**3GPP TSG-SA2 Meeting #154 S2-2210570**

**Toulouse, France, November 14 – 18, 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.502** | **CR** | **3627** | **rev** | **-** | **Current version:** | **17.6.0** |  |
|  | | | | | | | | |
| *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:*** | Support of QoS request for a list of UEs and reusing URLLC QoS monitoring for AIML-based services | | | | | | | | | |
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| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | DUMMY | | | | |  | ***Date:*** | | | 2022-10-31 |
|  |  | | | |  | |  | | |  |
| ***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 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:*** | | In Clause 8.6.2 of TR 23.700-80, it is concluded that:  - Existing QoS monitoring mechanism for URLLC services is reused for AI/ML traffic.  - In order to request QoS for the AIML communication with each of the members of the group, extensions to the procedure for the AF request with QoS, and Nnef\_AFsessionwithQoS to provide a list of UE IP address are required.  - For the scenario where there are more than one PCFs serving the list of UEs whose group QoS is requested, extensions to BSF management discovery to provide a list of PCF addresses based on the UE addresses are supported.  This CR is 1) to capture the general description of reusing the URLLC QoS monitoring mechanism for AI/ML-based services and 2) enable a QoS request for a list of UEs. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | -Add descriptions of reusing the URLLC QoS monitoring mechanism for AIML-based services  -Update AF Session setup with required QoS procedure to support QoS request for a list of UEs.  -Add a list of UE address in the input parameter for Npcf\_PolicyAuthorization\_Create  -Add a list of UE address in the input parameter for Nnef\_AFsessionwithQoS service  -Add a a list of UE address in the output parameter and add multiple PCF addresses in the output parameter for Nbsf\_Management discovery service | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | URLLC QoS monitoring mechnisam and QoS request for a list of UEs (e.g., FL member UEs) is not supported for AI/ML-based services. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.15.6.6, 5.2.5.3.2, 5.2.6.9.1, 5.2.6.9.2, 5.2.6.9.3, 5.2.8.3.1, 5.2.13.2.4, 5.2.26.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 is part of outcome of SI FS\_AIMLsys and the WI code for the work is not assigned yet & will replace WI code DUMMY when available | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* 1st 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 or a list of UE address, AF Identifier, Flow description(s) or External Application Identifier, QoS reference, QoS parameters, 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 Guaranteed Bitrate, Requested Maximum Bitrate. Regardless, whether the AF request is formulated using a QoS Reference or Individual QoS paramaters, the AF may also provide the following optional QoS parameters: flow direction, Burst Size, Burst Arrival Time at UE (uplink) or UPF (downlink), Periodicity, Time domain, Survival Time. When optional Alternative Service Requirements are provided by the AF request that is formulated with the help of Individual QoS parameters, Requested Alternative QoS Parameter Set(s) as in clause 6.1.3.22 of TS 23.503 [20] may be provided instead of a 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.

3. The NEF determines whether to invoke the TSCTSF or to directly contact the PCF. This determination may use the set of individual QoS parameters or Requested Alternative QoS Parameter Set(s) from the AF. The determination may also use the AF identifier.

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.

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 or the NEF uses the list of UE address to discover the PCF(s) from the BSF. The NEF interacts with each discovered PCF by triggering a Npcf\_PolicyAuthorization\_Create request and provides UE address or a list of UE address corresponding to the PCF, AF Identifier, Flow description(s), the individual QoS parameters, QoS Reference and the 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 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 individual QoS parameters, QoS references and Requested Alternative QoS Parameter Set(s) 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 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 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 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 does not have an AF-session for a given UE address, the TSCTSF discovers the PCF and TSCTSF sends the Requested PDB, the TSC Assistance Container and other received individual QoS parameters and Requested Alternative QoS Parameter Set(s) to the PCF in Npcf\_PolicyAuthorization\_Create request message.

If the TSCTSF receives a Requested 5GS Delay and if the TSCTSF does not have the 5GS Bridge information for the AF-session, the TSCTSF can subscribe for the 5GS Bridge information from the PCF by triggering a Npcf\_PolicyAuthorization\_Subscribe request. 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. 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\_Create/Update request 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 or the Requested Alternative QoS Parameter Set(s) 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 more than one UE address is provided from the NEF, the PCF considers the individual QoS parameters and/or Alternative Service Requirements provided by the NEF to be applicable for each of the UE.

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

NOTE 1: 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].

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. 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, or Requested Alternative QoS Parameter Set(s) (if provided) contained in the Alternative Service Requirements and Requested PDBs corresponding to the Requested Alternative QoS Parameter Set(s) 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 GBR and MBR for the PCC rule according to requested values sent by the TSCTSF. 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]. 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 PCF receives a subscription for the 5GS Bridge information from the TSCTSF, if the PCF does not have the 5GS Bridge 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 information event from the SMF. Once the PCF has the 5GS Bridge information, the PCF notifies the TSCTSF for the 5GS Bridge information (including the UE-DS-TT Residence Time).

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.

\* \* \* 2nd Change \* \* \*

##### 5.2.5.3.2 Npcf\_PolicyAuthorization\_Create service operation

**Service operation name:** Npcf\_PolicyAuthorization\_Create

**Description:** Authorize the request and optionally determines and installs SM Policy Control Data according to the information provided by the NF Consumer or provides Port Management Information Container for ports on DS-TT or NW-TT, or User plane node Management Information Container.

**Inputs, Required:** UE (IP or MAC) address or list of UE address, identification of the application session context.

**Inputs, Optional:** GPSI or SUPI if available, Internal Group Identifier, DNN if available, S-NSSAI if available, Media type, Media format, bandwidth requirements, sponsored data connectivity information if applicable, flow description, AF Application Identifier, AF Communication Service Identifier, AF Record Identifier, Flow status, Priority indicator, emergency indicator, ASP Identifier, resource allocation outcome, AF Application Event Identifier, a list of DNAI(s) and corresponding routing profile ID(s) or N6 traffic routing information, AF Transaction Id, Early and/or late notifications about UP path management events, temporal validity condition, spatial validity condition, Information for EAS IP Replacement in 5GC, Indication for EAS Relocation, AF indication for simultaneous connectivity over source and target PSA at edge relocation as described in clause 5.6.7 in 23.501 [2], Background Data Transfer Reference ID, priority sharing indicator as described in clause 6.1.3.15 in TS 23.503 [20], pre-emption control information as described in clause 6.1.3.15 in TS 23.503 [20], Port Management Information Container and related port number, User plane node Management Information Container, TSN AF parameters provided by the TSN AF to the PCF as described in clause 6.1.3.23 of TS 23.503 [20], Requested Alternative QoS Parameter Set(s), 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], individual QoS parameters as described in clause 6.1.3.22 of TS 23.503 [20], Alternative Service Requirements (containing one or more QoS reference parameters in a prioritized order), MPS for Data Transport Service indicator as described in clause 6.1.3.11 of TS 23.503 [20].

NOTE: When only one DNAI and corresponding routing profile ID(s) and the Indication for EAS Relocation are available, the presented DNAI is the target DNAI as defined in clause 6.3.7 of TS 23.548 [74].

**Outputs, Required:** Success or Failure (reason for failure, e.g. as defined in clauses 6.1.3.16 and clause 6.1.3.10 of TS 23.503 [20]).

**Outputs, Optional:** The service information that can be accepted by the PCF.

\* \* \* 3rd 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 or AI/ML-based services, 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) or list of UE 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], individual QoS parameters as described in clause 6.1.3.22 of TS 23.503 [20], 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 or AI/ML-based services, 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.

\* \* \* 4th Change \* \* \*

5.2.8.3 Nsmf\_EventExposure Service

5.2.8.3.1 General

**Service description:** This service provides events related to PDU Sessions towards consumer NF. The service operations exposed by this service allow other NFs to subscribe and get notified of events happening on PDU Sessions. The following are the key functionalities of this NF service.

- Allow consumer NFs to Subscribe and unsubscribe for an Event ID on PDU Session(s);

- Allow the NWDAF to collect data for network data analytics as specified in TS 23.288 [50];

- Notifying events on the PDU Session to the subscribed NFs; and

- Allow consumer NFs to acknowledge or respond to an event notification.

The following events can be subscribed by a NF consumer (Event ID is defined in clause 4.15.1):

- UE IP address / Prefix allocation/change: The event notification may contain a new UE IP address / Prefix or an indication of which UE IP address / Prefix has been released.

- PDU Session Establishment and/or PDU Session Release.

The event notification may contain following information:

- PDU Session Type.

- DNN.

- UE IP address/Prefix.

- UP path change: a notification corresponding to this event is sent when the UE IP address / Prefix and / or DNAI and /or the N6 traffic routing information has changed.

The event notification may contain following information:

- the type of notification ("EARLY" or "LATE").

- for both the source and target UP path between the UE and the DN, the corresponding information is provided when it has changed:

- DNAI.

- UE IP address / Prefix.

- N6 traffic routing information.

NOTE 1: UP path change notification, DNAI and N6 traffic routing information are further described in clause 5.6.7 of TS 23.501 [2].

- QoS Monitoring for URLLC or AI/ML-based services: the event notification may contain the QoS Monitoring report as described in clause 5.33.3.2 of TS 23.501 [2].

- Change of Access Type; The event notification contains the new Access Type for the PDU Session.

- Change of RAT Type; the event notification contains the new RAT Type for the PDU Session.

- PLMN change; The event notification contains the new PLMN Identifier for the PDU Session.

- Downlink data delivery status. The event notification contains the status of downlink data buffering in the core network including:

- First downlink packet per source of the downlink IP traffic in extended buffering and Estimated maximum wait time.

- First downlink packet per source of the downlink IP traffic discarded.

- First downlink packet per source of the downlink IP traffic transmitted after previous buffering and/or discarding of corresponding packet(s).

- QFI allocation: The event notification is sent when a new QoS flow is established within a PDU session and contains:

- If the Target of Event Reporting is a PDU session, both the allocated QFI and either one of the following (Application Identifier or IP Packet Filter Set or Ethernet Packet Filter Set). The DNN, S-NSSAI corresponding to the PDU session are also sent.

- If the Target of Event Reporting is a SUPI, both the allocated QFI and either one of the following (Application Identifier or IP Packet Filter Set or Ethernet Packet Filter Set) for each PDU session ID established for this SUPI. The DNN, S-NSSAI corresponding to each PDU session are also sent.

- If the Target of Event Reporting is an Internal-Group-Id or any UE, multiple instances of the tuple (allocated QFI and either one of the following (Application Identifier or IP Packet Filter Set or Ethernet Packet Filter Set). PDU session ID, SUPI). The DNN, S-NSSAI corresponding to each PDU session are also sent.

- Total number of Session Management transactions:

- The total number of Session Management transaction is used to collect the number of SM transactions of a SUPI or Internal Group ID, for example Dispersion Analytics as specified in TS 23.288 [50]. The transaction count is incremented when the NAS transactions from PDU Session Establishment, PDU Session Authentication, PDU Session Modification and PDU Session Release procedures is concluded. Only the periodic reporting mode applies.

- Information on PDU Session for WLAN (i.e. Access Type is Non-3GPP and RAT Type is TRUSTED\_WLAN).

NOTE 2: When the consumer NF is the NWDAF, the event QFI allocation is used to collect data for Observed Service Experience analytics and UE communication analytics as specified in TS 23.288 [50].

- User plane status information: The event notification contains:

- PDU Session ID.

- User Plane Inactivity Timer (as specified in TS 29.244 [65]).

- PDU Session status (activated, deactivated).

NOTE 3: When the consumer NF is the NWDAF, the event user plane status information is used to collect data for UE Communication analytics as specified in TS 23.288 [50].

- Session Management Congestion Control Experience for PDU Session: The event notification contains the data related to Session Management Congestion Control experience per PDU Session as described in TS 23.288 [50].

- UE session behaviour trends (see clause 4.15.4.3);

- UE communications trends (see clause 4.15.4.3); and

- UP with redundant transmission: the event notification indicates if redundant transmission (see clause 5.33.2.2 of TS 23.501 [2]) has been activated or not for the PDU session.

When the consumer NF is the NWDAF, the event Information on PDU Session for WLAN is used to collect data for WLAN performance analytics as specified in TS 23.288 [50].

When the consumer NF is the NWDAF, the event Session Management Congestion Control Experience for PDU Session is used to collect data for Session Management Congestion Control Experience analytics as specified in TS 23.288 [50].

Event Filters are used to specify the conditions to match for notifying the events (i.e. "List of Parameter values to match"). If there are no conditions to match for a specific Event ID, then the Event Filter is not provided. The following table provides as an example how the conditions to match for event reporting can be specified for various Event IDs for SMF exposure.

**Table 5.2.8.3.1-1: Example of Event Filters for SMF exposure events**

|  |  |
| --- | --- |
| **Event ID for SMF exposure** | **Event Filter (List of Parameter Values to Match)** |
| DNAI Change | None |
| PDU Session Release | <Parameter Type = S-NSSAI, Value = S-NSSAI1> |
| PDU Session Establishment | <Parameter Type = S-NSSAI, Value = S-NSSAI1> |
| QoS Monitoring for URLLC or AI/ML-based services | None |
| QFI allocation | <Parameter Type = DNN, Value = DNN1>  <Parameter Type = S-NSSAI, Value = S-NSSAI1> |
| QFI allocation | <Parameter Type = Application Identifier, Value = Application Identifier1> |
| Transaction Count | <Parameter Type = TAI, Value = TA1> (NOTE)  <Parameter Type = S-NSSAI, Value = S-NSSAI1> |
| User plane status information | <Parameter Type = Application Identifier, Value = Application Identifier1>  <Parameter Type = SUPI, Value = SUPI1> |
| Information on PDU Session for WLAN | <Parameter Type = Access Type, Value = Non-3GPP> && <Parameter Type = RAT Type, Value = TRUSTED\_WLAN> |
| Session Management Congestion Control Experience for PDU Session | <Parameter Type = DNN, Value = DNN1>  <Parameter Type = S-NSSAI, Value = S-NSSAI1> |
| UP with redundant transmission | <Parameter Type = DNN, Value = DNN1> |
| NOTE: Optionally the SMF can fetch the location information from the AMF but transaction information correlation at the location can also be achieved without it and through transaction information associated with the requested time period, which corresponds to the UE's time span at the location of interest. | |

The target of SMF event reporting may correspond to a PDU Session ID, an UE ID (SUPI), an Internal Group Identifier, an indication that any UE is targeted (e.g. on a specific DNN), or an indication that any PDU session is the target.

When acknowledgment is expected the SMF also provides Notification Correlation Information to the consumer NF in the event notification.

The consumer NF may provide the following event-specific information when acknowledging an event notification:

- For UP path change event:

- N6 traffic routing information related to the target DNAI.

NOTE 4: Acknowledgement to a UP path change event notification is further described in clause 5.6.7 of TS 23.501 [2].

\* \* \* 5th Change \* \* \*

##### 5.2.13.2.4 Nbsf\_Management\_Discovery service operation

**Service Operation name:** Nbsf\_Management discovery

**Description:** Discovers the PCF and PCF set selected for a PDU Session identified by the tuple (UE address(es), SUPI, GPSI, DNN, S-NSSAI), or discovers the PCF and PCF set selected for the UE identified by the tuple (SUPI, GPSI). This operation may also be used to determine the SUPI from the tuple (UE address, DNN, S-NSSAI).

**Inputs, Required:** UE address (i.e. IP address or MAC address) or list of UE address, [Required, for a PDU Session and for a UE], DNN [Conditional], S-NSSAI [Conditional], if the target PCF is for a PDU Session, MBS session ID as defined in TS 23.247 [78], [Required, for an MBS Session].

SUPI and/or GPSI, if the target PCF is for a UE.

NOTE: For support of time sensitive communication and time synchronization (as described in clause 5.28.3.2 of TS 23.501 [2]) the UE address contains the DS-TT port MAC address for Ethernet type PDU Session.

**Inputs, Optional:** If the target PCF is for a PDU Session, SUPI, GPSI.

**Outputs, Required:** PCF address(es), PCF instance ID [Conditional, if available] and PCF Set ID [Conditional, if available], level of Binding [Conditional, if available] (see clause 6.3.1.0 of TS 23.501 [2]).

**Outputs, Optional:** None.

\* \* \* 6th Change \* \* \*

#### 5.2.26.2 Nupf\_EventExposure Service

##### 5.2.26.2.1 General

**Service description:** This service can expose UPF related information to other NFs. There is one operation for this service:

- Notifying events on the PDU Session to the NFs.

The following events can be notified to a NF consumer:

- QoS Monitoring for URLLC or AI/ML-based services: the event notification may contain the QoS Monitoring report as described in clause 5.33.3.2 of TS 23.501 [2].

The event notification may contain following information:

- QoS monitoring result e.g. end to end delay for specific QoS flow or for specific PDU session.

\* \* \*End of Changes \* \* \*