**3GPP TSG-SA2 Meeting #148E *S2-2108478r08***

**15 – 22 November 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.502** | **CR** | **3248** | **rev** | **-** | **Current version:** | **17.2.1** |  |
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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:*** | Fixes for AF session with required QoS update procedure | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, Huawei, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | S2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | IIoT | | | | |  | ***Date:*** | | | 2021-09-30 |
|  |  | | | |  | |  | | |  |
| ***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](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:*** | | Provide Alternative QoS for TSC, resolve ENs related to use of priority requested by the AF. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1 – UDR storage of TSCTSF address for TSC QoS is eliminated. It is assumed that in TSCTSF discovery & selection (or local configuration) there is only one TSCTSF or TSCTSF set per UE/S-NSSAI/DNN. Hence the same TSCTSF (or set) is selected when the PCF sends 5GS Bridge Information (with UE residence time) to the TSCTSF and when an NEF sends an AF request for QoS. This significantly simplifies the QoS procedures and resolves the issue of always selecting a correct UDR (where a TSCTSF address is stored).  3 – A QoS Reference may not be specified with Individual QoS Parameters and Alternative QoS Related Parameters in the AF request.  4 – In step 1 (AF request), a reference is corrected. The currently referenced clause 5.7.1.2a of TS23.501 refers to Alternative QoS Profies (provided by the SMF to the RAN) not Alternative QoS Related parameters provided by the AF to the PCF. Instead a reference is given to 23.503 clause 6.1.3.22. Clarifying text is added at the end of step 1 with the 23.501 reference.  5 – Step 3 should only be executed when individual parameters for Alt QoS (Alternative QoS Related parameter set(s)) are not specified. A condition is added to the beginning of step 3 and a reference is added to point to 23.503 clause 6.1.3.22  6 – In steps 3a and 3b, the Alternative QoS Related parameters (ie: the individual parameters specified by the AF for a Alternative QoS Reference) are also part of the Alternative Service Requirements sent to the TSCTSF (3a) and PCF (3b). Note that the Alternative QoS Related Parameters (which are sent from AF to the PCF) and specify individual QoS Parameters for Alt QoS references (as per 23.503 clause 6.1.3.22) are not the same as the Alternative QoS parameter set(s) in the PCC rules, which are unchanged from Rel. 16.  7 – In step 4 text refering to Alternative QoS Related parameter sets is removed and in step 4a, the PCF may use the Alternative QoS Related parameter sets (that are part of the Alternative Service Requirements and originated at the AF) to determine the Alternative QoS parameter set(s) in the PCC rules. Note there is no change to the contents of the PCC rules – they already contain Alternative QoS parameter Set(s).  8 – The ENs on whether and how the PCF uses priority values specfied by an AF other than a TSN-AF is resolved. The AF requested priority may be used by the PCF to set priority of a QoS Flow as specfied in 23.501 clause 5.7.1.2a.  9 – Requested Priority is added to Nnef\_AFsessionWithQoS and Ntsctsf\_QoSandTSCAssistance service operations to be consistent with text in clause 4.15.6.6 and 4.15.6.6a  The CR also includes aspects from CR#3131 (S2-2108426) merged in. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incomplete and inconsitant specification | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.15.6.6, 4.15.6.6a, 5.2.6.9.2, 5.2.6.9.5, 5.2.12.1.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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*

#### 4.15.6.6 Setting up an AF session with required QoS procedure

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(s) or External Application Identifier, QoS reference, (optional) Alternative Service Requirements (as described in clause 6.1.3.22 of TS 23.503 [20]), DNN, S-NSSAI) to the NEF. 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 the following individual QoS parameters: Requested 5GS delay (optional), Requested Priority (optional), Requested GFBR, Requested MFBR, flow direction, Burst Size (optional), Burst Arrival Time (optional) at UE (uplink) or UPF (downlink), Periodicity (optional), Time domain (optional), Survival Time (optional). When Alternative Service Requirements are provided by the AF, a set of Alternative QoS Related parameters as in clause 5.7.1.2a of TS 23.501 [2] may be provided for each QoS Reference.

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.

If the NEF does not receive any of the individual QoS parameters as described in clause 6.1.3.22 of TS 23.503 [20] from the AF, the steps 3, 4, 5, 6, 7, 8 are executed, otherwise, the steps 3a, 3b, 4a, 4b, 5, 6a, 7a, 7b, 8 are executed.

3. If the NEF does not receive any of the individual QoS parameters or Alternative QoS Related parameter set(s) from the AF as described in clause 6.1.3.22 of TS 23.503 [20], the NEF uses the UE address to discover the PCF from the BSF. The NEF interacts with the PCF by triggering a Npcf\_PolicyAuthorization\_Create request and provides UE address, AF Identifier, Flow description(s), the QoS Reference and the optional Alternative Service Requirements. Any optionally received period of time or traffic volume is also included and mapped to sponsored data connectivity information (as defined in TS 23.503 [20]).

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

3a. If the NEF receives any of the individual QoS parameters as described in clause 6.1.3.22 of TS 23.503 [20] from the AF, the NEF forwards these received individual QoS parameters in the Ntsctsf\_QoSandTSCAssistance\_Create request message to the TSCTSF.

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 TSCTSF is discovered from the NRF.

3b. The TSCTSF interacts with the PCF by triggering a Npcf\_PolicyAuthorization\_Update request and provides UE address, AF Identifier, Flow description(s), the QoS Reference, Individual QoS Parameters and the optional Alternative Service Requirements. Any optionally received period of time or traffic volume is also included and mapped to sponsored data connectivity information (as defined in TS 23.203 [24]).

If the TSCTSF receives a Requested 5GS delay, the TSCTSF calculates a Requested PDB by subtracting the UE-DS-TT Residence Time provided by the PCF (if available), from the Requested 5GS delay. If the TSCTSF receives any of the following individual QoS parameters: flow direction, Burst Arrival Time, Periodicity, Time domain, Survival Time from the NEF, the TSCTSF determines the TSC Assistance Container and sends it together with the Requested PDB, the TSC Assistance Container, and other received individual QoS parameters in the Npcf\_PolicyAuthorization\_Update request to the PCF.

The TSCTSF can also discover the PCF in case the TSCTSF has not received any notification from PCF (e.g. no UE-DS-TT Residence time), TSCTSF sends the Requested PDB, the TSC Assistance Container, and other received individual QoS and Alternative QoS Related parameters to the PCF.

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

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

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

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 request is not authorized, or the required QoS is not allowed, NEF responds to the AF in step 5 with a Result value indicating the failure cause.

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

If the PCF receives the individual QoS parameters instead of QoS Reference, the PCF sets the PDB and MDBV according to the received Requested PDB and Burst Size received from the TSCTSF. If the Requested PDB is not provided, the PCF determines the PDB that matches the QoS Reference. It also sets the GFBR and MFBR according to requested values sent by the TSCTSF. The PCF may use the Requested Priority from the AF to determine QoS Flow Priority as defined in clause 5.7.3.3 of TS 23.501 [2]. TSCTSF specified Individual QoS Parameter values supersede default values for the 5QI.

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 request is not authorized, or the required QoS is not allowed, TSCTSF responds to the NEF in step 4b with a Result value indicating the failure cause.

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].

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.

#### 4.15.6.6a AF session with required QoS update procedure



Figure 4.15.6.6a-1: AF session with required QoS update procedure

1. For an established AF session with required QoS, the AF may send a Nnef\_AFsessionWithQoS\_Update request message (AF Identifier, Transaction Reference ID, [Flow description(s)], [QoS Reference], [Alternative Service Requirements (as described in clause 6.1.3.22 of TS 23.503 [20])]) to NEF for updating the reserved resources. Optionally, a period of time or a traffic volume for the requested QoS can be included in the AF request. The Transaction Reference ID provided in the AF session with required QoS update request message is set to the Transaction Reference ID that was assigned, by the NEF, to the Nnef\_AFsessionWithQoS\_Create request message. The AF may in addition provide the following individual QoS parameters: Requested 5GS delay (optional), Requested Priority (optional), Requested GFBR, Requested MFBR, flow direction, Burst Size (optional), Burst Arrival Time (optional) at UE (uplink) or UPF (downlink), Periodicity (optional), Time domain (optional), Survival Time (optional). When Alternative Service Requirements are provided by the AF, a set of Alternative QoS Related parameters as defined in clause 6.1.3.22 of TS 23.503 [20] may be provided in the Alternative Service Requirements in place of each QoS Reference. The Alternative Service Requirements may be used by the PCF to formulate PCC rules, which are subsequently used to establish Alternative QoS Profile(s) as specified in clause 5.7.1.2a of TS 23.501 [1].

2. The NEF authorizes the AF request of updating AF session with required QoS 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.

If the NEF does not receive any of the individual QoS parameters as described in clause 6.1.3.22 of TS 23.503 [20] from the AF, then the steps 3, 4, 5, 6, 7 are executed, otherwise, the steps 3a, 3b, 4a, 4b, 5, 6a, 6b, 7 are executed.

3. If the NEF does not receive any of the individual QoS parameters or Alternative QoS Related parameter set(s) from the AF as described in clause 6.1.3.22 of TS 23.503 [20], the NEF uses the UE address to discover the PCF from the BSF. The NEF interacts with the PCF by triggering a Npcf\_PolicyAuthorization\_Update request and provides UE address, AF Identifier, Flow description(s), the QoS Reference and the optional Alternative Service Requirements. Any optionally received period of time or traffic volume is also included and mapped to sponsored data connectivity information (as defined in TS 23.503 [20]).

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

3a. If the NEF receives one or more of the individual QoS parameters or Alternative QoS Related parameters as described in clause 6.1.3.22 of TS 23.503 [20] from the AF, the NEF forwards these received individual QoS parameters and Alternative QoS Related Parameters in the Ntsctsf\_QoSandTSCAssistance\_Update or Ntsctsf\_QoSandTSCAssistance\_Create request message to the TSCTSF. If the AF is considered to be trusted by the operator, the AF uses the Ntsctsf\_QoSandTSCAssistance\_Update request message to interact directly with TSCTSF to update the 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 TSCTSF is discovered from NRF.

3b. The TSCTSF interacts with the PCF by triggering a Npcf\_PolicyAuthorization\_Update request and provides UE address, AF Identifier, Flow description(s), the QoS Reference, Individual QoS Parameters and the optional Alternative Service Requirements. Any optionally received period of time or traffic volume is also included and mapped to sponsored data connectivity information (as defined in TS 23.203 [24]).

If the TSCTSF receives a Requested 5GS delay, the TSCTSF calculates a Requested PDB by subtracting the UE-DS-TT Residence Time provided by the PCF (if available) , from the Requested 5GS delay.

If the TSCTSF receives any of the flow direction, Burst Arrival Time, Periodicity, Time domain, Survival Time from the NEF, the TSCTSF forwards these parameters in the TSC Assistance Container in the Npcf\_PolicyAuthorization\_Update request to the PCF. The TSCTSF sends the Requested PDB, the TSC Assistance Container, and other received individual QoS and Alternative QoS Related parameters in the Npcf\_PolicyAuthorization\_Update request to the PCF.

4. If the PCF received request from the NEF in step 3, the PCF determines whether the request is authorized.

If the request is authorized, the PCF derives the required QoS parameters 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. In addition, if the Alternative Service Requirements are provided, the PCF derives the Alternative QoS parameter set(s) from the one or more QoS reference parameters contained in the Alternative Service Requirements in the same prioritized order (as defined in TS 23.503 [20]).

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

If the request is not authorized or the required QoS is not allowed, NEF responds to the AF in step 5 with a Result value indicating the failure cause.

4a. If the PCF received request from the TSCTSF in step 3b, the PCF determines whether the request is authorized.

If the request is authorized, the PCF derives the required QoS parameters based on the information provided by the TSCTSF and determines whether this QoS is allowed (according to the PCF configuration for this AF), and notifies the result to the TSCTSF. In addition, if the Alternative Service Requirements are provided, the PCF derives the Alternative QoS parameter set(s) from the one or more QoS reference parameters (if provided) and Alternative QoS Related parameter set(s) (if provided) contained in the Alternative Service Requirements in the same prioritized order (as defined in clause 6.1.3.22 of TS 23.503 [20]).

If the PCF receives individual QoS parameters instead of a QoS Reference, the PCF sets the PDB and/or MDBV according to the received Requested PDB and Burst Size received from the TSCTSF. If the Requested PDB is not provided from TSCTSF, the PCF determines the PDB that matches the QoS Reference. It also sets the GFBR and MFBR according to the requested values provided by the TSCTSF. The PCF may use the Priority requested by the AF to determine QoS Flow Priority as defined in clause 5.7.3.3 of TS 23.501 [2]. The MFBR is used to assign the MBR value and then GBR is set equal to MBR unless the TSCTSF provides a GFBR value. TSCTSF specified Individual QoS Parameter values supersede default values for the 5QI

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 request is not authorized or the required QoS is not allowed, TSCTSF responds to the NEF in step 4b with a Result value indicating the failure cause.

4b. The TSCTSF sends a Ntsctsf\_QoSandTSCAssistance\_Update 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\_Update response message directly to AF.

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

6. The PCF sends Npcf\_PolicyAuthorization\_Notify message to the NEF when the modification of the transmission resources corresponding to the QoS update succeeded or failed.

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

6a. The PCF sends Npcf\_PolicyAuthorization\_Notify message to the TSCTSF when the modification of the transmission resources corresponding to the QoS update succeeded or failed.

6b. 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.

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

*Third CHANGE*

#### 5.2.6.9 Nnef\_AFsessionWithQoS service

##### 5.2.6.9.1 General

See clause 4.15.6.6.

This service is also used to support subscription and notification of QoS Monitoring for URLLC, as described in clause 5.33.3.2 of TS 23.501 [2].

##### 5.2.6.9.2 Nnef\_AFsessionWithQoS\_Create service operation

**Service operation name:** Nnef\_AFsessionWithQoS Create

**Description:** The consumer requests the network to provide a specific QoS for an AF session.

**Inputs, Required:** AF Identifier, UE address (i.e. IP address or MAC address), Flow description(s) or External Application Identifier, QoS Reference.

**Inputs, Optional:** time period, traffic volume, Alternative Service Requirements (containing one or more QoS reference parameters in a prioritized order), QoS parameter(s) to be measured, Reporting frequency, Target of reporting and optional an indication of local event notification as described in clause 6.1.3.21 of TS 23.503 [20], Requested 5GS delay, Requested Priority, Requested GFBR, Requested MFBR, Flow Direction, Burst Size, Burst Arrival Time at UE (uplink) or UPF (downlink), Periodicity, Survival Time, Time domain, DNN if available, S-NSSAI if available, Alternative QoS Related parameter sets.

**Outputs, Required:** Transaction Reference ID, result.

**Output (optional):** None.

##### 5.2.6.9.3 Nnef\_AFsessionWithQoS\_Notify service operation

**Service operation name:** Nnef\_AFsessionWithQoS Notify

**Description:** NEF reports the QoS Flow level event(s) to the consumer.

**Inputs, Required:** Reports of the events as defined in clause 6.1.3.18 of TS 23.503 [20].

**Inputs, Optional:** When the event report is for QoS Monitoring for URLLC, includes Packet delay for UL, DL, or round trip of the single UP path or two UP paths in the case of redundant transmission, as defined in clause 5.33.3.2 of TS 23.501 [2].

**Outputs, Required:** None.

**Output (optional):** None.

##### 5.2.6.9.4 Nnef\_AFsessionWithQoS\_Revoke service operation

**Service operation name:** Nnef\_AFsessionWithQoS Revoke

**Description:** The consumer requests the network to revoke the AF session with requested QoS or the AF session with requested QoS including Alternative Service Requirements.

**Inputs, Required:** Transaction Reference ID.

**Inputs, Optional:** None.

**Outputs, Required:** Transaction Reference ID, result.

**Output (optional):** None.

##### 5.2.6.9.5 Nnef\_AFsessionWithQoS\_Update service operation

**Service operation name:** Nnef\_AFsessionWithQoS Update

**Description:** The consumer requests the network to update the Service Requirement(s) and/or additional Alternative Service Requirement(s) for an AF session.

**Inputs, Required:** Transaction Reference ID.

**Inputs, Optional:** Flow description, QoS reference, time period, traffic volume, Alternative Service Requirements (containing one or more QoS reference parameters in a prioritized order), QoS parameter(s) to be measured, Reporting frequency, Target of reporting and optional an indication of local event notification as described in clause 6.1.3.21 of TS 23.503 [20], Requested 5GS delay, Requested Priority, Requested GFBR, Requested MFBR, Flow Direction, Burst Size, Burst Arrival Time at UE (uplink) or UPF (downlink), Periodicity, Time domain, Alternative QoS Related parameter sets.

**Outputs, Required:** Result.

**Output (optional):** None.

*Fourth CHANGE*

#### 5.2.12.2 Nudr\_DataManagement (DM) service

##### 5.2.12.1.1 General

The operations defined for Nudr\_DM service use following set of parameters defined in this clause:

- Data Set Identifier: uniquely identifies the requested set of data within the UDR (see clause 4.2.5).

- Data Subset Identifier: it uniquely identifies the data subset within each Data Set Identifier. As specified in the procedures in clause 4, e.g. subscription data can consist of subsets particularised for specific procedures like mobility, session, etc.

- Data Keys defined in Table 5.2.12.2.1-1

For Nudr\_DM\_Subscribe and Nudr\_DM\_Notify operations:

- The Target of Event Reporting is made up of a Data Key and possibly a Data Sub Key both defined in Table 5.2.12.2.1-1. When a Data Sub Key is defined in the table but not present in the Nudr\_DM\_Subscribe this means that all values of the Data Sub Key are targeted.

- The Data Set Identifier plus (if present) the (set of) Data Subset Identifier(s) corresponds to a (set of) Event ID(s) as defined in clause 4.15.1

An NF Service Consumer may include an indicator when it invokes Nudr\_DM Query/Create/Update service operation to subscribe the changes of the data, to avoid a separate Nudr\_DM\_Subscribe service operation.

Depending on the use case, it is possible to use a Data Key and/or one or multiple Data sub keys to further identify the corresponding data, as defined in Table 5.2.12.2.1-1 below.

Table 5.2.12.2.1-1: Data keys

|  |  |  |  |
| --- | --- | --- | --- |
| Data Set | Data Subset | Data Key | Data Sub Key |
|  | Access and Mobility Subscription data | SUPI | Serving PLMN ID and optionally NID |
|  | SMF Selection Subscription data | SUPI | Serving PLMN ID and optionally NID |
|  | UE context in SMF data | SUPI | PDU Session ID or DNN |
| Subscription Data (see clause 5.2.3.3.1) | SMS Management Subscription data | SUPI | Serving PLMN ID and optionally NID |
|  | SMS Subscription data | SUPI | Serving PLMN ID and optionally NID |
|  | Session Management Subscription data | SUPI | S-NSSAI |
|  |  |  | DNN |
|  |  |  | Serving PLMN ID and optionally NID |
|  | Slice Selection Subscription data | SUPI | Serving PLMN ID and optionally NID |
|  | Group Data | Internal Group Identifier or  External Group Identifier | - |
|  | Identifier translation | GPSI |  |
|  |  | SUPI | Application Port ID |
|  | Intersystem continuity Context | SUPI | DNN |
|  | LCS privacy | SUPI | - |
|  | LCS mobile origination | SUPI | - |
|  | UE reachability | SUPI | - |
|  | Group Identifier Translation | Internal Group Identifier or  External Group Identifier | - |
|  | UE context in SMSF data | SUPI | - |
|  | V2X Subscription data | SUPI | - |
|  | ProSe Subscription data | SUPI | - |
|  | User consent | SUPI | Purpose |
|  | ECS Address Configuration Information (See Table 4.15.6.3d-1) | SUPI |  |
| Application data | Packet Flow Descriptions (PFDs) | Application Identifier | - |
|  | AF traffic influence request information | AF transaction internal ID |  |
|  | (See clause 5.6.7 and clause 6.3.7.2 of TS 23.501 [2]) | S-NSSAI and DNN  and/or  Internal Group Identifier or SUPI |  |
|  | Background Data Transfer  (NOTE 3) | Internal Group Identifier or SUPI |  |
|  | Service specific information (See clause 4.15.6.7) | S-NSSAI and DNN  or  Internal Group Identifier or SUPI |  |
|  | EAS Deployment Information | See TS 23.548 [74] clause 7. (See NOTE 4) |  |
|  | AM policy influence request information (See clause 4.15.6.9.3) | AF transaction internal ID |  |
|  |  | S-NSSAI and DNN  and/or  Internal Group Identifier or SUPI |  |
|  | Time-Sync data  (See clauses  4.15.9.2, 4.15.9.3 and 4.15.9.4 ) | DNN and S-NSSAI  Internal Group Identifier  SUPI |  |
| Policy Data | UE context policy control data  (See clause 6.2.1.3 of TS 23.503 [20]) | SUPI |  |
|  | PDU Session policy control data | SUPI | S-NSSAI |
|  | (See clause 6.2.1.3 of TS 23.503 [20]) |  | DNN |
|  | Policy Set Entry data  (See clause 6.2.1.3 of TS 23.503 [20]) | SUPI (for the UDR in HPLMN) |  |
|  |  | PLMN ID (for the UDR in VPLMN) |  |
|  | Remaining allowed Usage data | SUPI | S-NSSAI |
|  | (See clause 6.2.1.3 of TS 23.503 [20]) |  | DNN |
|  | Sponsored data connectivity profiles (See clause 6.2.1.6 of TS 23.503 [20]) | Sponsor Identity |  |
|  | Background Data Transfer data  (See clause 6.2.1.6 of TS 23.503 [20]) | Background Data Transfer Reference ID. (NOTE 2) |  |
|  |  | None. (NOTE 1) |  |
|  | Network Slice Specific Control Data  (See clause 6.2.1.3 of TS 23.503 [20]) | S-NSSAI |  |
| Exposure Data | Access and Mobility Information | SUPI or GPSI | PDU Session ID or |
| (see clause 5.2.12.1) | Session Management information | SUPI or GPSI | UE IP address or DNN |
| NOTE 1: Retrieval of the stored Background Data Transfer References for all ASP identifiers in the UDR requires Data Subset but no Data Key or Data Subkey(s).  NOTE 2: Update of a Background Data Transfer Reference in the UDR requires a Data key to refer to a Background Data Transfer Reference as input data.  NOTE 3: The Background Data Transfer includes the Background Data Reference ID and the ASP Identifier that requests to apply the Background Data Reference ID to the UE(s). Furthermore, the Background Data Transfer includes the relevant information received from the AF as defined in clause 6.1.2.4 of TS 23.503 [20].  NOTE 4: The data Keys, and data structure of EAS Deployment Information are defined in clause 7 of TS 23.548 [74]. | | | |

The content of the UDR storage for (Data Set Id= Application Data, Data Subset Id = AF TrafficInfluence request information) is specified in clause 5.6.7, Table 5.6.7-1 of TS 23.501 [2]. This information is written by the NEF and read by the PCF(s). PCF(s) may also subscribe to changes onto this information.

*END OF CHANGE*