**3GPP TSG-CT WG4 Meeting #96eC4-200579**

**E-Meeting, 17th – 28th February 2020**

**Source: Ericsson**

**Title: Completion of location information retrieval**

**Spec: 3GPP TS 29.562 v0.3.0**

**Agenda item: 6.1.14**

**Document for: Agreement**

**1. Introduction**

-

**2. Reason for Change**

Complete location information retrieval in cs and ps domains.

**3. Conclusions**

-

**4. Proposal**

It is proposed to agree the following changes to 3GPP TS 29.562 v0.3.0.

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

# 2 References

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

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

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

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

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

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

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

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

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

[6] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[7] 3GPP TS 29.335: "User Data Repository Access Protocol over the Ud interface; Stage 3".

[8] IETF RFC 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)".

[9] OpenAPI Initiative, "OpenAPI 3.0.0 Specification", <https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md>

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

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

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

[13] 3GPP TS 23.003: "Numbering, addressing and identification".

[14] 3GPP TS 33.203: "Access security for IP-based services".

[15] 3GPP TS 29.503: "Unified Data Management Services; Stage 3".

[16] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".

[xx] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2".

[yy] 3GPP TS 29.273: "Evolved Packet System (EPS); 3GPP EPS AAA interfaces".

[zz] IETF RFC 4776: "Dynamic Host Configuration Protocol (DHCPv4 and DHCPv6) Option for Civic Addresses Configuration Information".

[aa] IETF RFC 2045: "Multipurpose Internet Mail Extensions(MIME) Part One: Format of Internet Message Bodies".

[bb] ETSI 083 034: "Network Attachment Sub-System (NASS); e4 interface based on the DIAMETER protocol".

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

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

##### 5.3.2.2.x Location Information Retrieval for CS/PS domains

Figure 5.3.2.2.x-1 shows a scenario where the NF service consumer (e.g. AS) sends a request to the HSS to receive the Location Information associated to the UE The request contains the UE's identity (/{imsUeId}), the type of the requested information, the domain (cs-domain or ps-domain) requested (e.g. ims-data/access-data/ps-domain/location-data) and query parameters (e.g. supported-features, requested-nodes).



Figure 5.3.2.2.x-1: Location Information Retrieval

1a. The NF service consumer (e.g. AS) sends a GET request to the resource representing the UE's location information at PS domain with query parameters indicating the supported-features and optionally the requested nodes (e.g. MME, AMF)

1b. The NF service consumer (e.g. AS) sends a GET request to the resource representing the UE's location information at CS domain with query parameters indicating the supported-features.

2a. On success, the HSS responds with "200 OK" with the message body containing the location information for the requested domain (PS) and the requested nodes or all nodes (if no requested nodes were present in the request)

2b. On success, the HSS responds with "200 OK" with the message body containing the location information for the requested domain (CS).

2c. If there is no valid subscription data for the UE, HTTP status code "404 Not Found" shall be returned and it should include additional error information in the response body (in the "ProblemDetails" element).

On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the GET response body.

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

#### 6.2.3.x Resource: PS location Information

##### 6.2.3.x.1 Description

This resource represents the Location Information in PS domain. It is queried by the service consumer (e.g. AS) to retrieve the location information in PS domain as retrieved from the serving node(s). The service consumer may indicate the requested nodes for which the request is applicable (e.g. AMF only)

##### 6.2.3.x.2 Resource Definition

Resource URI: **{**apiRoot}/nhss-ims-sdm/{apiVersion}/{imsUeId}/access-data/ps-domain/location-data

This resource shall support the resource URI variables defined in table 6.2.3.x.2-1.

Table 6.2.3.x.2-1: Resource URI variables for this resource

|  |  |
| --- | --- |
| Name | Definition |
| apiRoot | See clause 6.2.1 |
| apiVersion | See clause 6.2.1 |
| imsUeId | Represents the IMS Public Identity (i.e. non-shared IMS Public User identity or Public Service Identity) or the IMS private Identity. pattern: "^(impu-sip\:([a-zA-Z0-9\_\-.!~\*()&=+$,;?\/]+)\@([A-Za-z0-9]+([-A-Za-z0-9]+)\.)+[a-z]{2,}|impu-tel\:\+[0-9]{5,15}|impi-.+|.+)$" |

##### 6.2.3.x.3 Resource Standard Methods

###### 6.2.3.x.3.1 GET

This method shall support the URI query parameters specified in table 6.2.3.x.3.1-1.

Table 6.2.3.x.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| requested-nodes | array(RequestedNode) | O | 0..N | Indicates the serving node(s) for which the request is applicable. |
| serving-node | boolean | O | 0..1 | Indicates that only the stored NF id/address of the serving node(s) requested and PLMN identity are required, that is, other location data (e.g. Global Cell ID) is not required.It shall be absent if current-location is present with value true.true: only the requested node(s) address(es) are requestedfalse or absent: location data as retrieved from the requested node(s) is requested. |
| local-time | boolean | O | 0..1 | Indicates that only the Local Time Zone information (Time Zone and Daylight Saving Time) and the PLMN identity of the location in the visited network where the UE is attached is requested, that is, other location data (e.g. Global Cell ID) is not required.true: only the local time is requestedfalse or absent: location data as retrieved from the requested node(s) is requested. |
| current-location | boolean | O | 0..1 | Indicates whether an active location retrieval has to be initiated by the requested node(s).true: active location retrieval is requestedfalse or absent: active location retrieval is not requested |
| supported-features | SupportedFeatures | O | 0..1 | see 3GPP TS 29.500 [4] clause 6.6 |

If "requested-nodes" is not included, HSS shall return location information as retrieved from all the nodes (AMF, MME and SGSN)

This method shall support the request data structures specified in table 6.2.3.x.3.1-2 and the response data structures and response codes specified in table 6.2.3.x.3.1-3.

Table 6.2.3.x.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 6.2.3.x.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| PsLocation | M | 1 | 200 OK | A response body containing the PS location information as requested shall be returned. |
| ProblemDetails | O | 0..1 | 404 Not Found | The "cause" attribute may be used to indicate one of the following application errors:- USER\_NOT\_FOUND- DATA\_NOT\_FOUNDDATA\_NOT\_FOUND indicates that the location information is unknown or unavailable. |
| ProblemDetails | O | 0..1 | 403 Forbidden | The "cause" attribute may be used to indicate the following application error:- OPERATION\_NOT\_ALLOWED |
| NOTE: In addition, common data structures as listed in table xx are supported. |

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

#### 6.2.3.y Resource: CS location Information

##### 6.2.3.y.1 Description

This resource represents the Location Information in CS domain. It is queried by the service consumer (e.g. AS) to retrieve the location information in CS domain as retrieved from the MSC/VLR.

##### 6.2.3.y.2 Resource Definition

Resource URI: **{**apiRoot}/nhss-ims-sdm/{apiVersion}/{imsUeId}/access-data/cs-domain/location-data

This resource shall support the resource URI variables defined in table 6.2.3.y.2-1.

Table 6.2.3.x.2-1: Resource URI variables for this resource

|  |  |
| --- | --- |
| Name | Definition |
| apiRoot | See clause 6.2.1 |
| apiVersion | See clause 6.2.1 |
| imsUeId | Represents the IMS Public Identity (i.e. non-shared IMS Public User identity or Public Service Identity) or the IMS private Identity. pattern: "^(impu-sip\:([a-zA-Z0-9\_\-.!~\*()&=+$,;?\/]+)\@([A-Za-z0-9]+([-A-Za-z0-9]+)\.)+[a-z]{2,}|impu-tel\:\+[0-9]{5,15}|impi-.+|.+)$" |

##### 6.2.3.y.3 Resource Standard Methods

###### 6.2.3.y.3.1 GET

This method shall support the URI query parameters specified in table 6.2.3.y.3.1-1.

Table 6.2.3.y.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| serving-node | boolean | O | 0..1 | Indicates that only the MSC/VLR address and PLMN identity are required, that is, other location data (e.g. Global Cell ID) is not required.It shall be absent if current-location is present.true: only the MSC/VLR number requestedfalse or absent: location data as retrieved from the MSC/VLR is requested. |
| local-time | boolean | O | 0..1 | Indicates that only the Local Time Zone information (Time Zone and Daylight Saving Time) and the PLMN identity of the location in the visited network where the UE is attached is requested, that is, other location data (e.g. Global Cell ID) is not required.It shall be absent if current-location is present. |
| current-location | boolean | O | 0..1 | Indicates whether an active location retrieval has to be initiated by the MSC/VLR. |
| supported-features | SupportedFeatures | O | 0..1 | see 3GPP TS 29.500 [4] clause 6.6 |

If "serving-node" is not included, HSS shall return the location data as retrieved from the MSC/VLR.

If "local-time" is not included, HSS shall return the location data as retrieved from the MSC/VLR.

This method shall support the request data structures specified in table 6.2.3.y.3.1-2 and the response data structures and response codes specified in table 6.2.3.y.3.1-3.

Table 6.2.3.y.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 6.2.3.y.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| CsLocation | M | 1 | 200 OK | A response body containing the CS location information as requested shall be returned. |
| ProblemDetails | O | 0..1 | 404 Not Found | The "cause" attribute may be used to indicate one of the following application errors:- USER\_NOT\_FOUND- DATA\_NOT\_FOUNDDATA\_NOT\_FOUND indicates that the location information is unknown or unavailable. |
| ProblemDetails | O | 0..1 | 403 Forbidden | The "cause" attribute may be used to indicate the following application error:- OPERATION\_NOT\_ALLOWED |
| NOTE: In addition, common data structures as listed in table xx are supported. |

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

#### 6.2.6.1 General

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

Table 6.2.6.1-1 specifies the data types defined for the Nhss\_imsSDM service API.

Table 6.2.6.1-1: Nhss\_imsSDM specific Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Clause defined | Description |
| ScscfCapabilityList | 6.2.6.2.2 | Information about mandatory and optional S-CSCF capabilities  |
| ImsProfileData | 6.2.6.2.4 | User's IMS profile data |
| RepositoryData | 6.2.6.2.7 | Repository Data for the requested Service Indication |
| MsisdnList | 6.2.6.2.8 | List of MSISDNs associated to the IMS public Identity  |
| PublicIdentities | 6.2.6.2.9 | IMS Public Identities which belong to the same Implicit Registration Set (if any) than the requested IMS Public Identity |
| PublicIdentity | 6.2.6.2.10 | IMS Public Identity and the related data (Alias Group Id, IRS default indication, Identity Type) |
| PsLocation | 6.2.6.2.x1 | Location data in PS domain. |
| CsLocation | 6.2.6.2.y1 | Location data in CS domain. |

Table 6.2.6.1-2 specifies data types re-used by the Nhss\_imsSDM service API from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Nhss\_imsSDM.

Table 6.2.6.1-2: Nhss\_imsSDM re-used Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Reference | Comments |
| Uri | 3GPP TS 29.571 [16] | Uniform Resource Identifier |
| SupportedFeatures | 3GPP TS 29.571 [16] | see 3GPP TS 29.500 [4] clause 6.6 |
| EutraLocation | 3GPP TS 29.571 [16] | E-UTRAN user location |
| NrLocation | 3GPP TS 29.571 [16] | NR user location |
| PlmnId | 3GPP TS 29.571 [16] | PLMN Identity |
| TimeZone | 3GPP TS 29.571 [16] | Time Zone and Daylight Saving Time |
| UtraLocation | 3GPP TS 29.571 [16] | UTRAN user location |
| GeraLocation | 3GPP TS 29.571 [16] | GERAN user location |
| DiameterIdentity | 3GPP TS 29.571 [16] | Diameter URI |
| NfInstanceId | 3GPP TS 29.571 [16] | String uniquely identifying a NF instance |
| RatType | 3GPP TS 29.571 [16] | RAT type |

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

##### 6.2.6.2.x1 Type: PsLocation

Table 6.2.6.2.x1-1: Definition of type PsLocation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| sgsnLocation | SgsnLocationData | O | 0..1 | Location information as retrieved from SGSN |
| mmeLocation | MmeLocationData | O | 0..1 | Location information as retrieved from MME |
| amfLocation | AmfLocationData | O | 0..1 | Location information as retrieved from AMF |
| twanLocation | TwanLocationData | O | 0..1 | 3GPP AAA Server for TWAN Location information. |
| NOTE: At least one of the "sgsnLocation", "mmeLocation", "amfLocation" or "twanLocation” shall be included. |

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

##### 6.2.6.2.x2 Type: SgsnLocationData

Table 6.2.6.2.x2-1: Definition of type SgsnLocationData

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| sgsnNumber | string | M | 1 | SGSN number. See 3GPP TS 23.003 [13] clause 5.1. |
| plmnId | PlmnId | M | 1 | PLMN identity |
| sgsnLocation | UtraLocation | O | 0..1 | User location as retrieved from SGSN. |
| csgInformation | CsgInformation | O | 0..1 | Closed Subscriber Group Information. See 3GPP TS 23.060 [xx]. |
| timeZone | TimeZone | O | 0..1 | Local Time Zone information (Time Zone and Daylight Saving Time) of the location in the visited network where the UE is located. |
| ratType | RatType | O | 0..1 | RAT type |

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

##### 6.2.6.2.x3 Type: MmeLocationData

Table 6.2.6.2.x3-1: Definition of type MmeLocationData

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| mmeAddress | DiameterIdentity | M | 1 | MME diameter identity |
| plmnId | PlmnId | M | 1 | PLMN identity |
| mmeLocation | EutraLocation | O | 0..1 | User location as retrieved from MME. |
| csgInformation | CsgInformation | O | 0..1 | Closed Subscriber Group Information. See 3GPP TS 23.060 [xx]. |
| timeZone | TimeZone | O | 0..1 | Local Time Zone information (Time Zone and Daylight Saving Time) of the location in the visited network where the UE is located. |
| ratType | RatType | O | 0..1 | RAT type |

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

##### 6.2.6.2.x4 Type: AmfLocationData

Table 6.2.6.2.x4-1: Definition of type AmfLocationData

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| amfAddress | NfInstanceId | M | 1 | AMF identity. |
| plmnId | PlmnId | M | 1 | PLMN identity |
| amfLocation | NrLocation | O | 0..1 | User location as retrieved from AMF. |
| SMSFAddress | NfInstanceId | O | 0..1 | SMSF identity |
| timeZone | TimeZone | O | 0..1 | Local Time Zone information (Time Zone and Daylight Saving Time) of the location in the visited network where the UE is located. |
| ratType | RatType | O | 0..1 | RAT type |

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

##### 6.2.6.2.x5 Type: TwanLocationData

Table 6.2.6.2.x5-1: Definition of type TwanLocationData

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| twanSsid | string | M | 1 | TWAN SSID, as defined in 3GPP TS 29.273 [yy]. |
| plmnId | PlmnId | M | 1 | PLMN identity of the TWAN |
| twanBssid | string | O | 0..1 | TWAN BSSID, as defined in 3GPP TS 29.273 [yy]. |
| civicAddress | string | O | 0..1 | Defined in clause 3.4 of IETF RFC 4776 [zz] excluding the first 3 octets.Base64 encoded, according to IETF RFC 2045 [aa]). |
| twanOperatorName | string | O | 0..1 | TWAN Operator Name, as defined in clause 19.8 of 3GPP TS 23.003 [13]. |
| timeZone | TimeZone | O | 0..1 | Local Time Zone information (Time Zone and Daylight Saving Time) of the location in the visited network where the UE is located. |
| logicalAccessId | string | O | 0..1 | Logical Access ID, as defined in ETSI ES 283 034 [bb]. |

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

##### 6.2.6.2.y1 Type: CsLocation

Table 6.2.6.2.y1-1: Definition of type CsLocation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| mscNumber | string | M | 0..1 | MSC number. See 3GPP TS 23.003 [13] clause 5.1. |
| vlrNumber | string | M | 0..1 | VLR number. See 3GPP TS 23.003 [13] clause 5.1. |
| plmnId | PlmnId | M | 0..1 | PLMN identity |
| vlrLocation | GeraLocation | O | 0..1 | User location as retrieved from MSC/VLR. |
| csgInformation | CsgInformation | O | 0..1 | Closed Subscriber Group Information. See 3GPP TS 23.060 [xx]. |
| timeZone | TimeZone | O | 0..1 | Local Time Zone information (Time Zone and Daylight Saving Time) of the location in the visited network where the UE is located. |
| ratType | RatType | O | 0..1 | RAT type |

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

##### 6.2.6.2.y2 Type: CsgInformation

Table 6.2.6.2.y2-1: Definition of type CsgInformation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| csgId | string | M | 1 | CSG Identity. Syntax described in 3GPP TS 29.002 [cc] i.e. 5 octets BER encoded value of 27-bit BIT STRING (Base64 encoded according to IETF RFC 2045 [aa]).Length = 8. |
| accessMode | string | O | 0..1 | CSG Access Mode. Syntax described in 3GPP TS 29.002 [cc] (Base64 encoded according to IETF RFC 2045 [aa]).Length = 4. |
| cMi | boolean | O | 0..1 | CSG Membership Indication0: CSG membership1: non CSG membership |

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

##### 6.1.6.3.x Enumeration: RequestedNode

The enumeration RequestedNode represents serving node requested. It shall comply with the provisions defined in table 6.1.6.3.x-1.

Table 6.1.6.3.x-1: Enumeration RequestedNode

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| "SGSN" | The requested node is SGSN. |  |
| "MME" | The requested node is MME. |  |
| "AMF" | The requested node is AMF. |  |
| "3GPP\_AAA\_SERVER\_TWAN" | The requested node is 3GPP-AAA-SERVER-TWAN |  |

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

## A.3 Nhss\_imsSDM API

openapi: 3.0.0

info:

 version: '1.0.0'

 title: 'Nhss\_imsSDM'

 description: |

 Nhss Subscriber Data Management Service for IMS.

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externalDocs:

 description: 3GPP TS 29.562 Unified Data Management Services, version 16.0.0

 url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.562/'

servers:

 - url: '{apiRoot}/nhss-ims-sdm/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501.

security:

 - oAuth2ClientCredentials:

 - nhss-ims-sdm

 - {}

paths:

 /{imsUeId}/access-data/ps-domain/location-data:

 get:

 summary: Retrieve the location data in PS domain

 operationId: GetLocPsDomain

 tags:

 - PS location retrieval

 parameters:

 - name: imsUeId

 in: path

 description: IMS Public Identity

 required: true

 schema:

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

 - name: requestedNodes

 in: query

 description: Indicates the serving node(s) for which the request is applicable.

 schema:

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

 - name: servingNode

 in: query

 description: Indicates that only the stored NF id/address of the serving node(s) is required

 schema:

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

 - name: localTime

 in: query

 description: Indicates that only the Local Time Zone information of the location in the visited network where the UE is attached is requested

 schema:

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

 - name: currentLocation

 in: query

 description: Indicates whether an active location retrieval has to be initiated by the requested node

 schema:

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

 - name: supported-features

 in: query

 description: Supported Features

 schema:

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

 responses:

 '200':

 description: Expected response to a valid request

 content:

 application/json:

 schema:

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

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '405':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/405'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /{imsUeId}/access-data/cs-domain/location-data:

 get:

 summary: Retrieve the location data in CS domain

 operationId: GetLocCsDomain

 tags:

 - CS location retrieval

 parameters:

 - name: imsUeId

 in: path

 description: IMS Public Identity

 required: true

 schema:

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

 - name: servingNode

 in: query

 description: Indicates that only the stored NF id/address of the serving node(s) is required

 schema:

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

 - name: localTime

 in: query

 description: Indicates that only the Local Time Zone information of the location in the visited network where the UE is attached is requested

 schema:

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

 - name: currentLocation

 in: query

 description: Indicates whether an active location retrieval has to be initiated by the requested node

 schema:

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

 - name: supported-features

 in: query

 description: Supported Features

 schema:

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

 responses:

 '200':

 description: Expected response to a valid request

 content:

 application/json:

 schema:

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

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '405':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/405'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /{imsUeId}/ims-data/location-data/scscf-capabilities:

 get:

 summary: Retrieve the S-CSCF capabilities for the associated IMS subscription

 operationId: GetScscfCapabilities

 tags:

 - Retrieval of the S-CSCF capabilities for the IMS subscription

 parameters:

 - name: imsUeId

 in: path

 description: IMS Identity

 required: true

 schema:

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

 responses:

 '200':

 description: Expected response to a valid request

 content:

 application/json:

 schema:

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

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '405':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/405'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 '504':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/504'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /{imsUeId}/repository-data/{serviceIndication}:

 get:

 summary: Retrieve the repository data associated to an IMPU and service indication

 operationId: GetRepositoryDataServInd

 tags:

 - Repository data

 parameters:

 - name: imsUeId

 in: path

 description: IMS Identity

 required: true

 schema:

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

 - name: serviceIndication

 in: path

 description: Identifier of a service related data

 required: true

 schema:

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

 responses:

 '200':

 description: Expected response to a valid request

 content:

 application/json:

 schema:

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

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '405':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/405'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /{imsUeId}/identities/msisdns:

 get:

 summary: retrieve the Msisdns associated to requested identity

 operationId: GetMsisdns

 tags:

 - Retrieval of the associated Msisdns

 parameters:

 - name: imsUeId

 in: path

 description: IMS Identity

 required: true

 schema:

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

 - name: privateId

 in: query

 description: Private identity

 schema:

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

 responses:

 '200':

 description: Expected response to a valid request

 content:

 application/json:

 schema:

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

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '405':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/405'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /{imsUeId}/identities/ims-associated-identities:

 get:

 summary: Retrieve the associated identities to the IMS public identity included in the service request

 operationId: GetImsAssocIds

 tags:

 - Retrieval of associated IMS public identities

 parameters:

 - name: imsUeId

 in: path

 description: IMS Public Identity

 required: true

 schema:

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

 responses:

 '200':

 description: Expected response to a valid request

 content:

 application/json:

 schema:

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

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '405':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/405'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

components:

 schemas:

# COMPLEX TYPES:

 ScscfCapabilityList:

 type: object

 properties:

 mandatoryCapabilityList:

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

 optionalCapabilityList:

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

 anyOf:

 - required: [mandatoryCapabilityList]

 - required: [optionalCapabilityList]

 Capabilities:

 type: array

 items:

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

 minItems: 1

 uniqueItems: true

 RepositoryData:

 type: object

 required:

 - serviceData

 - sequenceNumber

 properties:

 sequenceNumber:

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

 serviceData:

 type: string

 format: byte

 MsisdnList:

 type: object

 required:

 - basicMsisdn

 properties:

 basicMsisdn:

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

 additionalMsisdns:

 type: array

 minItems: 1

 items:

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

 PublicIdentities:

 type: object

 required:

 - publicIdentities

 properties:

 publicIdentities:

 type: array

 items:

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

 minItems: 1

 uniqueItems: true

 PublicIdentity:

 type: object

 required:

 - imsPublicId

 - identityType

 properties:

 imsPublicId:

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

 identityType:

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

 irsIsDefault:

 type: boolean

 aliasGroupId:

 type: integer

 RequestedNodes:

 type: array

 minItems: 1

 uniqueItems: true

 properties:

 requestedNode:

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

 PsLocation:

 type: object

 oneOf:

 - required:

 - sgsnLocationData

 - required:

 - mmeLocationData

 - required:

 - amfLocationData

 - required:

 - twanLocationData

 properties:

 sgsnLocationData:

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

 mmeLocationData:

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

 amfLocationData:

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

 twanLocationData:

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

 SgsnLocationData:

 type: object

 required:

 - sgsnNumber

 - plmnId

 properties:

 sgsnNumber:

 type: string

 plmnId:

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

 sgsnLocation:

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

 csgInformation:

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

 timeZone:

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

 ratType:

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

 MmeLocationData:

 type: object

 required:

 - mmeAddress

 - plmnId

 properties:

 mmeAddress:

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

 plmnId:

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

 mmeLocation:

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

 csgInformation:

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

 timeZone:

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

 ratType:

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

 AmfLocationData:

 type: object

 required:

 - amfAddress

 - plmnId

 properties:

 amfAddress:

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

 plmnId:

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

 amfLocation:

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

 SmsfAddress:

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

 timeZone:

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

 ratType:

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

 TwanLocationData:

 type: object

 required:

 - twanSsid

 - plmnId

 properties:

 twanSsid:

 type: string

 plmnId:

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

 twanBssid:

 type: string

 civicAddress:

 type: string

 format: byte

 twanOperatorName:

 type: string

 timeZone:

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

 logicalAccessId:

 type: string

 CsLocation:

 type: object

 required:

 - mscNumber

 - vlrNumber

 - plmnId

 properties:

 mscNumber:

 type: string

 vlrNumber:

 type: string

 plmnId:

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

 vlrLocation:

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

 csgInformation:

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

 timeZone:

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

 ratType:

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

 CsgInformation:

 type: object

 required:

 - csgId

 properties:

 csgId:

 type: string

 format: byte

 accessMode:

 type: string

 format: byte

 cMi:

 type: boolean

# SIMPLE TYPES:

 Capability:

 type: integer

 ImsUeId:

 type: string

 pattern: '^(impu-sip\:([a-zA-Z0-9\_\-.!~\*()&=+$,;?\/]+)\@([A-Za-z0-9]+([-A-Za-z0-9]+)\.)+[a-z]{2,}|impu-tel\:\+[0-9]{5,15}|impi-.+|.+)$'

 SequenceNumber:

 type: integer

 minimum: 0

 ServiceIndication:

 type: string

 Msisdn:

 type: string

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

 PrivateId:

 type: string

 ImsPublicId:

 type: string

 pattern: '^(sip\:([a-zA-Z0-9\_\-.!~\*()&=+$,;?\/]+)\@([A-Za-z0-9]+([-A-Za-z0-9]+)\.)+[a-z]{2,}|tel\:\+[0-9]{5,15})$'

 ServingNode:

 type: boolean

 LocalTime:

 type: boolean

 CurrentLocation:

 type: boolean

# ENUMS:

 IdentityType:

 anyOf:

 - type: string

 enum:

 - DISTINCT\_IMPU

 - DISTINCT\_PSI

 - WILDCARDED\_IMPU

 - WILDCARDED\_PSI

 - type: string

 RequestedNode:

 anyOf:

 - type: string

 enum:

 - SGSN

 - MME

 - AMF

 - 3GPP\_AAA\_SERVER\_TWAN

 - type: string

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