**3GPP TSG-CT WG4 Meeting #111-eC4-22xxxx**

**E-Meeting, 18th – 26th August 2022 *was* C4-224158**

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **29.571** | **CR** | **0369** | **rev** | **1** | **Current version:** | **17.6.0** |  |
|  |
| *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:***  | WLAN location information for interworking between ePDG connected to EPC and 5GS |
|  |  |
| ***Source to WG:*** | ZTE, Ericsson |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** | TEI17 |  | ***Date:*** | 2022-08-25 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | In the case of interworking bewteen ePDG connected EPC and 5GS, the SMF+PGW-C needs to send the PCF with the WLAN location information as specified in clause 4.5.7.2.8 of TS 23.402 if received from the ePDG. However, there is no data type to represent this "WLAN location information".Seeking for the minimum impact in the specifications, the TWAP Identifier is reused as the identifier of the untrusted WLAN in case of ePDG connected to SMF+PGW, where the ePDG sends the untrusted WLAN location information.Note that thought the TNAP identifier could have been equally reused for this purpose (it is unknown whether the UE that is using the ePDG is incapable of 5G NAS via WLAN), the “twapId” attribute is considered better, as it is more explicit, using a name that indicates WLAN, and it is also more aligned with the name of the AVP used in Gx, the TWAN-Identifier AVP. |
|  |  |
| ***Summary of change:*** | Extend the usage of "twapId" to contain the WLAN location information in the case of interworking between ePDG connected 5GS and EPC. |
|  |  |
| ***Consequences if not approved:*** | The SMF+PGW-C is not able to deliver the WLAN location information to the PCF if received from the ePDG. |
|  |  |
| ***Clauses affected:*** | 2, 5.4.4.10, A.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 29.512... CR 0950 |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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

# 2 References

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

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

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

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

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

[2] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

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

[4] IETF RFC 1166: "Internet Numbers".

[5] IETF RFC 5952: "A recommendation for IPv6 address text representation".

[6] IETF RFC 3986: "Uniform Resource Identifier (URI): Generic Syntax".

[7] 3GPP TS 23.003: "Numbering, addressing and identification".

[8] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[9] IETF RFC 7807: "Problem Details for HTTP APIs".

[10] IETF RFC 3339: "Date and Time on the Internet: Timestamps".

[11] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP) ".

[12] IETF RFC 6901: "JavaScript Object Notation (JSON) Pointer".

[13] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[14] IETF RFC 6902: "JavaScript Object Notation (JSON) Patch".

[15] IETF RFC 4122: "A Universally Unique IDentifier (UUID) URN Namespace".

[16] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)".

[17] IETF RFC 7042: "IANA Considerations and IETF Protocol and Documentation Usage for IEEE 802 Parameters".

[18] IETF RFC 6733: "Diameter Base Protocol".

[19] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".

[20] 3GPP TS 24.501: "Non-Access-Stratum (NAS) Protocol for 5G System (5GS); Stage 3".

[21] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[22] Void.

[23] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[24] ITU-T Recommendation Q.763 (1999): "Specifications of Signalling System No.7; Formats and codes".

[25] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[26] 3GPP TS 23.015: "Technical Realization of Operator Determined Barring".

[27] 3GPP TR 21.900: "Technical Specification Group working methods".

[28] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[29] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[30] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[31] IEEE Std 802.11-2012: "IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".

[32] CableLabs WR-TR-5WWC-ARCH: "5G Wireless Wireline Converged Core Architecture".

[33] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access; Stage 2".

[34] BBF TR-069: "CPE WAN Management Protocol".

[35] BBF TR-369: "User Services Platform (USP)".

[36] 3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support Vehicle-to-Everything (V2X) services".

[37] BBF TR-470: "5G Wireless Wireline Convergence Architecture".

[38] IEEE "Guidelines for Use of Extended Unique Identifier (EUI), Organizationally Unique Identifier (OUI), and Company ID (CID)", <https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/tutorials/eui.pdf>

[39] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[40] IETF RFC 5580: "Carrying Location Objects in RADIUS and Diameter".

[41] BBF TR-456: "".

[42] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol specification".

[43] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".

[44] ECMA-262: "ECMAScript® Language Specification", <https://www.ecma-international.org/ecma-262/5.1/>.

[45] 3GPP TS 33.246: "Security of Multimedia Broadcast/Multicast Service (MBMS)".

[46] 3GPP TS 33.501: "Security architecture and procedures for 5G system; Stage 2".

[4x] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".

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

#### 5.4.4.10 Type: N3gaLocation

Table 5.4.4.10-1: Definition of type N3gaLocation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| n3gppTai | Tai | C | 0..1 | This IE shall be present over the 3GPP PLMN internal interfaces, but it shall not be present over the N5 interface. When present, it shall contain the TAI reported by the N3IWF, TNGF or W-AGF for the non-3GPP access. |
| n3IwfId | string | C | 0..1 | This IE shall contain the N3IWF identifier received over NGAP and shall be encoded as a string of hexadecimal characters. Each character in the string shall take a value of "0" to "9", "a" to "f" or "A" to "F" and shall represent 4 bits. The most significant character representing the 4 most significant bits of the N3IWF ID shall appear first in the string, and the character representing the 4 least significant bit of the N3IWF ID shall appear last in the string.Pattern: '^[A-Fa-f0-9]+$'Example:The N3IWF Id 0x5BD6 shall be encoded as "5BD6".It shall be present over the 3GPP PLMN internal interfaces if the UE is accessing the 5GC via an untrusted non-3GPP access, but shall not be present over the N5 interface. |
| ueIpv4Addr | Ipv4Addr | C | 0..1 | UE/N5CW device local IPv4 address (used to reach the N3IWF, TNGF or TWIF).The ueIPv4Addr or the ueIPv6Addr shall be present if the UE is accessing the 5GC via a trusted or untrusted non-3GPP access and the information is available. |
| ueIpv6Addr | Ipv6Addr | C | 0..1 | UE/N5CW device local IPv6 address (used to reach the N3IWF, TNGF or TWIF).The ueIPv4Addr or the ueIPv6Addr shall be present if the UE is accessing the 5GC via a trusted or untrusted non-3GPP access and the information is available. |
| portNumber | Uinteger | C | 0..1 | UDP or TCP source port number. It shall be present if the UE is accessing the 5GC via a trusted or untrusted non-3GPP access and NAT is detected. |
| protocol | TransportProtocol | O | 0..1 | This IE may be present if portNumber is present.When present, this IE shall indicate the transport protocol used by the UE to access the core network via a trusted or untrusted non-3GPP access and NAT is detected.The absence of this IE indicates that the transport protocol used by the UE to access the core network via a trusted or untrusted non-3GPP access is not specified, i.e. could be UDP or TCP. |
| tnapId | TnapId | C | 0..1 | This IE shall contain the TNAP Identifier, see clause 5.6.2 of 3GPP TS 23.501 [8]. |
| twapId | TwapId | C | 0..1 | In the scenario of accessing 5GC from N5CW device, this IE shall contain the TWAP Identifier, see clause 4.2.8.5.3 of 3GPP TS 23.501 [8].In the scenario of interworking between ePDG/EPC and 5GS, this IE shall contain the WLAN location information, see clause 4.5.7.2.8 of 3GPP TS 23.402 [4x]. |
| hfcNodeId | HfcNodeId | C | 0..1 | This IE shall contain the HFC Node Identifier received over NGAP. It shall be present for a 5G-CRG/FN-CRG accessing the 5GC via wireline access network. |
| gli | Gli | C | 0..1 | This IE shall contain the Global Line Identifier. It shall be present for a 5G-BRG/FN-BRG accessing the 5GC via wireline access network. |
| w5gbanLineType | LineType | O | 0..1 | This IE may be present for a 5G-BRG/FN-BRG accessing the 5GC via wireline access network.When present, it shall indicate the type of the wireline (DSL or PON). |
| gci | Gci | C | 0..1 | This IE shall contain the Global Cable Identifier. It shall be present for the N5GC device accessing the 5GC via wireline access network. See clause 4.10a of 3GPP TS 23.316 [30] |

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

# A.2 Data related to Common Data Types

openapi: 3.0.0

info:

 version: '1.3.0'

 title: 'Common Data Types'

 description: |

 Common Data Types for Service Based Interfaces.

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externalDocs:

 description: 3GPP TS 29.571 Common Data Types for Service Based Interfaces, version 17.6.0

 url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.571/'

paths: {}

components:

 schemas:

#

# Common Data Types for Generic usage definitiones as defined in clause 5.2

#

#

# COMMON SIMPLE DATA TYPES

#

 Binary:

 format: binary

 type: string

 description: string with format 'binary' as defined in OpenAPI.

 BinaryRm:

 format: binary

 type: string

 nullable: true

 description: "string with format 'binary' as defined in OpenAPI OpenAPI with 'nullable: true' property."

 Bytes:

 format: byte

 type: string

 description: string with format 'bytes' as defined in OpenAPI

 BytesRm:

 format: byte

 type: string

 nullable: true

 description: >

 string with format 'bytes' as defined in OpenAPI OpenAPI with 'nullable: true' property.

 Date:

 format: date

 type: string

 description: string with format 'date' as defined in OpenAPI.

 DateRm:

 format: date

 type: string

 nullable: true

 description: >

 string with format 'date' as defined in OpenAPI OpenAPI with 'nullable: true' property.

 DateTime:

 format: date-time

 type: string

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

 DateTimeRm:

 format: date-time

 type: string

 nullable: true

 description: >

 string with format 'date-time' as defined in OpenAPI with 'nullable:true' property.

 DiameterIdentity:

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

 DiameterIdentityRm:

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

 Double:

 format: double

 type: number

 description: string with format 'double' as defined in OpenAPI

 DoubleRm:

 format: double

 type: number

 nullable: true

 description: >

 string with format 'double' as defined in OpenAPI with 'nullable: true' property.

 DurationSec:

 type: integer

 description: indicating a time in seconds.

 DurationSecRm:

 type: integer

 nullable: true

 description: "indicating a time in seconds with OpenAPI defined 'nullable: true' property."

 Float:

 format: float

 type: number

 description: string with format 'float' as defined in OpenAPI.

 FloatRm:

 format: float

 type: number

 nullable: true

 description: >

 string with format 'float' as defined in OpenAPI with the OpenAPI defined

 'nullable: true' property.

 Int32:

 format: int32

 type: integer

 description: string with format 'int32' as defined in OpenAPI.

 Int32Rm:

 format: int32

 type: integer

 nullable: true

 description: >

 string with format 'int32' as defined in OpenAPI with the OpenAPI defined

 'nullable: true' property.

 Int64:

 type: integer

 format: int64

 description: string with format 'int64' as defined in OpenAPI.

 Int64Rm:

 format: int64

 type: integer

 nullable: true

 description: >

 string with format 'int64' as defined in OpenAPI with the OpenAPI defined

 'nullable: true' property.

 Ipv4Addr:

 type: string

 pattern: '^(([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\.){3}([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])$'

 example: '198.51.100.1'

 description: >

 String identifying a IPv4 address formatted in the 'dotted decimal' notation

 as defined in RFC 1166.

 Ipv4AddrRm:

 type: string

 pattern: '^(([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\.){3}([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])$'

 example: '198.51.100.1'

 nullable: true

 description: >

 String identifying a IPv4 address formatted in the 'dotted decimal' notation

 as defined in RFC 1166 with the OpenAPI defined 'nullable: true' property.

 Ipv4AddrMask:

 type: string

 pattern: '^(([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\.){3}([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])(\/([0-9]|[1-2][0-9]|3[0-2]))$'

 example: '198.51.0.0/16'

 description: >

 "String identifying a IPv4 address mask formatted in the 'dotted decimal' notation

 as defined in RFC 1166."

 Ipv4AddrMaskRm:

 type: string

 pattern: '^(([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\.){3}([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])(\/([0-9]|[1-2][0-9]|3[0-2]))$'

 example: '198.51.0.0/16'

 nullable: true

 description: >

 String identifying a IPv4 address mask formatted in the 'dotted decimal' notation

 as defined in RFC 1166 with the OpenAPI defined 'nullable: true' property.

 Ipv6Addr:

 type: string

 allOf:

 - pattern: '^((:|(0?|([1-9a-f][0-9a-f]{0,3}))):)((0?|([1-9a-f][0-9a-f]{0,3})):){0,6}(:|(0?|([1-9a-f][0-9a-f]{0,3})))$'

 - pattern: '^((([^:]+:){7}([^:]+))|((([^:]+:)\*[^:]+)?::(([^:]+:)\*[^:]+)?))$'

 example: '2001:db8:85a3::8a2e:370:7334'

 description: >

 String identifying an IPv6 address formatted according to clause 4 of RFC5952.

 The mixed IPv4 IPv6 notation according to clause 5 of RFC5952 shall not be used.

 Ipv6AddrRm:

 type: string

 allOf:

 - pattern: '^((:|(0?|([1-9a-f][0-9a-f]{0,3}))):)((0?|([1-9a-f][0-9a-f]{0,3})):){0,6}(:|(0?|([1-9a-f][0-9a-f]{0,3})))$'

 - pattern: '^((([^:]+:){7}([^:]+))|((([^:]+:)\*[^:]+)?::(([^:]+:)\*[^:]+)?))$'

 example: '2001:db8:85a3::8a2e:370:7334'

 nullable: true

 description: >

 String identifying an IPv6 address formatted according to clause 4 of RFC5952 with the

 OpenAPI 'nullable: true' property.

 The mixed IPv4 IPv6 notation according to clause 5 of RFC5952 shall not be used.

 Ipv6Prefix:

 type: string

 allOf:

 - pattern: '^((:|(0?|([1-9a-f][0-9a-f]{0,3}))):)((0?|([1-9a-f][0-9a-f]{0,3})):){0,6}(:|(0?|([1-9a-f][0-9a-f]{0,3})))(\/(([0-9])|([0-9]{2})|(1[0-1][0-9])|(12[0-8])))$'

 - pattern: '^((([^:]+:){7}([^:]+))|((([^:]+:)\*[^:]+)?::(([^:]+:)\*[^:]+)?))(\/.+)$'

 example: '2001:db8:abcd:12::0/64'

 description: >

 String identifying an IPv6 address prefix formatted according to clause 4 of RFC 5952.

 IPv6Prefix data type may contain an individual /128 IPv6 address.

 Ipv6PrefixRm:

 type: string

 allOf:

 - pattern: '^((:|(0?|([1-9a-f][0-9a-f]{0,3}))):)((0?|([1-9a-f][0-9a-f]{0,3})):){0,6}(:|(0?|([1-9a-f][0-9a-f]{0,3})))(\/(([0-9])|([0-9]{2})|(1[0-1][0-9])|(12[0-8])))$'

 - pattern: '^((([^:]+:){7}([^:]+))|((([^:]+:)\*[^:]+)?::(([^:]+:)\*[^:]+)?))(\/.+)$'

 nullable: true

 description: >

 String identifying an IPv6 address prefix formatted according to clause 4 of RFC 5952 with

 the OpenAPI 'nullable: true' property. IPv6Prefix data type may contain an individual

 /128 IPv6 address.

 MacAddr48:

 type: string

 pattern: '^([0-9a-fA-F]{2})((-[0-9a-fA-F]{2}){5})$'

 description: >

 String identifying a MAC address formatted in the hexadecimal notation

 according to clause 1.1 and clause 2.1 of RFC 7042.

 MacAddr48Rm:

 type: string

 pattern: '^([0-9a-fA-F]{2})((-[0-9a-fA-F]{2}){5})$'

 nullable: true

 description: >

 "String identifying a MAC address formatted in the hexadecimal notation according to

 clause 1.1 and clause 2.1 of RFC 7042 with the OpenAPI 'nullable: true' property."

 SupportedFeatures:

 type: string

 pattern: '^[A-Fa-f0-9]\*$'

 description: >

 A string used to indicate the features supported by an API that is used as defined in clause

 6.6 in 3GPP TS 29.500. The string shall contain a bitmask indicating supported features in

 hexadecimal representation Each character in the string shall take a value of "0" to "9",

 "a" to "f" or "A" to "F" and shall represent the support of 4 features as described in

 table 5.2.2-3. The most significant character representing the highest-numbered features

 shall appear first in the string, and the character representing features 1 to 4

 shall appear last in the string. The list of features and their numbering (starting with 1)

 are defined separately for each API. If the string contains a lower number of characters

 than there are defined features for an API, all features that would be represented by

 characters that are not present in the string are not supported.

 Uinteger:

 type: integer

 minimum: 0

 description: Unsigned Integer, i.e. only value 0 and integers above 0 are permissible.

 UintegerRm:

 type: integer

 minimum: 0

 description: >

 Unsigned Integer, i.e. only value 0 and integers above 0 are permissible with

 the OpenAPI 'nullable: true' property.

 nullable: true

 Uint16:

 type: integer

 minimum: 0

 maximum: 65535

 description: Integer where the allowed values correspond to the value range of an unsigned 16-bit integer.

 Uint16Rm:

 type: integer

 minimum: 0

 maximum: 65535

 nullable: true

 description: >

 Integer where the allowed values correspond to the value range of an unsigned

 16-bit integer with the OpenAPI 'nullable: true' property.

 Uint32:

 type: integer

 minimum: 0

 maximum: 4294967295 #(2^32)-1

 description: >

 Integer where the allowed values correspond to the value range of an unsigned

 32-bit integer.

 Uint32Rm:

 format: int32

 type: integer

 minimum: 0

 maximum: 4294967295 #(2^32)-1

 nullable: true

 description: >

 Integer where the allowed values correspond to the value range of an unsigned

 32-bit integer with the OpenAPI 'nullable: true' property.

 Uint64:

 type: integer

 minimum: 0

 maximum: 18446744073709551615 #(2^64)-1

 description: >

 Integer where the allowed values correspond to the value range of an

 unsigned 64-bit integer.

 Uint64Rm:

 type: integer

 minimum: 0

 maximum: 18446744073709551615 #(2^64)-1

 nullable: true

 description: >

 Integer where the allowed values correspond to the value range of an unsigned

 16-bit integer with the OpenAPI 'nullable: true' property.

 Uri:

 type: string

 description: String providing an URI formatted according to RFC 3986.

 UriRm:

 type: string

 nullable: true

 description: >

 String providing an URI formatted according to RFC 3986 with the OpenAPI

 'nullable: true' property.

 VarUeId:

 type: string

 pattern: '^(imsi-[0-9]{5,15}|nai-.+|msisdn-[0-9]{5,15}|extid-[^@]+@[^@]+|gci-.+|gli-.+|.+)$'

 description: String represents the SUPI or GPSI

 VarUeIdRm:

 type: string

 pattern: '^(imsi-[0-9]{5,15}|nai-.+|msisdn-[0-9]{5,15}|extid-[^@]+@[^@]+|gci-.+|gli-.+|.+)$'

 nullable: true

 description: "String represents the SUPI or GPSI with the OpenAPI 'nullable: true' property."

 TimeZone:

 type: string

 example: '-08:00+1'

 description: |

 String with format "time-numoffset" optionally appended by "daylightSavingTime", where

 - "time-numoffset" shall represent the time zone adjusted for daylight saving time and be

 encoded as time-numoffset as defined in clause 5.6 of IETF RFC 3339;

 - "daylightSavingTime" shall represent the adjustment that has been made and shall be

 encoded as "+1" or "+2" for a +1 or +2 hours adjustment.

 The example is for 8 hours behind UTC, +1 hour adjustment for Daylight Saving Time.

 TimeZoneRm:

 type: string

 nullable: true

 description: |

 "String with format 'time-numoffset' optionally appended by '<daylightSavingTime>', where

 - 'time-numoffset' shall represent the time zone adjusted for daylight saving time and be

 encoded as time-numoffset as defined in clause 5.6 of IETF RFC 3339;

 - 'daylightSavingTime' shall represent the adjustment that has been made and shall be

 encoded as '+1' or '+2' for a +1 or +2 hours adjustment.

 But with the OpenAPI 'nullable: true' property."

 StnSr:

 type: string

 description: String representing the STN-SR as defined in clause 18.6 of 3GPP TS 23.003.

 StnSrRm:

 type: string

 nullable: true

 description: >

 String representing the STN-SR as defined in clause 18.6 of 3GPP TS 23.003

 with the OpenAPI 'nullable: true' property.

 CMsisdn:

 type: string

 pattern: '^[0-9]{5,15}$'

 description: String representing the C-MSISDN as defined in clause 18.7 of 3GPP TS 23.003.

 CMsisdnRm:

 type: string

 pattern: '^[0-9]{5,15}$'

 nullable: true

 description: >

 String representing the C-MSISDN as defined in clause 18.7 of 3GPP TS 23.003 with

 the OpenAPI 'nullable: true' property.

 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.

 TimeOfDay:

 type: string

 description: >

 String with format partial-time or full-time as defined in clause 5.6 of IETF RFC 3339.

 Examples, 20:15:00, 20:15:00-08:00 (for 8 hours behind UTC).

 EmptyObject:

 description: Empty JSON object { }, it is defined with the keyword additionalProperties false

 type: object

 additionalProperties: false

 Fqdn:

 description: Fully Qualified Domain Name

 type: string

 pattern: '^([0-9A-Za-z]([-0-9A-Za-z]{0,61}[0-9A-Za-z])?\.)+[A-Za-z]{2,63}\.?$'

 minLength: 4

 maxLength: 253

 FqdnRm:

 description: Fully Qualified Domain Name, but it also allows the null value

 anyOf:

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

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

#

# COMMON ENUMERATED DATA TYPES

#

 PatchOperation:

 anyOf:

 - type: string

 enum:

 - add

 - copy

 - move

 - remove

 - replace

 - test

 - type: string

 description: Operations as defined in IETF RFC 6902.

 UriScheme:

 anyOf:

 - type: string

 enum:

 - http

 - https

 - type: string

 description: HTTP and HTTPS URI scheme.

 ChangeType:

 anyOf:

 - type: string

 enum:

 - ADD

 - MOVE

 - REMOVE

 - REPLACE

 - type: string

 description: Indicates the type of change to be performed.

 HttpMethod:

 anyOf:

 - type: string

 enum:

 - GET

 - POST

 - PUT

 - DELETE

 - PATCH

 - OPTIONS

 - HEAD

 - CONNECT

 - TRACE

 - type: string

 description: HTTP methodes.

 NullValue:

 enum:

 - null

 description: JSON's null value.

 MatchingOperator:

 anyOf:

 - type: string

 enum:

 - FULL\_MATCH

 - MATCH\_ALL

 - STARTS\_WITH

 - NOT\_START\_WITH

 - ENDS\_WITH

 - NOT\_END\_WITH

 - CONTAINS

 - NOT\_CONTAIN

 - type: string

 description: the matching operation.

#

# COMMON STRUCTURED DATA TYPES

#

 ProblemDetails:

 description: Provides additional information in an error response.

 type: object

 properties:

 type:

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

 title:

 type: string

 status:

 type: integer

 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

 supportedFeatures:

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

 accessTokenError:

 $ref: 'TS29510\_Nnrf\_AccessToken.yaml#/components/schemas/AccessTokenErr'

 accessTokenRequest:

 $ref: 'TS29510\_Nnrf\_AccessToken.yaml#/components/schemas/AccessTokenReq'

 nrfId:

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

 Link:

 type: object

 properties:

 href:

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

 description: It contains the URI of the linked resource.

 LinkRm:

 type: object

 properties:

 href:

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

 nullable: true

 description: >

 It contains the URI of the linked resource with the OpenAPI 'nullable: true' property.

 PatchItem:

 type: object

 properties:

 op:

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

 path:

 type: string

 description: >

 contains a JSON pointer value (as defined in IETF RFC 6901) that references

 a location of a resource on which the patch operation shall be performed.

 from:

 type: string

 description: >

 indicates the path of the source JSON element (according to JSON Pointer syntax)

 being moved or copied to the location indicated by the "path" attribute.

 value: {}

 required:

 - op

 - path

 description: it contains information on data to be changed.

 LinksValueSchema:

 oneOf:

 - type: array

 items:

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

 minItems: 1

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

 description: A list of mutually exclusive alternatives of 1 or more links.

 SelfLink:

 type: object

 properties:

 self:

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

 required:

 - self

 description: It contains the URI of the linked resource.

 InvalidParam:

 type: object

 properties:

 param:

 type: string

 description: >

 If the invalid parameter is an attribute in a JSON body, this IE shall contain the

 attribute's name and shall be encoded as a JSON Pointer. If the invalid parameter is

 an HTTP header, this IE shall be formatted as the concatenation of the string "header "

 plus the name of such header. If the invalid parameter is a query parameter, this IE

 shall be formatted as the concatenation of the string "query " plus the name of such

 query parameter. If the invalid parameter is a variable part in the path of a resource

 URI, this IE shall contain the name of the variable, including the symbols "{" and "}"

 used in OpenAPI specification as the notation to represent variable path segments.

 reason:

 type: string

 description: >

 A human-readable reason, e.g. "must be a positive integer". In cases involving failed

 operations in a PATCH request, the reason string should identify the operation that

 failed using the operation's array index to assist in correlation of the invalid

 parameter with the failed operation, e.g." Replacement value invalid for attribute

 (failed operation index= 4)"

 required:

 - param

 description: It contains an invalid parameter and a related description.

 ChangeItem:

 type: object

 properties:

 op:

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

 path:

 type: string

 description: >

 contains a JSON pointer value (as defined in IETF RFC 6901) that references a target

 location within the resource on which the change has been applied.

 from:

 type: string

 description: >

 indicates the path of the source JSON element (according to JSON Pointer syntax)

 being moved or copied to the location indicated by the "path" attribute. It shall

 be present if the "op" attribute is of value "MOVE".

 origValue: {}

 newValue: {}

 required:

 - op

 - path

 description: It contains data which need to be changed.

 NotifyItem:

 type: object

 required:

 - resourceId

 - changes

 properties:

 resourceId:

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

 changes:

 type: array

 items:

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

 minItems: 1

 description: Indicates changes on a resource.

 ComplexQuery:

 oneOf:

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

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

 description: >

 The ComplexQuery data type is either a conjunctive normal form or a disjunctive normal form.

 The attribute names "cnfUnits" and "dnfUnits" (see clause 5.2.4.11 and clause 5.2.4.12)

 serve as discriminator.

 Cnf:

 type: object

 required:

 - cnfUnits

 properties:

 cnfUnits:

 type: array

 items:

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

 minItems: 1

 description: A conjunctive normal form

 Dnf:

 type: object

 required:

 - dnfUnits

 properties:

 dnfUnits:

 type: array

 items:

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

 minItems: 1

 description: A disjunctive normal form.

 CnfUnit:

 type: object

 required:

 - cnfUnit

 properties:

 cnfUnit:

 type: array

 items:

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

 minItems: 1

 description: >

 During the processing of cnfUnits attribute, all the members in the array shall be

 interpreted as logically concatenated with logical "AND".

 DnfUnit:

 type: object

 required:

 - dnfUnit

 properties:

 dnfUnit:

 type: array

 items:

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

 minItems: 1

 description: >

 During the processing of dnfUnits attribute, all the members in the array shall be

 interpreted as logically concatenated with logical "OR".

 Atom:

 description: contains a search parameter and its positive or negative content.

 type: object

 required:

 - attr

 - value

 properties:

 attr:

 type: string

 description: contains the name of a defined query parameter.

 value: {}

 negative:

 type: boolean

 description: indicates whether the negative condition applies for the query condition.

 PatchResult:

 description: The execution report result on failed modification.

 type: object

 required:

 - report

 properties:

 report:

 type: array

 items:

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

 minItems: 1

 description: >

 The execution report contains an array of report items. Each report item indicates one

 failed modification.

 ReportItem:

 type: object

 required:

 - path

 properties:

 path:

 type: string

 description: >

 Contains a JSON pointer value (as defined in IETF RFC 6901) that references a

 location of a resource to which the modification is subject.

 reason:

 type: string

 description: >

 A human-readable reason providing details on the reported modification failure.

 The reason string should identify the operation that failed using the operation's

 array index to assist in correlation of the invalid parameter with the failed

 operation, e.g. "Replacement value invalid for attribute (failed operation index= 4)".

 description: indicates performed modivications.

 HalTemplate:

 description: >

 Hypertext Application Language (HAL) template contains the extended 3GPP hypermedia format.

 type: object

 required:

 - method

 properties:

 title:

 type: string

 description: A human-readable string that can be used to identify this template

 method:

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

 contentType:

 type: string

 description: >

 The media type that should be used for the corresponding request. If the attribute

 is missing, or contains an unrecognized value, the client should act as if the

 contentType is set to "application/json".

 properties:

 type: array

 items:

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

 minItems: 1

 description: >

 The properties that should be included in the body of the corresponding request.

 If the contentType attribute is set to "application/json", then this attribute

 describes the attributes of the JSON object of the body.

 Property:

 description: >

 If the contentType attribute is set to "application/json", then this attribute describes

 the attributes of the JSON object of the body.

 type: object

 required:

 - name

 properties:

 name:

 type: string

 description: The name of the property

 required:

 type: boolean

 description: >

 Indicates whether the property is required – true= required –

 false(default)= not required.

 regex:

 type: string

 description: A regular expression string to be applied to the value of the property.

 value:

 type: string

 description: The property value. When present, it shall be a valid JSON string.

 RedirectResponse:

 description: >

 The response shall include a Location header field containing a different URI

 (pointing to a different URI of an other service instance), or the same URI if a request

 is redirected to the same target resource via a different SCP.

 type: object

 properties:

 cause:

 type: string

 targetScp:

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

 targetSepp:

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

 TunnelAddress:

 description: Tunnel address

 type: object

 properties:

 ipv4Addr:

 $ref: '#/components/schemas/Ipv4Addr'

 ipv6Addr:

 $ref: '#/components/schemas/Ipv6Addr'

 portNumber:

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

 required:

 - portNumber

 anyOf:

 - required: [ ipv4Addr ]

 - required: [ ipv6Addr ]

 FqdnPatternMatchingRule:

 description: a matching rule for a FQDN pattern

 type: object

 oneOf:

 - required: [ regex ]

 - required: [ stringMatchingRule ]

 properties:

 regex:

 type: string

 stringMatchingRule:

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

 StringMatchingRule:

 description: A list of conditions for string matching

 type: object

 properties:

 stringMatchingConditions:

 type: array

 items:

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

 minItems: 1

 StringMatchingCondition:

 description: A String with Matching Operator

 type: object

 properties:

 matchingString:

 type: string

 matchingOperator:

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

 required:

 - matchingOperator

#

# Data Types related to Subscription, Identification and Numbering as defined in clause 5.3

#

#

# SIMPLE DATA TYPES

#

 Dnn:

 type: string

 description: >

 String representing a Data Network as defined in clause 9A of 3GPP TS 23.003;

 it shall contain either a DNN Network Identifier, or a full DNN with both the Network

 Identifier and Operator Identifier, as specified in 3GPP TS 23.003 clause 9.1.1 and 9.1.2.

 It shall be coded as string in which the labels are separated by dots

 (e.g. "Label1.Label2.Label3").

 DnnRm:

 type: string

 nullable: true

 description: >

 String representing a Data Network as defined in clause 9A of 3GPP TS 23.003;

 it shall contain either a DNN Network Identifier, or a full DNN with both the

 Network Identifier and Operator Identifier, as specified in 3GPP TS 23.003 clause 9.1.1

 and 9.1.2. It shall be coded as string in which the labels are separated by dots

 (e.g. 'Label1.Label2.Label3') with the OpenAPI 'nullable: true' property.

 WildcardDnn:

 type: string

 pattern: '^[\*]$'

 description: String representing the Wildcard DNN. It shall contain the string "\*".

 WildcardDnnRm:

 type: string

 pattern: '^[\*]$'

 nullable: true

 description: >

 String representing the Wildcard DNN. It shall contain the string '\*' but with the

 OpenAPI 'nullable: true' property.

 Gpsi:

 type: string

 pattern: '^(msisdn-[0-9]{5,15}|extid-[^@]+@[^@]+|.+)$'

 description: >

 String identifying a Gpsi shall contain either an External Id or an MSISDN.

 It shall be formatted as follows -External Identifier= "extid-'extid', where 'extid'

 shall be formatted according to clause 19.7.2 of 3GPP TS 23.003 that describes an

 External Identifier.

 GpsiRm:

 type: string

 pattern: '^(msisdn-[0-9]{5,15}|extid-[^@]+@[^@]+|.+)$'

 nullable: true

 description: >

 String identifying a Gpsi shall contain either an External Id or an MSISDN. It shall be

 formatted as follows -External Identifier= 'extid-'extid', where 'extid' shall be formatted

 according to clause 19.7.2 of 3GPP TS 23.003 that describes an External Identifier with the

 OpenAPI 'nullable: true' property.

 GroupId:

 type: string

 pattern: '^[A-Fa-f0-9]{8}-[0-9]{3}-[0-9]{2,3}-([A-Fa-f0-9][A-Fa-f0-9]){1,10}$'

 description: >

 String identifying a group of devices network internal globally unique ID which identifies

 a set of IMSIs, as specified in clause 19.9 of 3GPP TS 23.003.

 GroupIdRm:

 type: string

 pattern: '^[A-Fa-f0-9]{8}-[0-9]{3}-[0-9]{2,3}-([A-Fa-f0-9][A-Fa-f0-9]){1,10}$'

 nullable: true

 description: >

 String identifying a group of devices network internal globally unique ID which

 identifies a set of IMSIs, as specified in clause 19.9 of 3GPP TS 23.003 with the

 OpenAPI 'nullable: true' property.

 ExternalGroupId:

 type: string

 pattern: '^extgroupid-[^@]+@[^@]+$'

 description: >

 String identifying External Group Identifier that identifies a group made up of one or

 more subscriptions associated to a group of IMSIs, as specified in clause 19.7.3 of 3GPP

 TS 23.003.

 ExternalGroupIdRm:

 type: string

 pattern: '^extgroupid-[^@]+@[^@]+$'

 nullable: true

 description: >

 String identifying External Group Identifier that identifies a group made up of one or

 more subscriptions associated to a group of IMSIs, as specified in clause 19.7.3 of

 3GPP TS 23.003 with the OpenAPI 'nullable: true' property.

 Pei:

 type: string

 pattern: '^(imei-[0-9]{15}|imeisv-[0-9]{16}|mac((-[0-9a-fA-F]{2}){6})(-untrusted)?|eui((-[0-9a-fA-F]{2}){8})|.+)$'

 description: >

 String representing a Permanent Equipment Identifier that may contain - an IMEI or IMEISV,

 as specified in clause 6.2 of 3GPP TS 23.003; a MAC address for a 5G-RG or FN-RG via

 wireline access, with an indication that this address cannot be trusted for regulatory

 purpose if this address cannot be used as an Equipment Identifier of the FN-RG, as

 specified in clause 4.7.7 of 3GPP TS23.316. Examples are imei-012345678901234 or

 imeisv-0123456789012345.

 PeiRm:

 type: string

 pattern: '^(imei-[0-9]{15}|imeisv-[0-9]{16}|mac((-[0-9a-fA-F]{2}){6})(-untrusted)?|eui((-[0-9a-fA-F]{2}){8})|.+)$'

 nullable: true

 description: >

 This data type is defined in the same way as the 'Pei' data type but with the OpenAPI 'nullable: true' property.

 Supi:

 type: string

 pattern: '^(imsi-[0-9]{5,15}|nai-.+|gci-.+|gli-.+|.+)$'

 description: |

 String identifying a Supi that shall contain either an IMSI, a network specific identifier,

 a Global Cable Identifier (GCI) or a Global Line Identifier (GLI) as specified in clause

 2.2A of 3GPP TS 23.003. It shall be formatted as follows

 - for an IMSI "imsi-<imsi>", where <imsi> shall be formatted according to clause 2.2

 of 3GPP TS 23.003 that describes an IMSI.

 - for a network specific identifier "nai-<nai>, where <nai> shall be formatted

 according to clause 28.7.2 of 3GPP TS 23.003 that describes an NAI.

 - for a GCI "gci-<gci>", where <gci> shall be formatted according to clause 28.15.2

 of 3GPP TS 23.003.

 - for a GLI "gli-<gli>", where <gli> shall be formatted according to clause 28.16.2 of

 3GPP TS 23.003.To enable that the value is used as part of an URI, the string shall

 only contain characters allowed according to the "lower-with-hyphen" naming convention

 defined in 3GPP TS 29.501.

 SupiRm:

 type: string

 pattern: '^(imsi-[0-9]{5,15}|nai-.+|gci-.+|gli-.+|.+)$'

 nullable: true

 description: >

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

 OpenAPI 'nullable: true' property.

 NfInstanceId:

 type: string

 format: uuid

 description: >

 String uniquely identifying a NF instance. The format of the NF Instance ID shall be a

 Universally Unique Identifier (UUID) version 4, as described in IETF RFC 4122.

 AmfId:

 type: string

 pattern: '^[A-Fa-f0-9]{6}$'

 description: >

 String identifying the AMF ID composed of AMF Region ID (8 bits), AMF Set ID (10 bits)

 and AMF Pointer (6 bits) as specified in clause 2.10.1 of 3GPP TS 23.003. It is encoded

 as a string of 6 hexadecimal characters (i.e., 24 bits).

 AmfRegionId:

 type: string

 pattern: '^[A-Fa-f0-9]{2}$'

 description: >

 String identifying the AMF Set ID (10 bits) as specified in clause 2.10.1 of 3GPP TS 23.003.

 It is encoded as a string of 3 hexadecimal characters where the first character is limited

 to values 0 to 3 (i.e. 10 bits)

 AmfSetId:

 type: string

 pattern: '^[0-3][A-Fa-f0-9]{2}$'

 description: >

 String identifying the AMF Set ID (10 bits) as specified in clause 2.10.1 of 3GPP TS 23.003.

 It is encoded as a string of 3 hexadecimal characters where the first character is limited

 to values 0 to 3 (i.e. 10 bits).

 RfspIndex:

 type: integer

 minimum: 1

 maximum: 256

 description: >

 Unsigned integer representing the "Subscriber Profile ID for RAT/Frequency Priority"

 as specified in 3GPP TS 36.413.

 RfspIndexRm:

 type: integer

 minimum: 1

 maximum: 256

 nullable: true

 description: >

 Unsigned integer representing the 'Subscriber Profile ID for RAT/Frequency Priority'

 as specified in 3GPP TS 36.413 with the OpenAPI 'nullable: true' property.

 NfGroupId:

 type: string

 description: Identifier of a group of NFs.

 MtcProviderInformation:

 type: string

 description: String uniquely identifying MTC provider information.

 CagId:

 type: string

 pattern: '^[A-Fa-f0-9]{8}$'

 description: String containing a Closed Access Group Identifier.

 SupiOrSuci:

 type: string

 pattern: '^(imsi-[0-9]{5,15}|nai-.+|gli-.+|gci-.+|suci-(0-[0-9]{3}-[0-9]{2,3}|[1-7]-.+)-[0-9]{1,4}-(0-0-.\*|[a-fA-F1-9]-([1-9]|[1-9][0-9]|1[0-9]{2}|2[0-4][0-9]|25[0-5])-[a-fA-F0-9]+)|.+)$'

 description: String identifying a SUPI or a SUCI.

#

# STRUCTURED DATA TYPES

#

 Guami:

 type: object

 properties:

 plmnId:

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

 amfId:

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

 required:

 - plmnId

 - amfId

 description: Globally Unique AMF Identifier constructed out of PLMN, Network and AMF identity.

 GuamiRm:

 anyOf:

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

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

 description: >

 This data type is defined in the same way as the 'Guami' data type, but with the OpenAPI

 'nullable: true' property.

 NetworkId:

 type: object

 properties:

 mnc:

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

 mcc:

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

 description: contains PLMN and Network identity.

#

# Data Types related to 5G Network as defined in clause 5.4

#

#

# SIMPLE DATA TYPES

#

 ApplicationId:

 type: string

 description: String providing an application identifier.

 ApplicationIdRm:

 type: string

 nullable: true

 description: >

 String providing an application identifier with the OpenAPI 'nullable: true' property.

 PduSessionId:

 type: integer

 minimum: 0

 maximum: 255

 description: >

 Unsigned integer identifying a PDU session, within the range 0 to 255, as specified in

 clause 11.2.3.1b, bits 1 to 8, of 3GPP TS 24.007. If the PDU Session ID is allocated by the

 Core Network for UEs not supporting N1 mode, reserved range 64 to 95 is used. PDU Session ID

 within the reserved range is only visible in the Core Network.

 Mcc:

 type: string

 pattern: '^\d{3}$'

 description: >

 Mobile Country Code part of the PLMN, comprising 3 digits, as defined in clause 9.3.3.5

 of 3GPP TS 38.413.

 MccRm:

 type: string

 pattern: '^\d{3}$'

 nullable: true

 description: >

 Mobile Country Code part of the PLMN, comprising 3 digits, as defined in clause 9.3.3.5 of

 3GPP TS 38.413 with the OpenAPI 'nullable: true' property.

 Mnc:

 type: string

 pattern: '^\d{2,3}$'

 description: Mobile Network Code part of the PLMN, comprising 2 or 3 digits, as defined in clause 9.3.3.5 of 3GPP TS 38.413.

 MncRm:

 type: string

 pattern: '^\d{2,3}$'

 nullable: true

 description: >

 Mobile Network Code part of the PLMN, comprising 2 or 3 digits, as defined in clause

 9.3.3.5 of 3GPP TS 38.413 with the OpenAPI 'nullable: true' property.

 Tac:

 type: string

 pattern: '(^[A-Fa-f0-9]{4}$)|(^[A-Fa-f0-9]{6}$)'

 description: >

 2 or 3-octet string identifying a tracking area code as specified in clause 9.3.3.10

 of 3GPP TS 38.413, in hexadecimal representation. Each character in the string shall

 take a value of "0" to "9", "a" to "f" or "A" to "F" and shall represent 4 bits. The

 most significant character representing the 4 most significant bits of the TAC shall

 appear first in the string, and the character representing the 4 least significant bit

 of the TAC shall appear last in the string.

 TacRm:

 type: string

 pattern: '(^[A-Fa-f0-9]{4}$)|(^[A-Fa-f0-9]{6}$)'

 nullable: true

 description: >

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

 OpenAPI 'nullable: true' property.

 EutraCellId:

 type: string

 pattern: '^[A-Fa-f0-9]{7}$'

 description: >

 28-bit string identifying an E-UTRA Cell Id as specified in clause 9.3.1.9 of

 3GPP TS 38.413, in hexadecimal representation. Each character in the string shall take a

 value of "0" to "9", "a" to "f" or "A" to "F" and shall represent 4 bits. The most

 significant character representing the 4 most significant bits of the Cell Id shall appear

 first in the string, and the character representing the 4 least significant bit of the

 Cell Id shall appear last in the string.

 EutraCellIdRm:

 type: string

 pattern: '^[A-Fa-f0-9]{7}$'

 nullable: true

 description: >

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

 the OpenAPI 'nullable: true' property.

 NrCellId:

 type: string

 pattern: '^[A-Fa-f0-9]{9}$'

 description: >

 36-bit string identifying an NR Cell Id as specified in clause 9.3.1.7 of 3GPP TS 38.413,

 in hexadecimal representation. Each character in the string shall take a value of "0" to

 "9", "a" to "f" or "A" to "F" and shall represent 4 bits. The most significant character

 representing the 4 most significant bits of the Cell Id shall appear first in the string,

 and the character representing the 4 least significant bit of the Cell Id shall appear last

 in the string.

 NrCellIdRm:

 type: string

 pattern: '^[A-Fa-f0-9]{9}$'

 nullable: true

 description: >

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

 OpenAPI 'nullable: true' property.

 Dnai:

 type: string

 description: DNAI (Data network access identifier), see clause 5.6.7 of 3GPP TS 23.501.

 DnaiRm:

 type: string

 nullable: true

 description: >

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

 OpenAPI 'nullable: true' property.

 5GMmCause:

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

 AmfName:

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

 AreaCode:

 type: string

 description: Values are operator specific.

 AreaCodeRm:

 type: string

 nullable: true

 description: >

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

 OpenAPI 'nullable: true' property.

 N3IwfId:

 type: string

 pattern: '^[A-Fa-f0-9]+$'

 description: >

 This represents the identifier of the N3IWF ID as specified in clause 9.3.1.57 of

 3GPP TS 38.413 in hexadecimal representation. Each character in the string shall take a value

 of "0" to "9", "a" to "f" or "A" to "F" and shall represent 4 bits. The most significant

 character representing the 4 most significant bits of the N3IWF ID shall appear first in the

 string, and the character representing the 4 least significant bit of the N3IWF ID shall

 appear last in the string.

 WAgfId:

 type: string

 pattern: '^[A-Fa-f0-9]+$'

 description: >

 This represents the identifier of the W-AGF ID as specified in clause 9.3.1.162 of

 3GPP TS 38.413 in hexadecimal representation. Each character in the string shall take a

 value of "0" to "9", "a" to "f" or "A" to "F" and shall represent 4 bits. The most

 significant character representing the 4 most significant bits of the W-AGF ID shall

 appear first in the string, and the character representing the 4 least significant bit

 of the W-AGF ID shall appear last in the string.

 TngfId:

 type: string

 pattern: '^[A-Fa-f0-9]+$'

 description: >

 This represents the identifier of the TNGF ID as specified in clause 9.3.1.161 of

 3GPP TS 38.413 in hexadecimal representation. Each character in the string shall take a value

 of "0" to "9", "a" to "f" or "A" to "F" and shall represent 4 bits. The most significant

 character representing the 4 most significant bits of the TNGF ID shall appear first in

 the string, and the character representing the 4 least significant bit of the TNGF ID

 shall appear last in the string.

 NgeNbId:

 type: string

 pattern: '^(MacroNGeNB-[A-Fa-f0-9]{5}|LMacroNGeNB-[A-Fa-f0-9]{6}|SMacroNGeNB-[A-Fa-f0-9]{5})$'

 description: >

 This represents the identifier of the ng-eNB ID as specified in clause 9.3.1.8 of

 3GPP TS 38.413. The value of the ng-eNB ID shall be encoded in hexadecimal representation.

 Each character in the string shall take a value of "0" to "9", "a" to "f" or "A" to "F" and

 shall represent 4 bits. The padding 0 shall be added to make multiple nibbles, so the most

 significant character representing the padding 0 if required together with the 4 most

 significant bits of the ng-eNB ID shall appear first in the string, and the character

 representing the 4 least significant bit of the ng-eNB ID (to form a nibble) shall appear

 last in the string.

 example: SMacroNGeNB-34B89

 Nid:

 type: string

 pattern: '^[A-Fa-f0-9]{11}$'

 description: >

 This represents the Network Identifier, which together with a PLMN ID is used to identify

 an SNPN (see 3GPP TS 23.003 and 3GPP TS 23.501 clause 5.30.2.1).

 NidRm:

 type: string

 pattern: '^[A-Fa-f0-9]{11}$'

 nullable: true

 description: >

 This data type is defined in the same way as the 'Nid' data type, but with the OpenAPI

 'nullable: true' property."

 NfSetId:

 type: string

 description: >

 NF Set Identifier (see clause 28.12 of 3GPP TS 23.003), formatted as the following string

 "set<Set ID>.<nftype>set.5gc.mnc<MNC>.mcc<MCC>", or

 "set<SetID>.<NFType>set.5gc.nid<NID>.mnc<MNC>.mcc<MCC>" with

 <MCC> encoded as defined in clause 5.4.2 ("Mcc" data type definition)

 <MNC> encoding the Mobile Network Code part of the PLMN, comprising 3 digits.

 If there are only 2 significant digits in the MNC, one "0" digit shall be inserted

 at the left side to fill the 3 digits coding of MNC. Pattern: '^[0-9]{3}$'

 <NFType> encoded as a value defined in Table 6.1.6.3.3-1 of 3GPP TS 29.510 but

 with lower case characters <Set ID> encoded as a string of characters consisting of

 alphabetic characters (A-Z and a-z), digits (0-9) and/or the hyphen (-) and that

 shall end with either an alphabetic character or a digit.

 NfServiceSetId:

 type: string

 description: >

 NF Service Set Identifier (see clause 28.12 of 3GPP TS 23.003) formatted as the following

 string "set<Set ID>.sn<Service Name>.nfi<NF Instance ID>.5gc.mnc<MNC>.mcc<MCC>", or

 "set<SetID>.sn<ServiceName>.nfi<NFInstanceID>.5gc.nid<NID>.mnc<MNC>.mcc<MCC>" with

 <MCC> encoded as defined in clause 5.4.2 ("Mcc" data type definition)

 <MNC> encoding the Mobile Network Code part of the PLMN, comprising 3 digits.

 If there are only 2 significant digits in the MNC, one "0" digit shall be inserted

 at the left side to fill the 3 digits coding of MNC. Pattern: '^[0-9]{3}$'

 <NID> encoded as defined in clause 5.4.2 ("Nid" data type definition)

 <NFInstanceId> encoded as defined in clause 5.3.2

 <ServiceName> encoded as defined in 3GPP TS 29.510

 <Set ID> encoded as a string of characters consisting of alphabetic

 characters (A-Z and a-z), digits (0-9) and/or the hyphen (-) and that shall end

 with either an alphabetic character or a digit.

 PlmnAssiUeRadioCapId:

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

 ManAssiUeRadioCapId:

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

 TypeAllocationCode:

 type: string

 pattern: '^[0-9]{8}$'

 description: >

 Type Allocation Code (TAC) of the UE, comprising the initial eight-digit portion of the

 15-digit IMEI and 16-digit IMEISV codes. See clause 6.2 of 3GPP TS 23.003.

 HfcNId:

 type: string

 maxLength: 6

 description: >

 This IE represents the identifier of the HFC node Id as specified in CableLabs

 WR-TR-5WWC-ARCH. It is provisioned by the wireline operator as part of wireline

 operations and may contain up to six characters.

 HfcNIdRm:

 type: string

 maxLength: 6

 nullable: true

 description: >

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

 OpenAPI 'nullable: true' property.

 ENbId:

 type: string

 pattern: '^(MacroeNB-[A-Fa-f0-9]{5}|LMacroeNB-[A-Fa-f0-9]{6}|SMacroeNB-[A-Fa-f0-9]{5}|HomeeNB-[A-Fa-f0-9]{7})$'

 description: >

 This represents the identifier of the eNB ID as specified in clause 9.2.1.37 of

 3GPP TS 36.413. The string shall be formatted with the following pattern

 '^('MacroeNB-[A-Fa-f0-9]{5}|LMacroeNB-[A-Fa-f0-9]{6}|SMacroeNB-[A-Fa-f0-9]{5}

 |HomeeNB-[A-Fa-f0-9]{7})$'. The value of the eNB ID shall be encoded in hexadecimal

 representation. Each character in the string shall take a value of "0" to "9", "a" to "f"

 or "A" to "F" and shall represent 4 bits. The padding 0 shall be added to make multiple

 nibbles, so the most significant character representing the padding 0 if required together

 with the 4 most significant bits of the eNB ID shall appear first in the string, and the

 character representing the 4 least significant bit of the eNB ID (to form a nibble) shall

 appear last in the string.

 Gli:

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

 Gci:

 type: string

 description: >

 Global Cable Identifier uniquely identifying the connection between the 5G-CRG or FN-CRG

 to the 5GS. See clause 28.15.4 of 3GPP TS 23.003. This shall be encoded as a string per

 clause 28.15.4 of 3GPP TS 23.003, and compliant with the syntax specified in clause 2.2

 of IETF RFC 7542 for the username part of a NAI. The GCI value is specified in

 CableLabs WR-TR-5WWC-ARCH.

 NsSrg:

 type: string

 description: >

 String providing a Network Slice Simultaneous Registration Group. See clause 5.15.12 of

 3GPP TS 23.501

 NsSrgRm:

 type: string

 nullable: true

 description: >

 String providing a Network Slice Simultaneous Registration Group with the OpenAPI

 "nullable: true" property. See clause 5.15.12 of 3GPP TS 23.501

 RelayServiceCode:

 type: integer

 minimum: 0

 maximum: 16777215

 description: >

 Relay Service Code to identify a connectivity service provided by the UE-to-Network relay.

 NsagId:

 type: integer

 description: >

 The Network Slice AS Group ID, see 3GPP TS 38.413

 NsagIdRm:

 type: integer

 nullable: true

 description: >

 This data type is defined in the same way as the "NsagId" data type, but with the OpenAPI "nullable: true" property

#

# ENUMERATED DATA TYPES

#

 AccessType:

 type: string

 enum:

 - 3GPP\_ACCESS

 - NON\_3GPP\_ACCESS

 description: Indicates wether the access is via 3GPP or via non-3GPP.

 AccessTypeRm:

 anyOf:

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

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

 description: >

 Indicates wether the access is via 3GPP or via non-3GPP but with the OpenAPI

 'nullable: true' property."

 RatType:

 anyOf:

 - type: string

 enum:

 - NR

 - EUTRA

 - WLAN

 - VIRTUAL

 - NBIOT

 - WIRELINE

 - WIRELINE\_CABLE

 - WIRELINE\_BBF

 - LTE-M

 - NR\_U

 - EUTRA\_U

 - TRUSTED\_N3GA

 - TRUSTED\_WLAN

 - UTRA

 - GERA

 - NR\_LEO

 - NR\_MEO

 - NR\_GEO

 - NR\_OTHER\_SAT

 - NR\_REDCAP

 - type: string

 description: Indicates the radio access used.

 RatTypeRm:

 anyOf:

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

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

 description: >

 Provides information about the radio access but with the OpenAPI 'nullable: true' property.

 PduSessionType:

 anyOf:

 - type: string

 enum:

 - IPV4

 - IPV6

 - IPV4V6

 - UNSTRUCTURED

 - ETHERNET

 - type: string

 description: >

 PduSessionType indicates the type of a PDU session. It shall comply with the provisions

 defined in table 5.4.3.3-1.

 PduSessionTypeRm:

 anyOf:

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

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

 description: >

 PduSessionType indicates the type of a PDU session. It shall comply with the provisions

 defined in table 5.4.3.3-1 but with the OpenAPI "nullable: true" property.

 UpIntegrity:

 anyOf:

 - type: string

 enum:

 - REQUIRED

 - PREFERRED

 - NOT\_NEEDED

 - type: string

 description: >

 indicates whether UP integrity protection is required, preferred or not needed for all

 the traffic on the PDU Session. It shall comply with the provisions defined in

 table 5.4.3.4-1.

 UpIntegrityRm:

 anyOf:

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

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

 description: >

 indicates whether UP integrity protection is required, preferred or not needed for all

 the traffic on the PDU Session. It shall comply with the provisions defined in

 table 5.4.3.4-1.

 UpConfidentiality:

 anyOf:

 - type: string

 enum:

 - REQUIRED

 - PREFERRED

 - NOT\_NEEDED

 - type: string

 description: >

 indicates whether UP confidentiality protection is required, preferred or not needed for

 all the traffic on the PDU Session. It shall comply with the provisions defined in

 table 5.4.3.5-1.

 UpConfidentialityRm:

 anyOf:

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

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

 description: >

 indicates whether UP integrity protection is required, preferred or not needed for all the

 traffic on the PDU Session. It shall comply with the provisions defined in table 5.4.3.4-1,

 but with the OpenAPI 'nullable: true' property.

 SscMode:

 anyOf:

 - type: string

 enum:

 - SSC\_MODE\_1

 - SSC\_MODE\_2

 - SSC\_MODE\_3

 - type: string

 description: >

 represents the service and session continuity mode It shall comply with the provisions defined in table 5.4.3.6-1.

 SscModeRm:

 anyOf:

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

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

 description: >

 represents the service and session continuity mode It shall comply with the provisions

 defined in table 5.4.3.6-1 but with the OpenAPI 'nullable: true' property.

 DnaiChangeType:

 anyOf:

 - type: string

 enum:

 - EARLY

 - EARLY\_LATE

 - LATE

 - 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:

 - EARLY: Early notification of UP path reconfiguration.

 - EARLY\_LATE: Early and late notification of UP path reconfiguration. This value shall

 only be present in the subscription to the DNAI change event.

 - LATE: Late notification of UP path reconfiguration.

 DnaiChangeTypeRm:

 anyOf:

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

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

 description: >

 It can take the values as specified for DnaiChangeType but with the OpenAPI

 'nullable: true' property.

 RestrictionType:

 anyOf:

 - type: string

 enum:

 - ALLOWED\_AREAS

 - NOT\_ALLOWED\_AREAS

 - type: string

 description: It contains the restriction type ALLOWED\_AREAS or NOT\_ALLOWED\_AREAS.

 RestrictionTypeRm:

 anyOf:

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

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

 description: >

 It contains the restriction type ALLOWED\_AREAS or NOT\_ALLOWED\_AREAS but with the

 OpenAPI 'nullable: true' property.

 CoreNetworkType:

 anyOf:

 - type: string

 enum:

 - 5GC

 - EPC

 - type: string

 description: It contains the Core Network type 5GC or EPC.

 CoreNetworkTypeRm:

 anyOf:

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

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

 description: >

 It contains the Core Network type 5GC or EPC but with the OpenAPI

 'nullable: true' property.

 PresenceState:

 anyOf:

 - type: string

 enum:

 - IN\_AREA

 - OUT\_OF\_AREA

 - UNKNOWN

 - INACTIVE

 - type: string

 description: |

 Possible values are:

 -IN\_AREA: Indicates that the UE is inside or enters the presence reporting area.

 -OUT\_OF\_AREA: Indicates that the UE is outside or leaves the presence reporting area

 -UNKNOW: Indicates it is unknown whether the UE is in the presence reporting area or not

 -INACTIVE: Indicates that the presence reporting area is inactive in the serving node.

 StationaryIndication:

 anyOf:

 - type: string

 enum:

 - STATIONARY

 - MOBILE

 - 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:

 - STATIONARY: Identifies the UE is stationary

 - MOBILE: Identifies the UE is mobile

 StationaryIndicationRm:

 anyOf:

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

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

 description: >

 This enumeration is defined in the same way as the 'StationaryIndication' enumeration,

 but with the OpenAPI 'nullable: true' property."

 ScheduledCommunicationType:

 anyOf:

 - type: string

 enum:

 - DOWNLINK\_ONLY

 - UPLINK\_ONLY

 - BIDIRECTIONAL

 - type: string

 description: |

 Possible values are:

 -DOWNLINK\_ONLY: Downlink only

 -UPLINK\_ONLY: Uplink only

 -BIDIRECTIONA: Bi-directional

 ScheduledCommunicationTypeRm:

 anyOf:

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

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

 description: >

 This enumeration is defined in the same way as the 'ScheduledCommunicationTypen'

 enumeration, but with the OpenAPI 'nullable: true' property."

 TrafficProfile:

 anyOf:

 - type: string

 enum:

 - SINGLE\_TRANS\_UL

 - SINGLE\_TRANS\_DL

 - DUAL\_TRANS\_UL\_FIRST

 - DUAL\_TRANS\_DL\_FIRST

 - MULTI\_TRANS

 - 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:

 - SINGLE\_TRANS\_UL: Uplink single packet transmission.

 - SINGLE\_TRANS\_DL: Downlink single packet transmission.

 - DUAL\_TRANS\_UL\_FIRST: Dual packet transmission, firstly uplink packet transmission

 with subsequent downlink packet transmission.

 - DUAL\_TRANS\_DL\_FIRST: Dual packet transmission, firstly downlink packet transmission

 with subsequent uplink packet transmission.

 TrafficProfileRm:

 anyOf:

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

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

 description: >

 This enumeration is defined in the same way as the 'TrafficProfile' enumeration, but

 with the OpenAPI 'nullable: true' property.

 LcsServiceAuth:

 anyOf:

 - type: string

 enum:

 - "LOCATION\_ALLOWED\_WITH\_NOTIFICATION"

 - "LOCATION\_ALLOWED\_WITHOUT\_NOTIFICATION"

 - "LOCATION\_ALLOWED\_WITHOUT\_RESPONSE"

 - "LOCATION\_RESTRICTED\_WITHOUT\_RESPONSE"

 - "NOTIFICATION\_ONLY"

 - "NOTIFICATION\_AND\_VERIFICATION\_ONLY"

 - 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:

 - "LOCATION\_ALLOWED\_WITH\_NOTIFICATION": Location allowed with notification

 - "LOCATION\_ALLOWED\_WITHOUT\_NOTIFICATION": Location allowed without notification

 - "LOCATION\_ALLOWED\_WITHOUT\_RESPONSE": Location with notification and privacy

 verification; location allowed if no response

 - "LOCATION\_RESTRICTED\_WITHOUT\_RESPONSE": Location with notification and privacy

 verification; location restricted if no response

 - "NOTIFICATION\_ONLY": Notification only

 - "NOTIFICATION\_AND\_VERIFICATION\_ONLY": Notification and privacy verification only

 UeAuth:

 anyOf:

 - type: string

 enum:

 - AUTHORIZED

 - NOT\_AUTHORIZED

 - type: string

 description: |

 Possible values are:

 - AUTHORIZED: Indicates that the UE is authorized.

 - NOT\_AUTHORIZED: Indicates that the UE is not authorized.

 DlDataDeliveryStatus:

 anyOf:

 - type: string

 enum:

 - BUFFERED

 - TRANSMITTED

 - DISCARDED

 - 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:

 - BUFFERED: The first downlink data is buffered with extended buffering matching the

 source of the downlink traffic.

 - TRANSMITTED: The first downlink data matching the source of the downlink traffic is

 transmitted after previous buffering or discarding of corresponding packet(s) because

 the UE of the PDU Session becomes ACTIVE, and buffered data can be delivered to UE.

 - DISCARDED: The first downlink data matching the source of the downlink traffic is

 discarded because the Extended Buffering time, as determined by the SMF, expires or

 the amount of downlink data to be buffered is exceeded.

 DlDataDeliveryStatusRm:

 anyOf:

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

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

 description: >

 This data type is defined in the same way as the ' DlDataDeliveryStatus ' data type,

 but with the OpenAPI 'nullable: true' property.

 AuthStatus:

 anyOf:

 - type: string

 enum:

 - EAP\_SUCCESS

 - EAP\_FAILURE

 - PENDING

 - 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:

 - "EAP\_SUCCESS": The NSSAA status is EAP-Success.

 - "EAP\_FAILURE": The NSSAA status is EAP-Failure.

 - "PENDING": The NSSAA status is Pending.

 LineType:

 anyOf:

 - type: string

 enum:

 - DSL

 - PON

 - 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:

 - DSL: Identifies a DSL line

 - PON: Identifies a PON line

 LineTypeRm:

 anyOf:

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

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

 description: >
 This data type is defined in the same way as the 'LineType' data type, but with the

 OpenAPI 'nullable: true' property.

 NotificationFlag:

 anyOf:

 - type: string

 enum:

 - ACTIVATE

 - DEACTIVATE

 - RETRIEVAL

 - 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:

 - ACTIVATE: The event notification is activated.

 - DEACTIVATE: The event notification is deactivated and shall be muted. The available

 event(s) shall be stored.

 - RETRIEVAL: The event notification shall be sent to the NF service consumer(s),

 after that, is muted again.

 TransportProtocol:

 anyOf:

 - type: string

 enum:

 - UDP

 - TCP

 - 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:

 - UDP: User Datagram Protocol.

 - TCP: Transmission Control Protocol.

 SatelliteBackhaulCategory:

 anyOf:

 - type: string

 enum:

 - GEO

 - MEO

 - LEO

 - OTHER\_SAT

 - NON\_SATELLITE

 - type: string

 description: Indicates the satellite backhaul used.

 SatelliteBackhaulCategoryRm:

 anyOf:

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

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

 description: >
 Provides information about the satellite backhaul but with the OpenAPI

 'nullable: true' property.

#

# STRUCTURED DATA TYPES

#

 SubscribedDefaultQos:

 type: object

 required:

 - 5qi

 - arp

 properties:

 5qi:

 $ref: '#/components/schemas/5Qi'

 arp:

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

 priorityLevel:

 $ref: '#/components/schemas/5QiPriorityLevel'

 description: Provides the subsribed 5QI and the ARP, it may contain the priority level.

 Snssai:

 type: object

 properties:

 sst:

 type: integer

 minimum: 0

 maximum: 255

 description: >

 Unsigned integer, within the range 0 to 255, representing the Slice/Service Type.

 It indicates the expected Network Slice behaviour in terms of features and services.

 Values 0 to 127 correspond to the standardized SST range. Values 128 to 255 correspond

 to the Operator-specific range. See clause 28.4.2 of 3GPP TS 23.003.

 Standardized values are defined in clause 5.15.2.2 of 3GPP TS 23.501.

 sd:

 type: string

 pattern: '^[A-Fa-f0-9]{6}$'

 description: >

 3-octet string, representing the Slice Differentiator, in hexadecimal representation.

 Each character in the string shall take a value of "0" to "9", "a" to "f" or "A" to "F"

 and shall represent 4 bits. The most significant character representing the 4 most

 significant bits of the SD shall appear first in the string, and the character

 representing the 4 least significant bit of the SD shall appear last in the string.

 This is an optional parameter that complements the Slice/Service type(s) to allow to

 differentiate amongst multiple Network Slices of the same Slice/Service type. This IE

 shall be absent if no SD value is associated with the SST.

 description: >

 When Snssai needs to be converted to string (e.g. when used in maps as key), the string shall

 be composed of one to three digits "sst" optionally followed by "-" and 6 hexadecimal digits

 "sd".

 required:

 - sst

 PlmnId:

 type: object

 properties:

 mcc:

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

 mnc:

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

 description: >

 When PlmnId needs to be converted to string (e.g. when used in maps as key), the string

 shall be composed of three digits "mcc" followed by "-" and two or three digits "mnc".

 required:

 - mcc

 - mnc

 PlmnIdRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property.

 Tai:

 description: Contains the tracking area identity as described in 3GPP 23.003

 type: object

 properties:

 plmnId:

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

 tac:

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

 nid:

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

 required:

 - plmnId

 - tac

 TaiRm:

 anyOf:

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

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

 description: >

 This data type is defined in the same way as the 'Tai' data type, but with the OpenAPI

 'nullable: true' property.

 Ecgi:

 description: Contains the ECGI (E-UTRAN Cell Global Identity), as described in 3GPP 23.003

 type: object

 properties:

 plmnId:

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

 eutraCellId:

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

 nid:

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

 required:

 - plmnId

 - eutraCellId

 EcgiRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property.

 Ncgi:

 description: Contains the NCGI (NR Cell Global Identity), as described in 3GPP 23.003

 type: object

 properties:

 plmnId:

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

 nrCellId:

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

 nid:

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

 required:

 - plmnId

 - nrCellId

 NcgiRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property.

 UserLocation:

 type: object

 properties:

 eutraLocation:

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

 nrLocation:

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

 n3gaLocation:

 $ref: '#/components/schemas/N3gaLocation'

 utraLocation:

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

 geraLocation:

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

 description: >

 At least one of eutraLocation, nrLocation and n3gaLocation shall be present. Several

 of them may be present.

 EutraLocation:

 description: Contains the E-UTRA user location.

 type: object

 properties:

 tai:

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

 ignoreTai:

 type: boolean

 default: false

 ecgi:

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

 ignoreEcgi:

 type: boolean

 default: false

 description: >

 This flag when present shall indicate that the Ecgi shall be ignored

 When present, it shall be set as follows:

 - true: ecgi shall be ignored.

 - false (default): ecgi shall not be ignored.

 ageOfLocationInformation:

 type: integer

 minimum: 0

 maximum: 32767

 description: >

 The value represents the elapsed time in minutes since the last network contact of the

 mobile station. Value "0" indicates that the location information was obtained after a

 successful paging procedure for Active Location Retrieval when the UE is in idle mode

 or after a successful NG-RAN location reporting procedure with the eNB when the UE is

 in connected mode. Any other value than "0" indicates that the location information is

 the last known one. See 3GPP TS 29.002 clause 17.7.8.

 ueLocationTimestamp:

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

 geographicalInformation:

 type: string

 pattern: '^[0-9A-F]{16}$'

 description: >

 Refer to geographical Information. See 3GPP TS 23.032 clause 7.3.2. Only the

 description of an ellipsoid point with uncertainty circle is allowed to be used.

 geodeticInformation:

 type: string

 pattern: '^[0-9A-F]{20}$'

 description: >

 Refers to Calling Geodetic Location. See ITU-T Recommendation Q.763 (1999) [24]

 clause 3.88.2. Only the description of an ellipsoid point with uncertainty circle

 is allowed to be used.

 globalNgenbId:

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

 globalENbId:

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

 required:

 - tai

 - ecgi

 EutraLocationRm:

 anyOf:

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

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

 description: >

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

 the OpenAPI 'nullable: true' property.

 NrLocation:

 description: Contains the NR user location.

 type: object

 properties:

 tai:

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

 ncgi:

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

 ignoreNcgi:

 type: boolean

 default: false

 ageOfLocationInformation:

 type: integer

 minimum: 0

 maximum: 32767

 description: >

 The value represents the elapsed time in minutes since the last network contact of the mobile

 station. Value "0" indicates that the location information was obtained after a

 successful paging procedure for Active Location Retrieval when the UE is in idle mode

 or after a successful NG-RAN location reporting procedure with the eNB when the UE is

 in connected mode. Any other value than "0" indicates that the location information is

 the last known one. See 3GPP TS 29.002 clause 17.7.8.

 ueLocationTimestamp:

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

 geographicalInformation:

 type: string

 pattern: '^[0-9A-F]{16}$'

 description: >

 Refer to geographical Information. See 3GPP TS 23.032 clause 7.3.2. Only the description

 of an ellipsoid point with uncertainty circle is allowed to be used.

 geodeticInformation:

 type: string

 pattern: '^[0-9A-F]{20}$'

 description: >

 Refers to Calling Geodetic Location. See ITU-T Recommendation Q.763 (1999) [24] clause

 3.88.2. Only the description of an ellipsoid point with uncertainty circle is allowed

 to be used.

 globalGnbId:

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

 required:

 - tai

 - ncgi

 NrLocationRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property."

 N3gaLocation:

 description: Contains the Non-3GPP access user location.

 type: object

 properties:

 n3gppTai:

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

 n3IwfId:

 type: string

 pattern: '^[A-Fa-f0-9]+$'

 description: >

 This IE shall contain the N3IWF identifier received over NGAP and shall be encoded as a

 string of hexadecimal characters. Each character in the string shall take a value of "0"

 to "9", "a" to "f" or "A" to "F" and shall represent 4 bits. The most significant

 character representing the 4 most significant bits of the N3IWF ID shall appear first in

 the string, and the character representing the 4 least significant bit of the N3IWF ID

 shall appear last in the string.

 ueIpv4Addr:

 $ref: '#/components/schemas/Ipv4Addr'

 ueIpv6Addr:

 $ref: '#/components/schemas/Ipv6Addr'

 portNumber:

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

 protocol:

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

 tnapId:

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

 twapId:

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

 hfcNodeId:

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

 gli:

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

 w5gbanLineType:

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

 gci:

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

 UpSecurity:

 description: Contains Userplain security information.

 type: object

 properties:

 upIntegr:

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

 upConfid:

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

 required:

 - upIntegr

 - upConfid

 UpSecurityRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property.

 NgApCause:

 description: Represents the NGAP cause.

 type: object

 properties:

 group:

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

 value:

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

 required:

 - group

 - value

 BackupAmfInfo:

 description: Provides details of the Backup AMF.

 type: object

 properties:

 backupAmf:

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

 guamiList:

 type: array

 items:

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

 minItems: 1

 description: >

 If present, this IE shall contain the list of GUAMI(s) (supported by the AMF) for

 which the backupAmf IE applies.

 required:

 - backupAmf

 RefToBinaryData:

 description: This parameter provides information about the referenced binary body data.

 type: object

 properties:

 contentId:

 type: string

 description: >

 This IE shall contain the value of the Content-ID header of the referenced binary

 body part.

 required:

 - contentId

 RefToBinaryDataRm:

 anyOf:

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

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

 description: >

 This data type is defined in the same way as the ' RefToBinaryData ' data type,

 but with the OpenAPI 'nullable: true' property.

 RouteToLocation:

 type: object

 properties:

 dnai:

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

 routeInfo:

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

 routeProfId:

 type: string

 nullable: true

 description: Identifies the routing profile Id.

 required:

 - dnai

 anyOf:

 - required: [ routeInfo ]

 - required: [ routeProfId ]

 nullable: true

 description: >

 At least one of the "routeInfo" attribute and the "routeProfId" attribute shall be included

 in the "RouteToLocation" data type.

 RouteInformation:

 type: object

 properties:

 ipv4Addr:

 $ref: '#/components/schemas/Ipv4Addr'

 ipv6Addr:

 $ref: '#/components/schemas/Ipv6Addr'

 portNumber:

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

 required:

 - portNumber

 nullable: true

 description: >

 At least one of the "ipv4Addr" attribute and the "ipv6Addr" attribute shall be included in

 the "RouteInformation" data type.

 Area:

 description: Provides area information.

 type: object

 oneOf:

 - required:

 - tacs

 - required:

 - areaCode

 properties:

 tacs:

 type: array

 items:

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

 minItems: 1

 areaCode:

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

 ServiceAreaRestriction:

 description: Provides information about allowed or not allowed areas.

 type: object

 properties:

 restrictionType:

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

 areas:

 type: array

 items:

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

 maxNumOfTAs:

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

 maxNumOfTAsForNotAllowedAreas:

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

 allOf:

 #

 # 1st condition: restrictionType and areas attributes shall be either both absent

 # or both present

 #

 - oneOf:

 - not:

 required: [ restrictionType ]

 - required: [ areas ]

 #

 # 2nd condition: if restrictionType takes value NOT\_ALLOWED\_AREAS,

 # then maxNumOfTAs shall be absent

 #

 - anyOf:

 - not:

 required: [ restrictionType ]

 properties:

 restrictionType:

 type: string

 enum: [ NOT\_ALLOWED\_AREAS ]

 - not:

 required: [ maxNumOfTAs ]

 #

 # 3rd condition: if restrictionType takes value ALLOWED\_AREAS,

 # then maxNumOfTAsForNotAllowedAreas shall be absent

 #

 - anyOf:

 - not:

 required: [ restrictionType ]

 properties:

 restrictionType:

 type: string

 enum: [ ALLOWED\_AREAS ]

 - not:

 required: [ maxNumOfTAsForNotAllowedAreas ]

 PresenceInfo:

 type: object

 properties:

 praId:

 type: string

 description: >

 Represents an identifier of the Presence Reporting Area (see clause 28.10 of 3GPP

 TS 23.003. This IE shall be present if the Area of Interest subscribed or reported is

 a Presence Reporting Area or a Set of Core Network predefined Presence Reporting Areas.

 When present, it shall be encoded as a string representing an integer in the following

 ranges:

 0 to 8 388 607 for UE-dedicated PRA

 8 388 608 to 16 777 215 for Core Network predefined PRA

 Examples:

 PRA ID 123 is encoded as "123"

 PRA ID 11 238 660 is encoded as "11238660"

 additionalPraId:

 type: string

 description: >

 This IE may be present if the praId IE is present and if it contains a PRA identifier

 referring to a set of Core Network predefined Presence Reporting Areas. When present,

 this IE shall contain a PRA Identifier of an individual PRA within the Set of Core

 Network predefined Presence Reporting Areas indicated by the praId IE.

 presenceState:

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

 trackingAreaList:

 type: array

 items:

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

 minItems: 1

 description: >

 Represents the list of tracking areas that constitutes the area. This IE shall be

 present if the subscription or the event report is for tracking UE presence in the

 tracking areas. For non 3GPP access the TAI shall be the N3GPP TAI.

 ecgiList:

 type: array

 items:

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

 minItems: 1

 description: >

 Represents the list of EUTRAN cell Ids that constitutes the area. This IE shall

 be present if the Area of Interest subscribed is a list of EUTRAN cell Ids.

 ncgiList:

 type: array

 items:

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

 minItems: 1

 description: >

 Represents the list of NR cell Ids that constitutes the area. This IE shall be

 present if the Area of Interest subscribed is a list of NR cell Ids.

 globalRanNodeIdList:

 type: array

 items:

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

 minItems: 1

 description: >

 Represents the list of NG RAN node identifiers that constitutes the area. This IE shall

 be present if the Area of Interest subscribed is a list of NG RAN node identifiers.

 globaleNbIdList:

 type: array

 items:

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

 minItems: 1

 description: >

 Represents the list of eNodeB identifiers that constitutes the area. This IE shall be

 present if the Area of Interest subscribed is a list of eNodeB identifiers.

 description: >

 If the additionalPraId IE is present, this IE shall state the presence information of the

 UE for the individual PRA identified by the additionalPraId IE; If the additionalPraId IE

 is not present, this IE shall state the presence information of the UE for the PRA

 identified by the praId IE.

 PresenceInfoRm:

 type: object

 properties:

 praId:

 type: string

 description: |

 Represents an identifier of the Presence Reporting Area (see clause 28.10 of

 3GPP TS 23.003. This IE shall be present if the Area of Interest subscribed or

 reported is a Presence Reporting Area or a Set of Core Network predefined Presence

 Reporting Areas. When present, it shall be encoded as a string representing an integer

 in the following ranges:

 - 0 to 8 388 607 for UE-dedicated PRA

 - 8 388 608 to 16 777 215 for Core Network predefined PRA

 Examples:

 PRA ID 123 is encoded as "123"

 PRA ID 11 238 660 is encoded as "11238660"

 additionalPraId:

 type: string

 description: >

 This IE may be present if the praId IE is present and if it contains a PRA identifier

 referring to a set of Core Network predefined Presence Reporting Areas.

 When present, this IE shall contain a PRA Identifier of an individual PRA within the Set

 of Core Network predefined Presence Reporting Areas indicated by the praId IE.

 presenceState:

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

 trackingAreaList:

 type: array

 items:

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

 minItems: 0

 description: >

 Represents the list of tracking areas that constitutes the area. This IE shall be

 present if the subscription or the event report is for tracking UE presence in the

 tracking areas. For non 3GPP access the TAI shall be the N3GPP TAI.

 ecgiList:

 type: array

 items:

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

 minItems: 0

 description: >

 Represents the list of EUTRAN cell Ids that constitutes the area. This IE shall be

 present if the Area of Interest subscribed is a list of EUTRAN cell Ids.

 ncgiList:

 type: array

 items:

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

 minItems: 0

 description: >

 Represents the list of NR cell Ids that constitutes the area. This IE shall be present

 if the Area of Interest subscribed is a list of NR cell Ids.

 globalRanNodeIdList:

 type: array

 items:

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

 description: >

 Represents the list of NG RAN node identifiers that constitutes the area. This IE shall be

 present if the Area of Interest subscribed is a list of NG RAN node identifiers.

 globaleNbIdList:

 type: array

 items:

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

 minItems: 1

 description: >

 Represents the list of eNodeB identifiers that constitutes the area. This IE shall be present

 if the Area of Interest subscribed is a list of eNodeB identifiers.

 nullable: true

 description: >

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

 OpenAPI 'nullable: true' property. If the additionalPraId IE is present, this IE shall state

 the presence information of the UE for the individual PRA identified by the additionalPraId

 IE; If the additionalPraId IE is not present, this IE shall state the presence information

 of the UE for the PRA identified by the praId IE.

 GlobalRanNodeId:

 type: object

 properties:

 plmnId:

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

 n3IwfId:

 $ref: '#/components/schemas/N3IwfId'

 gNbId:

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

 ngeNbId:

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

 wagfId:

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

 tngfId:

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

 nid:

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

 eNbId:

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

 oneOf:

 - required: [ n3IwfId ]

 - required: [ gNbId ]

 - required: [ ngeNbId ]

 - required: [ wagfId ]

 - required: [ tngfId ]

 - required: [ eNbId ]

 description: >

 One of the six attributes n3IwfId, gNbIdm, ngeNbId, wagfId, tngfId, eNbId shall be present.

 required:

 - plmnId

 GNbId:

 description: Provides the G-NB identifier.

 type: object

 properties:

 bitLength:

 type: integer

 minimum: 22

 maximum: 32

 description: >

 Unsigned integer representing the bit length of the gNB ID as defined in clause

 9.3.1.6 of 3GPP TS 38.413 [11], within the range 22 to 32.

 gNBValue:

 type: string

 pattern: '^[A-Fa-f0-9]{6,8}$'

 description: >

 This represents the identifier of the gNB. The value of the gNB ID shall be encoded

 in hexadecimal representation. Each character in the string shall take a value of

 "0" to "9", "a" to "f" or "A" to "F" and shall represent 4 bits. The padding 0 shall

 be added to make multiple nibbles, the most significant character representing the

 padding 0 if required together with the 4 most significant bits of the gNB ID shall

 appear first in the string, and the character representing the 4 least significant bit

 of the gNB ID shall appear last in the string.

 required:

 - bitLength

 - gNBValue

 AtsssCapability:

 description: >

 Containes Capability to support procedures related to Access Traffic Steering, Switching,

 Splitting.

 type: object

 properties:

 atsssLL:

 type: boolean

 default: false

 description: >

 Indicates the ATSSS-LL capability to support procedures related to Access Traffic

 Steering, Switching, Splitting (see clauses 4.2.10, 5.32 of 3GPP TS 23.501).

 true: Supported

 false (default): Not Supported

 mptcp:

 type: boolean

 default: false

 description: >

 Indicates the MPTCP capability to support procedures related to Access Traffic Steering,

 Switching, Splitting (see clauses 4.2.10, 5.32 of 3GPP TS 23.501

 true: Supported

 false (default): Not Supported

 rttWithoutPmf:

 type: boolean

 default: false

 description: >

 This IE is only used by the UPF to indicate whether the UPF supports RTT measurement

 without PMF (see clauses 5.32.2, 6.3.3.3 of 3GPP TS 23.501

 true: Supported

 false (default): Not Supported

 PlmnIdNid:

 description: >

 Contains the serving core network operator PLMN ID and, for an SNPN, the NID that together

 with the PLMN ID identifies the SNPN.

 type: object

 required:

 - mcc

 - mnc

 properties:

 mcc:

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

 mnc:

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

 nid:

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

 PlmnIdNidRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property.

 SmallDataRateStatus:

 description: It indicates theSmall Data Rate Control Status

 type: object

 properties:

 remainPacketsUl:

 type: integer

 minimum: 0

 description: >

 When present, it shall contain the number of packets the UE is allowed to send uplink

 in the given time unit for the given PDU session (see clause 5.31.14.3 of 3GPP TS 23.501.

 remainPacketsDl:

 type: integer

 minimum: 0

 description: >

 When present it shall contain the number of packets the AF is allowed to send downlink

 in the given time unit for the given PDU session (see clause 5.31.14.3 of 3GPP TS 23.501.

 validityTime:

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

 remainExReportsUl:

 type: integer

 minimum: 0

 description: >

 When present, it shall indicate number of additional exception reports the UE is allowed

 to send uplink in the given time unit for the given PDU session (see clause 5.31.14.3

 of 3GPP TS 23.501.

 remainExReportsDl:

 type: integer

 minimum: 0

 description: >

 When present, it shall indicate number of additional exception reports the AF is allowed

 to send downlink in the given time unit for the given PDU session (see clause 5.31.14.3

 in 3GPP TS 23.501

 HfcNodeId:

 description: REpresents the HFC Node Identifer received over NGAP.

 type: object

 required:

 - hfcNId

 properties:

 hfcNId:

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

 HfcNodeIdRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property.

 WirelineArea:

 type: object

 properties:

 globalLineIds:

 type: array

 items:

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

 minItems: 1

 hfcNIds:

 type: array

 items:

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

 minItems: 1

 areaCodeB:

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

 areaCodeC:

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

 description: >

 One and only one of the "globLineIds", "hfcNIds", "areaCodeB" and "areaCodeC" attributes

 shall be included in a WirelineArea data structure

 WirelineServiceAreaRestriction:

 type: object

 properties:

 restrictionType:

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

 areas:

 type: array

 items:

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

 description: >

 The "restrictionType" attribute and the "areas" attribute shall be either both present

 or absent. The empty array of areas is used when service is allowed/restricted nowhere.

 ApnRateStatus:

 description: Contains the APN rate control status e.g. of the AMF.

 type: object

 properties:

 remainPacketsUl:

 type: integer

 minimum: 0

 description: >

 When present, it shall contain the number of packets the UE is allowed to send uplink

 in the given time unit for the given APN (all PDN connections of the UE to this APN

 see clause 4.7.7.3 in 3GPP TS 23.401.

 remainPacketsDl:

 type: integer

 minimum: 0

 description: >

 When present, it shall contain the number of packets the UE is allowed to send uplink

 in the given time unit for the given APN (all PDN connections of the UE to this APN

 see clause 4.7.7.3 in 3GPP TS 23.401.

 validityTime:

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

 remainExReportsUl:

 type: integer

 minimum: 0

 description: >

 When present, it shall indicate the number of additional exception reports the UE is

 allowed to send uplink in the given time unit for the given APN (all PDN connections of the UE to this APN,

 see clause 4.7.7.3 in 3GPP TS 23.401.

 remainExReportsDl:

 type: integer

 minimum: 0

 description: >

 When present, it shall indicate the number of additional exception reports the AF is

 allowed to send downlink in the given time unit for the given APN (all PDN connections

 of the UE to this APN, see clause 4.7.7.3 in 3GPP TS 23.401.

 ScheduledCommunicationTime:

 description: Identifies time and day of the week when the UE is available for communication.

 type: object

 properties:

 daysOfWeek:

 type: array

 items:

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

 minItems: 1

 maxItems: 6

 description: >

 Identifies the day(s) of the week. If absent, it indicates every day of the week.

 timeOfDayStart:

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

 timeOfDayEnd:

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

 ScheduledCommunicationTimeRm:

 anyOf:

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

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

 description: >

 This data type is defined in the same way as the 'ScheduledCommunicationTime' data type,

 but with the OpenAPI 'nullable: true' property.

 BatteryIndication:

 type: object

 properties:

 batteryInd:

 type: boolean

 description: >

 This IE shall indicate whether the UE is battery powered or not.

 true: the UE is battery powered;

 false or absent: the UE is not battery powered

 replaceableInd:

 type: boolean

 description: >

 This IE shall indicate whether the battery of the UE is replaceable or not.

 true: the battery of the UE is replaceable;

 false or absent: the battery of the UE is not replaceable.

 rechargeableInd:

 type: boolean

 description: >

 This IE shall indicate whether the battery of the UE is rechargeable or not.

 true: the battery of UE is rechargeable;

 false or absent: the battery of the UE is not rechargeable.

 description: >

 Parameters "replaceableInd" and "rechargeableInd" are only included if the value of

 Parameter "batteryInd" is true.

 BatteryIndicationRm:

 anyOf:

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

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

 description: >

 This data type is defined in the same way as the 'BatteryIndication' data type, but

 with the OpenAPI 'nullable: true' property.

 AcsInfo:

 description: The ACS information for the 5G-RG is defined in BBF TR-069 [42] or in BBF TR-369

 type: object

 properties:

 acsUrl:

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

 acsIpv4Addr:

 $ref: '#/components/schemas/Ipv4Addr'

 acsIpv6Addr:

 $ref: '#/components/schemas/Ipv6Addr'

 AcsInfoRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property.

 NrV2xAuth:

 description: Contains NR V2X services authorized information.

 type: object

 properties:

 vehicleUeAuth:

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

 pedestrianUeAuth:

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

 LteV2xAuth:

 description: Contains LTE V2X services authorized information.

 type: object

 properties:

 vehicleUeAuth:

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

 pedestrianUeAuth:

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

 Pc5QoSPara:

 description: Contains policy data on the PC5 QoS parameters.

 type: object

 required:

 - pc5QosFlowList

 properties:

 pc5QosFlowList:

 type: array

 items:

 $ref: '#/components/schemas/Pc5QosFlowItem'

 pc5LinkAmbr:

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

 Pc5QosFlowItem:

 description: Contains a PC5 QOS flow.

 type: object

 required:

 - pqi

 properties:

 pqi:

 $ref: '#/components/schemas/5Qi'

 pc5FlowBitRates:

 $ref: '#/components/schemas/Pc5FlowBitRates'

 range:

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

 Pc5FlowBitRates:

 description: it shall represent the PC5 Flow Bit Rates

 type: object

 properties:

 guaFbr:

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

 maxFbr:

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

 UtraLocation:

 type: object

 oneOf:

 - required:

 - cgi

 - required:

 - sai

 - required:

 - rai

 description: Exactly one of cgi, sai or lai shall be present.

 properties:

 cgi:

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

 sai:

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

 lai:

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

 rai:

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

 ageOfLocationInformation:

 type: integer

 minimum: 0

 maximum: 32767

 description: >

 The value represents the elapsed time in minutes since the last network contact of the

 mobile station. Value "0" indicates that the location information was obtained after a

 successful paging procedure for Active Location Retrieval when the UE is in idle mode

 or after a successful location reporting procedure the UE is in connected mode. Any

 other value than "0" indicates that the location information is the last known one.

 See 3GPP TS 29.002 clause 17.7.8.

 ueLocationTimestamp:

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

 geographicalInformation:

 type: string

 pattern: '^[0-9A-F]{16}$'

 description: >

 Refer to geographical Information.See 3GPP TS 23.032 clause 7.3.2. Only the

 description of an ellipsoid point with uncertainty circle is allowed to be used.

 geodeticInformation:

 type: string

 pattern: '^[0-9A-F]{20}$'

 description: >

 Refers to Calling Geodetic Location. See ITU-T Recommendation Q.763 (1999) clause

 3.88.2. Only the description of an ellipsoid point with uncertainty circle is allowed

 to be used.

 GeraLocation:

 type: object

 oneOf:

 - required:

 - cgi

 - required:

 - sai

 - required:

 - lai

 - required:

 - rai

 description: Exactly one of cgi, sai or lai shall be present.

 properties:

 locationNumber:

 type: string

 description: Location number within the PLMN. See 3GPP TS 23.003, clause 4.5.

 cgi:

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

 rai:

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

 sai:

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

 lai:

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

 vlrNumber:

 type: string

 description: VLR number. See 3GPP TS 23.003 clause 5.1.

 mscNumber:

 type: string

 description: MSC number. See 3GPP TS 23.003 clause 5.1.

 ageOfLocationInformation:

 type: integer

 minimum: 0

 maximum: 32767

 description: >

 The value represents the elapsed time in minutes since the last network contact of the

 mobile station. Value "0" indicates that the location information was obtained after a

 successful paging procedure for Active Location Retrieval when the UE is in idle mode

 or after a successful location reporting procedure the UE is in connected mode. Any

 other value than "0" indicates that the location information is the last known one.

 See 3GPP TS 29.002 clause 17.7.8.

 ueLocationTimestamp:

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

 geographicalInformation:

 type: string

 pattern: '^[0-9A-F]{16}$'

 description: >

 Refer to geographical Information.See 3GPP TS 23.032 clause 7.3.2. Only the

 description of an ellipsoid point with uncertainty circle is allowed to be used.

 geodeticInformation:

 type: string

 pattern: '^[0-9A-F]{20}$'

 description: >

 Refers to Calling Geodetic Location.See ITU-T Recommendation Q.763 (1999) clause 3.88.2.

 Only the description of an ellipsoid point with uncertainty circle is allowed to be

 used.

 CellGlobalId:

 description: Contains a Cell Global Identification as defined in 3GPP TS 23.003, clause 4.3.1.

 type: object

 required:

 - plmnId

 - lac

 - cellId

 properties:

 plmnId:

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

 lac:

 type: string

 pattern: '^[A-Fa-f0-9]{4}$'

 cellId:

 type: string

 pattern: '^[A-Fa-f0-9]{4}$'

 ServiceAreaId:

 description: Contains a Service Area Identifier as defined in 3GPP TS 23.003, clause 12.5.

 type: object

 required:

 - plmnId

 - lac

 - sac

 properties:

 plmnId:

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

 lac:

 type: string

 pattern: '^[A-Fa-f0-9]{4}$'

 description: Location Area Code.

 sac:

 type: string

 pattern: '^[A-Fa-f0-9]{4}$'

 description: Service Area Code.

 LocationAreaId:

 description: Contains a Location area identification as defined in 3GPP TS 23.003, clause 4.1.

 type: object

 required:

 - plmnId

 - lac

 properties:

 plmnId:

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

 lac:

 type: string

 pattern: '^[A-Fa-f0-9]{4}$'

 description: Location Area Code.

 RoutingAreaId:

 description: Contains a Routing Area Identification as defined in 3GPP TS 23.003, clause 4.2.

 type: object

 required:

 - plmnId

 - lac

 - rac

 properties:

 plmnId:

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

 lac:

 type: string

 pattern: '^[A-Fa-f0-9]{4}$'

 description: Location Area Code

 rac:

 type: string

 pattern: '^[A-Fa-f0-9]{2}$'

 description: Routing Area Code

 DddTrafficDescriptor:

 description: Contains a Traffic Descriptor.

 type: object

 properties:

 ipv4Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 ipv6Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

 portNumber:

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

 macAddr:

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

 MoExpDataCounter:

 description: Contain the MO Exception Data Counter.

 type: object

 required:

 - counter

 properties:

 counter:

 type: integer

 description: >

 Unsigned integer identifying the MO Exception Data Counter, as specified in clause

 5.31.14.3 of 3GPP TS 23.501.

 timeStamp:

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

 NssaaStatus:

 description: contains the Subscribed S-NSSAI subject to NSSAA procedure and the status.

 type: object

 required:

 - snssai

 - status

 properties:

 snssai:

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

 status:

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

 NssaaStatusRm:

 anyOf:

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

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

 description: >

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

 the OpenAPI 'nullable: true' property.

 TnapId:

 description: Contain the TNAP Identifier see clause5.6.2 of 3GPP TS 23.501.

 type: object

 properties:

 ssId:

 type: string

 description: >

 This IE shall be present if the UE is accessing the 5GC via a trusted WLAN access

 network.When present, it shall contain the SSID of the access point to which the UE

 is attached, that is received over NGAP, see IEEE Std 802.11-2012.

 bssId:

 type: string

 description: >

 When present, it shall contain the BSSID of the access point to which the UE is

 attached, that is received over NGAP, see IEEE Std 802.11-2012.

 civicAddress:

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

 TnapIdRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property.

 TwapId:

 description: >

 Contain the TWAP Identifier as defined in clause 4.2.8.5.3 of 3GPP TS 23.501

 or the WLAN location information as defined in clause 4.5.7.2.8 of 3GPP TS 23.402.

 type: object

 required:

 - ssId

 properties:

 ssId:

 type: string

 description: >

 This IE shall contain the SSID of the access point to which the UE is attached, that is

 received over NGAP, see IEEE Std 802.11-2012.

 bssId:

 type: string

 description: >

 When present, it shall contain the BSSID of the access point to which the UE is

 attached, for trusted WLAN access, see IEEE Std 802.11-2012.

 civicAddress:

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

 TwapIdRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property.

 SnssaiExtension:

 description: >

 Extensions to the Snssai data type, sdRanges and wildcardSd shall not be present

 simultaneously

 type: object

 not:

 required:

 - sdRanges

 - wildcardSd

 properties:

 sdRanges:

 description: >

 When present, it shall contain the range(s) of Slice Differentiator values supported for

 the Slice/Service Type value indicated in the sst attribute of the Snssai data type

 type: array

 items:

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

 minItems: 1

 wildcardSd:

 description: >

 When present, it shall be set to true, to indicate that all SD values are supported for

 the Slice/Service Type value indicated in the sst attribute of the Snssai data type.

 type: boolean

 enum:

 - true

 SdRange:

 description: A range of SDs (Slice Differentiators)

 type: object

 properties:

 start:

 type: string

 pattern: '^[A-Fa-f0-9]{6}$'

 description: >

 First value identifying the start of an SD range. This string shall be formatted as

 specified for the sd attribute of the Snssai data type in clause 5.4.4.2.

 end:

 type: string

 pattern: '^[A-Fa-f0-9]{6}$'

 description: >

 Last value identifying the end of an SD range. This string shall be formatted as

 specified for the sd attribute of the Snssai data type in clause 5.4.4.2.

 ProseServiceAuth:

 description: >

 Indicates whether the UE is authorized to use ProSe Direct Discovery, ProSe Direct

 Communication, or both.

 type: object

 properties:

 proseDirectDiscoveryAuth:

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

 proseDirectCommunicationAuth:

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

 EcsServerAddr:

 description: >

 Contains the Edge Configuration Server Address Configuration Information as defined in

 clause 5.2.3.6.1 of 3GPP TS 23.502.

 type: object

 properties:

 ecsFqdnList:

 type: array

 items:

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

 minItems: 1

 ecsIpAddressList:

 type: array

 items:

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

 minItems: 1

 ecsProviderId:

 type: string

 EcsServerAddrRm:

 anyOf:

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

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

 description: >

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

 the OpenAPI 'nullable: true' property.

 IpAddr:

 description: Contains an IP adresse.

 type: object

 oneOf:

 - required:

 - ipv4Addr

 - required:

 - ipv6Addr

 - required:

 - ipv6Prefix

 properties:

 ipv4Addr:

 $ref: '#/components/schemas/Ipv4Addr'

 ipv6Addr:

 $ref: '#/components/schemas/Ipv6Addr'

 ipv6Prefix:

 $ref: '#/components/schemas/Ipv6Prefix'

 SACInfo:

 description: >

 Represents threshold(s) to control the triggering of network slice reporting notifications

 or the information contained in the network slice reporting notification.

 type: object

 properties:

 numericValNumUes:

 type: integer

 numericValNumPduSess:

 type: integer

 percValueNumUes:

 type: integer

 minimum: 0

 maximum: 100

 percValueNumPduSess:

 type: integer

 minimum: 0

 maximum: 100

 SACEventStatus:

 description: >

 Contains the network slice status information in terms of the current number of UEs

 registered with a network slice, the current number of PDU Sessions established on a

 network slice or both.

 type: object

 properties:

 reachedNumUes:

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

 reachedNumPduSess:

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

 SpatialValidityCond:

 description: Contains the Spatial Validity Condition.

 type: object

 properties:

 trackingAreaList:

 type: array

 items:

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

 minItems: 1

 countries:

 type: array

 items:

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

 minItems: 1

 SpatialValidityCondRm:

 description: Contains the Spatial Validity Condition or the null value.

 anyOf:

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

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

 ServerAddressingInfo:

 description: Contains addressing information (IP addresses and/or FQDNs) of a server.

 type: object

 anyOf:

 - required:

 - ipv4Addresses

 - required:

 - ipv6Addresses

 - required:

 - fqdnList

 properties:

 ipv4Addresses:

 type: array

 items:

 $ref: '#/components/schemas/Ipv4Addr'

 minItems: 1

 ipv6Addresses:

 type: array

 items:

 $ref: '#/components/schemas/Ipv6Addr'

 minItems: 1

 fqdnList:

 type: array

 items:

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

 minItems: 1

 PcfUeCallbackInfo:

 description: >

 Contains the PCF for the UE information necessary for the PCF for the PDU session to send

 SM Policy Association Establishment and Termination events.

 type: object

 properties:

 callbackUri:

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

 bindingInfo:

 type: string

 nullable: true

 required:

 - callbackUri

 PduSessionInfo:

 description: indicates the DNN and S-NSSAI combination of a PDU session.

 properties:

 snssai:

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

 dnn:

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

 required:

 - dnn

 - snssai

 EasIpReplacementInfo:

 description: Contains EAS IP replacement information for a Source and a Target EAS.

 type: object

 properties:

 source:

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

 target:

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

 required:

 - source

 - target

 EasServerAddress:

 description: Represents the IP address and port of an EAS server.

 type: object

 properties:

 ip:

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

 port:

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

 required:

 - ip

 - port

 RoamingRestrictions:

 description: >

 Indicates if access is allowed to a given serving network, e.g. a PLMN (MCC, MNC) or an

 SNPN (MCC, MNC, NID).

 type: object

 properties:

 accessAllowed:

 type: boolean

#

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

#

 ExtSnssai:

 allOf:

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

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

 description: >

 The sdRanges and wildcardSd attributes shall be exclusive from each other. If one of these

 attributes is present, the sd attribute shall also be present and it shall contain one Slice

 Differentiator value within the range of SD (if the sdRanges attribute is present) or with

 any value (if the wildcardSd attribute is present).

#

# Data Types related to 5G QoS as defined in clause 5.5

#

#

# SIMPLE DATA TYPES

#

#

 Qfi:

 type: integer

 minimum: 0

 maximum: 63

 description: Unsigned integer identifying a QoS flow, within the range 0 to 63.

 QfiRm:

 type: integer

 minimum: 0

 maximum: 63

 nullable: true

 description: >

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

 OpenAPI 'nullable: true' property.

 5Qi:

 type: integer

 minimum: 0

 maximum: 255

 description: >

 Unsigned integer representing a 5G QoS Identifier (see clause 5.7.2.1 of 3GPP TS 23.501,

 within the range 0 to 255.

 5QiRm:

 type: integer

 minimum: 0

 maximum: 255

 nullable: true

 description: >

 This data type is defined in the same way as the '5QiPriorityLevel' data type, but with

 the OpenAPI 'nullable: true' property. "

 BitRate:

 type: string

 pattern: '^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$'

 description: >

 String representing a bit rate; the prefixes follow the standard symbols from The International

 System of Units, and represent x1000 multipliers, with the exception that prefix "K" is

 used to represent the standard symbol "k".

 BitRateRm:

 type: string

 pattern: '^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$'

 nullable: true

 description: >

 This data type is defined in the same way as the 'BitRate' data type, but with the OpenAPI 'nullable: true' property.

 ArpPriorityLevelRm:

 type: integer

 minimum: 1

 maximum: 15

 nullable: true

 description: >

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

 the OpenAPI 'nullable: true' property.

 ArpPriorityLevel:

 type: integer

 minimum: 1

 maximum: 15

 nullable: true

 description: >

 nullable true shall not be used for this attribute. Unsigned integer indicating the ARP

 Priority Level (see clause 5.7.2.2 of 3GPP TS 23.501, within the range 1 to 15.Values are

 ordered in decreasing order of priority, i.e. with 1 as the highest priority and 15 as

 the lowest priority.

 5QiPriorityLevel:

 type: integer

 minimum: 1

 maximum: 127

 description: >

 Unsigned integer indicating the 5QI Priority Level (see clauses 5.7.3.3 and 5.7.4 of 3GPP

 TS 23.501, within the range 1 to 127.Values are ordered in decreasing order of priority,

 i.e. with 1 as the highest priority and 127 as the lowest priority.

 5QiPriorityLevelRm:

 type: integer

 minimum: 1

 maximum: 127

 nullable: true

 description: >

 This data type is defined in the same way as the '5QiPriorityLevel' data type, but with

 the OpenAPI 'nullable: true' property.

 PacketDelBudget:

 type: integer

 minimum: 1

 description: >

 Unsigned integer indicating Packet Delay Budget (see clauses 5.7.3.4 and 5.7.4 of 3GPP

 TS 23.501), expressed in milliseconds.

 PacketDelBudgetRm:

 type: integer

 minimum: 1

 nullable: true

 description: >

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

 the OpenAPI 'nullable: true' property.

 PacketErrRate:

 type: string

 pattern: '^([0-9]E-[0-9])$'

 description: >

 String representing Packet Error Rate (see clause 5.7.3.5 and 5.7.4 of 3GPP TS 23.501,

 expressed as a "*scalar* x 10-k" where the scalar and the *exponent k are each encoded as*

 *one decimal digit.*

 PacketErrRateRm:

 type: string

 pattern: '^([0-9]E-[0-9])$'

 nullable: true

 description: >

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

 the OpenAPI 'nullable: true' property.

 PacketLossRate:

 type: integer

 minimum: 0

 maximum: 1000

 description: >

 Unsigned integer indicating Packet Loss Rate (see clauses 5.7.2.8 and 5.7.4 of 3GPP

 TS 23.501), expressed in tenth of percent.

 PacketLossRateRm:

 type: integer

 minimum: 0

 maximum: 1000

 nullable: true

 description: >

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

 the OpenAPI 'nullable: true' property.

 AverWindow:

 type: integer

 minimum: 1

 maximum: 4095

 default: 2000

 description: Unsigned integer indicating Averaging Window (see clause 5.7.3.6 and 5.7.4 of 3GPP TS 23.501), expressed in milliseconds.

 AverWindowRm:

 type: integer

 maximum: 4095

 default: 2000

 minimum: 1

 nullable: true

 description: >

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

 the OpenAPI 'nullable: true' property.

 MaxDataBurstVol:

 type: integer

 minimum: 1

 maximum: 4095

 description: >

 Unsigned integer indicating Maximum Data Burst Volume (see clauses 5.7.3.7 and 5.7.4 of

 3GPP TS 23.501), expressed in Bytes.

 MaxDataBurstVolRm:

 type: integer

 minimum: 1

 maximum: 4095

 nullable: true

 description: >

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

 the OpenAPI 'nullable: true' property.

 SamplingRatio:

 type: integer

 minimum: 1

 maximum: 100

 description: >

 Unsigned integer indicating Sampling Ratio (see clauses 4.15.1 of 3GPP TS 23.502),

 expressed in percent.

 SamplingRatioRm:

 type: integer

 minimum: 1

 maximum: 100

 nullable: true

 description: >

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

 OpenAPI 'nullable: true' property.

#

 RgWirelineCharacteristics:

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

 RgWirelineCharacteristicsRm:

 anyOf:

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

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

 description: >

 This data type is defined in the same way as the 'RgWirelineCharacteristics' data type,

 but with the OpenAPI 'nullable: true' property.

 ExtMaxDataBurstVol:

 type: integer

 minimum: 4096

 maximum: 2000000

 description: >

 Unsigned integer indicating Maximum Data Burst Volume (see clauses 5.7.3.7 and 5.7.4 of

 3GPP TS 23.501), expressed in Bytes.

 ExtMaxDataBurstVolRm:

 type: integer

 minimum: 4096

 maximum: 2000000

 nullable: true

 description: >

 This data type is defined in the same way as the 'ExtMaxDataBurstVol' data type, but

 with the OpenAPI 'nullable: true' property.

 ExtPacketDelBudget:

 type: integer

 minimum: 1

 description: >

 Unsigned integer indicating Packet Delay Budget (see clauses 5.7.3.4 and 5.7.4 of 3GPP

 TS 23.501 [8])), expressed in 0.01 milliseconds.

 ExtPacketDelBudgetRm:

 type: integer

 minimum: 1

 nullable: true

 description: >

 This data type is defined in the same way as the 'ExtPacketDelBudget' data type, but

 with the OpenAPI 'nullable: true' property. "

#

# ENUMERATED DATA TYPES

#

 PreemptionCapability:

 anyOf:

 - type: string

 enum:

 - NOT\_PREEMPT

 - MAY\_PREEMPT

 - type: string

 description: >

 The enumeration PreemptionCapability indicates the pre-emption capability of a request on

 other QoS flows. See clause 5.7.2.2 of 3GPP TS 23.501. It shall comply with the provisions

 defined in table 5.5.3.1-1.

 PreemptionCapabilityRm:

 anyOf:

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

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

 description: >

 This enumeration is defined in the same way as the 'PreemptionCapability' enumeration,

 but with the OpenAPI 'nullable: true' property.

 PreemptionVulnerability:

 anyOf:

 - type: string

 enum:

 - NOT\_PREEMPTABLE

 - PREEMPTABLE

 - type: string

 description: >

 The enumeration PreemptionVulnerability indicates the pre-emption vulnerability of the QoS

 flow to pre-emption from other QoS flows. See clause 5.7.2.2 of 3GPP TS 23.501. It shall

 comply with the provisions defined in table 5.5.3.2-1

 PreemptionVulnerabilityRm:

 anyOf:

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

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

 description: >

 This enumeration is defined in the same way as the 'PreemptionVulnerability' enumeration,

 but with the OpenAPI 'nullable: true' property."

 ReflectiveQoSAttribute:

 anyOf:

 - type: string

 enum:

 - RQOS

 - NO\_RQOS

 - type: string

 description: >

 The enumeration ReflectiveQosAttribute indicates whether certain traffic of the QoS flow may

 be subject to Reflective QoS (see clause 5.7.2.3 of 3GPP TS 23.501). It shall comply with

 the provisions defined in table 5.5.3.3-1.

 ReflectiveQoSAttributeRm:

 anyOf:

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

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

 description: >

 This enumeration is defined in the same way as the 'ReflectiveQosAttribute' enumeration,

 but with the OpenAPI 'nullable: true' property. "

 NotificationControl:

 anyOf:

 - type: string

 enum:

 - REQUESTED

 - NOT\_REQUESTED

 - type: string

 description: >

 The enumeration NotificationControl indicates whether notifications are requested from the

 RAN when the GFBR can no longer (or again) be fulfilled for a QoS Flow during the lifetime

 of the QoS Flow (see clause 5.7.2.4 of 3GPP TS 23.501).

 It shall comply with the provisions defined in table 5.5.3.5-1.

 NotificationControlRm:

 anyOf:

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

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

 description: >

 This enumeration is defined in the same way as the 'NotificationControl' enumeration, but

 with the OpenAPI 'nullable: true' property.

 QosResourceType:

 anyOf:

 - type: string

 enum:

 - NON\_GBR

 - NON\_CRITICAL\_GBR

 - CRITICAL\_GBR

 - type: string

 description: >

 The enumeration QosResourceType indicates whether a QoS Flow is non-GBR, delay critical GBR,

 or non-delay critical GBR (see clauses 5.7.3.4 and 5.7.3.5 of 3GPP TS 23.501). It shall

 comply with the provisions defined in table 5.5.3.6-1.

 QosResourceTypeRm:

 anyOf:

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

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

 description: >

 This enumeration is defined in the same way as the 'QosResourceType' enumeration, but

 with the OpenAPI 'nullable: true' property. "

 AdditionalQosFlowInfo:

 anyOf:

 - anyOf:

 - type: string

 enum:

 - MORE\_LIKELY

 - type: string

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

 description: >

 The enumeration AdditionalQosFlowInfo provides additional QoS flow information (see clause

 9.3.1.12 3GPP TS 38.413 [11]). It shall comply with the provisions defined in table

 5.5.3.12-1.

 PartitioningCriteria:

 anyOf:

 - type: string

 enum:

 - TAC

 - SUBPLMN

 - GEOAREA

 - SNSSAI

 - DNN

 - 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:

 - "TAC": Type Allocation Code

 - "SUBPLMN": Subscriber PLMN ID

 - "GEOAREA": Geographical area, i.e. list(s) of TAI(s)

 - "SNSSAI": S-NSSAI

 - "DNN": DNN

 PartitioningCriteriaRm:

 anyOf:

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

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

 description: >

 This data type is defined in the same way as the ' PartitioningCriteria ' data type, but

 with the OpenAPI 'nullable: true' property.

#

#

# STRUCTURED DATA TYPES

#

 Arp:

 description: Contains Allocation and Retention Priority information.

 type: object

 properties:

 priorityLevel:

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

 preemptCap:

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

 preemptVuln:

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

 required:

 - priorityLevel

 - preemptCap

 - preemptVuln

 Ambr:

 description: Contains the maximum aggregated uplink and downlink bit rates.

 type: object

 properties:

 uplink:

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

 downlink:

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

 required:

 - uplink

 - downlink

 Dynamic5Qi:

 description: >

 It indicates the QoS Characteristics for a Non-standardised or not pre-configured 5QI

 for downlink and uplink.

 type: object

 properties:

 resourceType:

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

 priorityLevel:

 $ref: '#/components/schemas/5QiPriorityLevel'

 packetDelayBudget:

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

 packetErrRate:

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

 averWindow:

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

 maxDataBurstVol:

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

 extMaxDataBurstVol:

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

 extPacketDelBudget:

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

 cnPacketDelayBudgetDl:

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

 cnPacketDelayBudgetUl:

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

 required:

 - resourceType

 - priorityLevel

 - packetDelayBudget

 - packetErrRate

 NonDynamic5Qi:

 description: >

 It indicates the QoS Characteristics for a standardized or pre-configured 5QI for downlink

 and uplink.

 type: object

 properties:

 priorityLevel:

 $ref: '#/components/schemas/5QiPriorityLevel'

 averWindow:

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

 maxDataBurstVol:

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

 extMaxDataBurstVol:

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

 cnPacketDelayBudgetDl:

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

 cnPacketDelayBudgetUl:

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

 minProperties: 0

 ArpRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property.

 AmbrRm:

 anyOf:

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

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

 description: >

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

 OpenAPI 'nullable: true' property."

 SliceMbr:

 description: MBR related to slice

 type: object

 properties:

 uplink:

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

 downlink:

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

 required:

 - uplink

 - downlink

 SliceMbrRm:

 description: "SliceMbr with nullable: true"

 anyOf:

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

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

#

# Data Types related to 5G Trace as defined in clause 5.6

#

#

# SIMPLE DATA TYPES

#

 PhysCellId:

 type: integer

 minimum: 0

 maximum: 1007

 description: >

 Integer value identifying the physical cell identity (PCI), as definition of "*PhysCellId*" IE

 in clause 6.3.2 of 3GPP TS 38.331.

 ArfcnValueNR:

 type: integer

 minimum: 0

 maximum: 3279165

 description: >

 Integer value indicating the ARFCN applicable for a downlink, uplink or bi-directional (TDD)

 NR global frequency raster,

 as definition of "*ARFCN-ValueNR*" IE in clause 6.3.2 of 3GPP TS 38.331.

#

#

# Enumerations

#

 TraceDepth:

 anyOf:

 - type: string

 enum:

 - MINIMUM

 - MEDIUM

 - MAXIMUM

 - MINIMUM\_WO\_VENDOR\_EXTENSION

 - MEDIUM\_WO\_VENDOR\_EXTENSION

 - MAXIMUM\_WO\_VENDOR\_EXTENSION

 - type: string

 description: >

 The enumeration TraceDepth defines how detailed information should be recorded in the trace.

 See 3GPP TS 32.422 for further description of the values. It shall comply with the

 provisions defined in table 5.6.3.1-1

 TraceDepthRm:

 anyOf:

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

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

 description: >

 This enumeration is defined in the same way as the 'TraceDepth' enumeration, but with

 the OpenAPI 'nullable: true' property.

 JobType:

 anyOf:

 - type: string

 enum:

 - IMMEDIATE\_MDT\_ONLY

 - LOGGED\_MDT\_ONLY

 - TRACE\_ONLY

 - IMMEDIATE\_MDT\_AND\_TRACE

 - RLF\_REPORTS\_ONLY

 - RCEF\_REPORTS\_ONLY

 - LOGGED\_MBSFN\_MDT

 - type: string

 description: >

 The enumeration JobType defines Job Type in the trace. See 3GPP TS 32.422 for further

 description of the values. It shall comply with the provisions defined in table 5.6.3.3-1.

 ReportTypeMdt:

 anyOf:

 - type: string

 enum:

 - PERIODICAL

 - EVENT\_TRIGGED

 - type: string

 description: >

 The enumeration ReportTypeMdt defines Report Type for logged MDT in the trace. See 3GPP TS

 32.422 for further description of the values. It shall comply with the provisions defined

 in table 5.6.3.4-1.

 MeasurementLteForMdt:

 anyOf:

 - type: string

 enum:

 - M1

 - M2

 - M3

 - M4\_DL

 - M4\_UL

 - M5\_DL

 - M5\_UL

 - M6\_DL

 - M6\_UL

 - M7\_DL

 - M7\_UL

 - M8

 - M9

 - type: string

 description: >

 The enumeration MeasurementLteForMdt defines Measurements used for MDT in LTE in the trace.

 See 3GPP TS 32.422 for further description of the values. It shall comply with the

 provisions defined in table 5.6.3.5-1.

 MeasurementNrForMdt:

 anyOf:

 - type: string

 enum:

 - M1

 - M2

 - M3

 - M4\_DL

 - M4\_UL

 - M5\_DL

 - M5\_UL

 - M6\_DL

 - M6\_UL

 - M7\_DL

 - M7\_UL

 - M8

 - M9

 - type: string

 description: >

 The enumeration MeasurementNrForMdt defines Measurements used for MDT in NR in the trace.

 See 3GPP TS 32.422 for further description of the values. It shall comply with the provisions

 defined in table 5.6.3.6-1.

 SensorMeasurement:

 anyOf:

 - type: string

 enum:

 - BAROMETRIC\_PRESSURE

 - UE\_SPEED

 - UE\_ORIENTATION

 - type: string

 description: >

 The enumeration SensorMeasurement defines sensor measurement type for MDT in the trace. See 3GPP

 TS 32.422 for further description of the values. It shall comply with the provisions defined

 in table 5.6.3.7-1.

 ReportingTrigger:

 anyOf:

 - type: string

 enum:

 - PERIODICAL

 - EVENT\_A2

 - EVENT\_A2\_PERIODIC

 - ALL\_RRM\_EVENT\_TRIGGERS

 - type: string

 description: >

 The enumeration ReportingTrigger defines Reporting Triggers for MDT in the trace. See 3GPP

 TS 32.42] for further description of the values. It shall comply with the provisions

 defined in table 5.6.3.8-1.

 ReportIntervalMdt:

 anyOf:

 - type: string

 enum:

 - 120

 - 240

 - 480

 - 640

 - 1024

 - 2048

 - 5120

 - 10240

 - 60000

 - 360000

 - 720000

 - 1800000

 - 3600000

 - type: string

 description: >

 The enumeration ReportIntervalMdt defines Report Interval for MDT in the trace. See 3GPP

 TS 32.422 for further description of the values. It shall comply with

 the provisions defined in table 5.6.3.9-1.

 ReportAmountMdt:

 anyOf:

 - type: string

 enum:

 - 1

 - 2

 - 4

 - 8

 - 16

 - 32

 - 64

 - infinity

 - type: string

 description: >

 The enumeration ReportAmountMdt defines Report Amount for MDT in the trace. See 3GPP

 TS 32.422 for further description of the values. It shall comply with the provisions

 defined in table 5.6.3.10-1.

 EventForMdt:

 anyOf:

 - type: string

 enum:

 - OUT\_OF\_COVERAG

 - A2\_EVENT

 - type: string

 description: >

 The enumeration EventForMdt defines events triggered measurement for logged MDT in the

 trace. See 3GPP TS 32.422 for further description of the values. It shall comply with

 the provisions defined in table 5.6.3.11-1

 LoggingIntervalMdt:

 anyOf:

 - type: string

 enum:

 - 128

 - 256

 - 512

 - 1024

 - 2048

 - 3072

 - 4096

 - 6144

 - type: string

 description: >

 The enumeration LoggingIntervalMdt defines Logging Interval for MDT in the trace. See 3GPP

 TS 32.422 for further description of the values. It shall comply with the provisions

 defined in table 5.6.3.12-1.

 LoggingDurationMdt:

 anyOf:

 - type: string

 enum:

 - 600

 - 1200

 - 2400

 - 3600

 - 5400

 - 7200

 - type: string

 description: >

 The enumeration LoggingIntervalMdt defines Logging Interval for MDT in the trace. See 3GPP

 TS 32.422 for further description of the values. It shall comply with the provisions

 defined in table 5.6.3.12-1.

 PositioningMethodMdt:

 anyOf:

 - type: string

 enum:

 - GNSS

 - E\_CELL\_ID

 - type: string

 description: >

 The enumeration LoggingDurationMdt defines Logging Duration for MDT in the trace. See 3GPP

 TS 32.422 for further description of the values. It shall comply with the provisions

 defined in table 5.6.3.13-1.

 CollectionPeriodRmmLteMdt:

 anyOf:

 - type: string

 enum:

 - 1024

 - 1280

 - 2048

 - 2560

 - 5120

 - 10240

 - 60000

 - type: string

 description: >

 The enumeration CollectionPeriodRmmLteMdt defines Collection period for RRM measurements

 LTE for MDT in the trace. See 3GPP TS 32.422 for further description of the values. It shall

 comply with the provisions defined in table 5.6.3.15-1.

 MeasurementPeriodLteMdt:

 anyOf:

 - type: string

 enum:

 - 1024

 - 1280

 - 2048

 - 2560

 - 5120

 - 10240

 - 60000

 - type: string

 description: >

 The enumeration MeasurementPeriodLteMdt defines Measurement period LTE for MDT in the trace.

 See 3GPP TS 32.422 for further description of the values. It shall comply with the

 provisions defined in table 5.6.3.16-1.

 ReportIntervalNrMdt:

 anyOf:

 - type: string

 enum:

 - 120

 - 240

 - 480

 - 640

 - 1024

 - 2048

 - 5120

 - 10240

 - 20480

 - 40960

 - 60000

 - 360000

 - 720000

 - 1800000

 - 3600000

 - type: string

 description: >

 The enumeration ReportIntervalNrMdt defines Report Interval in NR for MDT in the trace. See

 3GPP TS 32.422 for further description of the values. It shall comply with the provisions

 defined in table 5.6.3.17-1.

 LoggingIntervalNrMdt:

 anyOf:

 - type: string

 enum:

 - 128

 - 256

 - 512

 - 1024

 - 2048

 - 3072

 - 4096

 - 6144

 - 320

 - 640

 - infinity

 - type: string

 description: >

 The enumeration LoggingIntervalNrMdt defines Logging Interval in NR for MDT in the trace.

 See 3GPP TS 32.422 for further description of the values. It shall comply with the

 provisions defined in table 5.6.3.18-1.

 CollectionPeriodRmmNrMdt:

 anyOf:

 - type: string

 enum:

 - 1024

 - 2048

 - 5120

 - 10240

 - 60000

 - type: string

 description: >

 The enumeration CollectionPeriodRmmNrMdt defines Collection period for RRM measurements NR for MDT in the trace.

 See 3GPP TS 32.422 for further description of the values. It shall comply with the provisions defined in table 5.6.3.19-1

 LoggingDurationNrMdt:

 anyOf:

 - type: string

 enum:

 - 600

 - 1200

 - 2400

 - 3600

 - 5400

 - 7200

 - type: string

 description: >

 The enumeration LoggingDurationMdt defines Logging Duration in NR for MDT in the trace. See

 3GPP TS 32.422 for further description of the values. It shall comply with the provisions

 defined in table 5.6.3.20-1.

#

# STRUCTURED DATA TYPES

#

 TraceData:

 description: contains Trace control and configuration parameters.

 type: object

 nullable: true

 properties:

 traceRef:

 type: string

 pattern: '^[0-9]{3}[0-9]{2,3}-[A-Fa-f0-9]{6}$'

 description: >

 Trace Reference (see 3GPP TS 32.422).It shall be encoded as the concatenation of MCC,

 MNC and Trace ID as follows: 'MCC'<MNC'-'Trace ID'The Trace ID shall be encoded as a 3 octet string in hexadecimal

 representation. Each character in the Trace ID string shall take a value of "0" to "9",

 "a" to "f" or "A" to "F" and shall represent 4 bits.

 The most significant character representing the 4 most significant bits of the Trace ID

 shall appear first in the string, and the character representing the 4 least significant

 bit of the Trace ID shall appear last in the string.

 traceDepth:

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

 neTypeList:

 type: string

 pattern: '^[A-Fa-f0-9]+$'

 description: >

 List of NE Types (see 3GPP TS 32.422).It shall be encoded as an octet string in

 hexadecimal representation.

 Each character in the string shall take a value of "0" to "9", "a" to "f" or "A" to "F"

 and shall represent 4 bits.

 The most significant character representing the 4 most significant bits shall appear

 first in the string, and the character representing the

 4 least significant bit shall appear last in the string.Octets shall be coded

 according to 3GPP TS 32.422.

 eventList:

 type: string

 pattern: '^[A-Fa-f0-9]+$'

 description: >

 Triggering events (see 3GPP TS 32.422).It shall be encoded as an octet string in

 hexadecimal representation. Each character in the string shall take a value of "0"

 to "9", "a" to "f" or "A" to "F" and shall represent 4 bits.

 The most significant character representing the 4 most significant bits shall appear

 first in the string, and the character representing the 4 least significant bit shall

 appear last in the string. Octets shall be coded according to 3GPP TS 32.422.

 collectionEntityIpv4Addr:

 $ref: '#/components/schemas/Ipv4Addr'

 collectionEntityIpv6Addr:

 $ref: '#/components/schemas/Ipv6Addr'

 interfaceList:

 type: string

 pattern: '^[A-Fa-f0-9]+$'

 description: >

 List of Interfaces (see 3GPP TS 32.422).It shall be encoded as an octet string in

 hexadecimal representation.

 Each character in the string shall take a value of "0" to "9", "a" to "f" or "A" to "F"

 and shall represent 4 bits. The most significant character representing the 4 most

 significant bits shall appear first in the string, and the character representing the

 4 least significant bit shall appear last in the string. Octets shall be coded

 according to 3GPP TS 32.422. If this attribute is not present, all the interfaces

 applicable to the list of NE types indicated in the neTypeList attribute should

 be traced.

 required:

 - traceRef

 - traceDepth

 - neTypeList

 - eventList

 MdtConfiguration:

 description: contains contain MDT configuration data.

 type: object

 required:

 - jobType

 properties:

 jobType:

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

 reportType:

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

 areaScope:

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

 measurementLteList:

 type: array

 items:

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

 measurementNrList:

 type: array

 items:

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

 minItems: 1

 sensorMeasurementList:

 type: array

 items:

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

 minItems: 1

 reportingTriggerList:

 type: array

 items:

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

 minItems: 1

 reportInterval:

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

 reportIntervalNr:

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

 reportAmount:

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

 eventThresholdRsrp:

 type: integer

 minimum: 0

 maximum: 97

 description: >

 This IE shall be present if the report trigger parameter is configured for A2 event

 reporting or A2 event triggered periodic reporting and the job type parameter is

 configured for Immediate MDT or combined Immediate MDT and Trace in LTE.

 When present, this IE shall indicate the Event Threshold for RSRP, and the value shall

 be between 0-97.

 eventThresholdRsrpNr:

 type: integer

 minimum: 0

 maximum: 127

 description: >

 This IE shall be present if the report trigger parameter is configured for A2 event

 reporting or A2 event triggered periodic reporting and the job type parameter is

 configured for Immediate MDT or combined Immediate MDT

 and Trace in NR. When present,

 this IE shall indicate the Event Threshold for RSRP, and the value shall be

 between 0-127.

 eventThresholdRsrq:

 type: integer

 minimum: 0

 maximum: 34

 description: >

 This IE shall be present if the report trigger parameter is configured for A2 event

 reporting or A2 event triggered periodic reporting and the job type parameter is

 configured for Immediate MDT or combined Immediate MDT and Trace in LTE.When present,

 this IE shall indicate the Event Threshold for RSRQ, and the value shall be

 between 0-34.

 eventThresholdRsrqNr:

 type: integer

 minimum: 0

 maximum: 127

 description: >

 This IE shall be present if the report trigger parameter is configured for A2 event

 reporting or A2 event triggered periodic reporting and the job type parameter is

 configured for Immediate MDT or combined Immediate MDT and Trace in NR.When present,

 this IE shall indicate the Event Threshold for RSRQ, and the value shall be

 between 0-127.

 eventList:

 type: array

 items:

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

 minItems: 1

 loggingInterval:

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

 loggingIntervalNr:

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

 loggingDuration:

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

 loggingDurationNr:

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

 positioningMethod:

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

 addPositioningMethodList:

 type: array

 items:

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

 minItems: 1

 collectionPeriodRmmLte:

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

 collectionPeriodRmmNr:

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

 measurementPeriodLte:

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

 mdtAllowedPlmnIdList:

 type: array

 items:

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

 minItems: 1

 maxItems: 16

 mbsfnAreaList:

 type: array

 items:

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

 minItems: 1

 maxItems: 8

 interFreqTargetList:

 type: array

 items:

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

 minItems: 1

 maxItems: 8

 AreaScope:

 description: Contain the area based on Cells or Tracking Areas.

 type: object

 properties:

 eutraCellIdList:

 type: array

 items:

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

 minItems: 1

 nrCellIdList:

 type: array

 items:

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

 minItems: 1

 tacList:

 type: array

 items:

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

 minItems: 1

 tacInfoPerPlmn:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: >

 A map (list of key-value pairs) where PlmnId converted to a string serves as key

 TacInfo:

 description: contains tracking area information (tracking area codes).

 type: object

 required:

 - tacList

 properties:

 tacList:

 type: array

 items:

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

 minItems: 1

 MbsfnArea:

 description: Contains an MBSFN area information.

 type: object

 properties:

 mbsfnAreaId:

 type: integer

 minimum: 0

 maximum: 255

 description: This IE shall contain the MBSFN Area ID.

 carrierFrequency:

 type: integer

 minimum: 0

 maximum: 262143

 description: When present, this IE shall contain the Carrier Frequency (EARFCN).

 InterFreqTargetInfo:

 description: Indicates the Inter Frequency Target information.

 required:

 - dlCarrierFreq

 type: object

 properties:

 dlCarrierFreq:

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

 cellIdList:

 type: array

 items:

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

 minItems: 1

 maxItems: 32

 description: >

 When present, this IE shall contain a list of the physical cell identities where the

 UE is requested to perform measurement logging for the indicated frequency.

# Data Types related to 5G ODB as defined in clause 5.7

#

# SIMPLE DATA TYPES

#

#

#

# Enumerations

#

 RoamingOdb:

 anyOf:

 - type: string

 enum:

 - OUTSIDE\_HOME\_PLMN

 - OUTSIDE\_HOME\_PLMN\_COUNTRY

 - type: string

 description: >

 The enumeration RoamingOdb defines the Barring of Roaming as. See 3GPP TS 23.015 for further

 description. It shall comply with the provisions defined in table 5.7.3.1-1.

 OdbPacketServices:

 anyOf:

 - anyOf:

 - type: string

 enum:

 - ALL\_PACKET\_SERVICES

 - ROAMER\_ACCESS\_HPLMN\_AP

 - ROAMER\_ACCESS\_VPLMN\_AP

 - type: string

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

 description: >

 The enumeration OdbPacketServices defines the Barring of Packet Oriented Services.

 See 3GPP TS 23.015 for further description. It shall comply with the provisions defined

 in table 5.7.3.2-1

#

# STRUCTURED DATA TYPES

#

 OdbData:

 description: Contains information regarding operater determined barring.

 type: object

 properties:

 roamingOdb:

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

#

# Data Types related to Charging as defined in clause 5.8

#

#

# SIMPLE DATA TYPES

#

#

 ChargingId:

 deprecated: true

 type: integer

 minimum: 0

 maximum: 4294967295 #(2^32)-1

 description: >

 Integer where the allowed values correspond to the value range of an unsigned 32-bit

 integer.

 ApplicationChargingId:

 type: string

 description: Application provided charging identifier allowing correlation of charging information.

 RatingGroup:

 $ref: '#/components/schemas/Uint32'

 ServiceId:

 $ref: '#/components/schemas/Uint32'

#

# Enumerations

#

#

# STRUCTURED DATA TYPES

#

 SecondaryRatUsageReport:

 description: Secondary RAT Usage Report to report usage data for a secondary RAT for QoS flows.

 type: object

 properties:

 secondaryRatType:

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

 qosFlowsUsageData:

 type: array

 items:

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

 minItems: 1

 required:

 - secondaryRatType

 - qosFlowsUsageData

 QosFlowUsageReport:

 description: Contains QoS flows usage data information.

 type: object

 properties:

 qfi:

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

 startTimeStamp:

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

 endTimeStamp:

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

 downlinkVolume:

 $ref: '#/components/schemas/Int64'

 uplinkVolume:

 $ref: '#/components/schemas/Int64'

 required:

 - qfi

 - startTimeStamp

 - endTimeStamp

 - downlinkVolume

 - uplinkVolume

 SecondaryRatUsageInfo:

 description: >

 Secondary RAT Usage Information to report usage data for a secondary RAT for QoS flows

 and/or the whole PDU session.

 type: object

 properties:

 secondaryRatType:

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

 qosFlowsUsageData:

 type: array

 items:

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

 minItems: 1

 pduSessionUsageData:

 type: array

 items:

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

 minItems: 1

 required:

 - secondaryRatType

 VolumeTimedReport:

 description: Contains Usage data information.

 type: object

 properties:

 startTimeStamp:

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

 endTimeStamp:

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

 downlinkVolume:

 $ref: '#/components/schemas/Int64'

 uplinkVolume:

 $ref: '#/components/schemas/Int64'

 required:

 - startTimeStamp

 - endTimeStamp

 - downlinkVolume

 - uplinkVolume

# Data Types related to MBS as defined in clause 5.9

#

#

# SIMPLE DATA TYPES

#

#

 AreaSessionId:

 $ref: '#/components/schemas/Uint16'

 MbsFsaId:

 description: MBS Frequency Selection Area Identifier

 type: string

 pattern: '^[A-Fa-f0-9]{6}$'

#

# Enumerations

#

#

 MbsServiceType:

 description: Indicates the type of an MBS session

 anyOf:

 - type: string

 enum:

 - MULTICAST

 - BROADCAST

 - type: string

 MbsSessionActivityStatus:

 description: Indicates the MBS session's activity status

 anyOf:

 - type: string

 enum:

 - ACTIVE

 - INACTIVE

 - type: string

 MbsSessionEventType:

 description: MBS Session Event Type

 anyOf:

 - type: string

 enum:

 - MBS\_REL\_TMGI\_EXPIRY

 - BROADCAST\_DELIVERY\_STATUS

 - INGRESS\_TUNNEL\_ADD\_CHANGE

 - type: string

 BroadcastDeliveryStatus:

 description: Broadcast MBS Session's Delivery Status

 anyOf:

 - type: string

 enum:

 - ACTIVATED

 - TERMINATED

 - type: string

#

# STRUCTURED DATA TYPES

#

 MbsSessionId:

 description: MBS Session Identifier

 type: object

 properties:

 tmgi:

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

 ssm:

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

 nid:

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

 Tmgi:

 description: Temporary Mobile Group Identity

 type: object

 properties:

 mbsServiceId:

 type: string

 pattern: '^[A-Fa-f0-9]{6}$'

 description: MBS Service ID

 plmnId:

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

 required:

 - mbsServiceId

 - plmnId

 Ssm:

 description: Source specific IP multicast address

 type: object

 properties:

 sourceIpAddr:

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

 destIpAddr:

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

 required:

 - sourceIpAddr

 - destIpAddr

 MbsServiceArea:

 description: MBS Service Area

 type: object

 properties:

 ncgiList:

 type: array

 items:

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

 minItems: 1

 description: List of NR cell Ids

 taiList:

 type: array

 items:

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

 minItems: 1

 description: List of tracking area Ids

 NcgiTai:

 description: List of NR cell ids, with their pertaining TAIs

 type: object

 properties:

 tai:

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

 cellList:

 type: array

 items:

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

 minItems: 1

 description: List of List of NR cell ids

 required:

 - tai

 - cellList

 MbsSession:

 description: Individual MBS session

 type: object

 properties:

 mbsSessionId:

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

 tmgiAllocReq:

 type: boolean

 default: false

 writeOnly: true

 tmgi:

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

 readOnly: true

 expirationTime:

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

 readOnly: true

 serviceType:

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

 writeOnly: true

 locationDependent:

 type: boolean

 default: false

 areaSessionId:

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

 readOnly: true

 ingressTunAddrReq:

 type: boolean

 default: false

 writeOnly: true

 ingressTunAddr:

 type: array

 items:

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

 minItems: 1

 readOnly: true

 ssm:

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

 writeOnly: true

 mbsServiceArea:

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

 writeOnly: true

 extMbsServiceArea:

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

 writeOnly: true

 dnn:

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

 writeOnly: true

 snssai:

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

 writeOnly: true

 activationTime:

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

 terminationTime:

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

 mbsSessionSubsc:

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

 activityStatus:

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

 anyUeInd:

 type: boolean

 default: false

 writeOnly: true

 mbsFsaIdList:

 type: array

 items:

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

 minItems: 1

 required:

 - serviceType

 anyOf:

 - required: [ mbsSessionId ]

 - required: [ tmgiAllocReq ]

 MbsSessionSubscription:

 description: MBS session subscription

 type: object

 properties:

 mbsSessionId:

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

 areaSessionId:

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

 eventList:

 type: array

 items:

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

 minItems: 1

 notifyUri:

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

 notifyCorrelationId:

 type: string

 expiryTime:

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

 nfcInstanceId:

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

 mbsSessionSubscUri:

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

 readOnly: true

 required:

 - eventList

 - notifyUri

 MbsSessionEventReportList:

 description: MBS session event report list

 type: object

 properties:

 eventReportList:

 type: array

 items:

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

 minItems: 1

 notifyCorrelationId:

 type: string

 required:

 - eventReportList

 MbsSessionEvent:

 description: MBS session event

 type: object

 properties:

 eventType:

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

 required:

 - eventType

 MbsSessionEventReport:

 description: MBS session event report

 type: object

 properties:

 eventType:

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

 timeStamp:

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

 ingressTunAddrInfo:

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

 broadcastDelStatus:

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

 required:

 - eventType

 ExternalMbsServiceArea:

 description: List of geographic area or list of civic address info for MBS Service Area

 type: object

 properties:

 geographicAreaList:

 type: array

 items:

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

 minItems: 1

 civicAddressList:

 type: array

 items:

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

 minItems: 1

 oneOf:

 - required: [ geographicAreaList ]

 - required: [ civicAddressList ]

 MbsSecurityContext:

 type: object

 properties:

 keyList:

 description: A map (list of key-value pairs) where a (unique) valid JSON string serves as key of MbsSecurityContext

 type: object

 additionalProperties:

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

 minProperties: 1

 required:

 - keyList

 MbsKeyInfo:

 description: MBS Security Key Data Structure

 type: object

 properties:

 keyDomainId:

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

 mskId:

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

 msk:

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

 mskLifetime:

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

 mtkId:

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

 mtk:

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

 required:

 - keyDomainId

 - mskId

 IngressTunAddrInfo:

 description: Ingress Tunnel Address Information

 type: object

 properties:

 ingressTunAddr:

 type: array

 items:

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

 minItems: 1

 required:

 - ingressTunAddr

 MbsServiceAreaInfo:

 description: MBS Service Area Information for location dependent MBS session

 type: object

 properties:

 areaSessionId:

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

 mbsServiceArea:

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

 required:

 - areaSessionId

 - mbsServiceArea

#

# HTTP responses

#

 responses:

 '307':

 description: Temporary Redirect

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'The URI pointing to the resource located on the redirect target'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of target NF (service) instance towards which the request is redirected'

 schema:

 type: string

 '308':

 description: Permanent Redirect

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'The URI pointing to the resource located on the redirect target'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: >

 'Identifier of target NF (service) instance towards which the request is redirected'

 schema:

 type: string

 '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

 '408':

 description: Request Timeout

 content:

 application/problem+json:

 schema:

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

 '406':

 description: 406 Not Acceptable

 '409':

 description: Conflict

 content:

 application/problem+json:

 schema:

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

 '410':

 description: Gone

 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'

 '501':

 description: Not Implemented

 content:

 application/problem+json:

 schema:

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

 '502':

 description: Bad Gateway

 content:

 application/problem+json:

 schema:

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

 '503':

 description: Service Unavailable

 content:

 application/problem+json:

 schema:

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

 '504':

 description: Gateway Timeout

 content:

 application/problem+json:

 schema:

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

 default:

 description: Generic Error

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