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

**Changsha, China, – was C3-242338**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** | **1250** | **rev** | **1** | **Current version:** |  |  |
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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:*** | 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 can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | |
| ***Reason for change:*** | | | The following issues have been identified:   * The data type used to encode the "acsParams" in Table 5.7.2.3.3-1 is incorrect, i.e., it should be AcsParams instead of Acs. * The name of the GMEC related feature defined for the AsSessionWithQoS API needs to be aligned with the name of the similar feature defined for the MonitoringEvent API. * The CpParams data type is listed twice in the reused data types table. * Some provisions are not using normative formulations (e.g., clause 4.4.15.5) or contain terminology misalignments (e.g., clause 4.4.37.1). * The OpenAPI description of the GroupParametersProvisioning API refers to TS 29.501 whereas it should refer to TS 29.122. * Various other GMEC related provisions may be a bit confusing and need some further clarifications or rewording. | | | | | | |
|  | | |  | | | | | | |
| ***Summary of change:*** | | | This CR proposes to:   * Address the above mentioned issues. * Apply additional editorial corrections and alignments with the NBI TS skeleton. | | | | | | |
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| ***Consequences if not approved:*** | | | * The provisions related to the GMEC functionality continue to contain errors and are not defined in a consistent way across the specification. | | | | | | |
|  | |  | | | | | | | |
| ***Clauses affected:*** | | 4.1, 4.4.2, 4.4.9.3, 4.4.15.5, 4.4.37.1, 4.4.37.2, 5.3, 5.7.2.1, 5.7.2.3.3, 5.7.3, 5.33.1, 5.33.2.2.3.1, 5.33.2.2.3.2, 5.33.2.3.3.1, 5.33.2.3.3.2, 5.33.2.3.3.3, 5.33.2.3.3.4, 5.33.5.1, 5.33.5.2.2, 5.33.5.2.3, 5.33.5.2.6, 5.33.5.4, 5.33.7.1, 5.33.7.3, A.31 | | | | | | | |
|  | |  | | | | | | | |
|  | | **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 GroupParametersProvisioning API defined in this specification. | | | | | | | |
|  | |  | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | |

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

## 4.1 Overview

The NEF Northbound interface is between the NEF and the AF. It specifies RESTful/RPC APIs that allow the AF to access the services and capabilities provided by 3GPP network entities and securely exposed by the NEF.

This document also specifies the procedures triggered at the NEF by API requests from the AF and by event notifications received from 3GPP network entities.

The stage 2 level requirements and signalling flows for the NEF Northbound interface are defined in 3GPP TS 23.502 [2], 3GPP TS 23.247 [53] for MBS specific aspects and 3GPP TS 26.531 [59] for data reporting provisioning and Media Streaming Event Exposure specific aspects.

The NEF Northbound interface supports the following procedures:

1) Procedures for Monitoring.

2) Procedures for Device Triggering.

3) Procedures for resource management of Background Data Transfer.

4) Procedures for CP Parameters, Network Configuration Parameters Provisioning, 5G LAN Parameters Provisioning, ACS Configuration Parameter Provisioning, Location Privacy Indication Parameters Provisioning, ECS address provisioning, Slice Parameters Provisioning and DNN and S-NSSAI specific Group Parameters provisioning.

5) Procedures for PFD Management.

6) Procedures for Traffic Influence.

7) Procedures for changing the chargeable party at session set up or during the session.

8) Procedures for AF required QoS.

9) Procedures for MSISDN-less Mobile Originated SMS.

10) Procedures for non-IP data delivery.

11) Procedures for analytics information exposure.

12) Procedure for applying BDT policy.

13) Procedures for Enhanced Coverage Restriction Control.

14) Procedures for IPTV Configuration.

15) Procedures for Service Parameter Provisioning.

16) Procedures for RACS Parameter Provisioning.

17) Procedures for Mobile Originated Location Request.

18) Procedures for AKMA.

19) Procedures for AF triggered Access and Mobility Influence.

20) Procedures for AF triggered Access and Mobility Policy Authorization.

21) Procedures for Time Synchronization Exposure.

22) Procedures for EAS Deployment information provisioning.

23) Procedures for TMGI allocation, deallocation, expiry timer refresh and timer expiry notification.

24) Procedures for MBS session management and parameters provisioning.

25) Procedures for Data Reporting.

26) Procedures for Data Reporting Provisioning.

27) Procedures for AF specific UE ID retrieval.

28) Procedures for Media Streaming Event Exposure.

29) Procedures for MBS User Service management.

30) Procedures for MBS User Data Ingest Session management.

31) Procedures for MBS Group Message Delivery management.

32) Procedures for DNAI mapping.

33) Procedures for negotiation of Planned Data Transfer with QoS requirements.

34) Procedures for Member UE Slection Assistance.

37) Procedures for UE Address retrieval.

38) Procedures for ECS Address configuration in roaming.

Which correspond to the following services respectively, supported by the NEF as defined in 3GPP TS 23.502 [2] or 3GPP TS 26.531 [59]:

1) Nnef\_EventExposure service and Nnef\_APISupportCapability service.

2) Nnef\_Trigger service.

3) Nnef\_BDTPNegotiation service.

4) Nnef\_ParameterProvision service.

5) Nnef\_PFDManagement service.

6) Nnef\_TrafficInfluence service.

7) Nnef\_ChargeableParty service.

8) Nnef\_AFsessionWithQoS service and Nnef\_AF\_Request\_for\_QoS service.

9) Nnef\_MSISDN-less\_MO\_SMS service.

10) Nnef\_NIDDConfiguration and Nnef\_NIDD services.

11) Nnef\_AnalyticsExposure service.

12) Nnef\_ApplyPolicy service.

13) Nnef\_ECRestriction service.

14) Nnef\_IPTVConfiguration service.

15) Nnef\_ServiceParameter service.

16) Nnef\_UCMFProvisioning service.

17) Nnef\_Location service.

18) Nnef\_AKMA service.

19) Nnef\_AMInfluence service.

20) Nnef\_AMPolicyAuthorization service.

21) Nnef\_TimeSynchronization and Nnef\_ASTI services.

22) Nnef\_EASDeployment service.

23) Nnef\_MBSTMGI service.

24) Nnef\_MBSSession service.

25) Nnef\_DataReporting service.

26) Nnef\_DataReportingProvisioning service.

27) Nnef\_UEId service.

28) Nnef\_MSEventExposure service.

29) Nnef\_MBSUserService service.

30) Nnef\_MBSUserDataIngestSession service.

31) Nnef\_MBSGroupMsgDelivery service.

32) Nnef\_DNAIMapping service.

33) Nnef\_PDTQPolicyNegotiation service.

34) Nnef\_MemberUESelectionAssistance service.

37) Nnef\_UEAddress service.

38) Nnef\_ECSAddress service.

NOTE 1: For Nnef\_PFDManagement service, only the Nnef\_PFDManagement\_Create/Update/Delete service operations are applicable for the NEF Northbound interface.

NOTE 2: For Nnef\_NIDD service, NF consumer other than the AF does not use the NEF Northbound interface.

NOTE 3: For Nnef\_NIDDConfiguration service, the Nnef\_NIDDConfiguration\_Trigger service operation is only applicable for the NEF Northbound interface.

NOTE 4: The Nnef\_APISupportCapability service is only applicable in the MonitoringEvent API when the monitoring type sets to "API\_SUPPORT\_CAPABILITY".

NOTE 5: The Nnef\_MSEventExposure service maps to the Nnef\_EventExposure service and is applicable for the case where the event consumer AF in the Application Service Provider is deployed outside the trusted domain, as described in 3GPP TS 26.531 [59], and the subscribed event is set to "MS\_QOE\_METRICS", "MS\_CONSUMPTION", "MS\_NET\_ASSIST\_INVOCATION", "MS\_DYN\_POLICY\_INVOCATION", or "MS\_ACCESS\_ACTIVITY".

NOTE 6: The stage 2 Nnef\_AF\_Request\_for\_QoS API is defined by reusing the Nnef\_AFsessionWithQoS API together with the support of the "GMEC" feature.

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

### 4.4.2 Procedures for Monitoring

The procedures and provisions for event monitoring defined in clause 4.4.2 of 3GPP TS 29.122 [4] shall be applicable in 5GS with the following differences:

- description of the SCS/AS applies to the AF;

- description of the SCEF applies to the NEF;

- description of the HSS applies to the UDM, and the NEF shall interact with the UDM by using Nudm\_EventExposure service as defined in 3GPP TS 29.503 [17];

- description of the MME/SGSN applies to the AMF, the NEF shall resolve a location area to the involved AMF(s) either by local configuration or via the NRF and the NEF shall interact with the AMF by using the Namf\_EventExposure service as defined in 3GPP TS 29.518 [18];

- description about the PCRF is not applicable;

- description about the change of IMSI-IMEI(SV) association monitoring event apply to the change of SUPI-PEI association monitoring event;

- when the "monitoringType" sets to "LOCATION\_REPORTING" within the MonitoringEventSubscription data type as defined in clause 5.3.2.1.2 of 3GPP TS 29.122 [4] during the monitoring event subscription, only "CGI\_ECGI", "TA\_RA", "GEO\_AREA" and "CIVIC\_ADDR" within the Accuracy data type, as defined in clause 5.3.2.4.7 of 3GPP TS 29.122 [4], are applicable for 5G event monitoring using the MonitoringEvent API;

- after validation of the AF request, the NEF may determine a monitoring expiry time, based on operator policy and take into account the monitoring expire time if included in the request; and the NEF may provide an expiry time (determined by the NEF, UDM or AMF) to the AF even the AF does not provided before;

- if the "Loss\_of\_connectivity\_notification" feature as defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported, values 0-5 are not applicable for the lossOfConnectReason attribute within MonitoringEventReport data type, the lossOfConnectReason attribute shall be set to 6 if the UE is deregistered, 7 if the maximum detection timer expires, 8 if the UE is purged or 9 if the UE’s Unavailability Period Duration is available and the "Loss\_of\_connectivity\_notification\_5G" feature as defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported;

- the AF may include a periodic reporting time indicated by the "repPeriod" attribute within MonitoringEventSubscription data type, which is only applicable for the "Location\_notification", "Number\_of\_UEs\_in\_an\_area\_notification\_5G" and "NSAC" features in the NEF;

- if the "locationType" attribute sets to "LAST\_KNOWN\_LOCATION", the "maximumNumberOfReports" attribute shall set to 1 as a One-time Monitoring Request;

- description about the PDN connectivity status event apply to the PDU session status event, the description of the MME/SGSN applies to the SMF during the reporting of monitoring event procedure, the NEF receives the event notification via Nsmf\_EventExposure service as defined in 3GPP TS 29.508 [26];

- if the "Session\_Management\_Enhancement" feature as defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported, the "dnn"and/or "snssai" may be provided in MonitoringEventSubscription data type for monitoring type provided "PDN\_CONNECTIVITY\_STATUS" or " DOWNLINK\_DATA\_DELIVERY\_STATUS";

- when sending the UDM/AMF/SMF event report to the AF, the NEF may store the event data in the report in the UDR as part of the data for exposure as specified in 3GPP TS 29.519 [23] by using Nudr\_DataRepository service as specified in 3GPP TS 29.504 [20];

- if the "Downlink\_data\_delivery\_status\_5G" feature as defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported, in order to support the downlink data delivery status notification;

1) the AF shall send an HTTP POST message to the NEF to the resource "Monitoring Event Subscriptions" as defined in clause 5.3.3.2 of 3GPP TS 29.122 [4] for creating a subscription or send an HTTP PUT message to the NEF to the resource "Individual Monitoring Event Subscription" defined in clause 5.3.3.3 of 3GPP TS 29.122 [4] for updating the subscription as follows:

A) within the MonitoringEventSubscription data structure the AF may additionally include packet filter descriptor(s) within the "dddTraDescriptors" attribute and the list of monitoring downlink data delivery status event(s) within the "dddStati" attribute; and

B) the NEF shall subscribe the events to the appropriate UDM(s) within the network by invoking the Nudm\_EventExposure\_Subscribe service operation as defined in clause 5.5.2.2 of 3GPP TS 29.503 [17];

2) if the "Partial\_group\_modification" feature as defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported, in order to support partial cancellation or addition of certain UE(s) within the active group event subscription, the NEF shall map the "excludedExternalIds" and/or "excludedMsisdns" attributes to the "excludeGpsiList" attribute for the partial group cancellation, or shall map the "addedExternalIds" and/or "addedMsisdns" attributes to the "includeGpsiList" attribute within the Nudm\_EventExposure service; and

3) when the NEF receives the event notification as defined in clause 4.4.2 of 3GPP TS 29.508 [26], the NEF shall send an HTTP POST message to the AF as defined in clause 4.4.2.3 of 3GPP TS 29.122 [4] with the difference that within each MonitoringEventReport data structure, the NEF shall include:

A) the downlink data delivery status within the "dddStatus" attribute;

B) the downlink data descriptor impacted by the downlink data delivery status change within the "dddTraDescriptor" attribute;

C) the estimated buffering time within the "maxWaitTime" attribute if the downlink data delivery status is set to "BUFFERED"; and

D) if the "Availability\_after\_DDN\_failure\_notification\_enhancement" feature as defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported, the AF shall send an HTTP POST message to the NEF to the resource "Monitoring Event Subscriptions" as defined in clause 5.3.3.2 of 3GPP TS 29.122 [4] for creating an subscription or send an HTTP PUT message to the NEF to the resource "Individual Monitoring Event Subscription" as defined in clause 5.3.3.3 of 3GPP TS 29.122 [4] for updating the subscription with the difference that within the MonitoringEventSubscription data structure, the AF shall include packet filter descriptions within the "dddTraDescriptors" attribute;

- if the "eLCS" feature as defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported, the AF may send an HTTP POST message to the NEF to the resource "Monitoring Event Subscriptions" as defined in clause 5.3.3.2 of 3GPP TS 29.122 [4] for creating an subscription or send an HTTP PUT message to the NEF to the resource "Individual Monitoring Event Subscription" defined in clause 5.3.3.3 of 3GPP TS 29.122 [4] for updating the subscription as follows:

1) within the MonitoringEventSubscription data structure, the AF may additionally include location QoS requirement within the "locQoS" attribute, the service identifier within the "svcId" attribute, Location deferred requested event type within the "ldrType" attribute, the validity start time and the validity end time within the "locTimeWindow" attribute, the maximum age of location estimate within the "maxAgeOfLocEst" attribute, the requesting target UE velocity within the "velocityRequested" attribute, the linear distance within the "linearDistance" attribute, the reporting target UE location estimate indication within the "reportingLocEstInd" attribute, the sampling interval within the "samplingInterval" attribute, the maximum reporting expire interval within the "maxRptExpireIntvl" attribute, the supported GAD shapes within the "supportedGADShapes" attribute, the Code word within the "codeword" attribute, and other attributes as defined in clause 5.3.2.3.2 of 3GPP TS 29.122 [4] for location information subscription; The MonitoringEventSubscription data structure may also include the "locationArea5G" attribute containing only the "geographicAreas" attribute and the "accuracy" attribute set to the value "GEO\_AREA". The "accuracy" attribute and "locQoS" attribute are mutually exclusive. If the "MULTIQOS" feature is also supported, Multiple QoS Class is supported in the "lcsQosClass" attribute within the "locQoS" attribute for deferred MT-LR. If the "eLCS\_en" feature is also supported, the AF may include the "upLocRepIndAf" attribute to indicate whether or not location reporting over user plane is required, and may also include the "upLocRepAddrAf" attribute to convery the AF's addressing information for location reporting over user plane;

2) if the NEF identifies the location request precision higher than cell level location accuracy is required based on the "locQoS" attribute received, the NEF shall interact with the appropriate GMLC within the network by invoking the Ngmlc\_Location\_ProvideLocation service operation as defined in clause 6.1 of 3GPP TS 29.515 [35];

3) if the location request precision is lower than or equal to cell level, based on implementation, the NEF may interact with the GMLC by invoking the Ngmlc\_Location\_ProvideLocation service operation as defined in clause 6.1 of 3GPP TS 29.515 [35]; or retrieve the UE location privacy information from the UDM by using Nudm\_SDM service as described in clause 5.2 of 3GPP TS 29.503 [17] and if the privacy setting is verified, the NEF shall interact with the UDM for the serving AMF address by invoking the Nudm\_UECM service as described in clause 5.3 of 3GPP TS 29.503 [17]. After receiving the serving AMF address from the UDM, the NEF shall interact with the AMF by invoking the Namf\_EventExposure\_Subscribe service operation as defined in clause 5.3 of 3GPP TS 29.518 [18]; or may interact with UDM by using Nudm\_EventExposure service as defined in clause 5.5 of 3GPP TS 29.503 [17] and the NEF receives the location event notification from the AMF via Namf\_EventExposure service as defined in in clause 5.5 of 3GPP TS 29.518 [18]; and

4) based on the received AF information and local authorization policy, the NEF shall derive the LCS client type with a suitable enumeration value for the AF location request, to be provided as the "externalClientType" attribute when invoking the Ngmlc\_Location\_ProvideLocation service operation as defined in clause 6.1 of 3GPP TS 29.515 [35];

5) upon receipt of successful location response from the GMLC or the AMF or the UDM, the NEF shall create or update the "Individual Monitoring Event Subscription" resource and then send an HTTP POST or PUT response to the AF as defined in clause 4.4.2.2 of 3GPP TS 29.122 [4]. Upon receipt of the location Report from the GMLC or the AMF, the NEF shall determine the monitoring event subscription associated with the corresponding Monitoring Event Report as defined in clause 4.4.2.3 of 3GPP TS 29.122 [4]; and

6) in order to delete a previous active configured monitoring event subscription at the NEF, the AF shall send an HTTP DELETE message to the NEF to the resource "Individual Monitoring Event Subscription" which is received in the response to the request that has created the monitoring events subscription resource. The NEF shall interact with the GMLC or the AMF or the UDM to remove the request, upon receipt of the successful response from the GMLC or the AMF or the UDM, the NEF shall delete the active resource "Individual Monitoring Event Subscription" addressed by the URI and send an HTTP response to the AF with a "204 No Content" status code, or a "200 OK" status code including the monitoring event report if received;

- based on local regulations' requirements and operator policies, user consent management specified in Annex V of 3GPP TS 33.501 [6] may be required for EDGE applications to access the Nnef\_EventExposure API for UE's location retrieval. When it is the case and the NEF is used by the Edge Enabler Layer entities to access 3GPP 5GC services, the NEF acts as the consent enforcement entity, as specified in clause 5.1.3 of 3GPP TS 33.558 [56];

- when user consent management shall be carried out for EDGE applications, then:

1) if the AF (e.g. Edge Enabler Server) does not support the "UserConsentRevocation" feature or does not indicate its support for this feature in the HTTP POST request to create a new "Individual Monitoring Event Subscription" resource with the "monitoringType" attribute set to "LOCATION\_REPORTING", the NEF shall reject the request and respond to the AF with an HTTP "403 Forbidden" status code with the response body including a ProblemDetails data structure containing the "CONSENT\_REVOCATION\_NOT\_SUPPORTED" application error within the "cause" attribute;

2) if the AF indicates its support for the "UserConsentRevocation" feature in the HTTP POST request to create a new "Individual Monitoring Event Subscription" resource with the "monitoringType" attribute set to "LOCATION\_REPORTING", the NEF shall check user consent for the targeted UE(s) by retrieving the user consent subscription data via the Nudm\_SDM service API of the UDM as specified in clause 5.2.2.2.24 of 3GPP TS 29.503 [17], subscribe to user consent revocation notifications only for those UE(s) for which user consent is granted also using the Nudm\_SDM service API of the UDM and accept the request for the creation of the event monitoring subscription only for the UE(s) for which user consent is granted;

3) if user consent is not granted for all the targeted UE(s), the NEF shall reject the request and respond to the AF with an HTTP "403 Forbidden" status code with the response body including a ProblemDetails data structure including the "USER\_CONSENT\_NOT\_GRANTED" application error within the "cause" attribute;

4) the AF shall provide within the HTTP POST request to create a new event monitoring subscription the URI via which it desires to receive user consent revocation notifications within the "revocationNotifUri" attribute. The AF may update this URI in subsequent HTTP PUT/PATCH requests to update/modify the corresponding "Individual Monitoring Event Subscription" resource;

5) when becoming aware of user consent revocation for one or several UE(s), the NEF shall:

A) stop processing the data related to the concerned UE(s);

B) send a user consent revocation notification to the AF by sending an HTTP POST request with the request body including the ConsentRevocNotif data structure that shall contain the user consent revocation information (e.g. UE(s) for which user consent was revoked, etc.); and

C) remove the concerned UE(s) from the corresponding "Individual Monitoring Event Subscription" resource and from the related subscriptions at the GMLC, if any; and

D) unsubscribe from user consent revocation notifications for the concerned UE(s) at the UDM;

6) at the reception of the user consent revocation notification from the NEF, the AF shall take the necessary actions to stop processing the data related to the UE(s) for which user consent was revoked; and

7) if user consent is revoked for all the UE(s), the AF shall delete the corresponding "Individual Monitoring Event Subscription" resource as specified above in this clause;

- if the "NSAC" feature defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported, in order to support network slice status reporting:

1) the AF shall send an HTTP POST request to the NEF to the "Monitoring Event Subscriptions" resource to create a subscription, as defined in clause 5.3.3.2.3.4 of 3GPP TS 29.122 [4], or send an HTTP PUT message to the NEF to the "Individual Monitoring Event Subscription" resource to update an existing subscription defined in clause 5.3.3.3.3.2 of 3GPP TS 29.122 [4] as follows:

A) within the MonitoringEventSubscription data structure:

a) either the concerned network slice identified by the "snssai" attribute, in the case of a trusted AF, or the AF service identifier within the "afServiceId" attribute, in the case of an untrusted AF, shall be provided;

b) the value of the "monitoringType" attribute shall be set to either "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS";

c) the "maximumNumberOfReports" attribute set to a value of 1 shall be provided, if one-time reporting of the current network slice status information is requested;

d) if one-time reporting is not requested, either a targeted reporting threshold within the "tgtNsThreshold" attribute (if threshold-based reporting is requested) or a reporting periodicity within the "repPeriod" attribute (if periodic reporting is requested) shall be provided;

e) if periodic reporting or one-time reporting is requested, the "nsRepFormat" attribute shall be provided to indicate the requested reporting format (i.e. numerical or percentage); and

f) the "immediateRep" attribute shall be set to "true", if immediate reporting of the current network slice status information is requested or one-time reporting of the current network slice status information is requested;

2) the NEF shall then further interact with the concerned NSACF(s) to create or update the associated subscription(s) to notifications by invoking the Nnsacf\_SliceEventExposure\_Subscribe service operation as specified in 3GPP TS 29.536 [47];

3) if an AF service identifier was provided by the AF (case of an untrusted AF), the NEF shall translate it into the corresponding S-NSSAI prior to sending the request(s) to the NSACF(s);

NOTE 1: There can be a single or multiple NSACF(s) deployed in a network as specified in clause 5.15.11 of 3GPP TS 23.501 [3]. Whether the NEF needs to interact with one or multiple NSACF(s) to establish and manage network slice status reporting depends on the deployed NSAC architecture option (cf. clause 4.15.3.2.10 of 3GPP TS 23.502 [2] and clause 5.15.11 of 3GPP TS 23.501 [3]).

NOTE 2: If multiple NSACFs need to be contacted by the NEF to establish and manage network slice status reporting for the requested S-NSSAI, the NEF can set the event reporting type to periodic in its request to these NSACFs, irrespective of the requested reporting type by the AF (i.e. threshold based reporting or periodic reporting).

4) after receiving a successful response from the NSACF(s), the NEF shall:

A) for the HTTP POST request, respond to the AF as defined in clause 5.3.3.2.3.4 of 3GPP TS 29.122 [4] with either;

a) a "201 Created" status code and the response body containing the created "Individual Monitoring Event Subscription" resource within the MonitoringEventSubscription data structure. The NEF shall include the current network slice status information received from the NSACF within the "monitoringEventReport" attribute, if available and the "immediateRep" attribute was provided and set to "true" in the request; or

b) a "200 OK" status code and the response body containing the current network slice status information received from the NSACF within the "MonitoringEventReport" data structure, if it is a one-time reporting request with the "immediateRep" attribute set to "true";

B) for the HTTP PUT request, respond to the AF with a "200 OK" status code as defined in clause 5.3.3.3.3.2 of 3GPP TS 29.122 [4] and the response body including the MonitoringEventSubscription data structure containing a representation of the updated "Individual Monitoring Event Subscription" resource. The NEF shall include the current network slice status information received from the NSACF within the "monitoringEventReport" attribute, if available and the "immediateRep" attribute was provided and set to "true" in the request;

NOTE 3: When the "maximumNumberOfReports" attribute is provided and set to a value of 1 and the "immediateRep" attribute is provided and set to "true", the "Individual Monitoring Event Subscription" is immediately terminated after returning the current network slice status information in the HTTP POST response body.

NOTE 4: After sending a subscription creation request for network slice status reporting with a particular reporting format (e.g. percentage) for periodic reporting, an AF cannot send a subsequent subscription creation request for the same network slice with a different reporting format (e.g. numerical) for periodic reporting.

5) when the NEF receives event report(s) from the NSACF(s) as defined in 3GPP TS 29.536 [47], the NEF shall notify the AF via an HTTP POST message defined in clause 5.3.3A.2.3 of 3GPP TS 29.122 [4] as follows:

A) within the MonitoringEventReport data type of the MonitoringNotification data type:

a) the value of the "monitoringType" attribute shall be set to "NUM\_OF\_REGD\_UES" or "NUM\_OF\_ESTD\_PDU\_SESSIONS" (i.e. the same value received during the HTTP POST or PUT request that created or modified the subscription);

b) the AF service identifier to which the notification is related, within the "afServiceId" attribute, if it was provided by the AF in the related subscription request; and

c) the current network slice status information as the "nSStatusInfo" attribute shall be provided, wherein:

i) if the event reporting is threshold based (i.e. the "tgtNsThreshold" was provided within the MonitoringEventSubscription data type), the "nSStatusInfo" attribute shall contain a confirmation for reaching the targeted threshold value, i.e. by sending the current number of registered UEs, or if "eNSAC" feature is also supported, the current number of UEs with at least one PDU session/PDN connection, or the current number of established PDU Sessions, for the network slice identified by the "snssai" attribute provided during the subscription creation/update; and

ii) if the event reporting is periodical (i.e. the "repPeriod" was provided within the MonitoringEventSubscription data type), the "nSStatusInfo" attribute shall provide the current network slice status information, i.e. the current number of registered UEs, or if "eNSAC" feature is also supported, the current number of UEs with at least one PDU session/PDN connection, or the current number of established PDU Sessions for the network slice identified by the "snssai" attribute provided during the subscription creation/update;

NOTE 5: The handling of threshold-based notifications is described in clause 4.15.3.2.10 of 3GPP TS 23.502 [2].

NOTE 6: If the NEF interacts with multiple NSACFs for the requested S-NSSAI, the NEF performs the aggregation of the received network slice status reports from all these NSACFs and determines based on that whether a notification towards the subscribing AF needs to be sent or not (i.e. the reporting conditions to trigger a notification towards the AF are fulfilled or not).

and

6) in order to unsubscribe from network slice status reporting, the AF shall send an HTTP DELETE message to the NEF to the resource "Individual Monitoring Event Subscription" as defined in clause 5.3.3.3.3.5 of 3GPP TS 29.122 [4] to delete an existing network slice reporting subscription. Then the NEF shall interact with the NSACF to delete the associated subscription to notifications by invoking the Nnsacf\_SliceEventExposure\_Unsubscribe service operation as specified in 3GPP TS 29.536 [47];

- if the "enNB1\_5G" feature as defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported, the AF may require immediate reporting of the subscribed event(s) current available information with the "immediateRep" attribute set to "true", then if the NEF receives the current subscribed available event(s), shall include the "monitoringEventReport" attribute and/or "addnMonEventReports" attribute, if the "enNB" feature is supported, within the MonitoringEventSubscription data type in the subscription response;

- if the "UEId\_retrieval" feature defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported, in order to support AF specific UE ID retrieval:

1) the AF may request AF specific UE ID retrieval for an individual UE, by providing the UE's IP address in the "ueIpAddr" attribute or the UE's MAC address in the "ueMacAddr" attribute within the MonitoringEventSubscription data type;

2) the AF may also provide the DNN, within the "dnn" attribute, and/or the S-NSSAI, within the "snssai" attribute, in the MonitoringEventSubscription data type;

3) upon reception of the corresponding subscription request message from the AF, the NEF shall check whether the AF is authorized to perform this operation or not:

- if the AF's request for AF specific UE ID retrieval is not authorized, the NEF shall respond to the AF with a "403 Forbidden" status code with the response body including the ProblemDetails data structure containing the "cause" attribute set to the "REQUEST\_NOT\_AUTHORIZED" application error indicating AF authorisation failure; and

- if the AF request is for AF specific UE ID retrieval authorized by the NEF, then if the DNN and/or S-NSSAI information is not available in the request, the NEF shall determine the corresponding DNN and/or S-NSSAI information based on the received requesting AF Identifier, and if provided, the MTC Provider Information;

4) the NEF shall then interact with the BSF using the UE address and IP domain (if the UE IPv4 address is provided), DNN and/or S-NSSAI to retrieve the session binding information of the UE by invoking the Nbsf\_Management\_Discovery service operation as described in 3GPP TS 29.521 [9];

5) if the NEF receives an error response from the BSF, the NEF shall respond to the AF with a proper error status code. If the NEF received from the BSF an error response including a "ProblemDetails" data structure with the "cause" attribute indicating an application error, the NEF shall relay this error response to the AF with a corresponding application error. If no SUPI matching the provided UE information is returned by the BSF, the NEF shall respond to the AF with a "404 Not Found" status code with the response body including a ProblemDetails data structure containing the "cause" attribute set to the "UE\_NOT\_FOUND" application error to indicate that the requested UE address is not found;

6) upon success and a SUPI is returned by the BSF, the NEF shall then interact with the UDM to retrieve the AF specific UE Identifier using the received SUPI and at least one of the Application Port ID, MTC Provider Information or AF Identifier information by invoking Nudm\_SDM\_Get service as described in clause 5.2.2.2 of 3GPP TS 29.503 [17];

7) upon success, the UDM responds to the NEF with an AF specific UE Identifier represented as an External Identifier for the UE which is uniquely associated with the MTC provider Information and/or AF Identifier. The NEF shall then respond to the AF with the received information, i.e. the AF specific UE Identifier represented as an External Identifier that was received from the UDM;

8) if the NEF receives an error response from the UDM, the NEF shall respond to the AF with a proper error status code. If the NEF received from the UDM an error response including a "ProblemDetails" data structure with the "cause" attribute indicating an application error, the NEF shall relay this error response to the AF with a corresponding application error. If the UDM indicates that the requested UE Identifier is not available in the subscription data, the NEF shall respond to the AF with a "404 Not Found" error status code with the response body including a ProblemDetails data structure containing the "cause" attribute set to the "UE\_ID\_NOT\_AVAILABLE" application error to indicate that the AF specific UE ID is not available;

NOTE 7: The case where the UE's IP address provided by the AF to the NEF corresponds to an IP address that has been NATed (Network and Port Address Translation) is not supported in this release of the specification.

- if the "GMEC" feature defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported, in order to support group status change event reporting (e.g., the group member list is updated to add new group member(s) or remove existing group member(s)):

- the AF shall send an HTTP POST request to the NEF targeting the "Monitoring Event Subscriptions" collection resource defined in clause 5.3.3.2.3.4 of 3GPP TS 29.122 [4] to request the creation of a subscription with the the request body including the MonitoringEventSubscription data structure that shall contain:

- the external group identifier, to identify the targeted group (e.g. 5G VN group), within the "externalGroupId" attribute; and

- the "monitoringType" attribute (or the "addnMonTypes" attribute) set to "GROUP\_MEMBER\_LIST\_CHANGE" to indicate that the AF requests to be notified of the Group Members List changes event reporting;

- the AF may also update/modify an existing subscription to add group status change reporting event(s) to the list of monitored event(s) or update/modify its properties by sending and an HTTP PUT/PATCH request to the NEF targeting the corresponding "Individual Monitoring Event Subscription" resource, as defined in clause 5.3.3.3.3.2/5.3.3.3.3.3 of 3GPP TS 29.122 [4], including the above-mentioned attributes when relevant;

- the NEF shall then further interact with the UDM to create or update the associated subscription(s) to notifications by invoking the relevant service operations of the Nudm\_EventExposure API as specified in 3GPP TS 29.503 [17];

- upon reception of a successful response from the UDM, the NEF shall respond to the AF as defined in clause 5.3.3.2.3.4, 5.3.3.3.3.2 or 5.3.3.3.3.3 of 3GPP TS 29.122 [4];

- when the NEF receives group status change event report(s) via notification(s) from the UDM as defined in 3GPP TS 29.503 [17], the NEF shall in turn notify the AF by sending an HTTP POST request message as defined in clause 5.3.3A.2.3 of 3GPP TS 29.122 [4] as follows:

- within an array element of the "monitoringEventReports" attribute (encoded via the MonitoringEventReport data structure) of the MonitoringNotification data type:

- the "monitoringType" attribute shall be set to "GROUP\_MEMBER\_LIST\_CHANGE" (i.e., the same value received during the HTTP POST or PUT/PATCH request that created or updated/modified the subscription); and

- the information on the change(s) to the group members list shall be provided within the "groupMembListChanges" attribute;

and

- in order to unsubscribe from group status change event(s) reporting:

- if the AF subscribed to other monitoring event(s) in addition to the group status change event(s) reporting, the AF shall update/modify the corresponding subscription to remove the group status change event(s) reporting from the list of the subscribed monitoring event(s);

- if the AF subscribed only to group status change reporting event(s) or the AF desires to unsubscribe from all the monitoring event(s) that it has subscribed to via this monitoring event subscription, then:

- the AF shall send an HTTP DELETE request message to the NEF targeting the corresponding "Individual Monitoring Event Subscription" resource, as defined in clause 5.3.3.3.3.5 of 3GPP TS 29.122 [4], to request the deletion of the related existing "Individual Monitoring Event Subscription" resource;

- the NEF shall then interact with the UDM to request the deletion of the associated subscription(s) by invoking the relevant service operation of the Nudm\_EventExposure API as specified in 3GPP TS 29.503 [17]; and

- upon reception of a successful response from the UDM, the NEF shall delete the targeted subscription and respond to the AF as defined in clause 5.3.3.3.3.5 of 3GPP TS 29.122 [4];

and

- if the "AppDetection\_5G" feature defined in clause 5.3.4 of 3GPP TS 29.122 [4] is supported, in order to support AF request for Application traffic detection (Start/Stop) monitoring event notification, the AF shall send an HTTP POST request to the NEF targeting the "Monitoring Event Subscriptions" resource (defined in clause 5.3.3.2.3.4 of 3GPP TS 29.122 [4]) to request the creation of a subscription or send an HTTP PUT message to the NEF to the resource "Individual Monitoring Event Subscription" as defined in clause 5.3.3.3 of 3GPP TS 29.122 [4] for updating the subscription as follows:

1) targeting any UE application traffic associated with the S-NSSAI indicated by the "snssai" attribute and the DNN indicated by the "dnn" attribute for the application(s) identified by the "appIds" attribute in the MonitoringEventSubscription data type setting the monitoring type as "APPLICATION\_START" and "APPLICATION\_STOP";

2) upon reception of the corresponding subscription request message from the AF, the NEF shall check whether the AF is authorized to perform this operation or not:

- if the AF's request for Application detection is not authorized, the NEF shall respond to the AF with a "403 Forbidden" status code with the response body including the ProblemDetails data structure containing the "cause" attribute set to the "REQUEST\_NOT\_AUTHORIZED" application error indicating AF authorisation failure;

3) upon successful AF authorization, the NEF shall subscribe for the Application traffic detection (start/stop) event with the individual PCF(s) (locally configured at the NEF for the authorized DNN/S-NSSAI) using the Npcf\_EventExposure\_Subscribe service as described in clause 4.2.2.2 of 3GPP TS 29.523 [22]; and

4) when the NEF receives an event notification from the PCF via Npcf\_EventExposure service as described in clause 4.2.4 of 3GPP TS 29.523 [22] indicating that the subscribed event has been detected, then the NEF shall provide a notification by sending an HTTP POST message to the AF.

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

#### 4.4.9.3 Procedures for AF requested QoS for a target UE or group of UE(s) not identified by UE address(es)

When the "GMEC" feature is supported and the AF requested QoS is targeting a UE or group of UE(s) not identified by UE address(es) as defined in clause 4.15.6.14 of 3GPP TS 23.502 [2], the provisions and procedures of clause 4.4.9.2 shall apply with the following differences:

- Either the "gpsi" attribute or the "extGroupId" attribute shall be used to identify the target UE or group of UE(s) within the "Individual AS Session with Required QoS Subscription" resource representation.

- After the successful authorization of the request at the NEF, the NEF may further perform service specific authorization as defined in clause 4.15.6.10 of 3GPP TS 23.502 [2] and 3GPP TS 29.503 [63].

- At the reception of requests from the AF, the NEF shall either invoke the relevant TSCTSF service, as defined in 3GPP TS 29.565 [50], in order to fulfil the request, or when it determines to not invoke the TSCTSF, invoke the Nudr\_DataRepository service as defined in 3GPP TS 29.504 [20] and 3GPP TS 29.519 [23] to store the received AF requested QoS information for the target UE or group of UE(s) identified by the SUPI or Internal Group ID (derived respectively from the received GPSI or External Group ID) as Application Data in the UDR.

- No direct interactions between the NEF and the PCF shall take place.

- The NEF may receive notification(s) on the subscribed event(s) from the TSCTSF (in case the NEF decided to invoke the TSCTSF at the reception of the corresponding AF required QoS requests) or from the PCF (in case the NEF decided to not invoke the TSCTSF, but rather invoked the Nudr\_DataRepository service at the reception of the corresponding AF required QoS request). In the latter case, the PCF notifies the NEF on the subscribed event(s) using the Npcf\_PolicyAuthorization\_Notify service operation, as specified in 3GPP TS 29.514 [7].

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

#### 4.4.15.5 5G LAN parameter provisioning event notification

If the "GMEC" feature is supported and a previously subscribed AF shall be notified on 5G LAN parameters provisioning event(s) (e.g., when Network Parameters Configuration information is provisioned), the NEF shall initiate an HTTP POST request to the AF targeting the notification URI provided during the creation of the corresponding "Individual 5GLAN Parameters Provision Subscription" resource within the "notifUri" attribute.

Upon successful reception and processing of the HTTP POST request message, the AF shall acknowledge the successful reception of the notification by responding with an HTTP "204 No Content" status code.

On failure, the AF shall take proper error handling actions and respond to the AF with an appropriate error status code as specified in clause 5.7.4.

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

#### 4.4.37.1 General

The procedures described in the clauses below are used by an AF to interact with the 5GC for Group Parameters Provisioning, in order to carry out the following procedures:

- DNN and S-NSSAI specific Group Parameters Provisioning procedures (see clause 4.15.6.3e of 3GPP TS 23.502 [2]).

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

#### 4.4.37.2 Procedures for DNN and S-NSSAI specific Group Parameters Provisioning

This procedure is used by an AF to request the creation/update/deletion of a DNN and S-NSSAI specific Group Parameters Provisioning.

In order to request the creation of a DNN and S-NSSAI specific Group Parameters Provisioning:

- the AF shall trigger the Nnef\_GroupParametersProvisioning API by sending an HTTP POST request to the NEF targeting the "Group Parameters Provisionings" collection resource, with the request body including the GrpPpData data structure that shall contain:

- within the "afId" attribute, the identifier of the AF that is sending the request;

- within the "dnnSnssaiGrpData" attribute, the DNN and S-NSSAI specific Group parameters data that is to be provisioned; and

- within the "suppFeat" attribute, the features supported by the AF, if applicable (i.e., feature negociation needs to take place);

- the NEF shall then check whether the AF is authorized to perform this operation or not;

- if the AF is authorized:

- if the LADN Service Area is provided by the AF within the "dnnSnssaiGrpData" attribute (via the "ladnServArea" attribute) and in the form of a list of geographic area(s) or a list of civic address(es), the NEF shall translate this information into a list of TAI(s); and

- the NEF shall then trigger the Nudm\_ParameterProvision service API of the UDM to request the provisioning of the received DNN and S-NSSAI specific Group parameters data as specified in 3GPP TS 29.503 [17];

and

- upon reception of a successful response from the UDM as defined in 3GPP TS 29.503 [17] and successful processing of the request, the NEF shall respond to the AF with an HTTP "201 Created" status code including an HTTP "Location" header field containing the URI of the created resource, and the response body including a representation of the created "Individual Group Parameters Provisioning" resource within the GrpPpData data structure.

In order to request the update of an existing DNN and S-NSSAI specific Group Parameters Provisioning:

- the AF shall trigger the Nnef\_GroupParametersProvisioning API by sending to the NEF either:

- an HTTP PUT request targeting the corresponding "Individual Group Parameters Provisioning" resource with the request body including the GrpPpData data structure; or

- an HTTP PATCH request targeting the corresponding "Individual Group Parameters Provisioning" resource with the request body including the GrpPpDataPatch data structure;

- after authorizing the request, the NEF shall interact with the UDM via the the Nudm\_ParameterProvision service API to request the provisioning of the received updated DNN and S-NSSAI specific Group parameters provisioning data; and

- upon reception of a successful response from the UDM as defined in 3GPP TS 29.503 [17] and successful processing of the request, the NEF shall respond to the AF with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Group Parameters Provisioning" resource within the GrpPpData data structure; or

- an HTTP "204 No Content" status code.

In order to request the deletion of an existing DNN and S-NSSAI specific Group Parameters Provisioning:

- the AF shall trigger the Nnef\_GroupParametersProvisioning API by sending an HTTP DELETE request targeting the corresponding "Individual Group Parameters Provisioning" resource to the NEF; and

- upon success, the NEF shall respond to the AF with an HTTP "204 No Content" status code.

On failure or if the NEF receives an error response from the UDM, the NEF shall take proper error handling actions, as specified in clause 5.33.7, and respond to the AF with an appropriate error status code.

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

## 5.3 Reused APIs

This clause describes the northbound APIs which are applicable for both EPS and 5GS.

Table 5.3-1: Reused APIs applicable for both EPS and 5GS

|  |  |
| --- | --- |
| API Name | Differences |
| ResourceManagementOfBdt | - The following 5G-only features defined in clause 5.4.4 of 3GPP TS 29.122 [4] may be supported only by the NEF: "LocBdt\_5G", "Group\_Id", "BdtNotification\_5G", "AspId\_5G". |
| PfdManagement | - The following 5G-only features defined in clause 5.11.4 of 3GPP TS 29.122 [4] may be supported only by the NEF: "FailureLocation\_5G". |
| MonitoringEvent | - The following 5G-only features defined in clause 5.3.4 of 3GPP TS 29.122 [4] may be supported only by the NEF: "Number\_of\_UEs\_in\_an\_area\_notification\_5G", "Downlink\_data\_delivery\_status\_5G", "Availability\_after\_DDN\_failure\_notification\_enhancement", "eLCS", "eLCS\_en", "NSAC", "MULTIQOS", "EDGEAPP", "UEId\_retrieval", "Loss\_of\_connectivity\_notification\_5G", "GMEC", "enNB1\_5G", "AppDetection\_5G", "eNSAC", "QoSTiming\_5G", "ListUE\_5G" and "Ranging\_SL".  - For the "Pdn\_connectivity\_status" feature, APN is equivalent to DNN; the non-IP PDN type is equivalent to the unstructured PDU session type; and the enumeration InterfaceIndication value "PDN\_GATEWAY" stands for PDU session anchored in UPF in 5G. |
| DeviceTriggering |  |
| CpProvisioning | - The following 5G-only features defined in clause 5.10.4 of 3GPP TS 29.122 [4] may be supported only by the NEF: "ExpectedUMT\_5G", "ExpectedUmtTime\_5G", "ScheduledCommType\_5G", "UEId\_retrieval", "AppExpUeBehaviour". |
| ChargeableParty | - The following 5G-only features defined in clause 5.5.4 of 3GPP TS 29.122 [4] may be supported only by the NEF: "EthChgParty\_5G", "MacAddressRange\_5G", "ToSTC\_5G".  - The "LOSS\_OF\_BEARER", "RECOVERY\_OF\_BEARER" and "RELEASE\_OF\_BEARER" events do not apply for 5G. |
| AsSessionWithQoS | - The following 5G-only features defined in clause 5.14.4 of 3GPP TS 29.122 [4] may be supported only by the NEF: "EthAsSessionQoS\_5G", "QoSMonitoring\_5G", "PacketDelayFailureReport", "MacAddressRange\_5G", "AlternativeQoS\_5G", "TSC\_5G", "DisableUENotification\_5G", "ExposureToEAS", "AltQosWithIndParams\_5G", "EnEthAsSessionQoS\_5G", "enNB\_5G", "AltQoSProfilesSupportReport", "ExtQoS\_5G", "EnTSCAC", "L4S", "MultiMedia", "PowerSaving", "EnQoSMon", "PDUSetHandling", "RTLatency", "ToSTC\_5G", "QoSTiming\_5G" and "GMEC".  - The "LOSS\_OF\_BEARER", "RECOVERY\_OF\_BEARER" and "RELEASE\_OF\_BEARER" events do not apply for 5G. |
| MsisdnLessMoSms |  |
| NpConfiguration | - The following 5G-only features defined in clause 5.13.4 of 3GPP TS 29.122 [4] may be supported only by the NEF: "NpExpiry\_5G", "UEId\_retrieval". |
| NIDD |  |
| RacsParameterProvisioning |  |
| ECRControl | - The following 5G-only features defined in clause 5.12.4 of 3GPP TS 29.122 [4] may be supported only by the NEF: "ECR\_WB\_5G". |

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

#### 5.7.2.1 General

This clause specifies the application data model supported by the 5GLANParameterProvision API.

Table 5.7.2.1-1 specifies the data types defined for the 5GLANParameterProvision API.

Table 5.7.2.1-1: 5GLANParameterProvision API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| 5GLanParameters | 5.7.2.3.3 | Represents 5G LAN service related parameters that need to be provisioned. |  |
| 5GLanParametersPatch | 5.7.2.3.6 | Represents 5G LAN service related parameters that need to be modified. |  |
| 5GLanParametersProvision | 5.7.2.3.2 | Represents an individual 5G LAN parameters provision subscription resource. |  |
| 5GLanParametersProvisionPatch | 5.7.2.3.5 | Represents the 5G LAN parameters to request the modification of a subscription to provision parameters. |  |
| 5GLanParamProvNotif | 5.7.3.15 | Represents a 5G LAN Parameters Provisioning Event Notification. | GMEC |
| AaaUsage | 5.7.2.4.3 | Represents the usage of the DN-AAA server. |  |
| AcsParams | 5.7.3.12 | Represents ACS configuration parameters. | GMEC |
| AppDescriptor | 5.7.2.3.4 | Represents an operation system and the corresponding applications. |  |
| AppDescriptorRm | 5.7.2.3.7 | Represents the same as the AppDescriptor data type but with the "nullable: true" property. |  |
| CpParams | 5.7.3.9 | Represents Communication Pattern parameters. | GMEC |
| DnnSnssaiParams | 5.7.3.14 | Represents DNN and S-NSSAI specific group parameters. | GMEC |
| ECSAddrParams | 5.7.3.13 | Represents ECS address configuration parameters. | GMEC |
| LpiParams | 5.7.3.11 | Represents Location Privacy Indication parameters. | GMEC |
| NpConfigNotif | 5.7.3.16 | Represents a Network Parameters Configuration related notification. | GMEC |
| NpConfigParams | 5.7.3.10 | Represents Network Parameters Configuration information. | GMEC |
| MaxGrpDataRateInfo | 5.7.2.3.17 | Represents the Maximum Group Data Rate related information. | GMEC |

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

##### 5.7.2.3.3 Type: 5GLanParameters

This type represents the 5G LAN service related parameters need to be provisioned.

Table 5.7.2.3.3-1: Definition of type 5GLanParameters

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | | Applicability |
| exterGroupId | ExternalGroupId | M | 1 | Identifies an 5G Virtual Network Group. | |  |
| gpsis | map(Gpsi) | M | 1..N | Represents the list of 5G VN Group members, each member is identified by GPSI.  Any string value can be used as a key of the map. | |  |
| dnn | Dnn | M | 1 | DNN for the 5G VN group, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only. | |  |
| aaaIpv4Addr | Ipv4Addr | O | 1 | Identifies the DN-AAA server IPv4 address provided by AF, for the secondary authentication/authorization and/or UE IP address allocation by DN-AAA server. | |  |
| aaaIpv6Addr | Ipv6Addr | O | 1 | Identifies the DN-AAA server IPv6 address provided by AF, for the secondary authentication/authorization and/or UE IP address allocation by DN-AAA server. | |  |
| aaaUsgs | array(AaaUsage) | O | 1..N | Identifies the usage needs for secondary authentication/authorization and/or UE IP address allocation from the DN-AAA server. (NOTE 3) | |  |
| mtcProviderId | MtcProviderInformation | O | 0..1 | Indicates MTC provider information for 5G VN Group Configuration authorization. (NOTE 1) | |  |
| snssai | Snssai | M | 1 | S-NSSAI for the 5G VN group. | |  |
| sessionType | PduSessionType | M | 1 | PDU Session Type allowed for 5G VN group. | |  |
| sessionTypes | array(PduSessionType) | O | 1..N | If further PDU Session Types (in addition to the PDU Session Type indicated in the "sessionType" attribute) are allowed for the 5G VN group, they are provided in this attribute. (NOTE 2) | | multipleSessionTypes |
| appDesps | map(AppDescriptor) | M | 1..N | Describes the operation systems and the corresponding applications for each operation systems. The key of map is osId. | |  |
| vnGroupCommInd | boolean | O | 0..1 | Indicates whether the 5G VN group is associated with 5G VN group communication.  - "true" indicates that the 5G VN group is associated with 5G VN group communication.  - "false" indicates that the 5G VN group is not associated with 5G VN group communication.  - The default value when omitted is "false". | | GMEC |
| maxGrpDataRateInfo | MaxGrpDataRateInfo | O | 0..1 | Represents the Maximum Group Data Rate related information. | | GMEC |
| cpParams | CpParams | O | 0..1 | Contains Communication Pattern Parameters for the 5G VN group. | GMEC | |
| npConfigParams | NpConfigParams | O | 0..1 | Contains Network Parameters Configuration information for the 5G VN group. | GMEC | |
| lpiParams | LpiParams | O | 0..1 | Contains Location Privacy Indication parameters for the 5G VN group. | GMEC | |
| acsParams | AcsParams | O | 0..1 | Contains ACS configuration parameters for the 5G VN group. | GMEC | |
| ecsAddrParams | ECSAddrParams | O | 0..1 | Contains ECS address configuration parameters for the 5G VN group. | GMEC | |
| dnnSnssaiParams | DnnSnssaiParams | O | 0..1 | Contains DNN and S-NSSAI specific group parameters for the 5G VN group. | GMEC | |
| notifUri | Link | O | 0..1 | Contains a URI indicating the notification destination where notification requests shall be delivered.  This attribute may be present only when 5G LAN Parameters Provisioning Event notifications (e.g., Network Parameters Configuration related notifications) need to be delivered. | GMEC | |
| requestTestNotification | boolean | O | 0..1 | Set to "true" by the AF to request the NEF to send a test notification as defined in clause 5.2.5.3 of 3GPP TS 29.122 [4]. Set to "false" or omitted otherwise.  This attribute may be present only when 5G LAN Parameters Provisioning Event notifications (e.g., Network Parameter Configuration related notifications) need to be delivered. | GMEC, Notification\_test\_event | |
| websockNotifConfig | WebsockNotifConfig | O | 0..1 | Contains configuration parameters to set up notification delivery over Websocket protocol as defined in clause 5.2.5.4 of 3GPP TS 29.122 [4].  This attribute may be present only when 5G LAN Parameters Provisioning Event notifications (e.g., Network Parameter Configuration related notifications) need to be delivered. | GMEC, Notification\_websocket | |
| NOTE 1: The NEF should check received MTC Provider information and then the NEF may:  - override it with local configured value and send it to UDM;  - send it directly to the UDM; or  - reject the 5G VN Group Configuration request.  NOTE 2: Only one PDU Session type is applied for a PDU Session of a VN group at a time.  NOTE 3: This attribute shall contain at most 2 array elements. It is however kept defined as it is (i.e. with a cardinality of "1..N") for backward compatibility considerations. | | | | | | |

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

### 5.7.3 Used Features

The table below defines the features applicable to the 5GLANParameterProvision API. Those features are negotiated as described in clause 5.2.7 of 3GPP TS 29.122 [4].

Table 5.7.3-1: Features used by 5GLANParameterProvision API

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | multipleSessionTypes | Indicates that multiple allowed PDU Session Types can be provided for a 5G VN group. |
| 2 | GMEC | This feature indicates the support of Generic Group Management, Exposure and Communication Enhancements.  The following functionalities are supported:  - Support the provisioning of the Maximum Group Data Rate related information for 5G VN groups.  - Support the simultaneous provisioning of 5G VN group information and 5G VN group parameters.  - Support the provisioning of the indication on whether the 5G VN group is associated with 5G VN group communications or not. |
| 3 | Notification\_test\_event | The testing of notification connection is supported as described in 3GPP TS 29.122 [4]. |
| 4 | Notification\_websocket | The delivery of notifications over Websocket is supported as described in 3GPP TS 29.122 [4].  This feature requires that the "Notification\_test\_event" feature is also supported. |

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

### 5.33.1 Introduction

The Nnef\_ParameterProvision service shall use the GroupParametersProvisioning API for:

- DNN and S-NSSAI specific Group Parameters provisioning.

The API URI of the GroupParametersProvisioning API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 5.2.4 of 3GPP TS 29.122 [4], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- "apiRoot" is set as defined in clause 5.2.4 of 3GPP TS 29.122 [4].

- "apiName" shall be set to "3gpp-grp-pp".

- "apiVersion" shall be set to "v1" for the current version defined in the present document.

- The <apiSpecificSuffixes> shall be set as described in clause 5.2.4 of 3GPP TS 29.122 [4].

All resource URIs in the clauses below are defined relative to the above API URI.

NOTE: When 3GPP TS 29.122 [4] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 5.33, the NEF takes the role of the SCEF and the service consumer (i.e., AF) takes the role of the SCS/AS.

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

###### 5.33.2.2.3.1 GET

This method enables an AF to request to retrieve all the active "Group Parameters Provisionings" resources managed by the NEF.

This method shall support the URI query parameters specified in table 5.33.2.2.3.1-1.

Table 5.33.2.2.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 5.33.2.2.3.1-2 and the response data structures and response codes specified in table 5.33.2.2.3.1-3.

Table 5.33.2.2.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 5.33.2.2.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| array(GrpPpData) | M | 0..N | 200 OK | Successful case. All the "Individual Group Parameters Provisioning" resources managed by the NEF are returned.  If there are no existing "Individual Group Parameters Provisioning" resources managed at the NEF, an empty array is returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] shall also apply. | | | | | |

Table 5.33.2.2.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative NEF. |

Table 5.33.2.2.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative NEF. |

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

###### 5.33.2.2.3.2 POST

This method enables an AF to request the creation of a new Group Parameters Provisioning at the NEF.

This method shall support the URI query parameters specified in table 5.33.2.2.3.2-1.

Table 5.33.2.2.3.2-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 5.33.2.2.3.2-2 and the response data structures and response codes specified in table 5.33.2.2.3.2-3.

Table 5.33.2.2.3.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| GrpPpData | M | 1 | Contains the representation of the Group Parameters Provisioning to be created at the NEF. |

Table 5.33.2.2.3.2-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| GrpPpData | M | 1 | 201 Created | Successful case. A representation of the created "Individual Group Parameters Provisioning" resource is returned in the response body.  The URI of the created resource shall be returned in an HTTP "Location" header. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] shall also apply. | | | | |

Table 5.33.2.2.3.2-4: Headers supported by the 201 response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/3gpp-grp-pp/<apiVersion>/pp/{ppId} |

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

###### 5.33.2.3.3.1 GET

This method enables an AF to request to retrieve an existing "Individual Group Parameters Provisioning" resource at the NEF.

This method shall support the URI query parameters specified in table 5.33.2.3.3.1-1.

Table 5.33.2.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 5.33.2.3.3.1-2 and the response data structures and response codes specified in table 5.33.2.3.3.1-3.

Table 5.33.2.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 5.33.2.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| GrpPpData | M | 1 | 200 OK | Successful case. The requested "Individual Group Parameters Provisioning" resource is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] shall also apply. | | | | |

Table 5.33.2.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative NEF. |

Table 5.33.2.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative NEF. |

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

###### 5.33.2.3.3.2 PUT

This method enables an AF to request the update of an existing "Individual Group Parameters Provisioning" resource at the NEF.

This method shall support the URI query parameters specified in table 5.33.2.3.3.2-1.

Table 5.33.2.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 5.33.2.3.3.2-2 and the response data structures and response codes specified in table 5.33.2.3.3.2-3.

Table 5.33.2.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| GrpPpData | M | 1 | Represents the updated "Individual Group Parameters Provisioning" resource representation. |

Table 5.33.2.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description | |
| GrpPpData | M | 1 | 200 OK | Successful response. The "Individual Group Parameters Provisioning" resource is successfully updated and a representation of the updated resource is returned in the response body. | |
| n/a |  |  | 204 No Content | Successful response. The "Individual Group Parameters Provisioning" resource is successfully updated and no content is returned in the response body. | |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. | |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. | |
| NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [4] shall also apply. | | | | |

Table 5.33.2.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NEF. |

Table 5.33.2.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NEF. |

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

###### 5.33.2.3.3.3 PATCH

This method enables an AF to request the modification of an existing "Individual Group Parameters Provisioning" resource at the NEF.

This method shall support the URI query parameters specified in table 5.33.2.3.3.3-1.

Table 5.33.2.3.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 5.33.2.3.3.3-2 and the response data structures and response codes specified in table 5.33.2.3.3.3-3.

Table 5.33.2.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| GrpPpDataPatch | M | 1 | Represents the requested modifications to the "Individual Group Parameters Provisioning" resource. |

Table 5.33.2.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description | |
| GrpPpData | M | 1 | 200 OK | Successful response. The "Individual Group Parameters Provisioning" resource is successfully modified and a representation of the updated resource is returned in the response body. | |
| n/a |  |  | 204 No Content | Successful response. The "Individual Group Parameters Provisioning" resource is successfully modified and no content is returned in the response body. | |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. | |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. | |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in Table 5.2.6-1 of 3GPP TS 29.122 [4] shall also apply. | | | | |

Table 5.33.2.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NEF. |

Table 5.33.2.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NEF. |

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

###### 5.33.2.3.3.4 DELETE

This method enables an AF to request the deletion of an existing "Individual Group Parameters Provisioning" resource at the NEF.

This method shall support the URI query parameters specified in table 5.33.2.3.3.4-1.

Table 5.33.2.3.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 5.33.2.3.3.4-2 and the response data structures and response codes specified in table 5.33.2.3.3.4-3.

Table 5.33.2.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 5.33.2.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual Group Parameters Provisioning" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI of the resource located in an alternative NEF.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] shall also apply. | | | | |

Table 5.33.2.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative NEF. |

Table 5.33.2.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI of the resource located in an alternative NEF. |

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

#### 5.33.5.1 General

This clause specifies the application data model supported by the GroupParametersProvisioning API. Table 5.33.5.1-1 specifies the data types defined for the GroupParametersProvisioning API.

Table 5.33.5.1-1: GroupParametersProvisioning API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| AfReqDefaultQoS | 5.33.5.2.5 | Represents the AF requested default QoS. |  |
| DnnSnssaiGrpData | 5.33.5.2.4 | Represents DNN and S-NSSAI specific Group Parameters data. |  |
| GrpPpData | 5.33.5.2.2 | Represents Group Parameters Provisioning data. |  |
| GrpPpDataPatch | 5.33.5.2.3 | Represents the requested modification to an existing Group Parameters Provisioning data. |  |
| LadnServArea | 5.33.5.2.6 | Represents an LADN Service Area. |  |

Table 5.33.5.1-2 specifies data types re-used by the GroupParametersProvisioning API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the GroupParametersProvisioning API.

Table 5.33.5.1-2: GroupParametersProvisioning API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| 5Qi | 3GPP TS 29.571 [8] | Represents a 5G QoS Identifier. |  |
| 5QiPriorityLevelRm | 3GPP TS 29.571 [8] | Represents the 5QI Priority Level. |  |
| Arp | 3GPP TS 29.571 [8] | Represents an ARP. |  |
| BitRate | 3GPP TS 29.571 [8] | Represents a bit rate. |  |
| BitRateRm | 3GPP TS 29.571 [8] | This data type is defined in the same way as the BitRate data type, but with the OpenAPI "nullable: true" property. |  |
| CivicAddress | 3GPP TS 29.572 [34] | Represents a civic address. |  |
| Dnn | 3GPP TS 29.571 [8] | Represents a DNN. |  |
| ExternalGroupId | 3GPP TS 29.122 [4] | Represents the External Group Identifier for a user group. |  |
| GeographicArea | 3GPP TS 29.572 [34] | Represents a geographical area. |  |
| MtcProviderInformation | 3GPP TS 29.571 [8] | Represents the MTC provider information. |  |
| Snssai | 3GPP TS 29.571 [8] | Represents an S-NSSAI. |  |
| SupportedFeatures | 3GPP TS 29.571 [8] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| Tai | 3GPP TS 29.571 [8] | Represents a Tracking Area Identifier. |  |

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

##### 5.33.5.2.2 Type: GrpPpData

Table 5.33.5.2.2-1: Definition of type GrpPpData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| afId | string | M | 1 | Contains the identifier of the AF that is sending the request. |  |
| mtcProviderId | MtcProviderInformation | O | 0..1 | Contains the identifier of the MTC Service Provider and/or MTC Application. |  |
| dnnSnssaiGrpData | DnnSnssaiGrpData | C | 0..1 | Contains the DNN and S-NSSAI specific Group data that the AF requests to provision.  This attribute shall be present only when the AF requests to provision DNN and S-NSSAI specific Group parameters. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 5.33.6.  This attribute shall be present only when feature negotiation needs to take place. |  |

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

##### 5.33.5.2.3 Type: GrpPpDataPatch

Table 5.33.5.2.3-1: Definition of type GrpPpDataPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| dnnSnssaiGrpData | DnnSnssaiGrpData | O | 0..1 | Contains the updated DNN and S-NSSAI specific Group data that the AF requests to provision. |  |

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

##### 5.33.5.2.6 Type: LadnServArea

Table 5.33.5.2.6-1: Definition of type LadnServArea

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| geographicAreas | array(GeographicArea) | C | 1..N | Represents the LADN Service Area in the form of a list of geographic area(s).  (NOTE) |  |
| civicAddresses | array(CivicAddress) | C | 1..N | Represents the LADN Service Area in the form of a list of civic addresse(s).  (NOTE) |  |
| tais | array(Tai) | C | 1..N | Represents the LADN Service Area in the form of a list of Tracking Area Identifier(s).  (NOTE) |  |
| NOTE: These attributes are mutually exclusive. Either one of them shall be present. | | | | | |

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

#### 5.33.5.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

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

#### 5.33.7.1 General

For the GroupParametersProvisioning API, HTTP error responses shall be supported as specified in clause 5.2.6 of 3GPP TS 29.122 [4]. Protocol errors and application errors specified in clause 5.2.6 of 3GPP TS 29.122 [4] shall be supported for the HTTP status codes specified in table 5.2.6-1 of 3GPP TS 29.122 [4].

In addition, the requirements in the following clauses are applicable for the GroupParametersProvisioning API.

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

#### 5.33.7.3 Application Errors

The application errors defined for the GroupParametersProvisioning API are listed in table 5.33.7.3-1.

Table 5.33.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| **Application Error** | **HTTP status code** | **Description** | **Applicability** |
|  |  |  |  |

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

# A.31 GroupParametersProvisioning API

openapi: 3.0.0

info:

title: 3gpp-grp-pp

version: 1.0.0-alpha.2

description: |

API for Group Parameters Provisioning.

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externalDocs:

description: >

3GPP TS 29.522 V18.5.0; 5G System; Network Exposure Function Northbound APIs.

url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.522/'

servers:

- url: '{apiRoot}/3gpp-grp-pp/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122.

security:

- {}

- oAuth2ClientCredentials: []

paths:

/pp:

get:

summary: Request to retrieve all the active Group Parameters Provisioning resources at the NEF.

operationId: GetGrpParamsProvisionings

tags:

- Group Parameters Provisionings (Collection)

responses:

'200':

description: >

OK. All the Individual Group Parameters Provisioning resources managed by the NEF are

returned.

If there are no existing Individual Group Parameters Provisioning resources managed at

the NEF, an empty array is returned..

content:

application/json:

schema:

type: array

items:

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

minItems: 0

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

post:

summary: Request the creation of a new Group Parameters Provisioning.

tags:

- Group Parameters Provisioning (Collection)

operationId: CreateGrpParamsProvisioning

requestBody:

description: >

Representation of the new Group Parameters Provisioning to be created at the NEF.

required: true

content:

application/json:

schema:

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

responses:

'201':

description: >

Created. A representation of the created Individual Group Parameters Provisioning

resource is returned in the response body.

content:

application/json:

schema:

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

headers:

Location:

description: >

Contains the URI of the newly created resource, according to the structure

{apiRoot}/3gpp-grp-pp/v1/pp/{ppId}

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/pp/{ppId}:

parameters:

- name: ppId

in: path

description: >

Represents the identifier of the Individual Group Parameters Provisioning resource.

required: true

schema:

type: string

get:

summary: Request to retrieve an existing Individual Group Parameters Provisioning resource.

operationId: GetIndGrpParamsProvisioning

tags:

- Individual Group Parameters Provisioning (Document)

responses:

'200':

description: >

OK. Successful retrieval of the requested Individual Group Parameters Provisioning.

resource.

content:

application/json:

schema:

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

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual Group Parameters Provisioning resource.

tags:

- Individual Group Parameters Provisioning (Document)

operationId: UpdateIndGrpParamsProvisioning

requestBody:

description: >

Represents the updated Individual Group Parameters Provisioning resource representation.

required: true

content:

application/json:

schema:

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

responses:

'200':

description: >

OK. The Individual Group Parameters Provisioning resource is successfully updated and a

representation of the updated resource is returned in the response body.

content:

application/json:

schema:

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

'204':

description: >

No Content. The Individual Group Parameters Provisioning resource is successfully

updated and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual Group Parameters Provisioning resource.

tags:

- Individual Group Parameters Provisioning (Document)

operationId: ModifyIndGrpParamsProvisioning

requestBody:

description: >

Contains the parameters to request the modification of the Individual Group Parameters

Provisioning resource.

required: true

content:

application/merge-patch+json:

schema:

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

responses:

'200':

description: >

OK. The Individual Group Parameters Provisioning resource is successfully modified and a

representation of the updated resource is returned in the response body.

content:

application/json:

schema:

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

'204':

description: >

No Content. The Individual Group Parameters Provisioning resource is successfully

modified and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual Group Parameters Provisioning resource.

tags:

- Individual Group Parameters Provisioning (Document)

operationId: DeleteIndGrpParamsProvisioning

responses:

'204':

description: >

No Content. The Individual Group Parameters Provisioning resource is successfully

deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

GrpPpData:

description: Represents the Group Parameters Provisioning data.

type: object

properties:

afId:

type: string

mtcProviderId:

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

dnnSnssaiGrpData:

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

suppFeat:

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

required:

- afId

GrpPpDataPatch:

description: >

Represents the requested modifications to an existing Group Parameters Provisioning data.

type: object

properties:

dnnSnssaiGrpData:

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

DnnSnssaiGrpData:

description: Represents DNN and S-NSSAI specific Group Parameters data.

type: object

properties:

extGroupId:

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

dnn:

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

snssai:

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

defQos:

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

ladnServArea:

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

required:

- extGroupId

- dnn

- snssai

anyOf:

- required: [ defQos ]

- required: [ ladnServArea ]

AfReqDefaultQoS:

description: Represents the AF requested default QoS.

type: object

properties:

5qi:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/5Qi'

arp:

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

priorityLevel:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/5QiPriorityLevelRm'

required:

- 5qi

- arp

LadnServArea:

description: Represents an LADN Service Area.

type: object

properties:

geographicAreas:

type: array

items:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

minItems: 1

civicAddresses:

type: array

items:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/CivicAddress'

minItems: 1

tais:

type: array

items:

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

minItems: 1

oneOf:

- required: [ geographicAreas ]

- required: [ civicAddresses ]

- required: [ tais ]

#

# SIMPLE DATA TYPES

#

#

# ENUMERATIONS

#

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