**TSG-CT WG3 Meeting #120-e *C3-221179***

**E-Meeting, 17th – 25th February 2022**

**Source: Huawei**

**Title: Completion of error and redirect responses of Ntsctsf\_TimeSynchronization Service**

**Spec: 3GPP TS 29.565 v1.1.0**

**Agenda item: 17.16**

**Document for: Decision**

**1. Introduction**

<Introduction part (optional)>

**2. Reason for Change**

Error and redirect responses of Ntsctsf\_TimeSynchronization Service service are not resolved yet

**3. Conclusions**

Resolve the FFS.

**4. Proposal**

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

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

##### 5.2.2.9.2 Creating a new configuration

Figure 5.2.2.9.2-1 illustrates the creation of a configuration.



Figure 5.2.2.9.2-1: Creation of a configuration

To create a configuration, the NF service consumer shall send an HTTP POST message to the TSCTSF to the URI "{apiRoot}/ntsctsf-time-sync/<apiVersion>/asti-configurations". The HTTP POST message shall include the AccessTimeDistributionData data structure as request body, as shown in figure 5.2.2.9.2-1, step 1. The AccessTimeDistributionData data structure shall include:

- one of the indication of the UEs to which the 5G access stratum time distribution configuration is requested via:

- identification of a list of individual UEs within the "supis" attribute;

- indication of any UE within the "anyUeInd" attribute; or

- identification of a group of UE(s) within the "interGrpId" attribute.

- 5G access stratum time distribution parameters within the "asTimeDisParam" attribute;

* DNN with the "dnn" attribute if the "anyUeInd" attribute is included and set to "true";
* S-NSSAI with the "snssai" attribute if the "anyUeInd" attribute is included and set to "true".

Within the "asTimeDisParam" attribute inside the AccessTimeDistributionData data structure, the NF service consumer:

* shall include the "asTimeDisEnabled" attribute set to true if the access stratum time distribution via Uu reference point should be activated (otherwise, if the access stratum time distribution via Uu reference point should be inactive, the "asTimeDisEnabled" attribute may either be omitted or included and set to "false");
* may include the time synchronization error budget within the "timeSyncErrBudget" attribute;
* may include the temporal validity condition within the "tempValidity" attribute.

Upon receipt of the HTTP request from the NF service consumer, if the request is authorized, the TSCTSF shall:

- interact with the UDR to store the configuration information in the UDR by using the Nudr\_DataRepository service as defined in 3GPP TS 29.519 [14];

- create a new resource, which represents a new "Individual ASTI Configuration" instance, addressed by a URI as defined in subclause 6.1.3.7 and containing a TSCTSF created resource identifier;

- send an HTTP "201 Created" response with AccessTimeDistributionData data structure as response body and a Location header field containing the URI of the created Individual ASTI Configuration resource, i.e. "{apiRoot}/ntsctsf-time-sync/<apiVersion>/asti-configurations/{astiConfigId}", as shown in figure 5.2.2.9.2-1, step 2.

If the TSCTSF cannot successfully fulfil the received HTTP POST request due to the internal TSCTSF error or due to the error in the HTTP POST request, the TSCTSF shall send the HTTP error response as specified in clause 6.1.7.

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

##### 5.2.2.10.2 Updating an existing configuration

Figure 5.2.2.10.2-1 illustrates the updating of an existing configuration.



Figure 5.2.2.10.2-1: Update of a configuration

To update a configuration, the NF service consumer shall send an HTTP PUT request to the resource "{apiRoot}/ntsctsf-time-sync/<apiVersion>/asti-configurations/{astiConfigId}" representing an existing "Individual ASTI Configuration" resource, as shown in figure 5.2.2.10.2-1, step 1, to modify the configuration.

The AccessTimeDistributionData data structure provided in the request body shall include the updated information as defined in clause 5.2.2.9.2.

Upon receipt of the corresponding HTTP PUT message, if the request is authorized, theTSCTSF shall:

* interact with the UDR to update the configuration information in the UDR by using the Nudr\_DataRepository service as defined in 3GPP TS 29.519 [14].
* update the existing "Individual ASTI Configuration" resource. Then the TSCTSF shall send a HTTP response including "200 OK" status code with AccessTimeDistributionData data structure or "204 No Content" status code, as shown in figure 5.2.2.10.2-1, step 2.

If the TSCTSF cannot successfully fulfil the received HTTP PUT request due to the internal TSCTSF error or due to the error in the HTTP PUT request, the TSCTSF shall send the HTTP error response as specified in clause 6.1.7.

If the TSCTSF determines the received HTTP PUT request needs to be redirected, the TSCTSF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [4].

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

##### 5.2.2.11.2 Delete an existing configuration

Figure 5.2.2.11.2-1 illustrates the deleting of an existing configuration.



Figure 5.2.2.11.2-1: Deletion of a configuration

To delete a configuration, the NF service consumer shall send an HTTP DELETE request to the resource "{apiRoot}/ntsctsf-time-sync/<apiVersion>/asti-configurations/{astiConfigId}" representing an existing "Individual ASTI Configuration" resource, as shown in figure 5.2.2.11.2-1, step 1, to delete the configuration.

Upon the reception of an HTTP DELETE request from the NF service consumer, if the HTTP DELETE request is authorized, the TSCTSF shall:

- interact with the UDR to remove the configuration information in the UDR by using the Nudr\_DataRepository service as defined in 3GPP TS 29.519 [14].

- remove the corresponding configuration and respond with "204 No Content" as shown in figure 5.2.2.11.2-1, step 2.

If the TSCTSF cannot successfully fulfil the received HTTP DELETE request due to the internal TSCTSF error or due to the error in the HTTP DELETE request, the TSCTSF shall send the HTTP error response as specified in clause 6.1.7.

If the TSCTSF determines the received HTTP DELETE request needs to be redirected, the TSCTSF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [4].

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

##### 5.2.2.12.2 Retrieve the status of access stratum time distribution

Figure 5.2.2.12.2-1 illustrates the retrieval of the status of access stratum time distribution.



Figure 5.2.2.12.2-1: Retrieval of the status of access stratum time distribution

To retrieve the status of access stratum time distribution, the NF service consumer shall send an HTTP POST request to the resource "{apiRoot}/ntsctsf-time-sync/<apiVersion>/asti-configurations/retrieve". The HTTP POST message shall include the StatusRequestData data structure as request body, as shown in figure 5.2.2.11.2-1, step 1. The StatusRequestData data structure shall include:

- identification of a list of individual UEs within the "supis" attribute;

and may include:

* DNN with the "dnn" attribute
* S-NSSAI with the "snssai" attribute.

Upon the reception of an HTTP POST request and if the HTTP POST request is accepted by the TSCTSF, the TSCTSF shall send an HTTP "200 OK" response with the StatusResponseData data structure as response body, as shown in figure 5.2.2.11.2-1, step 2.

Within the StatusResponseData data structure, TSCTSF may include:

* a list of UE identifier(s) whose status of the access stratum time distribution is inactive within the "inactiveUes" attribute;
* the "activeUes" attribute containing one or more the ActiveUe instances which includes the UE identifier whose status of the access stratum time distribution is active within the "supi" attribute and optionally the requested time synchronization error budget within the "timeSyncErrBudget" attribute.

Editor's Note: Interaction with PCF is FFS.

Editor's Note: Whether to consider GET method is FFS.

If the TSCTSF cannot successfully fulfil the received HTTP POST request due to the internal TSCTSF error or due to the error in the HTTP POST request, the TSCTSF shall send the HTTP error response as specified in clause 6.1.7.

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

###### 6.1.3.6.3.1 POST

This method shall support the URI query parameters specified in table 6.1.3.6.3.1-1.

Table 6.1.3.6.3.1-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 6.1.3.6.3.1-2 and the response data structures and response codes specified in table 6.1.3.6.3.1-3.

Table 6.1.3.6.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| AccessTimeDistributionData | M | 1 | Contains the information for the creation of a new Individual ASTI Configuration resource. |

Table 6.1.3.6.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| AccessTimeDistributionData | M | 1 | 201 Created | The resource was created successfully and a representation of the created resource is returned.  The URI of the created resource shall be returned in the "Location" HTTP header. |
| NOTE: The manadatory HTTP error status code for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. | | | | |

Table 6.1.3.6.3.1-4: Headers supported by the 201 response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/ntsctsf-time-sync/<apiVersion>/asti-configurations/{astiConfigId} |

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

6.1.3.6.4.2.2 Operation Definition

This custom operation retrieves the status of the access stratum time distribution for a list of UEs.

This operation shall support the request data structures specified in table 6.1.3.6.4.2.2-1 and the response data structure and response codes specified in table 6.1.3.6.4.2.2-2.

Table 6.1.3.6.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| StatusRequestData | M | 1 | Parameters to be sent by the NF service consumer when the status of the 5G access stratum time distribution for a list of UEs is requested. |

Table 6.1.3.6.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| StatusResponseData | M | 1 | 200 OK | Status of the 5G access stratum time distribution for a list of UEs is returned. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [4] shall also apply. | | | | |

Editor's Note: Whether to consider GET method is FFS.

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

###### 6.1.3.7.3.2 PUT

This method shall support the URI query parameters specified in table 6.1.3.7.3.2-1.

Table 6.1.3.7.3.2-1: URI query parameters supported by the PATCH method on this resource

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

This method shall support the request data structures specified in table 6.1.3.7.3.2-2 and the response data structures and response codes specified in table 6.1.3.7.3.2-3.

Table 6.1.3.7.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| AccessTimeDistributionData | M | 1 | Contains the modification(s) to apply to the Individual ASTI Configuration resource. |

Table 6.2.3.7.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| AccessTimeDistributionData | M | 1 | 200 OK | Successful case. The Individual ASTI Configuration resource was modified and a representation of that resource is returned. |
| n/a |  |  | 204 No Content | Successful case.  The Individual ASTI Configuration resource was modified. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during an Individual ASTI Configuration resource modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative TSCTSF (service) instance. |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during an Individual ASTI Configuration resource modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative TSCTSF (service) instance. |
| NOTE: In addition, the HTTP status codes which are specified as mandatory in table 5.2.7.1-1 of 3GPP TS 29.500 [4] for the PATCH method shall also apply. | | | | |

Table 6.2.3.7.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative TSCTSF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the request is redirected. |

Table 6.2.3.7.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative TSCTSF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the request is redirected. |

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

###### 6.1.3.7.3.3 DELETE

This method shall support the URI query parameters specified in table 6.1.3.7.3.3-1.

Table 6.1.3.7.3.3-1: URI query parameters supported by the DELETE method on this resource

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

This method shall support the request data structures specified in table 6.1.7.3.3.3-2 and the response data structures and response codes specified in table 6.1.3.7.3.3-3.

Table 6.1.3.7.3.3-2: Data structures supported by the DELETE Request Body on this resource

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

Table 6.1.3.7.3.3-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | The configuration was terminated successfully. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during an Individual ASTI Configuration resource modification deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative TSCTSF (service) instance. |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during an Individual ASTI Configuration resource modification e deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative TSCTSF (service) instance. |
| NOTE: In addition, the HTTP status codes which are specified as mandatory in table 5.2.7.1-1 of 3GPP TS 29.500 [4] for the PATCH method shall also apply. | | | | |

Table 6.2.3.7.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative TSCTSF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the request is redirected. |

Table 6.1.3.7.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative TSCTSF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the request is redirected. |

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

6.1.5.2.3.1 POST

This method shall support the request data structures specified in table 6.1.5.2.3.1-1 and the response data structures and response codes specified in table 6.1.5.2.3.1-1.

Table 6.1.5.2.3.1-2: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| TimeSyncExposureSubsNotif | M | 1 | Provides the time synchronization capabilities of a list of UEs by the TSCTSF to the NF service consumer. |

Table 6.1.5.2.3.1-3: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | The event notification is received successfully. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during event notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative NF consumer (service) instance where the notification should be sent. |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during event notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative NF consumer (service) instance where the notification should be sent. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. | | | | |

Table 6.1.5.2.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification should be redirected. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the notification request is redirected |

Table 6.1.5.2.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification should be redirected. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the notification request is redirected |

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

6.1.5.3.3.1 POST

This method shall support the request data structures specified in table 6.1.5.3.3.1-1 and the response data structures and response codes specified in table 6.1.5.3.3.1-1.

Table 6.1.5.3.3.1-2: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| TimeSyncExposureConfigNotif | M | 1 | Provides the current state of time synchronization configuration by the TSCTSF to the NF service consumer. |

Table 6.1.5.3.3.1-3: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | The event notification is received successfully. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during event notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative NF consumer (service) instance where the notification should be sent. |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during event notification. The response shall include a Location header field containing an alternative URI representing the end point of an alternative NF consumer (service) instance where the notification should be sent. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [4] also apply. | | | | |

Table 6.1.5.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification should be redirected. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the notification request is redirected |

Table 6.1.5.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification should be redirected. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the notification request is redirected |

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

#### 6.1.7.3 Application Errors

The application errors defined for the Ntsctsf\_TimeSynchronization service are listed in Table 6.1.7.3-1.

Table 6.1.7.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
|  |  |  |

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