**3GPP TSG-CT WG3 Meeting #112e C3-205316**

**E-Meeting, 4th – 13th November 2020 (Revision of C3-20xxxx)**

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **29.122** | **CR** | **0317** | **rev** | **-** | **Current version:** | **15.8.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |
| --- |
|  |
| ***Title:***  | Corrections to support 405 error status code |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | NAPS-CT |  | ***Date:*** | 2020-10-10 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** |  Rel-15 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | "OPERATION\_PROHIBITED" described as HTTP PUT/DELETE method not allowed while indicated as 403 Forbidden, does not align with RFC 7231 403 definition of refusing authorization.Instead 405 Method Not Allowed shall be specified according to RFC 7231 definition and TS 29.500 allowed 405 Method Not Allowed as service specific. |
|  |  |
| ***Summary of change:*** | In the clauses describing "OPERATION\_PROHIBITED", adding 403 Forbidden to be 405 Method Not Allowed, and adding 405 Method Not Allowed error codes in subclause 5.6.2, A.2, A.3 and A.6.. |
|  |  |
| ***Consequences if not approved:*** | Sending wrong error code to SCS/AS not follow the mandatory HTTP requirement defined in this specification, causing wrong procedure fulfilment and SCS/AS judgement. |
|  |  |
| ***Clauses affected:*** | 4.4.2.2.4.1, 4.4.5.3.2, 5.2.6, 5.3.3.3.3.2, 5.3.5.3, A.2, A.3, A.6 |
|  |  |
|  | **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 backward compatible corrections into the OpenAPI files applicable to Data Types applicable to several APIs, MonitoringEvent API and NIDD API. |
|  |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**Proposed changes:**

\*\*\* 1st Change \*\*\*

###### 4.4.2.2.4.1 General

The following monitoring events: the location reporting event and communication failure event are applicable for the monitoring event configuration via PCRF for an individual UE.

If monitoring event configuration via PCRF is used for a subscription resource, the Subscription\_modification feature cannot be supported.

Only the location reporting event is applicabe for the monitoring event configuration via PCRF for a group of UEs.

Only one-time reporting is supported for the monitoring event configuration via PCRF.

HTTP PUT is not supported for the monitoring event configuration via PCRF. If it is received, the SCEF shall reject the HTTP PUT message with 405 Method Not Allowed or 403 Forbidden during monitoring and may indicate the "OPERATION\_PROHIBITED" error in the "cause" attribute of the "ProblemDetails" structure.

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

##### 4.4.5.3.2 Mobile Terminated NIDD for a group of UEs

If the SCS/AS needs to perform a downlink non-IP data delivery to a group of UEs and if both the SCS/AS and the SCEF support GroupMesageDelivery feature as defined in sublcause 5.6.4, the SCS/AS shall send an HTTP POST request message to the SCEF for the "NIDD downlink data deliveries" resource, identifying an existing NIDD configuration resource as parent resource. The body of the HTTP POST request message shall include the External Group Identifier and the non-IP data, and may include Reliable Data Service Configuration, PDN Connection Establishment Option and Maximum Latency.

Upon receipt of such an HTTP POST request from the SCS/AS requesting the group message delivery, the SCEF checks whether the SCS/AS is authorised to send NIDD requests and whether the non-IP packet size is larger than the Maximum Packet Size that was provided to the SCS/AS during NIDD Configuration. If any of those checks fails, the SCEF shall respond a HTTP response with a cause value indicating the reason for the failure condition. If all checks are successful, the SCEF shall create an "Individual NIDD downlink data delivery" resource and sends a 201 Created response to the SCS/AS to acknowledge acceptance of the HTTP POST request.

Then for each authorized External Identifier associated to the External Group Identifier which is retrieved from the HSS during preceding NIDD configuration procedure (as specified in subclause 4.4.5.2.2), the SCEF shall determine the EPS Bearer Context based on the APN associated with the NIDD configuration and the User Identity and continue the procedure as described for MT NIDD for a single UE in subclause 4.4.5.3.1 without sending downlink data delivery status notification for any individual UE to the SCS/AS.

At the end of buffering (duration determined by the Maximum Latency or local policy) or after processing data delivery for all UEs in the group, the SCEF shall send an HTTP POST message to SCS/AS to indicate the aggregated result of data delivery of each UE. The body of the HTTP POST request message shall include MSISDN or External Identifier, Retransmission Time (optional) and delivery result for each UE. Upon receipt of the request, the SCS/AS shall acknowledge the request with an HTTP 200 OK or 204 No Content response.

The MT\_NIDD\_modification\_cancellation feature is not supported for the group message delivery via NIDD. If a PUT or DELETE request is received for the "Individual NIDD downlink data delivery" resource which was created for a group of UEs, the SCEF shall reject the message with 405 Method Not Allowed or 403 Forbidden response with a cause value "OPERATION\_PROHIBITED" in the "cause" attribute of the "ProblemDetails" structure.

During MT NIDD delivery, if the UE indicates no support for RDS and the SCEF previously indicated RDS is enabled to the SCS/AS, the SCEF shall stop sending the non-IP data for the indicated UE. In the aggregated MT NIDD delivery notification, the SCEF shall send "FAILURE\_RDS\_DISABLED" delivery status for each failed UE.

\*\*\* 3rd Change \*\*\*

### 5.2.6 Error handling

Table 5.2.6-1 lists response bodies that are applicable to all APIs and as responses for all requests in the present specification unless otherwise specified. The HTTP client shall mandatorily support the processing of the status code for all the applicable methods, when received in a HTTP response message. In such cases the HTTP client shall also support the handling of the "ProblemDetails" JSON object with the Content-Type header field set to the value "application/problem+json", if the corresponding API definition in the current specification does not specify another response body for the corresponding status code.

Table 5.2.6-1: Response bodies supported for responses to all requests.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Response body | Data type | Cardinality | ResponseCodes(NOTE 1) | Remarks(NOTE 2, NOTE 4) | Applied Methods |
| ProblemDetails | 1 | 400 Bad Request | Incorrect parameters were passed in the request.  | GET, POST PUT, PATCH, DELETE |
| ProblemDetails | 1 | 401 Unauthorized | The client is not authorized as described in IETF RFC 7235 [21]. | GET, POST, PUT, PATCH, DELETE |
| ProblemDetails | 1 | 403 Forbidden | This represents the case when the server is able to understand the request but unable to fulfil the request due to errors (e.g. the requested parameters are out of range). More information may be provided in the "invalidParams" attribute of the "ProblemDetails" structure.(NOTE 3) | GET, POST, PUT, PATCH, DELETE |
| ProblemDetails | 1 | 404 Not Found | The resource URI was incorrect, for instance because of a wrong "scsAsId" field. | GET, POST, PUT, PATCH, DELETE |
| ProblemDetails | 1 | 405 Method Not Allowed | The code indicates that the method received in the request-line is known by the server but not supported by the target resource. | PUT, DELETE |
| ProblemDetails | 1 | 406 Not Acceptable | The content format provided in the "Accept" header is not acceptable by the server. | GET |
| ProblemDetails | 1 | 411 Length Required | The code indicates that the server refuses to accept the request without a Content-Length header field. | POST, PUT, PATCH |
| ProblemDetails | 1 | 413 Payload Too Large | If the received HTTP request contains payload body larger than the server is able to process, the NF shall reject the HTTP request with the HTTP status code "413 Payload Too Large". | POST, PUT, PATCH |
| ProblemDetails | 1 | 415 Unsupported Media Type | The code indicates that the resource is in a format which is not supported by the server for the method. | POST, PUT, PATCH |
| ProblemDetails | 1 | 429 Too Many Requests | The code indicates that due to excessive traffic which, if continued over time, may lead to (or may increase) an overload situation.The HTTP header field "Retry-After" may be added in the response to indicate how long the client has to wait before making a new request. | GET, POST, PUT, PATCH, DELETE |
| ProblemDetails | 1 | 500 Internal Server Error  | The server encountered an unexpected condition that prevented it from fulfilling the request. | GET, POST, PUT, PATCH, DELETE |
| ProblemDetails | 1 | 503 Service Unavailable  | The server is unable to handle the request. | GET, POST, PUT, PATCH, DELETE |
| NOTE 1: In addition to the above response codes, the SCEF can also send other valid HTTP response codes, if applicable. The list of all valid HTTP response codes can be found in HTTP Status Code Registry at IANA [6].NOTE 2: The MIME media type that shall be used within the related Content-Type header field is "application/problem+json", as defined in IETF RFC 7807 [8].NOTE 3: The information about which provided parameters are out of range shall be provided in the "invalidParams" attribute of the "ProblemDetails" structure for the API of network parameter configuration.NOTE 4: More information may be provided in the "detail" attribute of the "ProblemDetails" structure. |

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

###### 5.3.3.3.3.2 PUT

The PUT method modifies an existing subscription resource to update the subscription. The SCS/AS shall initiate the HTTP PUT request message and the SCEF shall respond to the message.

This method shall support the URI query parameters, request and response data structures, and response codes, as specified in the table 5.3.3.3.3.2-1 and table 5.3.3.3.3.2-2.

Table 5.3.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Data type | Cardinality | Remarks |
| none specified |  |  |  |

Table 5.3.3.3.3.2-2: Data structures supported by the PUT request/response by the resource

|  |  |  |  |
| --- | --- | --- | --- |
| Request body | Data type | Cardinality | Remarks |
| MonitoringEventSubscription | 1 | Parameters to update a subscription to notifications about monitoring event with the SCEF. |
| Response body | Data type | Cardinality | Responsecodes | Remarks |
| MonitoringEventSubscription | 1 | 200 OK | The subscription was updated successfully.  |
| ProblemDetails | 1 | 403 Forbidden or 405 Method Not Allowed | The subscription resource is not allowed to be updated since the HTTP method is not supported.(NOTE 2, NOTE 3) |
| NOTE 1: The mandatory HTTP error status codes for the PUT method listed in table 5.2.6-1 also apply.NOTE 2: The error case is only applicable for monitoring event configuration via PCRF.NOTE 3: The "cause" attribute within the "ProblemDetails" data structure may be set to "OPERATION\_PROHIBITED" as defined in subclause 5.3.5.3. |

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

#### 5.3.5.3 Application Errors

The application errors defined for MonitoringEvent API are listed in table 5.3.5.3-1. The SCEF shall include in the HTTP status code a “ProblemDetails” data structure with the “cause” attribute indicating the application error as listed in table 5.3.5.3-1.

Table 5.3.5.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
| PARAMETER\_OUT\_OF\_RANGE | 403 Forbidden | Indicates that the resource is not allowed to be created since one or more of the received parameter are out of range defined by operator policies. |
| IDLE\_STATUS\_UNSUPPORTED | 403 Forbidden | Indicates that the resource is not allowed to be created since the Idle Status Indication is received in the request but not supported by the network. |
| OPERATION\_PROHIBITED | 403 Forbidden or 405 Method Not Allowed | Indicates the HTTP method is not supported. |
| EVENT\_FEATURE\_MISMATCH | 400 Bad Request | Indicates the resource creation is not allowed since the supported feature corresponding to the monitoring event is not supported by the client. |
| EVENT\_UNSUPPORTED | 500 Internal Server Error | Indicates the required monitoring event is not supported by the server. |

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

## A.2 Data Types applicable to several APIs

For the purpose of referencing entities in the Open API file defined in this Annex, it shall be assumed that this Open API file is contained in a physical file named "TS29122\_CommonData.yaml".

NOTE: For the purpose of referencing the error status codes in the Open API file defined in this Annex, this Open API file contains all the mandatory status codes as defined in table 5.2.6-1, all the API specific error status codes defined for T8 APIs, in addition, some error status codes not used in the current release of this specification but for the purpose of referencing by other specifications.

openapi: 3.0.0

info:

 title: TS 29.122 Common Data Types

 version: 1.0.1

 description: |

 Data types applicable to several APIs.

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externalDocs:

 description: 3GPP TS 29.122 V15.4.0 T8 reference point for Northbound APIs

 url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.122/'

paths: {}

components:

 schemas:

 SponsorInformation:

 type: object

 properties:

 sponsorId:

 type: string

 description: It indicates Sponsor ID.

 aspId:

 type: string

 description: It indicates Application Service Provider ID.

 required:

 - sponsorId

 - aspId

 UsageThreshold:

 type: object

 properties:

 duration:

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

 totalVolume:

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

 downlinkVolume:

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

 uplinkVolume:

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

 UsageThresholdRm:

 type: object

 properties:

 duration:

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

 totalVolume:

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

 downlinkVolume:

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

 uplinkVolume:

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

 nullable: true

 TimeWindow:

 type: object

 properties:

 startTime:

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

 stopTime:

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

 required:

 - startTime

 - stopTime

 Acknowledgement:

 type: object

 properties:

 details:

 type: string

 description: A human-readable explanation specific to this successful acknowledgement

 required:

 - details

 NotificationData:

 type: object

 properties:

 transaction:

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

 eventReports:

 type: array

 items:

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

 minItems: 1

 description: Contains the reported event and applicable information

 required:

 - transaction

 - eventReports

 EventReport:

 type: object

 properties:

 event:

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

 accumulatedUsage:

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

 flowIds:

 type: array

 items:

 type: integer

 minItems: 1

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

 required:

 - event

 AccumulatedUsage:

 type: object

 properties:

 duration:

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

 totalVolume:

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

 downlinkVolume:

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

 uplinkVolume:

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

 FlowInfo:

 type: object

 properties:

 flowId:

 type: integer

 description: Indicates the IP flow.

 flowDescriptions:

 type: array

 items:

 type: string

 description: Indicates the packet filters of the IP flow. Refer to subclause 5.3.8 of 3GPP TS 29.214 for encoding. It shall contain UL and/or DL IP flow description.

 minItems: 1

 maxItems: 2

 required:

 - flowId

 TestNotification:

 type: object

 properties:

 subscription:

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

 required:

 - subscription

 WebsockNotifConfig:

 type: object

 properties:

 websocketUri:

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

 requestWebsocketUri:

 type: boolean

 description: Set by the SCS/AS to indicate that the Websocket delivery is requested.

 LocationArea:

 type: object

 properties:

 cellIds:

 type: array

 items:

 type: string

 minItems: 1

 description: Indicates a list of Cell Global Identities of the user which identifies the cell the UE is registered.

 enodeBIds:

 type: array

 items:

 type: string

 minItems: 1

 description: Indicates a list of eNodeB identities in which the UE is currently located.

 routingAreaIds:

 type: array

 items:

 type: string

 minItems: 1

 description: Identifies a list of Routing Area Identities of the user where the UE is located.

 trackingAreaIds:

 type: array

 items:

 type: string

 minItems: 1

 description: Identifies a list of Tracking Area Identities of the user where the UE is located.

 geographicAreas:

 type: array

 items:

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

 minItems: 1

 description: Identifies a list of geographic area of the user where the UE is located.

 civicAddresses:

 type: array

 items:

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

 minItems: 1

 description: Identifies a list of civic addresses of the user where the UE is located.

 LocationArea5G:

 type: object

 properties:

 geographicAreas:

 type: array

 items:

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

 minItems: 0

 description: Identifies a list of geographic area of the user where the UE is located.

 civicAddresses:

 type: array

 items:

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

 minItems: 0

 description: Identifies a list of civic addresses of the user where the UE is located.

 nwAreaInfo:

 $ref: 'TS29554\_Npcf\_BDTPolicyControl.yaml#/components/schemas/NetworkAreaInfo'

 ProblemDetails:

 type: object

 properties:

 type:

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

 title:

 type: string

 description: A short, human-readable summary of the problem type. It should not change from occurrence to occurrence of the problem.

 status:

 type: integer

 description: The HTTP status code for this occurrence of the problem.

 detail:

 type: string

 description: A human-readable explanation specific to this occurrence of the problem.

 instance:

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

 cause:

 type: string

 description: A machine-readable application error cause specific to this occurrence of the problem. This IE should be present and provide application-related error information, if available.

 invalidParams:

 type: array

 items:

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

 minItems: 1

 description: Description of invalid parameters, for a request rejected due to invalid parameters.

 InvalidParam:

 type: object

 properties:

 param:

 type: string

 description: Attribute's name encoded as a JSON Pointer, or header's name.

 reason:

 type: string

 description: A human-readable reason, e.g. "must be a positive integer".

 required:

 - param

 PlmnId:

 type: object

 properties:

 mcc:

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

 mnc:

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

 required:

 - mcc

 - mnc

 ConfigResult:

 type: object

 properties:

 externalIds:

 type: array

 items:

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

 minItems: 1

 description: Each element indicates an external identifier of the UE.

 msisdns:

 type: array

 items:

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

 minItems: 1

 description: Each element identifies the MS internal PSTN/ISDN number allocated for the UE.

 resultReason:

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

 required:

 - resultReason

 oneOf:

 - required: [externalIds]

 - required: [msisdns]

 Bandwidth:

 type: integer

 minimum: 0

 description: integer indicating a bandwidth in bits per second.

 BdtReferenceId:

 type: string

 description: string identifying a BDT Reference ID as defined in subclause 5.3.3 of 3GPP TS 29.154.

 Binary:

 type: string

 description: string with format "binary" as defined in OpenAPI Specification.

 Bytes:

 type: string

 description: String with format "byte" as defined in OpenAPI Specification, i.e, base64-encoded characters.

 DayOfWeek:

 type: integer

 minimum: 1

 maximum: 7

 description: integer between and including 1 and 7 denoting a weekday. 1 shall indicate Monday, and the subsequent weekdays shall be indicated with the next higher numbers. 7 shall indicate Sunday.

 DateTime:

 type: string

 description: string with format "date-time" as defined in OpenAPI.

 DateTimeRm:

 type: string

 description: string with format "date-time" as defined in OpenAPI with "nullable=true" property.

 nullable: true

 DateTimeRo:

 type: string

 description: string with format "date-time" as defined in OpenAPI with "readOnly=true" property.

 readOnly: true

 DurationSec:

 type: integer

 minimum: 0

 description: Unsigned integer identifying a period of time in units of seconds.

 DurationSecRm:

 type: integer

 minimum: 0

 description: Unsigned integer identifying a period of time in units of seconds with "nullable=true" property.

 nullable: true

 DurationSecRo:

 type: integer

 minimum: 0

 description: Unsigned integer identifying a period of time in units of seconds with "readOnly=true" property.

 readOnly: true

 DurationMin:

 type: integer

 format: int32

 minimum: 0

 description: Unsigned integer identifying a period of time in units of minutes.

 ExternalId:

 type: string

 description: string containing a local identifier followed by "@" and a domain identifier. Both the local identifier and the domain identifier shall be encoded as strings that do not contain any "@" characters. See Clause 4.6.2 of 3GPP TS 23.682 for more information.

 ExternalGroupId:

 type: string

 description: string containing a local identifier followed by "@" and a domain identifier. Both the local identifier and the domain identifier shall be encoded as strings that do not contain any "@" characters. See Clauses 4.6.2 and 4.6.3 of 3GPP TS 23.682 for more information.

 Ipv4Addr:

 type: string

 description: string identifying a Ipv4 address formatted in the "dotted decimal" notation as defined in IETF RFC 1166.

 Ipv6Addr:

 type: string

 description: string identifying a Ipv6 address formatted according to clause 4 in IETF RFC 5952. The mixed Ipv4 Ipv6 notation according to clause 5 of IETF RFC 5952 shall not be used.

 Ipv4AddrRo:

 type: string

 description: string identifying a Ipv4 address formatted in the "dotted decimal" notation as defined in IETF RFC 1166, with "readOnly=true" property.

 readOnly: true

 Ipv6AddrRo:

 type: string

 description: string identifying a Ipv6 address formatted according to clause 4 in IETF RFC 5952, with "readOnly=true" property. The mixed Ipv4 Ipv6 notation according to clause 5 of IETF RFC 5952 shall not be used.

 readOnly: true

 Link:

 type: string

 description: string formatted according to IETF RFC 3986 identifying a referenced resource.

 Mcc:

 type: string

 description: String encoding a Mobile Country Code part of the PLMN, comprising 3 digits, as defined in 3GPP TS 38.413.

 Mnc:

 type: string

 description: String encoding a Mobile Network Code part of the PLMN, comprising 2 or 3 digits, as defined in 3GPP TS 38.413.

 Msisdn:

 type: string

 description: string formatted according to subclause 3.3 of 3GPP TS 23.003 that describes an MSISDN.

 Port:

 type: integer

 description: Unsigned integer with valid values between 0 and 65535.

 minimum: 0

 maximum: 65535

 PortRo:

 type: integer

 description: Unsigned integer with valid values between 0 and 65535, with "readOnly=true" property.

 minimum: 0

 maximum: 65535

 readOnly: true

 ResourceId:

 type: string

 description: string chosen by the SCEF to serve as identifier in a resource URI.

 ScsAsId:

 type: string

 description: string that identifies an SCS/AS.

 TimeOfDay:

 type: string

 description: String with format partial-time or full-time as defined in subclause 5.6 of IETF RFC 3339. Examples, 20:15:00, 20:15:00-08:00 (for 8 hours behind UTC).

 Uri:

 type: string

 description: string providing an URI formatted according to IETF RFC 3986.

 Volume:

 type: integer

 format: int64

 minimum: 0

 description: Unsigned integer identifying a volume in units of bytes.

 VolumeRm:

 type: integer

 format: int64

 minimum: 0

 description: Unsigned integer identifying a volume in units of bytes with "nullable=true" property.

 nullable: true

 Event:

 anyOf:

 - type: string

 enum:

 - SESSION\_TERMINATION

 - LOSS\_OF\_BEARER

 - RECOVERY\_OF\_BEARER

 - RELEASE\_OF\_BEARER

 - USAGE\_REPORT

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - SESSION\_TERMINATION: Indicates that Rx session is terminated.

 - LOSS\_OF\_BEARER : Indicates a loss of a bearer.

 - RECOVERY\_OF\_BEARER: Indicates a recovery of a bearer.

 - RELEASE\_OF\_BEARER: Indicates a release of a bearer.

 - USAGE\_REPORT: Indicates the usage report event.

 ResultReason:

 anyOf:

 - type: string

 enum:

 - ROAMING\_NOT\_ALLOWED

 - OTHER\_REASON

 - type: string

 description: >

 This string provides a failure reason.

 description: >

 Possible values are

 - ROAMING\_NOT\_ALLOWED: Identifies the configuration parameters are not allowed by roaming agreement.

 - OTHER\_REASON: Identifies the configuration parameters are not configured due to other reason.

#

# HTTP responses

#

 responses:

 '400':

 description: Bad request

 content:

 application/problem+json:

 schema:

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

 '401':

 description: Unauthorized

 content:

 application/problem+json:

 schema:

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

 '403':

 description: Forbidden

 content:

 application/problem+json:

 schema:

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

 '404':

 description: Not Found

 content:

 application/problem+json:

 schema:

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

 '405':

 description: Method Not Allowed

 content:

 application/problem+json:

 schema:

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

 '406':

 description: Not Acceptable

 content:

 application/problem+json:

 schema:

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

 '409':

 description: Conflict

 content:

 application/problem+json:

 schema:

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

 '411':

 description: Length Required

 content:

 application/problem+json:

 schema:

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

 '412':

 description: Precondition Failed

 content:

 application/problem+json:

 schema:

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

 '413':

 description: Payload Too Large

 content:

 application/problem+json:

 schema:

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

 '414':

 description: URI Too Long

 content:

 application/problem+json:

 schema:

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

 '415':

 description: Unsupported Media Type

 content:

 application/problem+json:

 schema:

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

 '429':

 description: Too Many Requests

 content:

 application/problem+json:

 schema:

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

 '500':

 description: Internal Server Error

 content:

 application/problem+json:

 schema:

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

 '503':

 description: Service Unavailable

 content:

 application/problem+json:

 schema:

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

 default:

 description: Generic Error

\*\*\* 7th Change \*\*\*

## A.3 MonitoringEvent API

openapi: 3.0.0

info:

 title: 3gpp-monitoring-event

 version: 1.0.1

 description: |

 API for Monitoring Event.

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externalDocs:

 description: 3GPP TS 29.122 V15.4.0 T8 reference point for Northbound APIs

 url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.122/'

security:

 - {}

 - oAuth2ClientCredentials: []

servers:

 - url: '{apiRoot}/3gpp-monitoring-event/v1'

 variables:

 apiRoot:

 default: https://example.com

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

paths:

 /{scsAsId}/subscriptions:

 get:

 summary: read all of the active subscriptions for the SCS/AS

 tags:

 - MonitoringEvent API SCS/AS level GET Operation

 parameters:

 - name: scsAsId

 in: path

 description: Identifier of the SCS/AS

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK (Successful get all of the active subscriptions for the SCS/AS)

 content:

 application/json:

 schema:

 type: array

 items:

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

 minItems: 0

 description: Monitoring event subscriptions

 '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: Creates a new subscription resource for monitoring event notification

 tags:

 - MonitoringEvent API Subscription level POST Operation

 parameters:

 - name: scsAsId

 in: path

 description: Identifier of the SCS/AS

 required: true

 schema:

 type: string

 requestBody:

 description: Subscription for notification about monitoring event

 required: true

 content:

 application/json:

 schema:

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

 callbacks:

 notificationDestination:

 '{request.body#/notificationDestination}':

 post:

 requestBody: # contents of the callback message

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: No Content (successful notification)

 '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'

 responses:

 '201':

 description: Created (Successful creation of subscription)

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'Contains the URI of the newly created resource'

 required: true

 schema:

 type: string

 '200':

 description: The operation is successful and immediate report is included.

 content:

 application/json:

 schema:

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

 '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'

 /{scsAsId}/subscriptions/{subscriptionId}:

 get:

 summary: read an active subscriptions for the SCS/AS and the subscription Id

 tags:

 - MonitoringEvent API Subscription level GET Operation

 parameters:

 - name: scsAsId

 in: path

 description: Identifier of the SCS/AS

 required: true

 schema:

 type: string

 - name: subscriptionId

 in: path

 description: Identifier of the subscription resource

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK (Successful get the active subscription)

 content:

 application/json:

 schema:

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

 '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: Updates/replaces an existing subscription resource

 tags:

 - MonitoringEvent API subscription level PUT Operation

 parameters:

 - name: scsAsId

 in: path

 description: Identifier of the SCS/AS

 required: true

 schema:

 type: string

 - name: subscriptionId

 in: path

 description: Identifier of the subscription resource

 required: true

 schema:

 type: string

 requestBody:

 description: Parameters to update/replace the existing subscription

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '200':

 description: OK (Successful update of the subscription)

 content:

 application/json:

 schema:

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

 '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'

 '405':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/405'

 '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: Deletes an already existing monitoring event subscription

 tags:

 - MonitoringEvent API Subscription level DELETE Operation

 parameters:

 - name: scsAsId

 in: path

 description: Identifier of the SCS/AS

 required: true

 schema:

 type: string

 - name: subscriptionId

 in: path

 description: Identifier of the subscription resource

 required: true

 schema:

 type: string

 responses:

 '204':

 description: No Content (Successful deletion of the existing subscription)

 '200':

 description: OK (Successful deletion of the existing subscription)

 content:

 application/json:

 schema:

 type: array

 items:

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

 minItems: 1

 description: The subscription was terminated successfully, the monitoring event report(s) shall be included if received.

 '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:

 MonitoringEventSubscription:

 type: object

 properties:

 self:

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

 supportedFeatures:

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

 mtcProviderId:

 type: string

 description: Identifies the MTC Service Provider and/or MTC Application.

 externalId:

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

 msisdn:

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

 externalGroupId:

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

 addExtGroupId:

 type: array

 items:

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

 minItems: 2

 ipv4Addr:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Ipv4Addr'

 ipv6Addr :

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Ipv6Addr'

 notificationDestination:

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

 requestTestNotification:

 type: boolean

 description: Set to true by the SCS/AS to request the SCEF to send a test notification as defined in subclause 5.2.5.3. Set to false or omitted otherwise.

 websockNotifConfig:

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

 monitoringType:

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

 maximumNumberOfReports:

 type: integer

 minimum: 1

 description: Identifies the maximum number of event reports to be generated by the HSS, MME/SGSN as specified in subclause 5.6.0 of 3GPP TS 23.682 [2].

 monitorExpireTime:

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

 groupReportGuardTime:

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

 maximumDetectionTime:

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

 reachabilityType:

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

 maximumLatency:

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

 maximumResponseTime:

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

 suggestedNumberOfDlPackets:

 type: integer

 minimum: 0

 description: If "monitoringType" is "UE\_REACHABILITY", this parameter may be included to identify the number of packets that the serving gateway shall buffer in case that the UE is not reachable.

 idleStatusIndication:

 type: boolean

 description: If "monitoringType" is set to "UE\_REACHABILITY" or "AVAILABILITY\_AFTER\_DDN\_FAILURE", this parameter may be included to indicate the notification of when a UE, for which PSM is enabled, transitions into idle mode. - "true" indicate enabling of notification - "false" indicate no need to notify Default "false".

 locationType:

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

 accuracy:

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

 minimumReportInterval:

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

 associationType:

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

 plmnIndication:

 type: boolean

 description: If "monitoring-Type" is "ROAMING\_STATUS", this parameter may be included to indicate the notification of UE's Serving PLMN ID. - "true" The value shall be used to indicate enabling of notification; - "false" The value shall be used to indicate disabling of notification. Default "false".

 locationArea:

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

 locationArea5G:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/LocationArea5G'

 monitoringEventReport:

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

 required:

 - notificationDestination

 - monitoringType

 anyOf:

 - required: [maximumNumberOfReports]

 - required: [monitorExpireTime]

 MonitoringNotification:

 type: object

 properties:

 subscription:

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

 configResults:

 type: array

 items:

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

 minItems: 1

 description: Each element identifies a notification of grouping configuration result.

 monitoringEventReports:

 type: array

 items:

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

 minItems: 1

 description: Monitoring event reports.

 cancelInd:

 type: boolean

 description: Indicates whether to request to cancel the corresponding monitoring subscription. Set to false or omitted otherwise.

 required:

 - subscription

 MonitoringEventReport:

 type: object

 properties:

 imeiChange:

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

 externalId:

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

 idleStatusInfo:

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

 locationInfo:

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

 lossOfConnectReason:

 type: integer

 description: If "monitoring-Type" is "LOSS\_OF\_CONNECTIVITY", this parameter shall be included if available to identify the reason why loss of connectivity is reported. Refer to 3GPP TS 29.336 [11] Subclause 8.4.58.

 maxUEAvailabilityTime:

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

 msisdn:

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

 monitoringType:

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

 uePerLocationReport:

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

 plmnId:

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

 reachabilityType:

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

 roamingStatus:

 type: boolean

 description: If "monitoringType" is "ROAMING\_STATUS", this parameter shall be set to "true" if the UE is on roaming status. Set to false or omitted otherwise.

 failureCause:

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

 eventTime:

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

 required:

 - monitoringType

 IdleStatusInfo:

 type: object

 properties:

 activeTime:

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

 edrxCycleLength:

 format: float

 type: number

 minimum: 0

 suggestedNumberOfDlPackets:

 type: integer

 minimum: 0

 description: Identifies the number of packets shall be buffered in the serving gateway. It shall be present if the idle status indication is requested by the SCS/AS with "idleStatusIndication" in the "monitoringEventSubscription" sets to "true".

 idleStatusTimestamp:

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

 periodicAUTimer:

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

 UePerLocationReport:

 type: object

 properties:

 ueCount:

 type: integer

 minimum: 0

 description: Identifies the number of UEs.

 externalIds:

 type: array

 items:

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

 minItems: 1

 description: Each element uniquely identifies a user.

 msisdns:

 type: array

 items:

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

 minItems: 1

 description: Each element identifies the MS internal PSTN/ISDN number allocated for a UE.

 required:

 - ueCount

 LocationInfo:

 type: object

 properties:

 ageOfLocationInfo:

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

 cellId:

 type: string

 description: Indicates the Cell Global Identification of the user which identifies the cell the UE is registered.

 enodeBId:

 type: string

 description: Indicates the eNodeB in which the UE is currently located.

 routingAreaId:

 type: string

 description: Identifies the Routing Area Identity of the user where the UE is located.

 trackingAreaId:

 type: string

 description: Identifies the Tracking Area Identity of the user where the UE is located.

 plmnId:

 type: string

 description: Identifies the PLMN Identity of the user where the UE is located.

 twanId:

 type: string

 description: Identifies the TWAN Identity of the user where the UE is located.

 geographicArea:

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

 FailureCause:

 type: object

 properties:

 bssgpCause:

 type: integer

 description: Identifies a non-transparent copy of the BSSGP cause code. Refer to 3GPP TS 29.128 [12].

 causeType:

 type: integer

 description: Identify the type of the S1AP-Cause. Refer to 3GPP TS 29.128 [12].

 gmmCause:

 type: integer

 description: Identifies a non-transparent copy of the GMM cause code. Refer to 3GPP TS 29.128 [12].

 ranapCause:

 type: integer

 description: Identifies a non-transparent copy of the RANAP cause code. Refer to 3GPP TS 29.128 [12].

 ranNasCause:

 type: string

 description: Indicates RAN and/or NAS release cause code information, TWAN release cause code information or untrusted WLAN release cause code information. Refer to 3GPP TS 29.214 [10].

 s1ApCause:

 type: integer

 description: Identifies a non-transparent copy of the S1AP cause code. Refer to 3GPP TS 29.128 [12].

 smCause:

 type: integer

 description: Identifies a non-transparent copy of the SM cause code. Refer to 3GPP TS 29.128 [12].

 MonitoringType:

 anyOf:

 - type: string

 enum:

 - LOSS\_OF\_CONNECTIVITY

 - UE\_REACHABILITY

 - LOCATION\_REPORTING

 - CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION

 - ROAMING\_STATUS

 - COMMUNICATION\_FAILURE

 - AVAILABILITY\_AFTER\_DDN\_FAILURE

 - NUMBER\_OF\_UES\_IN\_AN\_AREA

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - LOSS\_OF\_CONNECTIVITY: The SCS/AS requests to be notified when the 3GPP network detects that the UE is no longer reachable for signalling or user plane communication

 - UE\_REACHABILITY: The SCS/AS requests to be notified when the UE becomes reachable for sending either SMS or downlink data to the UE

 - LOCATION\_REPORTING: The SCS/AS requests to be notified of the current location or the last known location of the UE

 - CHANGE\_OF\_IMSI\_IMEI\_ASSOCIATION: The SCS/AS requests to be notified when the association of an ME (IMEI(SV)) that uses a specific subscription (IMSI) is changed

 - ROAMING\_STATUS: The SCS/AS queries the UE's current roaming status and requests to get notified when the status changes

 - COMMUNICATION\_FAILURE: The SCS/AS requests to be notified of communication failure events

 - AVAILABILITY\_AFTER\_DDN\_FAILURE: The SCS/AS requests to be notified when the UE has become available after a DDN failure

 - NUMBER\_OF\_UES\_IN\_AN\_AREA: The SCS/AS requests to be notified the number of UEs in a given geographic area

 ReachabilityType:

 anyOf:

 - type: string

 enum:

 - SMS

 - DATA

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - SMS : The SCS/AS requests to be notified when the UE becomes reachable for sending SMS to the UE

 - DATA: The SCS/AS requests to be notified when the UE becomes reachable for sending downlink data to the UE

 LocationType:

 anyOf:

 - type: string

 enum:

 - CURRENT\_LOCATION

 - LAST\_KNOWN\_LOCATION

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - CURRENT\_LOCATION: The SCS/AS requests to be notified for current location

 - LAST\_KNOWN\_LOCATION: The SCS/AS requests to be notified for last known location

 AssociationType:

 anyOf:

 - type: string

 enum:

 - IMEI

 - IMEISV

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - IMEI: The value shall be used when the change of IMSI-IMEI association shall be detected

 - IMEISV: The value shall be used when the change of IMSI-IMEISV association shall be detected

 Accuracy:

 anyOf:

 - type: string

 enum:

 - CGI\_ECGI

 - ENODEB

 - TA\_RA

 - PLMN

 - TWAN\_ID

 - GEO\_AREA

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - CGI\_ECGI: The SCS/AS requests to be notified at cell level location accuracy.

 - ENODEB: The SCS/AS requests to be notified at eNodeB level location accuracy.

 - TA\_RA: The SCS/AS requests to be notified at TA/RA level location accuracy.

 - PLMN: The SCS/AS requests to be notified at PLMN level location accuracy.

 - TWAN\_ID: The SCS/AS requests to be notified at TWAN identifier level location accuracy.

 - GEO\_AREA: The SCS/AS requests to be notified of the geographical area accuracy.

\*\*\* 8th Change \*\*\*

## A.6 NIDD API

openapi: 3.0.0

info:

 title: 3gpp**-**nidd

 version: 1.0.2

 description: |

 API for non IP data delivery.

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externalDocs:

 description: 3GPP TS 29.122 V15.7.0 T8 reference point for Northbound APIs

 url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.122/'

security:

 - {}

 - oAuth2ClientCredentials: []

servers:

 - url: '{apiRoot}/3gpp**-**nidd/v1'

 variables:

 apiRoot:

 default: https://example.com

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

paths:

 /{scsAsId}/configurations:

 parameters:

 - name: scsAsId

 description: String identifying the SCS/AS.

 in: path

 required: true

 schema:

 type: string

 get:

 responses:

 '200':

 description: all NIDD configurations.

 content:

 application/json:

 schema:

 type: array

 items:

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

 minItems: 0

 description: individual NIDD configuration.

 '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:

 requestBody:

 description: Contains the data to create a NIDD configuration.

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: NIDD configuration is successfully created.

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'Contains the URI of the newly created resource'

 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'

 callbacks:

 niddNotifications:

 '{$request.body#/notificationDestination}':

 post:

 requestBody:

 description: Notification for NIDD configuration status, MO NIDD, MT NIDD delivery report.

 content:

 application/json:

 schema:

 oneOf:

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

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

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

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

 responses:

 '204':

 description: Expected response to a successful callback processing without a body

 '200':

 description: Expected response to a successful callback processing with a body

 content:

 application/json:

 schema:

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

 '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'

 /{scsAsId}/configurations/{configurationId}:

 parameters:

 - name: scsAsId

 description: String identifying the SCS/AS.

 in: path

 required: true

 schema:

 type: string

 - name: configurationId

 description: String identifying the individual NIDD configuration resource in the SCEF.

 in: path

 required: true

 schema:

 type: string

 get:

 responses:

 '200':

 description: The individual NIDD configuration is successfully retrieved.

 content:

 application/json:

 schema:

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

 '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'

 patch:

 requestBody:

 description: Contains information to be applied to the individual NIDD configuration.

 required: true

 content:

 application/merge-patch+json:

 schema:

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

 responses:

 '200':

 description: The Individual NIDD configuration is modified successfully and a representation of that resource is returned.

 content:

 application/json:

 schema:

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

 '204':

 description: The Individual NIDD configuration is modified successfully.

 '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:

 responses:

 '204':

 description: The Individual NIDD configuration is deleted.

 '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'

 /{scsAsId}/configurations/{configurationId}/downlink-data-deliveries:

 parameters:

 - name: scsAsId

 description: String identifying the SCS/AS.

 in: path

 required: true

 schema:

 type: string

 - name: configurationId

 description: String identifying the individual NIDD configuration resource in the SCEF.

 in: path

 required: true

 schema:

 type: string

 get:

 responses:

 '200':

 description: all NIDD downlink data deliveries.

 content:

 application/json:

 schema:

 type: array

 items:

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

 minItems: 0

 description: individual NIDD downlink data delivery.

 '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:

 requestBody:

 description: Contains the data to create a NIDD downlink data delivery.

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '200':

 description: NIDD downlink data delivery is successful.

 content:

 application/json:

 schema:

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

 '201':

 description: NIDD downlink data delivery is pending.

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'Contains the URI of the newly created resource'

 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':

 description: The NIDD downlink data delivery request was not successful.

 content:

 application/json:

 schema:

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

 '503':

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

 default:

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

 /{scsAsId}/configurations/{configurationId}/downlink-data-deliveries/{downlinkDataDeliveryId}:

 parameters:

 - name: scsAsId

 description: String identifying the SCS/AS.

 in: path

 required: true

 schema:

 type: string

 - name: configurationId

 description: String identifying the individual NIDD configuration resource in the SCEF.

 in: path

 required: true

 schema:

 type: string

 - name: downlinkDataDeliveryId

 description: String identifying the individual NIDD downlink data delivery in the SCEF.

 in: path

 required: true

 schema:

 type: string

 get:

 responses:

 '200':

 description: The individual NIDD downlink data delivery is successfully retrieved.

 content:

 application/json:

 schema:

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

 '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:

 requestBody:

 description: Contains information to be applied to the individual NIDD downlink data delivery.

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '200':

 description: The pending NIDD downlink data is replaced sucessfully but delivery is pending.

 content:

 application/json:

 schema:

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

 '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'

 '405':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/405'

 '409':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/409'

 '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':

 description: The NIDD downlink data replacement request was not successful.

 content:

 application/json:

 schema:

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

 '503':

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

 default:

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

 delete:

 responses:

 '204':

 description: The pending NIDD downlink data is deleted.

 '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'

 '405':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/405'

 '409':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/409'

 '429':

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

 '500':

 description: The NIDD downlink data cancellation request was not successful.

 content:

 application/json:

 schema:

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

 '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:

 NiddConfiguration:

 type: object

 properties:

 self:

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

 supportedFeatures:

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

 mtcProviderId:

 type: string

 description: Identifies the MTC Service Provider and/or MTC Application.

 externalId:

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

 msisdn:

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

 externalGroupId:

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

 duration:

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

 reliableDataService:

 type: boolean

 description: The reliable data service (as defined in subclause 4.5.15.3 of 3GPP TS 23.682) to indicate if a reliable data service acknowledgment is enabled or not.

 rdsPorts:

 type: array

 items:

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

 minItems: 1

 description: Indicates the port configuration that is used for reliable data transfer between specific applications using RDS (as defined in subclause 5.2.4 and 5.2.5 of 3GPP TS 24.250).

 pdnEstablishmentOption:

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

 notificationDestination:

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

 requestTestNotification:

 type: boolean

 description: Set to true by the SCS/AS to request the SCEF to send a test notification as defined in subclause 5.2.5.3. Set to false or omitted otherwise.

 websockNotifConfig:

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

 maximumPacketSize:

 type: integer

 minimum: 1

 description: The Maximum Packet Size is the maximum NIDD packet size that was transferred to the UE by the SCEF in the PCO, see subclause 4.5.14.1 of 3GPP TS 23.682. If no maximum packet size was provided to the UE by the SCEF, the SCEF sends a default configured max packet size to SCS/AS. Unit bit.

 readOnly: true

 niddDownlinkDataTransfers:

 type: array

 items:

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

 minItems: 1

 description: The downlink data deliveries that needed to be executed by the SCEF. The cardinality of the property shall be 0..1 in the request and 0..N in the response (i.e. response may contain multiple buffered MT NIDD).

 status:

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

 required:

 - notificationDestination

 oneOf:

 - required: [externalId]

 - required: [msisdn]

 - required: [externalGroupId]

 NiddDownlinkDataTransfer:

 type: object

 properties:

 externalId:

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

 externalGroupId:

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

 msisdn:

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

 self:

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

 data:

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

 reliableDataService:

 type: boolean

 description: The reliable data service (as defined in subclause 4.5.15.3 of 3GPP TS 23.682) to indicate if a reliable data service acknowledgment is enabled or not.

 rdsPort:

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

 maximumLatency:

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

 priority:

 type: integer

 description: It is used to indicate the priority of the non-IP data packet relative to other non-IP data packets.

 pdnEstablishmentOption:

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

 deliveryStatus:

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

 requestedRetransmissionTime:

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

 required:

 - data

 oneOf:

 - required: [externalId]

 - required: [msisdn]

 - required: [externalGroupId]

 NiddUplinkDataNotification:

 type: object

 properties:

 niddConfiguration:

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

 externalId:

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

 msisdn:

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

 data:

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

 reliableDataService:

 type: boolean

 description: Indicates whether the reliable data service is enabled.

 rdsPort:

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

 required:

 - niddConfiguration

 - data

 oneOf:

 - required: [externalId]

 - required: [msisdn]

 NiddDownlinkDataDeliveryStatusNotification:

 type: object

 properties:

 niddDownlinkDataTransfer:

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

 deliveryStatus:

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

 requestedRetransmissionTime:

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

 required:

 - niddDownlinkDataTransfer

 - deliveryStatus

 NiddConfigurationStatusNotification:

 type: object

 properties:

 niddConfiguration:

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

 externalId:

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

 msisdn:

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

 status:

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

 rdsCapIndication:

 type: boolean

 description: It indicates whether the network capability for the reliable data service is enabled or not.

 required:

 - niddConfiguration

 - status

 oneOf:

 - required: [externalId]

 - required: [msisdn]

 GmdNiddDownlinkDataDeliveryNotification:

 type: object

 properties:

 niddDownlinkDataTransfer:

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

 gmdResults:

 type: array

 items:

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

 minItems: 1

 description: Indicates the group message delivery result.

 required:

 - niddDownlinkDataTransfer

 - gmdResults

 RdsPort:

 type: object

 properties:

 portUE:

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

 portSCEF:

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

 required:

 - portUE

 - portSCEF

 GmdResult:

 type: object

 properties:

 externalId:

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

 msisdn:

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

 deliveryStatus:

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

 requestedRetransmissionTime:

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

 required:

 - deliveryStatus

 oneOf:

 - required: [externalId]

 - required: [msisdn]

 NiddDownlinkDataDeliveryFailure:

 type: object

 properties:

 problemDetail:

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

 requestedRetransmissionTime:

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

 required:

 - problemDetail

 PdnEstablishmentOptions:

 anyOf:

 - type: string

 enum:

 - WAIT\_FOR\_UE

 - INDICATE\_ERROR

 - SEND\_TRIGGER

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - WAIT\_FOR\_UE: wait for the UE to establish the PDN connection

 - INDICATE\_ERROR: respond with an error cause

 - SEND\_TRIGGER: send a device trigger

 PdnEstablishmentOptionsRm:

 anyOf:

 - type: string

 enum:

 - WAIT\_FOR\_UE

 - INDICATE\_ERROR

 - SEND\_TRIGGER

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - WAIT\_FOR\_UE: wait for the UE to establish the PDN connection

 - INDICATE\_ERROR: respond with an error cause

 - SEND\_TRIGGER: send a device trigger

 nullable: true

 DeliveryStatus:

 anyOf:

 - type: string

 enum:

 - SUCCESS

 - SUCCESS\_NEXT\_HOP\_ACKNOWLEDGED

 - SUCCESS\_NEXT\_HOP\_UNACKNOWLEDGED

 - SUCCESS\_ACKNOWLEDGED

 - SUCCESS\_UNACKNOWLEDGED

 - TRIGGERED

 - BUFFERING

 - BUFFERING\_TEMPORARILY\_NOT\_REACHABLE

 - SENDING

 - FAILURE

 - FAILURE\_RDS\_DISABLED

 - FAILURE\_NEXT\_HOP

 - FAILURE\_TIMEOUT

 - FAILURE\_TEMPORARILY\_NOT\_REACHABLE

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - SUCCESS: Success but details not provided

 - SUCCESS\_NEXT\_HOP\_ACKNOWLEDGED: Successful delivery to the next hop with acknowledgment.

 - SUCCESS\_NEXT\_HOP\_UNACKNOWLEDGED: Successful delivery to the next hop without acknowledgment

 - SUCCESS\_ACKNOWLEDGED: Reliable delivery was acknowledged by the UE

 - SUCCESS\_UNACKNOWLEDGED: Reliable delivery was not acknowledged by the UE

 - TRIGGERED: The SCEF triggered the device and is buffering the data.

 - BUFFERING: The SCEF is buffering the data due to no PDN connection established.

 - BUFFERING\_TEMPORARILY\_NOT\_REACHABLE: The SCEF has been informed that the UE is temporarily not reachable but is buffering the data

 - SENDING: The SCEF has forwarded the data, but they may be stored elsewhere

 - FAILURE: Delivery failure but details not provided

 - FAILURE\_RDS\_DISABLED: RDS was disabled

 - FAILURE\_NEXT\_HOP: Unsuccessful delivery to the next hop.

 - FAILURE\_TIMEOUT: Unsuccessful delivery due to timeout.

 - FAILURE\_TEMPORARILY\_NOT\_REACHABLE: The SCEF has been informed that the UE is temporarily not reachable without buffering the data.

 readOnly: true

 NiddStatus:

 anyOf:

 - type: string

 enum:

 - ACTIVE

 - TERMINATED\_UE\_NOT\_AUTHORIZED

 - TERMINATED

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - ACTIVE: The NIDD configuration is active.

 - TERMINATED\_UE\_NOT\_AUTHORIZED: The NIDD configuration was terminated because the UE´s authorisation was revoked.

 - TERMINATED: The NIDD configuration was terminated.

 readOnly: true

 NiddConfigurationPatch:

 type: object

 properties:

 duration:

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

 reliableDataService:

 type: boolean

 description: The reliable data service (as defined in subclause 4.5.15.3 of 3GPP TS 23.682) to indicate if a reliable data service acknowledgment is enabled or not.

 nullable: true

 rdsPorts:

 type: array

 items:

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

 minItems: 1

 description: Indicates the port configuration that is used for reliable data transfer between specific applications using RDS (as defined in subclause 5.2.4 and 5.2.5 of 3GPP TS 24.250).

 pdnEstablishmentOption:

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

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