**3GPP TSG CT WG3 Meeting #135 *C3-243336***

**Hyderabad, IN, 27 - 31 May, 2024**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **29.565** | **CR** | **0132** | **rev** | **-** | **Current version:** | **18.5.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | Correction to Individual QoS parameters |
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| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | GMEC |  | ***Date:*** | 2024-05-13 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | For GMEC, TS 23.501 clause 5.20c specifies:" NEF provisioning capability as defined in clause 5.20 allows an AF to perform provisioning of traffic characteristics and monitoring of performance characteristics for a group of UEs as specified in clause 4.15.6.14 of TS 23.502 [3] and clause 6.1.3.28 of TS 23.503 [45].(…)The NEF determines whether or not to invoke the TSCTSF in the same way as for AF session with required QoS procedure, as described in step 2 of clause 4.15.6.6 in TS 23.502 [3]. In the case that the TSCTSF is used, the TSCTSF receives the AF requested QoS information from the NEF. In the case that TSCTSF is not used, the AF request is handled as described in clause 4.15.6.14 of TS 23.502 [3] and clause 6.1.3.28 of TS 23.503 [45]."This text implies that the TSCTSF can be used to handle the provisioning of traffic characteristics and monitoring of performance for a Group of UEs, regardless the provisioning is for TSC services or any other service. QoS requirements for any service may grow independently of the QoS requirements for TSC applications (see TS 23.501, clause 5.27.3). However, the current data model (defined data type(s) and defined attribute(s) make reference to TSC type of applications) seems to apply only to TSC type of applications.  |
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| ***Summary of change:*** | Proposal to define a separate container for the individual 5GS QoS parameters an AF may request. The TSC/TSN QoS requirements should be placed in the tscQosReq attribute, but if a TSC type of application wants to use the attributes within the qosReq individual 5G QoS parameters, these ones will take precedence. The purpose is to stop evolving tscQosReq attribute, to enable the convergence of QoS requirements for any application within the qosReq attribute.In addition, further corrections are added to the description of the requested QoS procedure. |
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| ***Consequences if not approved:*** | Unclear growth of the QoS data model |
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| ***Clauses affected:*** | 5.3.2.2.8, 5.3.2.3.2, 5.3.2.3.8 |
|  |  |
|  | **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 ...  |
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| ***Other comments:*** | This CR does not impact the OpenAPI descriptions of the APIs defined in this specification. |
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| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**Proposed changes:**

\*\*\* First Change \*\*\*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[3] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[4] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[5] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[6] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.

[7] 3GPP TR 21.900: "Technical Specification Group working methods".

[8] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[9] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[10] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[11] IETF RFC 9113: "HTTP/2".

[12] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[13] IETF RFC 9457: "Problem Details for HTTP APIs".

[14] 3GPP TS 29.534: "5G System; Access and Mobility Policy Authorization Service; Stage 3".

[15] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".

[16] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".

[17] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[18] IEEE Std 802.1Q-2018: "IEEE Standard for Local and metropolitan area networks--Bridges and Bridged Networks".

[19] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System".

[20] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

[21] 3GPP TS 29.122: "T8 reference point for northbound Application Programming Interfaces (APIs)".

[22] IETF RFC 7396: "JSON Merge Patch".

[23] 3GPP TS 29.521: "5G System; Binding Support Management Service; Stage 3".

[24] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[25] IEEE Std 1588-2019: "IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control".

[26] IEEE Std 802.1AS-2020: "IEEE Standard for Local and metropolitan area networks--Timing and Synchronization for Time-Sensitive Applications".

[27] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[28] IETF draft-ietf-detnet-yang: "Deterministic Networking (DetNet) YANG Model".

Editor's note: The above document cannot be formally referenced until it is published as an RFC.

[29] IETF RFC 6241: "Network Configuration Protocol (NETCONF)".

[30] IETF RFC 8040: "RESTCONF Protocol".

[31] 3GPP TS 29.513: "5G System; Policy and Charging Control signalling flows and QoS parameter mapping; Stage 3".

[32] IETF RFC 8939: "Deterministic Networking (DetNet) Data Plane: IP".

[33] IETF RFC 7950: "The YANG 1.1 Data Modeling Language".

[34] IETF RFC 8407: "Guidelines for Authors and Reviewers of Documents Containing YANG Data Models".

[35] IETF RFC 6020: "YANG – A Data Modeling Language for the Network Configuration Protocol (NETCONF)".

[36] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository service for Policy Control Data, Application Data and Structured Data for Exposure; Stage 3".

\*\*\* Next Change \*\*\*

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

When the "GMEC" feature is supported, if the NF service consumer includes in the HTTP POST request message described 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 information may include:

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

b. the event(s) subscription, including the QoS parameters for monitoring, within the "evSubsc" attribute;

c. the traffic characteristics , 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 or the "enEthFlowInfo" attribute.

The TSCTSF shall reply to the NF service consumer as described 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 and, if available, 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; and

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 events. 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 so, 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 (the creation of the AF session) till a request is received for the concerned UE (time synchronization capability exposure or QoS provisioning request). In this case, when the TSCTSF receives the request, the TSCTSF interacts with the PCF by triggering 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 it is not associated with any "Individual Time Synchronization Exposure Subscription" resource and "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 Change \*\*\*

##### 5.3.2.3.2 Modification of TSC related service information

This procedure is used to modify an existing TSC application session context as defined in 3GPP TS 23.501 [2], 3GPP TS 23.502 [3] and 3GPP TS 23.503 [19].

Figure 5.3.2.3.2-1 illustrates the modification of TSC related service information using HTTP PATCH method.



Figure 5.3.2.3.2-1: Modification of TSC related service information using HTTP PATCH

The NF service consumer may modify the TSC application session context information at any time and invoke the Ntsctsf\_QoSandTSCAssistance\_Update service operation by sending the HTTP PATCH request message to the resource URI representing the "Individual TSC Application Session Context" resource, as shown in figure 5.3.2.3.2-1, step 1, with the modifications to apply.

The JSON body within the PATCH request shall include the "TscAppSessionContextUpdateData" data type and shall be encoded according to "JSON Merge Patch", as defined in IETF RFC 7396 [22].

The NF service consumer may include in the "TscAppSessionContextUpdateData" data structure:

- the updated flow information within the "flowInfo" attribute for IP flows or, either the "ethFlowInfo" or, if the Ethernet\_UL/DL\_Flows feature is supported, the "enEthFlowInfo" attribute for Ethernet flows;

- the updated application Id within the "appId" attribute;

- the updated QoS reference within the "qosReference" attribute or the updated individual QoS parameter set within the "tscQosReq" attribute;

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

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

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

- the updated ordered list of alternative QoS references within the "altQosReferences" attribute or updated ordered list of requested alternative QoS parameters set(s) within the "altQosReqs" attribute; and

- the updated event subscription information within the "evSubsc" attribute. Within the EventsSubscReqDataRm data structure, the NF service consumer shall include:

- the new complete list of subscribed events within the "events" attribute;

- when the NF service consumer requests to update the additional information related to an event (e.g. the NF service consumer needs to provide new thresholds to the TSCTSF in the "usgThres" attribute related to the "USAGE\_REPORT" event), the additional information within the corresponding attribute(s).

NOTE 2: Note that when the NF service consumer requests to remove an event, this event is not included in the "events" attribute.

NOTE 3: When an event is included in the "events" attribute and its related additional information is set to null, the TSCTSF considers the subscription to this event is active, but the related procedures stop applying.

NOTE 4: When an event is removed from the "events" attribute but its related information is not set to null, the TSCTSF considers the subscription to this event is terminated, the related additional information is removed, and the related procedures stop applying.

The NF service consumer shall remove existing event subscription information by setting to null the "evSubsc" attribute included in "TscAppSessionContextUpdateData".

NOTE 5: The "notifUri" attribute within the EventsSubscReqData data structure can be modified to request that subsequent notifications are sent to a new NF service consumer.

Upon the reception of this HTTP PATCH request, the TSCTSF shall

- if the updated 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, re-calculate a Requested PDB by subtracting the UE-DS-TT residence time provided by the PCF or pre-configured in the TSCTSF from the Requested 5GS delay;

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

- 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 6: 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 during the modification 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 update request, then the TSCTSF shall subscribe to the notification on BAT offset by using the "EventsSubscReqDataRm" data type including an event within the "events" attribute with the "event" attribute set to "BAT\_OFFSET\_INFO;

- 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];

- if receiving a successful response from the PCF, the TSCSTF shall update the "Individual TSC Application Session Context" resource and send a "200 OK" or "204 No Content" response to the HTTP POST request to the NF service consumer, as shown in figure 5.3.2.3.2-1, step 2.

If the TSCTSF cannot successfully fulfil the received HTTP PATCH request due to the internal TSCTSF error or due to the error in the HTTP PATCH 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 update responses received from the PCF as specified in 3GPP TS 29.514 [20]:

a. If the updated service information is not acceptable for the PCF (e.g. the subscribed guaranteed bandwidth for a particular user is exceeded or the authorized data rate in that slice for the UE is exceeded), the TSCTSF shall indicate in an HTTP "403 Forbidden" response message the received cause for the rejection including the "cause" attribute set to "REQUESTED\_SERVICE\_NOT\_AUTHORIZED".

b. 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 acceptable bandwidth within the attribute "acceptableServInfo" included in the "ProblemDetailsTsctsfQosTscac" data structure returned in the rejection response message.

If the TSCTSF determines the received HTTP PATCH request needs to be redirected, the TSCTSF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [4].

\*\*\* Next Change \*\*\*

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

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 a group of UE(s).

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

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

- the event(s) subscription, including the QoS parameters for monitoring,, within the "evSubsc" attribute;

- the traffic characteristics, 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 or the "enEthFlowInfo" attribute.

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

As result of this action, 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 Npcf\_PolicyAuthorization\_Update service operation as defined in 3GPP TS 29.514 [20].

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