**TSG-CT WG3 Meeting #119bis-e *C3-220169***

**E-Meeting, 17th – 21st January 2022**

**Source: Huawei**

**Title: State of time synchronization Configuration**

**Spec: 3GPP TS 29.565 v1.0.0**

**Agenda item: 17.16**

**Document for: Decision**

**1. Introduction**

<Introduction part (optional)>

**2. Reason for Change**

As defined in clause 4.15.9.3.2 of 23.502,

1. The TSCTSF constructs PMIC(s) and UMIC to NW-TT to activate the time synchronization service in NW-TT in respect to the service parameters
2. Upon reception of responses from each DS-TT and NW-TT, the TSCTSF determines the state of the time synchronization configuration.
3. The TSCTSF constructs a PMIC to each DS-TT/UE to subscribe for the port management information changes in the DS-TT. The TSCTSF constructs PMIC(s) and UMIC to NW-TT to subscribe for the port management and user-plane management information changes in NW-TT.
4. The TSCTSF notifies the NEF (or AF) with the Ntsctsf\_TimeSynchronization\_ConfigUpdateNotify service operation, containing the time synchronization configuration Id and the current state of the time synchronization service configuration.

**3. Conclusions**

TSCTSF reports the state of configuration.

**4. Proposal**

It is proposed to agree the following changes to 3GPP TS 29.565.

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

##### 5.2.2.8.2 Notifying the current state of an existing configuration

Figure 5.2.2.8.2-1 illustrates the notification about the current state of the time synchronization configuration.



Figure 5.2.2.8.2-1: Notification about the current state of the time synchronization configuration

When the TSFCST receives the notification for each DS-TT and NW-TT from the PCF, the TSCTSF shall determine the current state of the time synchronization configuration and sends an HTTP POST request with "{configNotifUri}", as previously provided by the NF service consumer within the corresponding configuration, as URI and the TimeSyncExposureConfigNotif data structure as request body, as shown in figure 5.2.2.8.2-1, step 1.

The TimeSyncExposureConfigNotif data structure as request body that shall include:

- Notification correlation ID provided by the NF service consumer during the configuration within "configNotifId" attribute;

- current state of the time synchronization configuration.

Editor's Note: Error/Redirect responses are FFS.

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

##### 6.1.6.2.x1 Type: TimeSyncExposureConfigNotif

Table 6.1.6.2.x1-1: Definition of type TimeSyncExposureConfigNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| configNotifId | string | M | 1 | Notification Correlation ID assigned by the NF service consumer. |  |
| stateOfConfig | StageOfConfiguration | M | 1 | Indicates the current state of time synchroniztion service configuration |  |

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

##### 6.1.6.2.x2 Type: StageOfConfiguration

Table 6.1.6.2.x2-1: Definition of type TimeSyncExposureConfigNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| state | boolean | M | 1 | When it is set to true, it indicates the states of configurations for NW-TT port and all DS-TT port are active.When it is set to false, it indicates the state of configurations for NW-TT port or at least one of the DS-TT port are inactive. |  |
| inactiveNwtt | boolean | C | 0..1 | When it is included and set to true, it indicates the state of configuration for NW-TT port is inactive. It may be included when the "state" attribute is set to false. Default value is false. |  |
| inactiveDstts | array(Supi) | C | 1..N | Contains the UE identities. The states of configurations for DS-TT ports corresponding to these UEs are inactive. It may be included when the "state" attribute is set to false. |  |

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

## A.2 Ntsctsf\_TimeSynchronization API

openapi: 3.0.0

info:

 title: Ntsctsf\_TimeSynchronization Service API

 version: 1.0.0-alpha.1

 description: |

 TSCTSF Time Synchronization Service.

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externalDocs:

 description: 3GPP TS 29.565 V1.0.0; 5G System; Time Sensitive Communication and Time Synchronization Function Services; Stage 3.

 url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.565/'

#

servers:

 - url: '{apiRoot}/ntsctsf-time-sync/v1'

 variables:

 apiRoot:

 default: https://example.com

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

security:

 - {}

 - oAuth2ClientCredentials:

 - ntsctsf-timesynchronization

paths:

 /subscriptions:

 post:

 summary: Creates a new subscription to notification of capability of time synchronization service resource

 operationId: TimeSynchronizationExposureSubscriptions

 tags:

 - Time Synchronization Exposure Subscriptions (Collection)

 requestBody:

 description: Contains the information for the creation the resource

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: Successful creation of the resource

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'Contains the URI of the created individual time synchronization exposure subscription resource, according to the structure: {apiRoot}/ntsctsf-time-sync/{apiVersion}/subscriptions/{subscriptionId}'

 required: true

 schema:

 type: string

 '400':

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

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

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

 '404':

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

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

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

 '503':

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

 default:

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

 callbacks:

 subsEventNotification:

 '{$request.body#/subsNotifUri':

 post:

 requestBody:

 description: Notification of an event occurrence in the TSCTSF.

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: The receipt of the notification is acknowledged

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

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

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

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

 '503':

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

 default:

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

 /subscriptions/{subscriptionId}:

 get:

 summary: "Reads an existing Individual Time Synchronization Exposure Subscription"

 operationId: GetIndividualTimeSynchronizationExposureSubscription

 tags:

 - Individual Time Synchronization Exposure Subscription (Document)

 parameters:

 - name: subscriptionId

 description: string identifying an Individual Time Synchronization Exposure Subscription

 in: path

 required: true

 schema:

 type: string

 responses:

 '200':

 description: A representation of the resource is returned.

 content:

 application/json:

 schema:

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

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

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

 '406':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/406'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

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

 '503':

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

 default:

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

 delete:

 operationId: DeleteIndividualTimeSynchronizationExposureSubscription

 summary: Delete an Individual TimeSynchronization Exposure Subscription

 tags:

 - Individual Time Synchronization Exposure Subscription (Document)

 parameters:

 - name: subscriptionId

 in: path

 description: string identifying an Individual Time Synchronization Exposure Subscription

 required: true

 schema:

 type: string

 responses:

 '204':

 description: No Content. Resource was successfully deleted

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

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

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

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

 '503':

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

 default:

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

 /subscriptions/{subscriptionId}/configurations:

 post:

 summary: "Craete a new Individual Time Synchronization Exposure Configuration"

 operationId: CreateIndividualTimeSynchronizationExposureConfiguration

 tags:

 - Individual Time Synchronization Exposure Configuration (Document)

 parameters:

 - name: subscriptionId

 description: string identifying an Individual Time Synchronization Exposure Subscription

 in: path

 required: true

 schema:

 type: string

 requestBody:

 description: Contains the information for the creation the resource

 required: true

 content:

 application/json:

 schema:

 $ref: 'TS29522\_TimeSyncExposure.yaml#/components/schemas/TimeSyncExposureConfig'

 responses:

 '201':

 description: Successful creation of the resource

 content:

 application/json:

 schema:

 $ref: 'TS29522\_TimeSyncExposure.yaml#/components/schemas/TimeSyncExposureConfig'

 headers:

 Location:

 description: 'Contains the URI of the created individual time synchronization exposure configuration resource, according to the structure: {apiRoot}/ntsctsf-time-sync/{apiVersion}/subscriptions/{subscriptionId}/configurations/{configurationId}'

 required: true

 schema:

 type: string

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

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

 '404':

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

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

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

 '503':

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

 default:

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

 callbacks:

 configEventNotification:

 '{$request.body#/configNotifUri':

 post:

 requestBody:

 description: Notification of an event occurrence in the TSCTSF.

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: The receipt of the notification is acknowledged

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

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

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 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

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 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

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

 '503':

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

 default:

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

 /subscriptions/{subscriptionId}/configurations/{configurationId}:

 get:

 summary: "Reads an existing Individual Time Synchronization Exposure Configuration"

 operationId: GetIndividualTimeSynchronizationExposureConfiguration

 tags:

 - Individual Time Synchronization Exposure Configuration (Document)

 parameters:

 - name: subscriptionId

 description: string identifying an Individual Time Synchronization Exposure Subscription

 in: path

 required: true

 schema:

 type: string

 - name: configurationId

 description: string identifying an Individual Time Synchronization Exposure Configuration

 in: path

 required: true

 schema:

 type: string

 responses:

 '200':

 description: A representation of the resource is returned.

 content:

 application/json:

 schema:

 $ref: 'TS29522\_TimeSyncExposure.yaml#/components/schemas/TimeSyncExposureConfig'

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

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

 '406':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/406'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

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

 '503':

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

 default:

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

 put:

 operationId: ReplaceIndividualTimeSynchronizationExposureConfiguration

 summary: Replace an individual Time Synchronization Exposure Configuration

 tags:

 - IndividualTimeSynchronizationExposureConfiguration (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

 $ref: 'TS29522\_TimeSyncExposure.yaml#/components/schemas/TimeSyncExposureConfig'

 parameters:

 - name: subscriptionId

 description: string identifying an Individual Time Synchronization Exposure Subscription

 in: path

 required: true

 schema:

 type: string

 - name: configurationId

 description: string identifying an Individual Time Synchronization Exposure Configuration

 in: path

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK. Resource was successfully modified and representation is returned

 content:

 application/json:

 schema:

 $ref: 'TS29522\_TimeSyncExposure.yaml#/components/schemas/TimeSyncExposureConfig'

 '204':

 description: No Content. Resource was successfully modified

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

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

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

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

 '503':

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

 default:

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

 delete:

 operationId: DeleteIndividualTimeSynchronizationExposureConfiguration

 summary: Delete an Individual TimeSynchronization Exposure Configuration

 tags:

 - Individual Time Synchronization Exposure Configuration (Document)

 parameters:

 - name: subscriptionId

 in: path

 description: string identifying an Individual Time Synchronization Exposure Subscription

 required: true

 schema:

 type: string

 - name: configurationId

 description: string identifying an Individual Time Synchronization Exposure Configuration

 in: path

 required: true

 schema:

 type: string

 responses:

 '204':

 description: No Content. Resource was successfully deleted

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

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

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

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

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '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:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 ntsctsf-timesynchronization: Access to the Ntsctsf\_TimeSynchronization API

 schemas:

 TimeSyncExposureSubsc:

 description: Contains the parameters for the subscription to notification of capability of time synchronization service.

 type: object

 properties:

 supis:

 type: array

 items:

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

 minItems: 1

 interGrpId:

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

 anyUeInd:

 type: boolean

 description: Identifies whether the request applies to any UE. This attribute shall set to "true" if applicable for any UE, otherwise, set to "false".

 notifMethod:

 $ref: 'TS29508\_Nsmf\_EventExposure.yaml#/components/schemas/NotificationMethod'

 dnn:

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

 snssai:

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

 subscribedEvents:

 type: array

 items:

 $ref: 'TS29522\_TimeSyncExposure.yaml#/components/schemas/SubscribedEvent'

 minItems: 1

 eventFilters:

 type: array

 items:

 $ref: 'TS29522\_TimeSyncExposure.yaml#/components/schemas/EventFilter'

 minItems: 1

 subsNotifUri:

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

 subsNotifId:

 type: string

 description: Notification Correlation ID assigned by the NF service consumer.

 maxReportNbr:

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

 expiry:

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

 repPeriod:

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

 suppFeat:

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

 required:

 - subsNotifUri

 - subsNotifId

 TimeSyncExposureSubsNotif:

 description: Contains the notification of time synchronization service.

 type: object

 properties:

 subsNotifId:

 type: string

 description: Notification Correlation ID assigned by the NF service consumer.

 eventNotifs:

 type: array

 items:

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

 minItems: 1

 SubsEventNotification:

 description: Contains the notification of capability of time synchronization for a list of UEs.

 type: object

 properties:

 event:

 $ref: 'TS29522\_TimeSyncExposure.yaml#/components/schemas/SubscribedEvent'

 timeSyncCapas:

 type: array

 items:

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

 minItems: 1

 TimeSyncCapability:

 description: Contains the capability of time synchronization service

 type: object

 properties:

 upNodeId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint64'

 gmCapables:

 type: array

 items:

 $ref: 'TS29522\_TimeSyncExposure.yaml#/components/schemas/GmCapable'

 minItems: 1

 ptpCapForUes:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: Contains the PTP capabilities supported by each of the UE(s). The key of the map is the supi.

 required:

 - upNodeId

 - ptpCapForUes

 PtpCapabilitiesPerUe:

 description: Contains the supported PTP capabilities per UE.

 type: object

 properties:

 supi:

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

 ptpCaps:

 type: array

 items:

 $ref: 'TS29522\_TimeSyncExposure.yaml#/components/schemas/EventFilter'

 minItems: 1

 required:

 - supi

 - ptpCaps

 TimeSyncExposureConfigNotif:

 description: Contains the notification of time synchronization service state.

 type: object

 properties:

 configNotifId:

 type: string

 description: Notification Correlation ID assigned by the NF service consumer.

 stateOfConfig:

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

 required:

 - configNotifId

 - stateOfConfig

 StageOfConfiguration:

 description: Contains the state of the time synchronization configuration.

 type: object

 properties:

 state:

 type: boolean

 description: When it is set to true, it indicates the states of configurations for NW-TT port and all DS-TT ports are active.

 inactiveNwtt:

 type: boolean

 description: When it is included and set to true, it indicates the state of configuration for NW-TT port is inactive.

 inactiveDstts:

 description: Contains the UE identities. The states of configurations for DS-TT ports corresponding to these UEs are inactive.

 type: array

 items:

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

 minItems: 1

 required:

 - state

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