**3GPP TSG-CT3 Meeting #134C3-242xxx**

**Changsha, China, 15th – 19st April 2024 was C3-242342**

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** | **0123** | **rev** | **1** | **Current version:** |  |  |
|  |
| *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:***  | Various GMEC related corrections |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | GMEC |  | ***Date:*** | 2024-04-18 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** |  |
|  | *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)* |
|  |  |
| ***Reason for change:*** | The following issues have been identified:* In clause 5.3.2.2.8, the flow description is missing one of the possible attributes that can be used to convey it, i.e., the "ethFlowInfo" attribute.
* Various GMEC related provisions need further clarifications and corrections to avoid confusion and improve the quality.
* Various terminology misalignments and misalignments with the drafting rules need to be corrected.
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|  |  |
| ***Summary of change:*** | This CR proposes to:* Address the above-mentioned issues.
* Apply additional editorial corrections.
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|  |  |
| ***Consequences if not approved:*** | * The provisions related to the GMEC functionality continue to contain provisions that may generate confusion and are misaligned with the other specifications defining this functionality.
 |
|  |  |
| ***Clauses affected:*** | 5.3.2.2.2, 5.3.2.2.8, 5.3.2.3.8, 5.3.2.4.4, 6.2.6.1, 6.2.6.2.2, 6.2.6.2.4, 6.2.6.2.9, 6.2.8, A.3 |
|  |  |
|  | **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 introduces backwards compatible corrections to the OpenAPI description of the Ntsctsf\_QoSandTSCAssistance API defined in this specification. |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* \* Start of changes \* \* \* \*

##### 5.3.2.2.2 Initial provisioning of TSC related service information

This procedure is used to set up a TSC AF application session context for the service as defined in 3GPP TS 23.501 [2], 3GPP TS 23.502 [3] and 3GPP TS 23.503 [19].

Figure 5.3.2.2.2-1 illustrates the initial provisioning of TSC related service information.



Figure 5.3.2.2.2-1: Initial provisioning of TSC related service information

When a new TSC AF application session context needs to be established, the NF service consumer shall invoke the Ntsctsf\_QoSandTSCAssistance\_Create service operation by sending the HTTP POST request to the resource URI representing the "TSC Application Sessions" collection resource of the TSCTSF, as shown in figure 5.3.2.2.2-1, step 1.

The NF service consumer shall include the "TscAppSessionContextData" data type in the content of the HTTP POST request in order to request the creation of the "Individual TSC Application Session Context" resource. The "Individual TSC Application Session Context" resource and the "Events Subscription" sub-resource are created as described below.

The NF service consumer shall include in the "TscAppSessionContextData" data structure:

- the AF identifier within the "afId" attribute;

- when the "GMEC" feature is not supported, either:

- the IP address (IPv4 or IPv6) of the PDU session within the "ueIpAddr" attribute, for IP type PDU sessions; or

- the MAC address of the DS-TT port within the "ueMac" attribute, for Ethernet type PDU sessions;

- when the "GMEC" feature is supported and as defined in clause 5.3.2.2.8, either:

- the targeted UE within the "ueId" attribute; or

- the targeted group of UE(s) within the "externalGroupId" attribute;

- either the Application Id within the "appId" attribute or the flow information within:

a. for IP flows, the "flowInfo" attribute; or

b. for Ethernet flows, either the "ethFlowInfo" attribute or, if the Ethernet\_UL/DL\_Flows feature is supported, the "enEthFlowInfo" attribute;

- the QoS reference within the "qosReference" attribute or the individual QoS parameter set (i.e. requested GBR, requested MBR, requested maximum burst size, requested priority if received and requested 5GS delay if received, and requested packet error rate if received) within the "tscQosReq" attribute;

- the input information to construct the TSC Assistance Container within the "tscaiInputUl" attribute and/or "tscaiInputDl" attribute of the "tscQosReq" attribute and the (g)PTP domain that the AF is located in within the "tscaiTimeDom" attribute of the "tscQosReq" attribute, if available; and

- the URI where the TSCTSF can request to the NF service consumer to delete the "Individual TSC Application Session Context" resource within the "notifUri" attribute;

and may include:

- the DNN within the "dnn" attribute;

- the S-NSSAI within the "snssai" attribute;

- the domain identity in the "ipDomain" attribute;

- if the "EnTSCAC" feature is supported, the capability for BAT adaptation in the "capBatAdaptation" attribute;

- an ordered list of alternative QoS references within the "altQosReferences" attribute if the QoS reference is provided or an ordered list of requested alternative QoS parameters set(s) within the "altQosReqs" attribute if the individual QoS parameter set is provided. When the NF service consumer provides the "altQosReferences" attribute or the "altQosReqs" attribute, the NF service consumer shall also subscribe to receive notifications from the TSCTSF when the resources associated to the corresponding service information have been allocated as described in clause 5.3.2.2.5 and when the GBR QoS targets for one or more service data flows can no longer (or can again) be guaranteed, as described in clause 5.3.2.2.3;

and

- the request of the notification of certain user plane events within the "evSubsc" attribute. Within the EventsSubscReqData data structure, the NF service consumer shall include:

a) the URI where the TSCTSF sends the event notification to the NF service consumer within the "notifUri" attribute;

b) a Notification Correlation Identifier for the requested notifications within the "notifCorreId" attribute;

c) the subscribed events within the "events" attribute;

d) the usage threshold within the "usgThres" attribute if the "USAGE\_REPORT" event is subscribed; and

e) QoS monitoring information within the "qosMon" attribute if the "QOS\_MONITORING" event is subscribed.

Upon the reception of this HTTP POST request, the TSCTSF shall:

- construct the TSC Assistance Container based on information provided by the NF service consumer;

- if the Requested 5GS delay including the requested 5GS delay within the individual QoS parameter set or within the requested alternative QoS parameters set(s) is received from NF service consumer, calculate 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 time domain information is not received with the Burst Arrival Time or Periodicity within the "tscQosReq" attribute from the NF service consumer, the TSCTSF may indicate Time Domain = "5GS" within the "tscaiTimeDom" attribute within the "tscQosReq" attribute to indicate that the NF service consumer does not provide the time domain information;

NOTE 1: The Time Domain value corresponding to "5GS" is locally configured in the SMF and in the TSCTSF, and indicates that the AF does not provide a Time Domain and the provided TSCAI input information will be used without adjustments.

- if the feature EnTSCAC is supported and if the NF service consumer includes the capability for BAT adaptation within the "capBatAdaptation" attribute or a BAT window within the "burstArrivalTimeWnd" attribute within the "tscaiInputUl" attribute and/or "tscaiInputDl" attribute of the "tscQosReq" attribute or the periodicity range in the "periodicityRange" attribute in the request, then the TSCTSF shall subscribe to the notification on BAT offset by using the "EventsSubscReqData" data type including an event within the "events" attribute with the "event" attribute set to "BAT\_OFFSET\_INFO;

- interact with the PCF for the received UE address:

a) if the TSCTSF has an AF-session with the PCF for the received UE address, the TSCTSF shall interact with the PCF by triggering a Npcf\_PolicyAuthorization\_Update request to provision the related parameters to the PCF as defined in 3GPP TS 29.514 [20]; or

b) if the TSCTSF does not have an AF-Session with the PCF for the received UE address, the TSCTSF shall discover the PCF for the PDU session as specified in 3GPP TS 29.521 [23], and shall interact with the PCF by triggering a Npcf\_PolicyAuthorization\_Create to provision the related parameters to the PCF as defined in 3GPP TS 29.514 [20]; and

NOTE 2: If the PCF determines an existing PDU Session is related with TSC traffic (based on local configuration or SM Policy Association), the PCF invokes Npcf\_PolicyAuthorization\_Notify service operation to the TSCTSF as defined in clause 4.2.5.16 of 3GPP TS 29.514 [20] to send the received TSC User Plane Node information. At that time, the TSCTSF retrieves from the BSF the PCF binding information, as specified in 3GPP TS 29.521 [23], and can create the AF-session by sending to the PCF the Npcf\_PolicyAuthorization\_Create service operation, if TSC related information, as e.g. QoS requirements, and/or subscription to PMIC(s)/UMIC updates need to be provided to the PCF.

NOTE 3: After the TSCTSF retrieves from the BSF the PCF binding information (including the UE Identities for the notified PDU session), as specified in 3GPP TS 29.521 [23], the TSCTSF can store internally the received information and delay the Npcf\_PolicyAuthorization\_Create service operation (the creation of the AF-session). In this case, when the TSCTSF receives the QoS request, the TSCTSF interacts with the PCF by triggering a Npcf\_PolicyAuthorization\_Create request to provision the related parameters to the PCF as defined in 3GPP TS 29.514 [20].

- if receiving a successful response from the PCF, the TSCSTF shall create an "Individual TSC Application Session Context" resource and send to the NF service consumer a "201 Created" response to the HTTP POST request, as shown in figure 5.3.2.2.2-1, step 2. If the "evSubsc" attribute is received, the "Events Subscription" sub-resource shall be created within the "Individual TSC Application Session Context" resource. The TSCTSF shall include in the "201 Created" response:

a) a Location header field; and

b) a "TscAppSessionContextData" data type in the content.

The Location header field shall contain the URI of the created "Individual TSC Application Session Context" i.e. "{apiRoot}/ntsctsf-qos-tscai/<apiVersion>/tsc-app-sessions/{appSessionId}".

When "Events Subscription" sub-resource is created in this procedure, the NF service consumer shall build the sub-resource URI by adding the path segment "/events-subscription" at the end of the URI path received in the Location header field.

If the TSCTSF cannot successfully fulfil the received HTTP POST request due to the internal TSCTSF error or due to the error in the HTTP POST request, the TSCTSF shall send the HTTP error response as specified in clause 6.2.7.

The TSCTSF may send the following error responses based on failed AF-session creation/update request responses received from the PCF as specified in 3GPP TS 29.514 [20]:

a. If the TSCSTSF receives the indication that the PCF failed in executing session binding, the TSCTSF shall reject the HTTP POST request with an HTTP "500 Internal Server Error" response including the "cause" attribute set to "PDU\_SESSION\_NOT\_AVAILABLE".

b. If the service information provided in the body of the HTTP POST request is rejected by the PCF (e.g. the subscribed guaranteed bandwidth for a particular user is exceeded or the authorized data rate in that slice for a UE is exceeded), the TSCTSF shall indicate in an HTTP "403 Forbidden" response message the cause for the rejection including the "cause" attribute set to "REQUESTED\_SERVICE\_NOT\_AUTHORIZED", as received.

c. If the service information provided in the body of the HTTP POST request is rejected due to a temporary condition in the network, the TSCTSF may include in the "403 Forbidden" response the "cause" attribute set to "REQUESTED\_SERVICE\_TEMPORARILY\_NOT\_AUTHORIZED". The TSCTSF may also provide a received retry interval within the "Retry-After" HTTP header field. When the NF service consumer receives the retry interval within the "Retry-After" HTTP header field, the NF service consumer shall not send the same service information to the TSCTSF again (for the same application session context) until the retry interval has elapsed. The "Retry-After" HTTP header is described in 3GPP TS 29.500 [4] clause 5.2.2.2.

The TSCTSF may additionally provide the received acceptable bandwidth within the attribute "acceptableServInfo" included in the "ProblemDetailsTsctsfQosTscac" data structure returned in the rejection response message.

\* \* \* \* Next changes \* \* \* \*

5.3.2.2.8 Initial provisioning of AF requested QoS for a UE or group of UE(s) not identified by UE address(es)

When the "GMEC" feature is supported, if the NF service consumer includes in the HTTP POST request message defined in clause 5.3.2.2.2 the targeted UE identified by its GPSI, within the "ueId" attribute, or the targeted group of UE(s) identified by its External Group ID, within the "externalGroupId" attribute, the provisions of clause 5.3.2.2.2 shall apply with the following differences:

- The AF request may include:

a. the temporal invalidity conditions, within the "tempInValidity" attribute;

b. the traffic characteristics information, within the "evSubsc" attribute;

c. the QoS parameters for monitoring, within the "tscQosReq" attribute;

d. the QoS parameters, within either the "qosReference" attribute, the "altQosReferences" attribute or the "altQosReqs" attribute; and/or

e. the flow description, within either the "flowInfo" attribute, the "ethFlowInfo" attribute or the "enEthFlowInfo" attribute.

The TSCTSF shall process the request and reply to the NF service consumer as defined in clause 5.3.2.2.2 with the following differences:

- Upon reception of the HTTP request from the NF service consumer, and if the request is authorized, the TSCTSF shall:

- create a new "Individual TSC Application Session Context" resource;

- if the "externalGroupId" attribute is received from the NF service consumer, interact with the UDM to retrieve the list of SUPI(s) identifying the UE(s) constituting the targeted group of UE(s) using the Nudm\_SDM service as defined in 3GPP TS 29.503 [24];

- if the "ueId" attribute is received from the NF service consumer, interact with the UDM to retrieve the SUPI that corresponds to the targeted GPSI using the Nudm\_SDM service as defined in 3GPP TS 29.503 [24];

- use the parameters received from the NF service consumer (i.e., DNN, S-NSSAI, the identifier of the targeted UE or group of UE(s)) to determine the corresponding AF session(s) (i.e., to which they macth); and

- for each matching AF session, interact with the PCF by invoking the Npcf\_PolicyAuthorization\_Create/Update service operation, as defined in 3GPP TS 29.514 [20], to create/update the AF session based on the provided requested QoS parameters.

NOTE 1: If the PCF determines that an existing PDU Session is potentially impacted by the time synchronization service (based on local configuration or SM Policy Association), the PCF invokes Npcf\_PolicyAuthorization\_Notify service operation towards the TSCTSF as defined in clause 4.2.5.16 of 3GPP TS 29.514 [20] to send the received TSC User Plane Node information. The TSCTSF then retrieves from the BSF the PCF binding information (including the UE Identities for the notified PDU session), as specified in 3GPP TS 29.521 [23], and can create the AF session by invoking the Npcf\_PolicyAuthorization\_Create service operation towards the PCF.

- The TSCTSF shall handle the AF session(s) associated with a given "Individual TSC Application Session Context" resource as follows:

- For the association of the AF session(s) at the PCF to the "Individual TSC Application Session Context" resource:

a. Upon PDU Session establishment, i.e. when the TSCTSF receives a Npcf\_PolicyAuthorization\_Notify service operation following the establishment of a new PDU session, the TSCTSF shall retrieve from the BSF, as specified in 3GPP TS 29.521 [23], the PCF binding information to complete the necessary AF session information. The TSCTSF shall then trigger the Npcf\_PolicyAuthorization\_Create service operation towards the PCF to create an AF session to subscribe to TSC user plane node related event(s). The TSCTSF shall use the parameters of the existing "Individual TSC Application Session Context" resources to determine whether they shall be associated to this newly created AF session. The TSCTSF associates the new AF session to the "Individual TSC Application Session Context" resource to which these parameters match.

b. Upon "Individual TSC Application Session Context" resource creation, the TSCTSF uses the parameters of the created resource to determine which existing AF session(s) it matches. The TSCTSF then associates the new "Individual TSC Application Session Context" resource to the corresponding AF session(s).

- To remove an AF session from the list of AF session(s) associated to an "Individual TSC Application Session Context" resource, when the TSCTSF receives the Npcf\_PolicyAuthorization\_Notify service operation from the PCF indicating the termination of the corresponding existing PDU session, the TSCTSF triggers the Npcf\_PolicyAuthorization\_Delete service operation towards the PCF and determines if the corresponding AF session is associated with the "Individual TSC Application Session Context" resource. If it is the case, the TSCTSF shall remove the AF session from the list of AF session(s) associated with the "Individual TSC Application Session Context" resource.

NOTE 2: After the TSCTSF retrieves from the BSF the PCF binding information (including the UE Identities for the notified PDU session), as specified in 3GPP TS 29.521 [23], the TSCTSF can store internally the information required to invoke Npcf\_PolicyAuthorization\_Create service operation and delay the Npcf\_PolicyAuthorization\_Create service operation (i.e., the creation of the AF session) until a request is received for the concerned UE (e.g., time synchronization capability exposure or QoS provisioning request). In this case, when the TSCTSF receives a request for the concerned UE (e.g., time synchronization capability exposure or QoS provisioning request), the TSCTSF interacts with the PCF by triggering the Npcf\_PolicyAuthorization\_Create service operation as defined in 3GPP TS 29.514 [20].

NOTE 3: When the TSCTSF receives the Npcf\_PolicyAuthorization\_Notify service operation indicating the termination of an existing PDU session associated to an AF session that is not associated with any "Individual Time Synchronization Exposure Subscription" resource nor "Individual TSC Application Session Context resource" resource, the TSCTSF removes the AF session and triggers the Npcf\_PolicyAuthorization\_Delete service operation towards the PCF.

\* \* \* \* Next changes \* \* \* \*

5.3.2.3.8 Modification of AF requested QoS for a UE or group of UE(s) not identified by UE address(es)

When the "GMEC" feature is supported, the NF service consumer shall use the HTTP PATCH method to modify the requested QoS, traffic characteristics information and/or QoS Monitoring information for a UE or group of UE(s).

The NF service consumer shall include in the HTTP PATCH request message the parameters to be modified as defined in clause 5.3.2.3.2, with the following differences:

- To support the modification of the requested QoS, the traffic characteristics and monitoring of performance characteristics for a group of UE(s), the NF service consumer may modify:

- the traffic characteristics information, within the "evSubsc" attribute;

- the QoS parameters for monitoring, within the "tscQosReq" attribute;

- the QoS parameters, within either the "qosReference" attribute, the "altQosReferences" attribute or the "altQosReqs" attribute;

- the temporal invalidity conditions, within the "tempInValidity" attribute; and

- the flow description, within either the "flowInfo" attribute, the "ethFlowInfo" attribute or the "enEthFlowInfo" attribute.

The TSCTSF shall reply to the NF service consumer as defined in clause 5.3.2.3.2.

As a result of this procedure, the TSCTSF shall, for the list of matching AF session(s) associated to the "Individual TSC Application Session Context" resource, provision to the PCF the updated requested QoS, traffic characteristics and/or QoS Monitoring information by the triggering the Npcf\_PolicyAuthorization\_Update service operation as defined in 3GPP TS 29.514 [20].

\* \* \* \* Next changes \* \* \* \*

5.3.2.4.4 Termination of AF requested QoS for a UE or group of UE(s) not identified by UE address(es)

When the "GMEC" feature is supported, the NF service consumer shall use the HTTP POST method to terminate the requested QoS, traffic characteristics information and/or QoS Monitoring information for a UE or group of UE(s) as defined in clause 5.3.2.4.2 with the following differences:

- The TSCTSF shall identify the affected AF session(s) and, for each AF session, interact with the PCF by triggering the Npcf\_PolicyAuthorization\_Delete service operation, as defined in 3GPP TS 29.514 [20], if the AF session is not associated with an "Individual Time Synchronization Exposure Subscription" resource.

\* \* \* \* Next changes \* \* \* \*

#### 6.2.6.1 General

This clause specifies the application data model supported by the API.

Table 6.2.6.1-1 specifies the data types defined for the Ntsctsf\_QoSandTSCAssistance service based interface protocol.

Table 6.2.6.1-1: Ntsctsf\_QoSandTSCAssistance specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| AdditionalInfoTsctsfQosTscac | 6.2.6.2.8 | Describes additional error information specific for this API. |  |
| EventsNotification | 6.2.6.2.6 | Describes the notification(s) about the event(s) occurred within an Individual TSC Application Session Context resource. |  |
| EventNotification | 6.2.6.2.7 | Describes the notification for an Event. |  |
| EventsSubscReqData | 6.2.6.2.3 | Identifies the events the application subscribes to within an Individual TSC Application Session Context resource |  |
| EventsSubscReqDataRm | 6.2.6.2.5 | This data type is defined in the same way as the "EventsSubscReqData" data type, but with the OpenAPI "nullable: true" property. |  |
| ProblemDetailsTsctsfQosTscac | 6.2.6.4.1 | Problem details as defined in 3GPP TS 29.571 [15] extended with specific error information for this API, as described in AdditionalInfoTsctsfQosTscac data type. |  |
| TemporalInValidity | 6.2.6.2.9 | Represents the temporal invalidity conditions, i.e., the time interval during which the NF service consumer request shall not to be applied. | GMEC |
| TscAppSessionContextData | 6.2.6.2.2 | Represents the Individual TSC Application Session Context resource data. |  |
| TscAppSessionContextUpdateData | 6.2.6.2.4 | Describes the modifications to an Individual TSC Application Session Context resource. |  |
| TscEvent | 6.2.6.3.3 | Indicates the subscribed event(s). |  |

Table 6.2.6.1-2 specifies data types re-used by the Ntsctsf\_QoSandTSCAssistance service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Ntsctsf\_QoSandTSCAssistance service based interface.

Table 6.2.6.1-2: Ntsctsf\_QoSandTSCAssistance re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AcceptableServiceInfo | 3GPP TS 29.514 [20] | Acceptable maximum requested bandwidth. |  |
| AccumulatedUsage | 3GPP TS 29.122 [21] | Accumulated Usage. |  |
| AspId | 3GPP TS 29.514 [20] | Contains an identity of an application service provider. |  |
| BatOffsetInfo | 3GPP TS 29.514 [20] | Contains the offset of the BAT and the optionally adjusted periodicity. | EnTSCAC |
| DateTime | 3GPP TS 29.571 [15] | Represents a date and a time. | GMEC |
| Dnn | 3GPP TS 29.571 [15] | The DNN the user is connected to. |  |
| ExternalGroupId | 3GPP TS 29.571 [15] | Represents the identifier of an External Group. | GMEC |
| EthFlowDescription | 3GPP TS 29.514 [20] | Defines a packet filter for an Ethernet flow. |  |
| EthFlowInfo | 3GPP TS 29.122 [21] | Contains an UL and/or DL Flow information. | Ethernet\_UL/DL\_Flows |
| FlowInfo | 3GPP TS 29.122 [21] | Contains the IP data flow information. |  |
| Gpsi | 3GPP TS 29.571 [15] | Represents a GPSI. | GMEC |
| IpAddr | 3GPP TS 29.571 [15] | Contains the IP address. |  |
| MacAddr48 | 3GPP TS 29.571 [15] | MAC Address. |  |
| ProblemDetails | 3GPP TS 29.571 [15] | Problem Details when returning an error response. |  |
| QosMonitoringInformation | 3GPP TS 29.122 [21] | Contains Qos Monitoring information. |  |
| QosMonitoringInformationRm | 3GPP TS 29.122 [21] | This data type is defined in the same way as the "QosMonitoringInformation" data type, but with the OpenAPI "nullable: true" property. |  |
| QosMonitoringReport | 3GPP TS 29.122 [21] | Contains Qos Monitoring Report information. |  |
| RedirectResponse | 3GPP TS 29.571 [15] | Contains redirection related information. |  |
| Snssai | 3GPP TS 29.571 [15] | Identifies the S-NSSAI. |  |
| SponId | 3GPP TS 29.514 [20] | Contains an Identity of a sponsor. |  |
| SponsoringStatus | 3GPP TS 29.514 [20] | Represents whether sponsored data connectivity is enabled or disabled/not enabled. |  |
| SubscribedEvent | 3GPP TS 29.522 [17] | Indicates the subscribed event. |  |
| SupportedFeatures | 3GPP TS 29.571 [15] | Used to negotiate the applicability of the optional features defined in table 5.8-1. |  |
| TerminationInfo | 3GPP TS 29.514 [20] | Includes information related to the termination of the Individual TSC Application Session Context resource. |  |
| TscQosRequirement | 3GPP TS 29.122 [21] | Contains the QoS requirements for time sensitive communication. |  |
| TscQosRequirementRm | 3GPP TS 29.122 [21] | This data type is defined in the same way as the "TscQosRequirement" data type, but with removable attributes. |  |
| UsageThreshold | 3GPP TS 29.122 [21] | Time period and/or traffic volume in which the QoS is to be applied. |  |
| UsageThresholdRm | 3GPP TS 29.122 [21] | This data type is defined in the same way as the "UsageThreshold" data type, but with the OpenAPI "nullable: true" property. |  |
| Uri | 3GPP TS 29.571 [15] | Identifies a referenced resource. |  |

\* \* \* \* Next changes \* \* \* \*

##### 6.2.6.2.2 Type TscAppSessionContextData

Table 6.2.6.2.2-1: Definition of type TscAppSessionContextData

| Attribute name | Data type | P | Cardinality | Description | Applicability |
| --- | --- | --- | --- | --- | --- |
| ueIpAddr | IpAddr | C | 0..1 | The address of the UE.(NOTE 1) (NOTE 5) |  |
| ipDomain | string | C | 0..1 | The IPv4 address domain identifier.The attribute may only be provided if the ueIpAddr attribute is present and contains an IPv4 address. |  |
| ueMac | MacAddr48 | C | 0..1 | Identifies the MAC address.(NOTE 1) (NOTE 5) |  |
| ueId | Gpsi | C | 0..1 | Contains the identifier of the targeted UE.(NOTE 5) | GMEC |
| externalGroupId | ExternalGroupId | C | 0..1 | Contains the identifier of the targeted group of UE(s).(NOTE 5) | GMEC |
| dnn | Dnn | O | 0..1 | Data Network Name, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only. |  |
| snssai | Snssai | O | 0..1 | Identifies the S-NSSAI. |  |
| notifUri | Uri | M | 1 | Notification URI for Individual TSC Application Session Context termination requests. |  |
| appId | string | C | 0..1 | Contains the Application Identifier. (NOTE 1) |  |
| flowInfo | array(FlowInfo) | C | 1..N | Describe the IP data flow which requires QoS.(NOTE 1) (NOTE 4) |  |
| enEthFlowInfo | array(EthFlowInfo) | C | 1..N | Identifies the Ethernet flows which require QoS. Each Ethernet flow consists of a flow identifier and the corresponding UL and/or DL flows.(NOTE 1) (NOTE 4) | Ethernet\_UL/DL\_Flows |
| ethFlowInfo | array(EthFlowDescription) | C | 1..N | Identifies Ethernet packet flows.(NOTE 1) |  |
| afId | string | M | 1 | Identifies the AF identifier. |  |
| tscQosReq | TscQosRequirement | C | 0..1 | Contains the QoS requirements for time sensitive communication. (NOTE 2) |  |
| qosReference | string | C | 0..1 | Identifies a pre-defined QoS information. (NOTE 2) (NOTE 3) |  |
| altQosReferences | array(string) | C | 1..N | Identifies an ordered list of pre-defined QoS information. The lower the index of the array for a given entry, the higher the priority. (NOTE 3) |  |
| altQosReqs | array(AlternativeServiceRequirementsData) | C | 1..N | Identifies an ordered list of alternative service requirements that include individual QoS parameter set(s). The lower the index of the array for a given entry, the higher the priority. (NOTE 3) |  |
| sponId | SponId | O | 0..1 | Sponsor identity.  |  |
| aspId | AspId | O | 0..1 | Contains the Application service provider identity. It shall be included if sponsored connectivity is applicable. |  |
| sponStatus | SponsoringStatus | O | 0..1 | Indication of whether sponsored connectivity is enabled or disabled/not enabled.The absence of the attribute indicates that the sponsored connectivity is enabled. |  |
| evSubsc | EventsSubscReqData | O | 0..1 | Identifies the events the application subscribes to at creation of an Individual TSC Application Session Context resource. |  |
| tempInValidity | TemporalInValidity | O | 0..1 | Contains the temporal invalidity conditions, i.e., the time interval during which the AF request is not to be applied. | GMEC |
| suppFeat | SupportedFeatures | C | 0..1 | This IE represents a list of Supported features used as described in clause 6.2.8.It shall be supplied by the NF service consumer in the POST request and response of requests a creation of an Individual TSC Application Session Context resource. |  |
| NOTE 1: When the "GMEC" feature is not supported, eirther the "ueIpAddr" attribute or the "ueMac" attribute shall be included. If IP address is provided, IP flow information shall be provided. If ipv4, the domain identifier may be provided. If mac address is provided, Ethernet flow information shall be provided. One of IP flow information, Ethernet flow information or Application Identifier shall be provided.NOTE 2: The attributes "reqGbrDl", "reqGbrUl", "reqMbrDl", "reqMbrUl", "maxTscBurstSize", "req5Gsdelay", "reqPer" (if the ExtQoS feature is supported), and "priority" within the "tscQosReq" attribute may be provided only if the "qosReference" attribute is not provided. At least one of the "tscQosReq" attribute or the "qosReference" attribute shall be included.NOTE 3: The attributes "altQoSReferences" and "altQosReqs" are mutually exclusive. The attributes "qosReference" and "altQosReqs" are also mutually exclusive.NOTE 4: When the Ethernet flow information is provided and the Ethernet\_UL/DL\_Flows feature is supported, either the "ethFlowInfo" or the "enEthFlowInfo" shall be provided, but not both simultaneously.NOTE 5: When the "GMEC" feature is supported, the "ueId" attribute and the "externalGroupId" attribute are mutually exclusive and either one of them shall be present. If either the "ueId" attribute or the "externalGroupId" attribute are present, then neither the "ueIpAddr" attribute nor the "ueMac" attribute shall be present. |

\* \* \* \* Next changes \* \* \* \*

##### 6.2.6.2.4 Type TscAppSessionContextUpdateData

Table 6.2.6.2.4-1: Definition of type TscAppSessionContextUpdateData

| Attribute name | Data type | P | Cardinality | Description | Applicability |
| --- | --- | --- | --- | --- | --- |
| notifUri | Uri | O | 0..1 | Notification URI for Individual TSC Application Session Context termination requests. |  |
| appId | string | O | 0..1 | Identifies the external Application Identifier. (NOTE 1) |  |
| flowInfo | array(FlowInfo) | O | 1..N | Describe the IP data flow which requires QoS.(NOTE 1) |  |
| ethFlowInfo | array(EthFlowDescription) | O | 1..N | Identifies Ethernet packet flows.(NOTE 1) (NOTE 4) |  |
| enEthFlowInfo | array(EthFlowInfo) | C | 1..N | Identifies the Ethernet flows which require QoS. Each Ethernet flow consists of a flow identifier and the corresponding UL and/or DL flows.(NOTE 1) (NOTE 4) | Ethernet\_UL/DL\_Flows |
| tscQosReq | TscQosRequirementRm | C | 0..1 | Contains the QoS requirements for time sensitive communication. (NOTE 2) |  |
| qosReference | string | C | 0..1 | Identifies a pre-defined QoS information. (NOTE 2) (NOTE 3) |  |
| altQosReferences | array(string) | C | 1..N | Identifies an ordered list of pre-defined QoS information. The lower the index of the array for a given entry, the higher the priority. (NOTE 3) |  |
| altQosReqs | array(AlternativeServiceRequirementsData) | C | 1..N | Identifies an ordered list of alternative service requirements that include individual QoS parameter set(s). The lower the index of the array for a given entry, the higher the priority. (NOTE 3) |  |
| evSubsc | EventsSubscReqDataRm | O | 0..1 | Identifies the events the application subscribes to at modification of an Individual TSC Application Session Context resource. |  |
| sponId | SponId | O | 0..1 | Sponsor identity.  |  |
| aspId | AspId | O | 0..1 | Application service provider identity. It may be included if sponsored connectivity is applicable. |  |
| sponStatus | SponsoringStatus | O | 0..1 | Indication of whether sponsored connectivity is enabled or disabled/not enabled.The absence of the attribute indicates that the sponsored connectivity is enabled. |  |
| tempInValidity | TemporalInValidity | O | 0..1 | Contains the updated temporal invalidity conditions, i.e., the time interval during which the AF request is not to be applied. | GMEC |
| NOTE 1: One of IP flow information, Ethernet flow information or Application Identifier may be provided.NOTE 2: Either "tscQosReq" attribute or "qosReference" attribute may be provided.NOTE 3: The attributes "altQoSReferences" and "altQosReqs" are mutually exclusive. The attributes "qosReference" and "altQosReqs" are also mutually exclusive.NOTE 4: When the Ethernet flow information is provided and the Ethernet\_UL/DL\_Flows feature is supported, either the "ethFlowInfo" or the "enEthFlowInfo" may be provided, but not both simultaneously. |

\* \* \* \* Next changes \* \* \* \*

6.2.6.2.9 Type TemporalInValidity

Table 6.2.6.2.9-1: Definition of type TemporalnValidity

| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| --- | --- | --- | --- | --- | --- |
| startTime | DateTime | M | 1 | Indicates the time at which the AF request ceases to apply.The absence of this attribute indicates that the AF request does not end at any time. |  |
| stopTime | DateTime | M | 1 | Indicates the time at which the AF request starts to apply.The absence of this attribute indicates the AF request applies immediately. |  |

\* \* \* \* Next changes \* \* \* \*

### 6.2.8 Feature negotiation

The optional features in table 6.2.8-1 are defined for the Ntsctsf\_QoSandTSCAssistance API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [4].

Table 6.2.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | Ethernet\_UL/DL\_Flows | Indicates the support of the description of the Ethernet flows as the combination of Flow Identifier, and UL and/or DL Ethernet flows. |
| 2 | PacketDelayFailureReport | Indicates the support of packet delay failure report as part of QoS Monitoring procedures.  |
| 3 | ExtQoS | Indicates the support of extended QoS parameters. |
| 4 | EnTSCAC | Indicates the support of extensions to TSCAC, e.g. burst arrival time window adaptation, periodicity adjustment, and subsequent BAT offset report. |
| 5 | AltQoSProfilesSupportReport | This feature indicates the support of the report of whether Alternative QoS parameters are supported by NG-RAN.  |
| 6 | GMEC | This feature indicates the support of Generic Group Management, Exposure and Communication Enhancements.The following functionalities are supported:- AF requested QoS for a UE or a group of UE(s) not identified by UE address(es). |

\* \* \* \* Next changes \* \* \* \*

# A.3 Ntsctsf\_QoSandTSCAssistance API

openapi: 3.0.0

info:

 title: Ntsctsf\_QoSandTSCAssistance Service API

 version: 1.1.0-alpha.4

 description: |

 TSCTSF QoS and TSC Assistance Service.

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externalDocs:

 description: >

 3GPP TS 29.565 V18.3.0; 5G System; Time Sensitive Communication and Time Synchronization function

 Services; Stage 3.

 url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.565/'

servers:

 - url: '{apiRoot}/ntsctsf-qos-tscai/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

security:

 - {}

 - oAuth2ClientCredentials:

 - ntsctsf-qos-tscai

paths:

 /tsc-app-sessions:

 post:

 summary: Creates a new Individual TSC Application Session Context resource

 operationId: PostTSCAppSessions

 tags:

 - TSC Application Sessions (Collection)

 requestBody:

 description: Contains the information for the creation the resource.

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/TscAppSessionContextData'

 responses:

 '201':

 description: Successful creation of the resource.

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/TscAppSessionContextData'

 headers:

 Location:

 description: >

 Contains the URI of the created individual TSC application session context resource,

 according to the structure

 {apiRoot}/ntsctsf-qos-tscai/<apiVersion>/tsc-app-sessions/{appSessionId} or the

 URI of the created events subscription sub-resource, according to the structure

 {apiRoot}/ntsctsf-qos-tscai/<apiVersion>/tsc-app-sessions/{appSessionId}/

 events-subscription}

 required: true

 schema:

 type: string

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 description: Forbidden

 content:

 application/problem+json:

 schema:

 $ref: '#/components/schemas/ProblemDetailsTsctsfQosTscac'

 headers:

 Retry-After:

 description: >

 Indicates the time the AF has to wait before making a new request. It can be a

 non-negative integer (decimal number) indicating the number of seconds the AF

 has to wait before making a new request or an HTTP-date after which the AF can

 retry a new request.

 schema:

 type: string

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 callbacks:

 terminationRequest:

 '{$request.body#/notifUri}/terminate':

 post:

 requestBody:

 description: >

 Request of the termination of the Individual TSC Application Session Context

 required: true

 content:

 application/json:

 schema:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/TerminationInfo'

 responses:

 '204':

 description: The receipt of the notification is acknowledged.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 eventNotification:

 '{$request.body#/evSubsc/notifUri}/notify':

 post:

 requestBody:

 description: Notification of an event occurrence in the TSCTSF.

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/EventsNotification'

 responses:

 '204':

 description: The receipt of the notification is acknowledged.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /tsc-app-sessions/{appSessionId}:

 get:

 summary: Reads an existing Individual TSC Application Session Context

 operationId: GetTSCAppSession

 tags:

 - Individual TSC Application Session Context (Document)

 parameters:

 - name: appSessionId

 description: String identifying the resource.

 in: path

 required: true

 schema:

 type: string

 responses:

 '200':

 description: A representation of the resource is returned.

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/TscAppSessionContextData'

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '406':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/406'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 patch:

 summary: Modifies an existing Individual TSC Application Session Context

 operationId: ModAppSession

 tags:

 - Individual TSC Application Session Context (Document)

 parameters:

 - name: appSessionId

 description: String identifying the resource.

 in: path

 required: true

 schema:

 type: string

 requestBody:

 description: Modification of the resource.

 required: true

 content:

 application/merge-patch+json:

 schema:

 $ref: '#/components/schemas/TscAppSessionContextUpdateData'

 responses:

 '200':

 description: >

 successful modification of the resource and a representation of that resource is

 returned.

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/TscAppSessionContextData'

 '204':

 description: The successful modification.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 description: Forbidden

 content:

 application/problem+json:

 schema:

 $ref: '#/components/schemas/ProblemDetailsTsctsfQosTscac'

 headers:

 Retry-After:

 description: >

 Indicates the time the AF has to wait before making a new request. It can be a

 non-negative integer (decimal number) indicating the number of seconds the AF

 has to wait before making a new request or an HTTP-date after which the AF can

 retry a new request.

 schema:

 type: string

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 callbacks:

 eventNotification:

 '{$request.body#/evSubsc/notifUri}/notify':

 post:

 requestBody:

 description: Notification of an event occurrence in the TSCTSF.

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/EventsNotification'

 responses:

 '204':

 description: The receipt of the notification is acknowledged.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /tsc-app-sessions/{appSessionId}/delete:

 post:

 summary: Deletes an existing Individual TSC Application Session Context

 operationId: DeleteTSCAppSession

 tags:

 - Individual TSC Application Session Context (Document)

 parameters:

 - name: appSessionId

 description: String identifying the Individual TSC Application Session Context resource.

 in: path

 required: true

 schema:

 type: string

 requestBody:

 description: >

 Deletion of the Individual TSC Application Session Context resource, request notification.

 required: false

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/EventsSubscReqData'

 responses:

 '200':

 description: The deletion of the resource is confirmed and a resource is returned

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/EventsNotification'

 '204':

 description: The deletion is confirmed without returning additional data.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /tsc-app-sessions/{appSessionId}/events-subscription:

 put:

 summary: Creates or modifies an Events Subscription subresource

 operationId: putEventsSubsc

 tags:

 - Events Subscription (Document)

 parameters:

 - name: appSessionId

 description: String identifying the Events Subscription resource

 in: path

 required: true

 schema:

 type: string

 requestBody:

 description: Creation or modification of an Events Subscription resource.

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/EventsSubscReqData'

 responses:

 '201':

 description: >

 The creation of the Events Subscription resource is confirmed and its representation is

 returned.

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/EventsSubscReqData'

 headers:

 Location:

 description: >

 Contains the URI of the created Events Subscription resource,

 according to the structure

 {apiRoot}/ntsctsf-qos-tscai/<apiVersion>/tsc-app-sessions/{appSessionId}/

 events-subscription}

 required: true

 schema:

 type: string

 '200':

 description: >

 The modification of the Events Subscription resource is confirmed and its representation

 is returned.

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/EventsSubscReqData'

 '204':

 description: >

 The modification of the Events Subscription subresource is confirmed without returning

 additional data.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 callbacks:

 eventNotification:

 '{$request.body#/notifUri}/notify':

 post:

 requestBody:

 description: >

 Contains the information for the notification of an event occurrence in the TSCTSF.

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/EventsNotification'

 responses:

 '204':

 description: The receipt of the notification is acknowledged.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 delete:

 summary: Deletes the Events Subscription subresource.

 operationId: DeleteEventsSubsc

 tags:

 - Events Subscription (Document)

 parameters:

 - name: appSessionId

 description: String identifying the Individual TSC Application Session Context resource

 in: path

 required: true

 schema:

 type: string

 responses:

 '204':

 description: >

 The deletion of the of the Events Subscription sub-resource is confirmed without returning

 additional data.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 ntsctsf-qos-tscai: Access to the Ntsctsf\_QoSandTSCAssistance API

 schemas:

 TscAppSessionContextData:

 description: Represents an Individual TSC Application Session Context resource.

 type: object

 required:

 - notifUri

 - afId

 - qosReference

 allOf:

 - oneOf:

 - required: [ueIpAddr]

 - required: [ueMac]

 - required: [ueId]

 - required: [externalGroupId]

 - not:

 required: [ethFlowInfo, enEthFlowInfo]

 - not:

 required: [altQosReqs, altQosReferences]

 - not:

 required: [qosReference, altQosReqs]

 properties:

 ueIpAddr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/IpAddr'

 ipDomain:

 type: string

 description: The IPv4 address domain identifier.

 ueMac:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

 ueId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

 externalGroupId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/ExternalGroupId'

 dnn:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'

 snssai:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

 notifUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 appId:

 type: string

 description: Identifies the Application Identifier.

 ethFlowInfo:

 type: array

 items:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/EthFlowDescription'

 minItems: 1

 enEthFlowInfo:

 type: array

 items:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/EthFlowInfo'

 minItems: 1

 description: >

 Identifies the Ethernet flows which require QoS. Each Ethernet flow consists of a flow

 identifer and the corresponding UL and/or DL flows.

 flowInfo:

 type: array

 items:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/FlowInfo'

 minItems: 1

 afId:

 type: string

 description: Identifies the AF identifier.

 tscQosReq:

 $ref: 'TS29122\_AsSessionWithQoS.yaml#/components/schemas/TscQosRequirement'

 qosReference:

 type: string

 description: Identifies a pre-defined QoS information.

 altQosReferences:

 type: array

 items:

 type: string

 minItems: 1

 description: Identifies an ordered list of pre-defined QoS information.

 altQosReqs:

 type: array

 items:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/AlternativeServiceRequirementsData'

 minItems: 1

 description: >

 Identifies an ordered list of alternative service requirements that include individual

 QoS parameter sets. The lower the index of the array for a given entry, the higher the

 priority.

 aspId:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/AspId'

 sponId:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/SponId'

 sponStatus:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/SponsoringStatus'

 evSubsc:

 $ref: '#/components/schemas/EventsSubscReqData'

 tempInValidity:

 $ref: '#/components/schemas/TemporalInValidity'

 suppFeat:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

 TscAppSessionContextUpdateData:

 description: >

 Describes the authorization data of an Individual TSC Application Session Context created by

 the PCF.

 type: object

 properties:

 notifUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 appId:

 type: string

 description: Identifies the Application Identifier.

 ethFlowInfo:

 type: array

 items:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/EthFlowDescription'

 minItems: 1

 enEthFlowInfo:

 type: array

 items:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/EthFlowInfo'

 minItems: 1

 description: >

 Identifies the Ethernet flows which require QoS. Each Ethernet flow consists of a flow

 identifer and the corresponding UL and/or DL flows.

 flowInfo:

 type: array

 items:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/FlowInfo'

 minItems: 1

 tscQosReq:

 $ref: 'TS29122\_AsSessionWithQoS.yaml#/components/schemas/TscQosRequirementRm'

 qosReference:

 type: string

 description: Identifies a pre-defined QoS information.

 altQosReferences:

 type: array

 items:

 type: string

 minItems: 1

 description: Identifies an ordered list of pre-defined QoS information.

 altQosReqs:

 type: array

 items:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/AlternativeServiceRequirementsData'

 minItems: 1

 description: >

 Identifies an ordered list of alternative service requirements that include individual

 QoS parameter sets. The lower the index of the array for a given entry, the higher the

 priority.

 aspId:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/AspId'

 sponId:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/SponId'

 sponStatus:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/SponsoringStatus'

 evSubsc:

 $ref: '#/components/schemas/EventsSubscReqDataRm'

 tempInValidity:

 $ref: '#/components/schemas/TemporalInValidity'

 allOf:

 - not:

 required: [ethFlowInfo, enEthFlowInfo]

 - not:

 required: [altQosReqs, altQosReferences]

 - not:

 required: [qosReference, altQosReqs]

 EventsSubscReqData:

 description: Identifies the events the application subscribes to.

 type: object

 required:

 - events

 - notifUri

 - notifCorreId

 properties:

 events:

 type: array

 items:

 $ref: '#/components/schemas/TscEvent'

 minItems: 1

 notifUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 qosMon:

 $ref: 'TS29122\_AsSessionWithQoS.yaml#/components/schemas/QosMonitoringInformation'

 usgThres:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/UsageThreshold'

 notifCorreId:

 type: string

 EventsSubscReqDataRm:

 description: >

 This data type is defined in the same way as the EventsSubscReqData data type, but with the

 OpenAPI nullable property set to true.

 type: object

 required:

 - events

 properties:

 events:

 type: array

 items:

 $ref: '#/components/schemas/TscEvent'

 minItems: 1

 notifUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 qosMon:

 $ref: 'TS29122\_AsSessionWithQoS.yaml#/components/schemas/QosMonitoringInformationRm'

 usgThres:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/UsageThresholdRm'

 notifCorreId:

 type: string

 nullable: true

 EventsNotification:

 description: Describes the notification of matched events.

 type: object

 required:

 - notifCorreId

 - events

 properties:

 notifCorreId:

 type: string

 events:

 type: array

 items:

 $ref: '#/components/schemas/EventNotification'

 minItems: 1

 EventNotification:

 description: Describes a notification of an matched event.

 type: object

 required:

 - event

 properties:

 event:

 $ref: '#/components/schemas/TscEvent'

 flowIds:

 type: array

 items:

 type: integer

 minItems: 1

 description: Identifies the IP flows that were sent during event subscription.

 qosMonReports:

 type: array

 items:

 $ref: 'TS29122\_AsSessionWithQoS.yaml#/components/schemas/QosMonitoringReport'

 minItems: 1

 usgRep:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/AccumulatedUsage'

 appliedQosRef:

 type: string

 description: >

 The currently applied alternative QoS requirement referring to an alternative QoS

 reference or a requested alternative QoS parameter set. Applicable for

 event QOS\_NOT\_GUARANTEED or SUCCESSFUL\_RESOURCES\_ALLOCATION.

 altQosNotSuppInd:

 type: boolean

 description: >

 When present and set to true it indicates that the Alternative QoS profiles are not

 supported by NG-RAN. Applicable for

 event QOS\_NOT\_GUARANTEED or SUCCESSFUL\_RESOURCES\_ALLOCATION.

 AdditionInfoTsctsfQosTscac:

 description: Describes additional error information specific for this API.

 type: object

 properties:

 acceptableServInfo:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/AcceptableServiceInfo'

 batOffsetInfo:

 $ref: 'TS29514\_Npcf\_PolicyAuthorization.yaml#/components/schemas/BatOffsetInfo'

 TemporalInValidity:

 description: Represents the temporal invalidity conditions, i.e., the time

 interval(s) during which the AF request is not to be applied.

 type: object

 properties:

 startTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

 stopTime:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

 required:

 - startTime

 - stopTime

#

# ENUMERATIONS DATA TYPES

#

 TscEvent:

 description: Represents an event to notify to the AF.

 anyOf:

 - type: string

 enum:

 - FAILED\_RESOURCES\_ALLOCATION

 - QOS\_MONITORING

 - QOS\_GUARANTEED

 - QOS\_NOT\_GUARANTEED

 - SUCCESSFUL\_RESOURCES\_ALLOCATION

 - USAGE\_REPORT

 - BAT\_OFFSET\_INFO

 - type: string

 description: >

 This string provides forward-compatibility with future extensions to the enumeration

 and is not used to encode content defined in the present version of this API.

#

# ALTERNATIVE DATA TYPES OR COMBINATIONS OF DATA TYPES

#

 ProblemDetailsTsctsfQosTscac:

 description: Extends ProblemDetails to also include the acceptable service info.

 allOf:

 - $ref: 'TS29571\_CommonData.yaml#/components/schemas/ProblemDetails'

 - $ref: '#/components/schemas/AdditionInfoTsctsfQosTscac'

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