shall subscribe to notification on BAT offset via sending a Npcf\_PolicyAuthorization\_Subscribe request message to the PCF.

7. When the event condition is met, e.g. that the establishment of the transmission resources corresponding to the QoS update succeeded or failed, the PCF sends Npcf\_PolicyAuthorization\_Notify message to the NEF notifying about the event.

 If the AF is considered to be trusted by the operator, the PCF sends the Npcf\_PolicyAuthorization\_Notify message directly to AF.

7a. When the event condition is met, e.g. that the establishment of the transmission resources corresponding to the QoS update succeeded or failed, the PCF sends Npcf\_PolicyAuthorization\_Notify message to the TSCTSF notifying about the event.

7b. The TSCTSF sends Ntsctsf\_QoSandTSCAssistance\_Notify message with the event reported by the PCF to the NEF.

 If the AF is considered to be trusted by the operator, the TSCTSF sends the Ntsctsf\_QoSandTSCAssistance\_Notify message directly to AF.

8. The NEF sends Nnef\_AFsessionWithQoS\_Notify message with the event reported by the PCF to the AF.

The AF may send Nnef\_AFsessionWithQoS\_Revoke request to NEF in order to revoke the AF request. The NEF authorizes the revoke request and triggers the Ntsctsf\_QoSandTSCAssistance\_Delete/Unsubscribe and/or Npcf\_PolicyAuthorization\_Delete and the Npcf\_PolicyAuthorization\_Unsubscribe operations for the AF request.

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