**3GPP TSG CT WG3 Meeting #138 *C3-246369***

**Orlando, US, 18th – 22nd November, 2024 was** **C3-246073**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** | **0335** | **rev** | **1** | **Current version:** |  |  |
|  | | | | | | | | |
| *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:*** | Updates to the SS\_LocationAreaMonitoring API to support geofencing | | | | | | | | |
|  |  | | | | | | | | |
| ***Source to WG:*** | Huawei | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | |
|  |  | | | | | | | | |
| ***Work item code:*** | eLSAPP | | | | |  | ***Date:*** | | 2024-11-18 |
|  |  | | | |  | |  | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | |  |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | |
| ***Reason for change:*** | | | As per the updates in clauses 9.3.12 and 9.3.2.14/15/17 of TS 23.434 (see also the agreed S6-243715, CR#0306 to TS 23.434), geofencing services have been introduced within the SS\_LocationAreaMonitoring API. | | | | | | |
|  | | |  | | | | | | |
| ***Summary of change:*** | | | This CR proposes to:   * Address the above-detailed stage 2 requirements. | | | | | | |
|  | | |  | | | | | | |
| ***Consequences if not approved:*** | | | * The above-detailed stage 2 requirements are not addressed. | | | | | | |
|  | |  | | | | | | | |
| ***Clauses affected:*** | | 7.5.1.4.1, 7.5.1.4.2.17, 7.5.1.4.2.20, 7.5.1.4.2.21, 7.5.1.4.2.24 (new clause), , 7.5.1.4.3.5, 7.5.1.6, A.6 | | | | | | | |
|  | |  | | | | | | | |
|  | | **Y** | | **N** |  | | |  | |
| ***Other specs*** | |  | | **X** | Other core specifications | | | TS/TR ... CR ... | |
| ***affected:*** | |  | | **X** | Test specifications | | | TS/TR ... CR ... | |
| ***(show related CRs)*** | |  | | **X** | O&M Specifications | | | TS/TR ... CR ... | |
|  | |  | | | | | | | |
| ***Other comments:*** | | This CR introduces a backwards compatible new feature to the OpenAPI description of the SS\_Events API defined in this specification. | | | | | | | |
|  | |  | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | |

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

##### 7.5.1.4.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 6.2 apply to this API.

Table 7.5.1.4.1-1 specifies the data types defined specifically for the SS\_Events API service.

Table 7.5.1.4.1-1: SS\_Events API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| EventSubscription | 7.5.1.4.2.4 | Represents the subscription to a single SEAL event. |  |
| PartialEventSubscFailRep | 7.5.1.4.2.23 | Represents the partial failure report during the subscription creation. | PartialFailureSupport |
| IdentityFilter | 7.5.1.4.2.7 | Represents a filter of VAL User / UE identities belonging to a VAL service. |  |
| LMInformation | 7.5.1.4.2.8 | The location information for a VAL User ID or a VAL UE ID. |  |
| LocationAreaMonReport | 7.5.1.4.2.20 | Represents the event report to notify the VAL UEs moving in or moving out from a given location. |  |
| LocationDevMonReport | 7.5.1.4.2.15 | Represents the event report to notify the VAL UE/User's location deviation from a given location. |  |
| LocationInfoCriteria | 7.5.1.4.2.18 | Represents the location information to be monitored.  It includes the geographic location information or a reference UE along with the application defined proximity range from the reference UE. |  |
| LocDevNotification | 7.5.1.4.3.4 | Enumeration of location deviation notification reports. |  |
| MessageFilter | 7.5.1.4.2.9 | The message filter information applicable to member VAL UEs or Users of the VAL group in the group change notification. |  |
| MonitorEvents | 7.5.1.4.2.11 | Represents the details of the monitoring and analytics events. | NRM\_EventMonitor |
| MonitorEventsReport | 7.5.1.4.2.12 | Represents the monitoring and analytics events information related to VAL UE or User. | NRM\_EventMonitor |
| MonitorFilter | 7.5.1.4.2.10 | Represents the filter information VAL User or UEs and the related events to be monitored. | NRM\_EventMonitor |
| MonitorLocationInterestFilter | 7.5.1.4.2.14 | Filter information to subscribe for monitoring the VAL UE/User location in a given area of interest. |  |
| MonLocAreaInterestFltr | 7.5.1.4.2.17 | Filter information to subscribe for location area monitoring information for a given area of interest. |  |
| MonLocTriggerEvent | 7.5.1.4.3.5 | Identifies the triggering event in the location area monitor filtering. |  |
| MoveInOutUEDetails | 7.5.1.4.2.21 | Represents the list of UEs either moved into the location area or moved out of the location area. |  |
| MovTimingInfo | 7.5.1.4.2.24 | Represents the timing information of a VAL UE's movements. | LM\_LocationAreaMonitor\_Ext1 |
| ReferenceUEDetail | 7.5.1.4.2.19 | Represents the reference UE details |  |
| SEALEvent | 7.5.1.4.3.3 | Represents the type of SEAL events that can be subscribed. |  |
| SEALEventDetail | 7.5.1.4.2.5 | Represents the SEAL event detail. |  |
| SEALEventNotification | 7.5.1.4.2.3 | Represents an individual SEAL Event Subscription Notification. |  |
| SEALEventSubscription | 7.5.1.4.2.2 | Represents an individual SEAL Event Subscription resource. |  |
| SEALEventSubscriptionPatch | 7.5.1.4.2.22 | Represents the parameters to request the modification of a SEAL Event subscription resource. | SubscUpdate |
| TempGroupInfo | 7.5.1.4.2.16 | Represents the created temporary VAL group information. | GM\_TempGroup |
| VALGroupFilter | 7.5.1.4.2.6 | Represents a filter of VAL group identifiers belonging to a VAL service. |  |
| ValidityConditions | 7.5.1.4.2.13 | Represents the temporal and/or spatial conditions applied for the events to be monitored. | NRM\_EventMonitor |

Table 7.5.1.4.1-2 specifies data types re-used by the SS\_Events API service:

Table 7.5.1.4.1-2: Re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AnalyticsEvent | 3GPP TS 29.522 [28] | Analytics event in NWDAF. | NRM\_EventMonitor |
| DateTime | 3GPP TS 29.122 [3] | Used to indicate a timestamp. |  |
| DurationSec | 3GPP TS 29.122 [3] | Used to indicate the notification interval in the location monitoring filter. |  |
| Float | 3GPP TS 29.571 [21] | Used to represent the fractional part of the proximity range in the reference UE details. |  |
| GeographicArea | 3GPP TS 29.572 [31] | Identifies the geographical information of the user(s). |  |
| LocationArea5G | 3GPP TS 29.122 [3] | User location area when the UE is attached to 5G. | NRM\_EventMonitor |
| LocationInfo | 3GPP TS 29.122 [3] | Location information |  |
| LocationQoS | 3GPP TS 29.572 [31] | Identifies QoS requested by VAL server. | LM\_LocationInfoChange\_Extension1 |
| MonitoringType | 3GPP TS 29.122 [3] | Monitoring event type in 3GPP system core network. | NRM\_EventMonitor |
| ProfileDoc | Clause 7.3.1.4.2.2 | Used to send VAL User or VAL UE profile information as part of event detail in the event notification. |  |
| ReportingInformation | 3GPP TS 29.523 [20] | Used to indicate the reporting requirement, only the following information are applicable for SEAL:  - immRep  - notifMethod  - maxReportNbr  - monDur  - repPeriod |  |
| ScheduledCommunicationTime | 3GPP TS 29.122 [3] | Used to define the time frame for message filters. |  |
| SupportedFeatures | 3GPP TS 29.571 [21] | Used to negotiate the applicability of optional features defined in table 7.5.1.6-1. |  |
| TestNotification | 3GPP TS 29.122 [3] | Following differences apply:  - The SCEF is the SEAL server; and  - The SCS/AS is the subscribing VAL server. |  |
| TimeWindow | 3GPP TS 29.122 [3] | Time window identified by a start time and a stop time. | NRM\_EventMonitor |
| Uinteger | 3GPP TS 29.571 [21] | Used to represent maximum number of messages in MesageFilter data type. |  |
| Uri | 3GPP TS 29.122 [3] | Used to indicate a notification URI. |  |
| VALGroupDocument | Clause 7.2.1.4.2.2 | Used to send VAL group document as part of event detail in the event notification. |  |
| ValSvcAreaId | Clause 7.1.3.4.3.2 | Used to represent the VAL service area identifier. | ValSrvArea |
| ValTargetUe | 7.3.1.4.2.3 | Used to identify a VAL user ID or a VAL UE ID. |  |
| WebsockNotifConfig | 3GPP TS 29.122 [3] | Following differences apply:  - The SCEF is the CAPIF core function; and  - The SCS/AS is the Subscribing functional entity. |  |

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

###### 7.5.1.4.2.17 MonLocAreaInterestFltr

Table 7.5.1.4.2.17-1: Definition of type MonLocAreaInterestFltr

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| locInfoCri | LocationInfoCriteria | M | 1 | Contains the location area information where the VAL server wishes to monitor the VAL UE(s) moving in or moving out.  This attribute applies also for geofencing services when the "LM\_LocationAreaMonitor\_Ext1" feature is supported. In such case, it contains the geofencing area. |  |
| trigEvnts | array(MonLocTriggerEvent) | O | 1..N | Contains the triggering events when to send the notifications.  This attribute applies also for geofencing services when the "LM\_LocationAreaMonitor\_Ext1" feature is supported. In such case, it shall be present and contain the subscribed geofencing monitoring event(s). |  |
| valServiceId | string | O | 0..1 | Contains the identifier of the VAL service for which location area monitoring is requested. | LM\_LocationAreaMonitor\_Ext1 |

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

###### 7.5.1.4.2.20 LocationAreaMonReport

Table 7.5.1.4.2.20-1: Definition of type LocationAreaMonReport

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| curPreUEs | array(ValTargetUe) | O | 1..N | Contains the list of the identifier(s) of all VAL UE(s) who are currently present in the given location area.  (NOTE) |  |
| moveInOutUEs | MoveInOutUEDetails | C | 0..1 | Contains the list of the UE(s) that either moved in to the location area or moved out of the location area.  This attribute applies also for geofencing services when the "LM\_LocationAreaMonitor\_Ext1" feature is supported. In such case, it may also contain the statistics (e.g., number of UEs, timing information) of the UE(s) moving in/out of the geofencing area.  (NOTE) |  |
| trigEvnt | MonLocTriggerEvent | C | 0..1 | Contains the event that triggered the sending of the notification.  This attribute applies also for geofencing services when the "LM\_LocationAreaMonitor\_Ext1" feature is supported. In such case, it shall be present and contain the reported geofencing monitoring event.  (NOTE) |  |
| NOTE: When the "LM\_LocationAreaMonitor\_Ext1" feature is not supported, for the first notification report the "curPreUEs" attribute shall be provided, and for the next notification report, either the "curPreUEs" or the "moveInOutUEs" attribute shall be present. When the "LM\_LocationAreaMonitor\_Ext1" feature is supported, the "curPreUEs" attribute may not be present, and the "moveInOutUEs" and "trigEvnt" attributes shall be present. | | | | | |

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

###### 7.5.1.4.2.21 MoveInOutUEDetails

Table 7.5.1.4.2.21-1: Definition of type MoveInOutUEDetails

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| moveInUEs | array(ValTargetUe) | O | 1..N | Contains the list of the identifier(s) of the VAL UE(s) that moved into the given location area since the previous reporting.  This attribute applies also for geofencing services when the "LM\_LocationAreaMonitor\_Ext1" feature is supported. In such case, it contains the VAL UE(s) that moved into the geofencing area. |  |
| numUEsMovedIn | Uinteger | O | 0..1 | Contains the number of UE(s) that moved into the geofencing area since the previous notification. | LM\_LocationAreaMonitor\_Ext1 |
| timingUEsMovedIn | map(MovTimingInfo) | O | 1..N | Contains the timing information of the VAL UE(s) that moved into the geofencing area since the previous notification.  The key of the map shall be set to the value of the identifier of the VAL UE (among the ones provided within the "moveInUEs" attribute) to which the timing information provided within the map value is related. | LM\_LocationAreaMonitor\_Ext1 |
| moveOutUEs | array(ValTargetUe) | O | 1..N | Contains the list of the identifier(s) of the VAL UE(s) that moved out of the given location area since the previous reporting.  This attribute applies also for geofencing services when the "LM\_LocationAreaMonitor\_Ext1" feature is supported. In such case, it contains the VAL UE(s) that moved out of the geofencing area. |  |
| numUEsMovedOut | Uinteger | O | 0..1 | Contains the number of UE(s) that moved out of the geofencing area. | LM\_LocationAreaMonitor\_Ext1 |
| timingUEsMovedOut | map(MovTimingInfo) | O | 1..N | Contains the timing information of the VAL UE(s) that moved out of the geofencing area since the previous notification.  The key of the map shall be set to the value of the identifier of the VAL UE (among the ones provided within the "moveOutUEs" attribute) to which the timing information provided within the map value is related. | LM\_LocationAreaMonitor\_Ext1 |

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

###### 7.5.1.4.2.24 MovTimingInfo

Table 7.5.1.4.2.24-1: Definition of type MovTimingInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| timestamp | DateTime | C | 0..1 | Contains the time at which the VAL UE moved in/out.  (NOTE) |  |
| duration | DurationSec | C | 0..1 | Contains the time duration for the VAL UE to move in/out.  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. | | | | | |

Editor’s Note: Whether the " duration" attribute is needed or not and to what it corresponds is FFS.

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

###### 7.5.1.4.3.5 Enumeration: MonLocTriggerEvent

Table 7.5.1.4.3.5-1: Enumeration MonLocTriggerEvent

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| DISTANCE\_TRAVELLED | Trigger event for the location area monitoring based on the distance travelled by the reference UE. |  |
| MOVING\_IN | Indicates that the event is the UE(s) moving in.  This event applies only to geofencing services. | LM\_LocationAreaMonitor\_Ext1 |
| MOVING\_OUT | Indicates that the event is the UE(s) moving out.  This event applies only to geofencing services. | LM\_LocationAreaMonitor\_Ext1 |
| NUMBER\_UE\_MOVING\_IN | Indicates that the event is the number of UE(s) moving in.  This event applies only to geofencing services. | LM\_LocationAreaMonitor\_Ext1 |
| NUMBER\_UE\_MOVING\_OUT | Indicates that the event is the number of UE(s) moving out.  This event applies only to geofencing services. | LM\_LocationAreaMonitor\_Ext1 |
| TIME\_UE\_MOVING\_IN | Indicates that the event is the timing information for the UE(s) moving in.  This event applies only to geofencing services. | LM\_LocationAreaMonitor\_Ext1 |
| TIME\_UE\_MOVING\_OUT | Indicates that the event is the timing information for the UE(s) moving out.  This event applies only to geofencing services. | LM\_LocationAreaMonitor\_Ext1 |

Editor’s Note: Whether the geofencing events should be defined under this enumeration together with the triggering events is FFS. The OpenAPI description of the SS\_Events API is to be updated accordingly.

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

#### 7.5.1.6 Feature Negotiation

General feature negotiation procedures are defined in clause 6.8. Table 7.5.1.6-1 lists the supported features for SS\_Events API.

Table 7.5.1.6-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | Notification\_test\_event | Testing of notification connection is supported according to clause 6.6. |
| 2 | Notification\_websocket | The delivery of notifications over Websocket is supported according to clause 6.6. This feature requires that the Notification\_test\_event feature is also supported. |
| 3 | LM\_LocationInfoChange | This feature supports the location information change event. |
| 4 | GM\_GroupInfoChange | This feature supports the group information change event. |
| 5 | CM\_UserProfileChange | This feature supports the user profile change event. |
| 6 | GM\_GroupCreate | This feature supports the group creation event. |
| 7 | GM\_MessageFilter | This feature supports the message filter information in group information change event. |
| 8 | NRM\_EventMonitor | This feature supports the monitoring of events related to VAL UEs or Users. |
| 9 | LM\_LocationDeviation | This feature supports the monitoring of VAL UE / User's deviation from a given area of interest. |
| 10 | GM\_TempGroup | This feature supports the functionality of temporary VAL group formation within a VAL system. |
| 11 | LM\_LocationAreaMonitor | This feature supports the monitoring of VAL UEs which are moving in or moving out from a given area of interest. |
| 12 | SubscUpdate | Indicates the support for updating an SEAL event subscription resource. |
| 13 | LM\_SuppLoc | This feature indicates the support of supplementary location information.  This feature requires the support of the LM\_LocationInfoChange feature. |
| 14 | enNB1 | This feature indicates the support of enhancements to this application layer API in Rel-18. |
| 15 | PartialFailureSupport | Indicates the support of the partial failure cases during a SEAL event subscription creation/update. |
| 16 | ValSrvArea | This feature indicates the support of VAL service area ID functionality as part of the phase-3 of the enhancements to the SEAL framework.  The following functionalities are supported:  - Support the usage of the VAL service area identifier to identify a VAL service area. |
| 17 | LM\_LocationInfoChange\_Extension1 | This feature indicates the support of the enhancement to location information change event as part of the 5G-enabled fused location service capability exposure.  The following functionalities are supported:  - Support location information requests with expected location QoS requirements.  This feature requires the support of the LM\_LocationInfoChange feature. |
| 18 | GM\_GroupDeletion | This feature indicates the support of group deletion event notifications as part of the enhancements to this application layer API. |
| 19 | LM\_LocationAreaMonitor\_Ext1 | This feature indicates the support of the enhancement to the location area monitoring functionality to enable enhanced application layer support for location services (eLSAPP).  The following functionalities are supported:  - Support geofencing services.  This feature requires the support of the "LM\_LocationAreaMonitor" feature. |

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

# A.6 SS\_Events API

openapi: 3.0.0

info:

title: SS\_Events

description: |

API for SEAL Events management.

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version: "1.3.0-alpha.1"

externalDocs:

description: >

3GPP TS 29.549 V19.0.0 Service Enabler Architecture Layer for Verticals (SEAL);

Application Programming Interface (API) specification; Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.549/

security:

- {}

- oAuth2ClientCredentials: []

servers:

- url: '{apiRoot}/ss-events/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

paths:

/subscriptions:

post:

description: Creates a new individual SEAL Event Subscription.

operationId: CreateSealEventSubsc

tags:

- SEAL Events Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

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

callbacks:

notificationDestination:

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

post:

requestBody: # contents of the callback message

required: true

content:

application/json:

schema:

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

responses:

'204':

description: No Content (successful notification)

'307':

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

'308':

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

'400':

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

'401':

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

'403':

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

'404':

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

'411':

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

'413':

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

'415':

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

'429':

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

'500':

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

'503':

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

default:

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

responses:

'201':

description: SEAL Events subscription resource created successfully.

content:

application/json:

schema:

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

headers:

Location:

description: Contains the URI of the newly created resource.

required: true

schema:

type: string

'400':

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

'401':

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

'403':

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

'404':

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

'411':

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

'413':

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

'415':

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

'429':

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

'500':

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

'503':

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

default:

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

/subscriptions/{subscriptionId}:

delete:

description: Deletes an individual SEAL Event Subscription.

operationId: DeleteIndSealEventSubsc

tags:

- Individual SEAL Events Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Identifier of an individual Events Subscription

required: true

schema:

type: string

responses:

'204':

description: >

The individual SEAL Events Subscription matching the subscriptionId is deleted.

'307':

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

'308':

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

'400':

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

'401':

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

'403':

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

'404':

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

'429':

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

'500':

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

'503':

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

default:

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

patch:

description: Modify an existing SEAL Event Subscription.

operationId: ModifyIndSealEventSubsc

tags:

- Individual SEAL Events Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Identifier of an individual Events Subscription

required: true

schema:

type: string

requestBody:

required: true

content:

application/merge-patch+json:

schema:

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

responses:

'200':

description: >

The definition SEAL event subscription is modified successfully and

a representation of the updated service API is returned in the request body.

content:

application/json:

schema:

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

'204':

description: No Content. The SEAL Event Subscription is modified successfully.

'307':

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

'308':

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

'400':

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

'401':

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

'403':

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

'404':

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

'411':

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

'413':

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

'415':

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

'429':

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

'500':

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

'503':

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

default:

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

put:

description: Replace an existing SEAl event subscription.

operationId: UpdateIndSealEventSubsc

tags:

- Individual SEAL Events Subscription (Document)

parameters:

- name: subscriptionId

in: path

description: Identifier of an individual Events Subscription

required: true

schema:

type: string

requestBody:

description: Individual SEAL events subscription to be replaced.

required: true

content:

application/json:

schema:

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

responses:

'200':

description: SEAL Event subscription updated successfully.

content:

application/json:

schema:

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

'204':

description: No Content. Individual SEAL event subscription was updated successfully.

'307':

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

'308':

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

'400':

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

'401':

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

'403':

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

'404':

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

'411':

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

'413':

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

'415':

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

'429':

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

'500':

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

'503':

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

default:

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

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

SEALEventSubscription:

description: Represents an individual SEAL Event Subscription resource.

type: object

properties:

subscriberId:

type: string

description: String identifying the subscriber of the event.

eventSubs:

type: array

items:

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

minItems: 1

description: Subscribed events.

eventReq:

$ref: 'TS29523\_Npcf\_EventExposure.yaml#/components/schemas/ReportingInformation'

notificationDestination:

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

requestTestNotification:

type: boolean

description: >

Set to true by Subscriber to request the SEAL server to send a test notification.

Set to false or omitted otherwise.

websockNotifConfig:

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

eventDetails:

type: array

items:

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

minItems: 1

suppFeat:

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

required:

- subscriberId

- eventSubs

- eventReq

- notificationDestination

SEALEventSubscriptionPatch:

description: Represents the partial update of individual SEAL Event Subscription resource.

type: object

properties:

eventSubs:

type: array

items:

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

minItems: 1

description: Subscribed events.

eventReq:

$ref: 'TS29523\_Npcf\_EventExposure.yaml#/components/schemas/ReportingInformation'

notificationDestination:

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

SEALEventNotification:

description: Represents notification information of a SEAL Event.

type: object

properties:

subscriptionId:

type: string

description: Identifier of the subscription resource.

eventDetails:

type: array

items:

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

minItems: 1

description: Detailed notifications of individual events.

required:

- subscriptionId

- eventDetails

EventSubscription:

description: Represents the subscription to a single SEAL event.

type: object

properties:

eventId:

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

valGroups:

type: array

items:

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

minItems: 1

description: >

Each element of the array represents the VAL group identifier(s) of a VAL service

that the subscriber wants to know in the interested event.

identities:

type: array

items:

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

minItems: 1

description: >

Each element of the array represents the VAL User / UE IDs of a VAL service

that the event subscriber wants to know in the interested event.

monFltr:

type: array

items:

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

minItems: 1

description: >

List of event monitoring details that the subscriber wishes to mmonitor the VAL UEs,

VAL group and/or VAL service.

areaInt:

type: array

items:

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

minItems: 1

description: >

Represents the list of VAL User / UE IDs and the area of interest information

which the subscriber wishes to monitor the location deviation of VAL User / UEs.

locAreaMon:

type: array

items:

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

minItems: 1

description: >

Each element represents the location area monitoring details to monitor the

VA UEs moving in and out of the provided location area.

partialFailRep:

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

required:

- eventId

SEALEventDetail:

description: Represents the SEAL event details.

type: object

properties:

eventId:

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

lmInfos:

type: array

items:

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

minItems: 1

valGroupDocuments:

type: array

items:

$ref: 'TS29549\_SS\_GroupManagement.yaml#/components/schemas/VALGroupDocument'

minItems: 1

description: >

The VAL groups documents with modified membership and configuration information.

profileDocs:

type: array

items:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ProfileDoc'

minItems: 1

description: Updated profile information associated with VAL Users or VAL UEs.

msgFltrs:

type: array

items:

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

minItems: 1

description: >

The message filter information for various member VAL User or UEs of the VAL group.

monRep:

type: array

items:

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

minItems: 1

description: The events reports with details of the events related to the VAL UE(s).

locAdhr:

type: array

items:

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

minItems: 1

description: >

The location deviation information for the interested VAL User ID or UE IDs

in a given location.

tempGroupInfo:

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

locAreaMonRep:

type: array

items:

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

minItems: 1

description: The location area monitoring of the given area of interest.

valGroupIds:

type: array

items:

type: string

minItems: 1

description: Contains the identifier(s) of the deleted VAL Group(s).

required:

- eventId

VALGroupFilter:

description: Represents a filter of VAL group identifiers belonging to a VAL service.

type: object

properties:

valSvcId:

type: string

description: Identity of the VAL service

valGrpIds:

type: array

items:

type: string

minItems: 1

description: >

VAL group identifiers that event subscriber wants to know in the interested event.

required:

- valGrpIds

IdentityFilter:

description: Represents a filter of VAL User / UE identities belonging to a VAL service.

type: object

properties:

valSvcId:

type: string

description: Identity of the VAL service

valTgtUes:

type: array

items:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

minItems: 1

description: >

VAL User IDs or VAL UE IDs that the event subscriber wants to know

in the interested event.

suppLoc:

type: boolean

description: Set to true by Subscriber to request the supplementary location information.

locQoS:

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

LMInformation:

description: Represents the location information for a VAL User ID or a VAL UE ID.

type: object

properties:

valTgtUe:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

locInfo:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/LocationInfo'

timeStamp:

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

valSvcId:

type: string

description: Identity of the VAL service

required:

- locInfo

- valTgtUe

MessageFilter:

description: Represents the message filters applicable to a VAL User ID or VAL UE ID.

type: object

properties:

reqUe:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

tgtUe:

type: array

items:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

minItems: 1

description: List of VAL User or UE IDs whose message to be sent.

maxMsgs:

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

scheds:

type: array

items:

$ref: 'TS29122\_CpProvisioning.yaml#/components/schemas/ScheduledCommunicationTime'

minItems: 1

description: Time frame associated with total number of messages.

msgTypes:

type: array

items:

type: string

minItems: 1

description: List of message types to be sent to VAL UE.

required:

- reqUe

MonitorFilter:

description: Represents the event monitoring filters applicable to a VAL User ID or VAL UE ID.

type: object

properties:

idnts:

type: array

items:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

minItems: 1

description: List of VAL User or UE IDs whose events monitoring is requested.

valSvcId:

type: string

description: Identity of the VAL service.

valGrpId:

type: string

description: Identity of the group of the target UEs.

profId:

type: string

description: The monitoring profile ID identifying a list of monitoring, analytics events.

valCnds:

type: array

items:

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

minItems: 1

description: The temporal,spatial conditions for the events to be considered valid.

evntDets:

type: array

items:

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

minItems: 1

description: List of monitoring, analytics events to be monitored.

MonitorEvents:

description: List of event types to be monitored in the context of events monitoring service.

type: object

properties:

cnEvnts:

type: array

items:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/MonitoringType'

minItems: 1

description: List of monitoring events related to VAL UE.

anlEvnts:

type: array

items:

$ref: 'TS29522\_AnalyticsExposure.yaml#/components/schemas/AnalyticsEvent'

minItems: 1

description: List of analytics events related to VAL UE.

MonitorEventsReport:

description: List of monitoring and/or analytics events related to VAL UE.

type: object

properties:

tgtUe:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

evnts:

type: array

items:

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

minItems: 1

description: List of monitoring and analytics events related to VAL UE.

required:

- tgtUe

- evnts

ValidityConditions:

description: List of monitoring and/or analytics events related to VAL UE.

type: object

properties:

locArea:

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

tmWdws:

type: array

items:

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

minItems: 1

description: Time window validity conditions.

MonitorLocationInterestFilter:

description: Represents the location monitoring filter information.

type: object

properties:

tgtUes:

type: array

items:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

minItems: 1

description: List of VAL Users or UE IDs for which location monitoring is requested.

locInt:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/LocationInfo'

valSvcId:

$ref: 'TS29549\_SS\_VALServiceAreaConfiguration.yaml#/components/schemas/ValSvcAreaId'

notInt:

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

required:

- tgtUes

- notInt

oneOf:

- required: [locInt]

- required: [valSvcId]

LocationDevMonReport:

description: Location deviation monitoring report.

type: object

properties:

tgtUes:

type: array

items:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

minItems: 1

description: List of VAL Users or UE IDs for which report is related to.

locInfo:

$ref: 'TS29122\_MonitoringEvent.yaml#/components/schemas/LocationInfo'

notifType:

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

required:

- tgtUes

- locInfo

- notifType

TempGroupInfo:

description: Represents the created temporary VAL group information.

type: object

properties:

valGrpIds:

type: array

items:

type: string

minItems: 1

tempValGrpId:

type: string

valServIds:

type: array

items:

type: string

minItems: 1

required:

- valGrpIds

- tempValGrpId

MonLocAreaInterestFltr:

description: >

Filter information indicate the area of interest and triggering/geofencing events.

type: object

properties:

locInfoCri:

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

trigEvnts:

type: array

items:

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

minItems: 1

valServiceId:

type: string

required:

- locInfoCri

LocationInfoCriteria:

description: >

Geographic location and reference UE details, where the UEs moving in and out

to be monitored.

type: object

properties:

geoArea:

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

refUe:

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

valSvcAreaId:

$ref: 'TS29549\_SS\_VALServiceAreaConfiguration.yaml#/components/schemas/ValSvcAreaId'

oneOf:

- required: [geoArea]

- required: [refUe]

ReferenceUEDetail:

description: Reference UE details, where the UEs moving in and out to be monitored.

type: object

properties:

valTgtUe:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

proxRange:

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

proxRangeFrac:

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

required:

- valTgtUe

- proxRange

LocationAreaMonReport:

description: Event report to notify the VAL UEs moving in or out from a given location.

type: object

properties:

curPreUEs:

type: array

items:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

minItems: 1

description: List of identities of all VAL UEs present in the given location area.

moveInOutUEs:

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

trigEvnt:

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

MoveInOutUEDetails:

description: List of UEs moved in and out.

type: object

properties:

moveInUEs:

type: array

items:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

minItems: 1

description: >

List of identities of VAL UEs who moved in to given location area

since previous notification.

numUEsMovedIn:

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

timingUEsMovedIn:

type: object

additionalProperties:

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

minProperties: 1

description: >

Contains the timing information of the VAL UE(s) that moved into the geofencing area

since the previous notification.

The key of the map shall be set to the value of the identifier of the VAL UE (among the

ones provided within the moveInUEs attribute) to which the timing information provided

within the map value is related.

moveOutUEs:

type: array

items:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

minItems: 1

description: >

List of identities of VAL UEs who moved out of the given location area

since previous notification.

numUEsMovedOut:

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

timingUEsMovedOut:

type: object

additionalProperties:

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

minProperties: 1

description: >

Contains the timing information of the VAL UE(s) that moved out of the geofencing area

since the previous notification.

The key of the map shall be set to the value of the identifier of the VAL UE (among the

ones provided within the "moveOutUEs" attribute) to which the timing information

provided within the map value is related.

PartialEventSubscFailRep:

description: Represents the partial failure report during the subscription creation or update.

type: object

properties:

valTgtUes:

type: array

items:

$ref: 'TS29549\_SS\_UserProfileRetrieval.yaml#/components/schemas/ValTargetUe'

minItems: 1

description: >

List of VAL user(s) / VAL UE(s) whose identifier(s) is not found.

valGrpIds:

type: array

items:

type: string

minItems: 1

description: >

List of VAL group(s) whose identifier(s) is not found.

oneOf:

- required: [valTgtUes]

- required: [valGrpIds]

MovTimingInfo:

description: Represents the timing information of a VAL UE's movements.

type: object

properties:

timestamp:

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

duration:

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

anyOf:

- required: [timestamp]

- required: [duration]

# Simple data types and Enumerations

SEALEvent:

anyOf:

- type: string

enum:

- LM\_LOCATION\_INFO\_CHANGE

- GM\_GROUP\_INFO\_CHANGE

- CM\_USER\_PROFILE\_CHANGE

- GM\_GROUP\_CREATE

- NRM\_MONITOR\_UE\_USER\_EVENTS

- LM\_LOCATION\_DEVIATION\_MONITOR

- GM\_TEMP\_GROUP\_FORMATION

- LM\_LOCATION\_AREA\_MONITOR

- GM\_GROUP\_DELETION

- 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: |

Represents the type of SEAL events that can be subscribed.

Possible values are:

- LM\_LOCATION\_INFO\_CHANGE: Events related to the location information of VAL Users or

VAL UEs from the Location Management Server.

- GM\_GROUP\_INFO\_CHANGE: Events related to the modification of VAL group membership

and configuration information from the Group Management Server.

- CM\_USER\_PROFILE\_CHANGE: Events related to update of user profile information from

the Configuration Management Server.

- GM\_GROUP\_CREATE: Events related to creation of new VAL groups from the Group

Mananagement Server.

- NRM\_MONITOR\_UE\_USER\_EVENTS: Monitoring and analytic events related to VAL UEs,

users or VAL group, from the Network Resource Management Server.

- LM\_LOCATION\_DEVIATION\_MONITOR: Events from Location Management server,

related to the deviation of the VAL User(s) / UE(s) location from an area of interest.

- GM\_TEMP\_GROUP\_FORMATION: Events related to the formation of new temporary VAL groups

from the Group Management Server.

- LM\_LOCATION\_AREA\_MONITOR: Events from Location Management server, related to the list

of UEs moving in or moving out of the specific location.

- GM\_GROUP\_DELETION: Events related to deletion of existing VAL Group(s) from the GM Server.

LocDevNotification:

anyOf:

- type: string

enum:

- NOTIFY\_MISMATCH\_LOCATION

- NOTIFY\_ABSENCE

- NOTIFY\_PRESENCE

- 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:

Enumeration of location deviation notification reports.

- NOTIFY\_MISMATCH\_LOCATION: This value indicates that the location information of

the VAL UE(s) from the SEAL LM client and the core network are not matching.

- NOTIFY\_ABSENCE: This value indicates that the current location information of

the VAL UE(s)is deviating from the VAL server's area of interest.

- NOTIFY\_PRESENCE: This value indicates that the current location information of

the VAL UE(s) is within the VAL server's area of interest.

MonLocTriggerEvent:

anyOf:

- type: string

enum:

- DISTANCE\_TRAVELLED

- 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: |

Identifies the triggering event in the location area monitor filtering.

Possible values are:

- DISTANCE\_TRAVELLED: This value indicates the trigger event for the location area

monitoring based on the distance travelled by the reference UE.

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