**3GPP TSG-CT WG3 Meeting #136 *C3-243340***

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

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **29.565** | **CR** | **0133** | **rev** | **-** | **Current version:** | **18.5.0** |  |
|  |
| *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:***  | Correction of the description of the attribute periodicityRange |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | TRS\_URLLC |  | ***Date:*** | 2024-05-07 |
|  |  |  |  |  |
| ***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)* |
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| ***Reason for change:*** | The periodicityRange is also part of the tscaiInputUl and tscaiInputDl. The description now excludes the periodicityRange outside which can lead misunderstandings. |
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| ***Summary of change:*** | Move the tscaiInputUl and tscaiInputDl after the periodicityRange. |
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| ***Consequences if not approved:*** | Imcomplete description can lead to implementation erros. |
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| ***Clauses affected:*** | 5.3.2.2.2, 5.3.2.3.2 |
|  |  |
|  | **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 has no impact on OpenAPI file. |
|  |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**Proposed changes:**

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

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

- when the "GMEC" feature is supported, either the targeted UE within the "ueId" attribute or the targeted group of UE(s) within the "externalGroupId" attribute as defined in clause 5.3.2.2.8;

- 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 "tscQosReq" attribute in the request from the NF service consumer it includes the capability for BAT adaptation within the "capBatAdaptation" attribute or the BAT window within the "burstArrivalTimeWnd" attribute or the periodicity range in the "periodicityRange" attribute, 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 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 "tscQosReq" attribute in the update request from the NF service consumer during the modification it includes the capability for BAT adaptation within the "capBatAdaptation" attribute or the BAT window within the "burstArrivalTimeWnd" attribute or the periodicity range in the "periodicityRange" attribute, 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].

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