**3GPP TSG CT WG3 Meeting #113eC3-210065**

**E-Meeting, 25th – 29th January 2021 *(revision of C3-21xxxx)***

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| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **29.507** | **CR** | 0152 | **rev** | **-** | **Current version:** | **17.1.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| --- |
|  |
| ***Title:***  | Support of stateless NFs |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | 5G\_eSBA |  | ***Date:*** | 2021-01-29 |
|  |  |  |  |  |
| ***Category:*** | **A** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | To support Stateless NF, it was agreed in TS 29.500, 6.5.3.2 and 6.5.3.3 during the last CT4 and CT3 e-meetings (cf. reply LS in C3-205495):* Stateless NF as service consumer:
	+ When the NF service consumer is changed, and if the new NF service consumer does not support handling notifications as specified in the above bullet 5, the new NF service consumer should update the NF service producers with the new Notification URI. For explicit subscriptions, this is achieved by updating the existing subscription or creating a new subscription, depending on the NF service producer's API. For implicit subscriptions, this is carried out via a service update request message
	+ Each NF service consumer within the NF (service) set shall be prepared to receive notifications from the NF service producer, either by handling the notifications to the Notification URI constructed according to the above bullet 5 with its own address as authority part, by handling the notifications to the Notification URI notified in the above bullet 6, or by replying with an HTTP 3xx redirect pointing to a new NF service consumer or with another HTTP error.
* Stateless NF as service producer:
	+ When the NF service producer changes, the new NF service producer may include an updated binding indication in a notification/callback request sent to the NF service consumer. The new NF service producer may also generate a new resource URI and return it to the NF service consumer upon reception of a service request related to the resource from that NF service consumer, e.g. the new NF service producer may reply with an HTTP 3xx redirect status code pointing to the new location of the resource.
 |
|  |  |
| ***Summary of change:*** | OpenAPI file is updated with the support of 307 and 308 responses for the GET and DELETE of Individual AM Policy Association resource, custom methods and methods of the Callback URIs. |
|  |  |
| ***Consequences if not approved:*** | Lack of full support of the functionality required to become stateless NFs |
|  |  |
| ***Clauses affected:*** | 4.2.3.1, 4.2.4.2, 4.2.4.3, 4.2.5, 5.3.3.3.1, 5.3.3.3.2, 5.3.3.4.2.2, 5.5.2.2, 5.5.3.2, 5.7.1, 5.8, A.2 |
|  |  |
|  | **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 correction to the OpenAPI file. |
|  |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**…**

**Proposed changes:**

\*\*\* 1st Change \*\*\*

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

#### 4.2.3.1 General

The procedure in the present subclause is applicable when the NF service consumer modifies an existing AM policy association (including the case where the AMF is relocated and the new AMF selects the old PCF to maintain the policy association and to update the Notification URI).

Figure 4.2.3.1-1 illustrates the update of a policy association.



Figure 4.2.3.1-1: Update of a policy association

The AMF as NF service consumer invokes this procedure when a policy control request trigger (see subclause 4.2.3.2) occurs. When the Service Area restriction change trigger and/or the RFSP index change trigger occur, and/or the feature "UE-AMBR\_Authorization" is supported and the subscribed UE-AMBR change trigger occurs, the AMF shall always invoke the procedure. When the location change trigger or the change of UE presence in PRA trigger occurs, the AMF shall only invoke the procedure if the PCF has subscribed to that event trigger.

If an AMF knows by implementation specific means that the UE context has been transferred to an AMF with another GUAMI within the AMF set, it may also invoke this procedure to update the Notification URI and the GUAMI.

NOTE 1: Either the old or the new AMF can invoke this procedure.

During the AMF relocation, if the new AMF received the resource URI of the individual AM Policy from the old AMF and selects the old PCF, the new AMF shall also invoke this procedure to update the Notification URI and the GUAMI. The new AMF may also update the alternate or backup IP addresses.

To request policies from the PCF, to update the Notification URI, to update the trace control configuration and/or to request the termination of trace, the NF Service Consumer (e.g. AMF) shall request the update of the AM Policy Association by providing the relevant parameters about the UE context by sending an HTTP POST request with "{apiRoot}/npcf-am-policy-control/v1/policies/{polAssoId}/update" as Resource URI and the PolicyAssociationUpdateRequest data structure as request body that shall include:

- at least one of the following:

1. a new Notification URI encoded in the "notificationUri" attribute;

2. observed Policy Control Request Trigger(s) (see subclause 4.2.3.2) encoded as "triggers" attribute;

3. if a Service Area restriction change occurred, the Service Area Restrictions (see subclause 4.2.2.3.1) as obtained from the UDM encoded as "servAreaRes" attribute;

4. if a RFSP index change occurred, the RFSP index (see subclause 4.2.2.3.2) as obtained from the UDM encoded as "rfsp" attribute;

5. if a UE location change occurred, the UE location encoded as "userLoc" attribute;

6. if the Policy Control Request Trigger "Change of UE presence in PRA" is provided, the current presence status of the UE for the presence reporting areas for which reporting was requested, if not previously provided, or the presence reporting areas for which reporting was requested and the status has changed encoded as "praStatuses" attribute.

NOTE 2: If the PCF included the identifer of a Core Network predefined Presence Reporting Area Set within the "praId" attribute during the subscription to changes of UE presence in PRA, the AMF only provides the presence reporting area information corresponding to the concerned individual Presence Reporting Area Identifier(s) within the Set. The "praId" attribute within each returned "PresenceInfo" data type hence includes the identifier of the concerned individual Presence Reporting Area.

7. if the trace control configuration needs to be updated, trace control and configuration parameters information encoded as "traceReq" attribute;

8. if trace needs to be terminated, the "traceReq" attribute set to the Null value;

9. if the "SliceSupport" feature or the "DNNReplacementControl" feature is supported, the UE is registered via 3GPP access, the allowed NSSAI changed, and the Policy Control Request Trigger "Change of allowed NSSAI" was provided, then the allowed NSSAI encoded in the "allowedSnssais" attribute;

10. for AMF relocation scenarios, if available, alternate or backup IPv4 Address(es) where to send Notifications encoded as "altNotifIpv4Addrs" attribute;

11. for AMF relocation scenarios, if available, alternate or backup IPv6 Address(es) where to send Notifications encoded as "altNotifIpv6Addrs" attribute;

12. for AMF relocation scenarios, if available, alternate or backup FQDN(s) where to send Notifications encoded as "altNotifFqdns" attribute;

13. for AMF relocation scenarios, if available, the GUAMI encoded as "guami" attribute;

NOTE 3: An alternate NF service consumer than the one that requested the generation of the subscription resource can send the request. For instance, an AMF as service consumer can change.

14. if the feature "UE-AMBR\_Authorization" is supported, and a subscribed UE-AMBR change occurred, the UE-AMBR (see subclause 4.2.2.3.x) as obtained from the UDM encoded as "ueAmbr" attribute;

15. if the feature "DNNReplacementControl" is supported, DNN replacement applies and the Policy Control Request Trigger "Change of SMF selection information" is provided, the "smfSelInfo" attribute including:

- the UE requested DNN in the "dnn" attribute; and

- the UE requested S-NSSAI in the "snssai" attribute and, if available, the corresponding mapped home S-NSSAI in the "mappingSnssai" attribute;

when:

- the UE requested an unsupported DNN and the "unsuppDnn" attribute is set to "true"; or

- the UE requested DNN and S-NSSAI matched one of the S-NSSAI and DNN provided in the "candidates" attribute; and

16. if feature "DNNReplacementControl" is supported, the UE is registered via 3GPP access, the Allowed NSSAI changed and/or the mapping of a S-NSSAI of the Allowed NSSAI to the corresponding S-NSSAI of the HPLMN changed, and the Policy Control Request Trigger" Change of allowed NSSAI" was provided, then the mapping of each S-NSSAI of the Allowed NSSAI to the corresponding S-NSSAI of the HPLMN encoded in the "mappingSnssais" attribute.

NOTE 4: When the feature "DNNReplacementControl" is supported, the AMF applies DNN replacement for non-roaming scenarios and LBO. For a PDU session with home routed roaming, whether to perform DNN replacement is based on operator agreement.

Upon the reception of the HTTP POST request, the PCF shall:

- update the corresponding individual AM Policy resource based on the information provided by the AMF;

- determine the applicable policy based on local policy;

- for the successful case, send a HTTP "200 OK" response with the PolicyUpdate data type as body with possible updates for that applicable policy and Policy Control Request Trigger(s) encoded as described in subclause 4.2.3.3 and according to the following provisions:

a) if the PCF received the "servAreaRes" attribute in the request, Service Area Restrictions encoded as "servAreaRes" attribute;

b) if the PCF received the "rfsp" attribute in the request, RAT Frequency Selection Priority (RFSP) Index encoded as "rfsp" attribute;

c) if the feature "UE-AMBR\_Authorization" is supported and the PCF received the "ueAmbr" attribute in the request, UE-AMBR encoded as "ueAmbr" attribute; and/or

d) if the PCF received the "smfSelInfo" attribute in the request, the "smfSelInfo" attribute encoding the PCF selected DNN in the "dnn" attribute corresponding to the S-NSSAI received in the "snssai" attribute;

NOTE 5: A PolicyUpdate data structure with only mandatory attribute(s) is included in the "200 OK" response when the PCF decides not to update the policies.

- if errors occur when processing the HTTP POST request, apply error handling procedures as specified in subclause 5.7 and according to the following provisions:

a) if the PCF is, due to incomplete, erroneous or missing information in the request, not able to provision an AM policy decision, the PCF may reject the request and include in an HTTP "400 Bad Request" response message the "cause" attribute of the ProblemDetails data structure set to "ERROR\_REQUEST\_PARAMETERS".

b) if the "ES3XX" feature is supported and the PCF (service) instance has changed, the PCF may respond with an HTTP 3xx redirect response pointing to a new PCF (service) instance as defined in subclause 6.5.3.3 of 3GPP TS 29.500 [5].

If the PCF received a "traceReq" attribute, it shall perform trace procedures as defined in 3GPP TS 32.422 [18].

If the AMF received the request of removal of Service Area Restrictions and/or RFSP and/or UE-AMBR from the UDM, the AMF shall remove the authorized Service Area Restrictions and/or RFSP and/or UE-AMBR provisioned by the PCF and apply the configured Service Area Restrictions and/or RFSP and/or UE-AMBR at the AMF without interacting with the PCF.

If feature "DNNReplacementControl" is supported and the AMF received the update of the SMF selection information within the "smfSelInfo" attribute in the response, the AMF shall apply the updated SMF selection information to the new PDU Sessions only, i.e. already established PDU Sessions are not affected.

If the PCF received a new GUAMI, the PCF may subscribe to GUAMI changes using the AMFStatusChange service operation of the Namf\_Communication service specified in 3GPP TS 29.518 [14], and it may use the Nnrf\_NFDiscovery Service specified in 3GPP TS 29.510 [13] (using the obtained GUAMI and possibly service name) to query the other AMFs within the AMF set.

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

#### 4.2.4.2 Policy update notification

Figure 4.2.4.2-1 illustrates the policy update notification.



Figure 4.2.4.2-1: policy update notification

The PCF may decide to update Access and Mobility policies and shall then send an HTTP POST request with "{notificationUri}/update" as URI (where the Notification URI was previously supplied by the NF service consumer) and the PolicyUpdate data structure as request body encoded as described in subclause 4.2.3.3.

Upon the reception of the HTTP POST request, the NF service consumer shall enforce the received updated policy.

In case of a successful update of AM policies:

- if the feature "ImmediateReport" is supported and the PCF provisioned the policy control request triggers related to access type change, PRA change or location change, a "200 OK" response code and a response body with the corresponding available information in the "AmRequestedValueRep" data structure shall be returned in the response;

- otherwise, a "204 No Content" response code shall be returned in the response.

If errors occur when processing the HTTP POST request, send an HTTP error response or, if the feature "ES3XX" is supported, an HTTP redirect response as specified in subclause 5.7.

If the AMF as NF service consumer is not able to handle the notification but knows by implementation specific means that another AMF is able to handle the notification, it shall reply with an HTTP "307 temporary redirect" error response pointing to the URI of the new AMF. If the AMF is not able to handle the notification but another unknown AMF could possibly handle the notification, it shall reply with an HTTP "404 Not found" error response.

If the PCF receives a "307 temporary redirect" response, the PCF shall resend the failed policy update notification request using the received URI in the Location header field as Notification URI. Subsequent policy update notifications, triggered after the failed one, shall be sent to the Notification URI provided by the NF service consumer during the corresponding policy association creation/update.

If the PCF becomes aware that a new AMF is requiring notifications (e.g. via the "404 Not found" response, via Namf\_Communication service AMFStatusChange Notifications, see 3GPP TS 29.518 [14], or via link level failures), and the PCF knows alternate or backup IPv4, IPv6 Addess(es) or FQDN(s) where to send Notifications (e.g. via "altNotifIpv4Addrs", "altNotifIpv6Addrs" or "altNotifFqdns" attributes received when the policy association was created, via AMFStatusChange Notifications or via the Nnrf\_NFDiscovery Service specified in 3GPP TS 29.510 [13] (using the service name and GUAMI obtained during the creation of the subscription) to discover the other AMFs within the AMF set), the PCF shall exchange the authority part of the corresponding Notification URI with one of those addresses and shall use that URI in any subsequent communication.

If the PCF received a "404 Not found" response, the PCF should resend the failed policy update notification request to that URI.

If the feature "DNNReplacementControl" is supported and the AMF received the update of the SMF selection information within the "smfSelInfo" attribute in the request, the AMF shall apply the updated SMF selection information to the new PDU Sessions only, i.e. already established PDU Sessions are not affected.

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

#### 4.2.4.3 Request for termination of the policy association

Figure 4.2.4.3-1 illustrates the request for a termination of the policy association.



Figure 4.2.4.3-1: request for a termination of the policy association

The PCF may request the termination of the policy association and shall then send an HTTP POST request with "{notificationUri}/terminate" as URI (where the Notification URI was previously supplied by the NF service consumer) and the TerminationNotification data structure as request body that shall include:

- the policy association ID encoded as "polAssoId" attribute; and

- the cause why the PCF requests the termination of the policy association encoded as "cause" attribute.

Upon the reception of the HTTP POST request, the NF service consumer shall:

- either send a HTTP "204 No Content" response for the successful processing of the HTTP POST request or an appropriate failure response; and

- if errors occur when processing the HTTP POST request, send an HTTP error response or, if the feature "ES3XX" is supported, an HTTP redirect response as specified in subclause 5.7.

After the successful processing of the HTTP POST request, the NF service consumer shall remove the context related to the policy association but still apply the provisioned AM policies to the UE and invoke the Npcf\_AMPolicyControl\_Delete Service Operation defined in subclause 4.2.5 to terminate the policy association.

If the AMF as NF service consumer is not able to handle the notification but knows by implementation specific means that another AMF is able to handle the notification, it shall reply with an HTTP "307 temporary redirect" error response pointing to the URI of the new AMF. If the AMF is not able to handle the notification but another unknown AMF could possibly handle the notification, it shall reply with an HTTP "404 Not found" error response.

If the PCF receives a "307 temporary redirect" response, the PCF shall resend the failed request for termination of the policy association using the received URI in the Location header field as Notification URI.

If the PCF becomes aware that a new AMF is requiring notifications (e.g. via the "404 Not found" response, via Namf\_Communication service AMFStatusChange Notifications, see 3GPP TS TS 29.518 [14], or via link level failures), and the PCF knows alternate or backup IPv4, IPv6 Address(es) or FQDN(s) where to send Notifications (e.g. via "altNotifIpv4Addrs", "altNotifIpv6Addrs" or "altNotifFqdns" attributes received when the policy association was created, via AMFStatusChange Notifications or via the Nnrf\_NFDiscovery Service specified in 3GPP TS 29.510 [13] (using the service name and GUAMI obtained during the creation of the subscription) to discover the other AMFs within the AMF set), the PCF shall exchange the authority part of the corresponding Notification URI with one of those addresses and shall resend the failed request for termination of the policy association to that URI.

If the PCF received a "404 Not found" response, the PCF should resend the failed request for termination of the policy association to that URI.

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

### 4.2.5 Npcf\_AMPolicyControl\_Delete Service Operation

Figure 4.2.5-1 illustrates the deletion of a policy association.



Figure 4.2.5-1: Deletion of a policy association

The AMF as NF service consumer requests that the policy association is deleted when the corresponding UE context is terminated, e.g. during UE de-registration from the network, or when the UE moves from 5GS to EPS and the UE is not connected to the 5GC over a non-3GPP access.

During the AMF relocation, the old AMF shall invoke this procedure when:

- the resource URI of the "Individual AM Policy Association" resource is not transferred to the new AMF; or

- the new AMF informs the old AMF that the "Individual AM Policy Association" resource is not being reused (i.e. the old PCF is not being reused).

To request that the policy association is deleted, the NF service consumer (e.g. AMF) shall send an HTTP DELETE request with "{apiRoot}/npcf-am-policy-control/v1/policies/{polAssoId}" as Resource URI.

Upon the reception of the HTTP DELETE request, the PCF shall:

- delete the policy association;

- send either an HTTP "204 No Content" response indicating the success of the deletion or an appropriate failure response; and

- if errors occur when processing the HTTP DELETE request, send an HTTP error response or, if the feature "ES3XX" is supported, an HTTP redirect response as specified in subclause 5.7.

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

##### 5.3.3.3.1 GET

This method shall support the URI query parameters specified in table 5.3.2.3.1-1.

Table 5.3.3.3.1-1: URI query parameters supported by the GET method on this resource

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

This method shall support the request data structures specified in table 5.3.2.3.1-2 and the response data structures and response codes specified in table 5.3.2.3.1-3.

Table 5.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

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

Table 5.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| PolicyAssociation | M | 1 | 200 OK |  |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual AM policy retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PCF (service) instance. Applicable if the feature "ES3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual AM policy retrieval. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PCF (service) instance.Applicable if the feature "ES3XX" is supported. |
| NOTE: The mandatory HTTP error status codes for the GET method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [5] also apply. |

Table 5.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative PCF (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 5.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative PCF (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 \*\*\*

##### 5.3.3.3.2 DELETE

This method shall support the URI query parameters specified in table 5.3.3.3.2-1.

Table 5.3.3.3.2-1: 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 5.3.3.3.2-2 and the response data structures and response codes specified in table 5.3.3.3.2-3.

Table 5.3.3.3.2-2: Data structures supported by the DELETE Request Body on this resource

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

Table 5.3.3.3.2-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | The policy association was successfully deleted. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual AM policy deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PCF (service) instance. Applicable if the feature "ES3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual AM policy deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PCF (service) instance.Applicable if the feature "ES3XX" is supported. |
| NOTE: The mandatory HTTP error status codes for the DELETE method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [5] also apply. |

Table 5.3.3.3.2-4: 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 PCF (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 5.3.3.3.2-5: 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 PCF (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 \*\*\*

###### 5.3.3.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 5.3.3.4.2.2-1 and the response data structure and response codes specified in table 5.3.3.4.2.2-2.

Table 5.3.3.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PolicyAssociationUpdateRequest | M | 1 | Describes the observed event trigger(s). |

Table 5.3.3.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| PolicyUpdate | M | 1 | 200 OK | Describes updated policies. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual AM policy modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PCF (service) instance.Applicable if the feature "ES3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual AM policy modification. The response shall include a Location header field containing an alternative URI of the resource located in an alternative PCF (service) instance.Applicable if the feature "ES3XX" is supported. |
| ProblemDetails | O | 0..1 | 400 Bad Request | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [5] also apply. NOTE 2: Failure cases are described in subclause 5.7. |

Table 5.3.3.4.2.2-3: 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 PCF (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 5.3.3.4.2.2-4: 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 PCF (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 \*\*\*

#### 5.5.2.2 Operation Definition

This operation shall support the request data structures specified in table 5.5.2.2-1 and the response data structure and response codes specified in table 5.5.2.2-2.

Table 5.5.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PolicyUpdate | M | 1 | Updated policies. |

Table 5.5.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | The policies were successfully updated. |
| AmRequestedValueRep | O | 0..1 | 200 OK | The current applicable values corresponding to the policy control request trigger are reported. |
| ProblemDetails | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during AM policy 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.ProblemDetail may be included in the response if the feature "ES3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during AM policy 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 as defined in subclause 6.5.3.2 of 3GPP TS 29.500 [5].Applicable if the feature "ES3XX" is supported. |
| ProblemDetails | O | 0..1 | 400 Bad Request | (NOTE 2) |
| ProblemDetails | O | 0..1 | 404 Not Found | The NF service consumer can use this response when the notification can be sent to another unknown host. |
| NOTE 1: The mandatory HTTP error status codes for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [5] also apply. NOTE 2: Failure cases are described in subclause 5.7. |

Table 5.5.2.2-3: 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 consumer (service) instance towards which the notification request is redirected. May be included if the feature "ES3XX" is supported. |

Table 5.5.2.2-4: 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 \*\*\*

#### 5.5.3.2 Operation Definition

This operation shall support the request data structures specified in table 5.5.3.2-1 and the response data structure and response codes specified in table 5.5.3.2-2.

Table 5.5.3.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| TerminationNotification | M | 1 | Request to terminate the policy association. |

Table 5.5.3.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | The request for policy association termination was received. |
| ProblemDetails | O | 0..1 | 307 temporary redirect | Temporary redirection, during AM policy 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.ProblemDetail may be included in the response if the feature "ES3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during AM policy 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.Applicable if the feature "ES3XX" is supported. |
| ProblemDetails | O | 0..1 | 404 Not Found | The NF service consumer can use this response when the notification can be sent to another unknown host. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in Table 5.2.7.1-1 of 3GPP TS 29.500 [5] also apply. |

Table 5.5.3.2-3: 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 consumer (service) instance towards which the notification request is redirected. May be included if the feature "ES3XX" is supported. |

Table 5.5.3.2-4: 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 consumer (service) instance towards which the notification request is redirected |

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

### 5.7.1 General

For the Npcf\_AMPolicyControl API, HTTP error responses shall be supported as specified in subclause 4.8 of 3GPP TS 29.501 [6].

Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [5] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [5].

Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [5] for HTTP redirections shall be supported if the feature "ES3XX" is supported.

In addition, the requirements in the following subclauses are applicable for the Npcf\_AMPolicyControl API.

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

## 5.8 Feature negotiation

The optional features in table 5.8-1 are defined for the Npcf\_AMPolicyControl API. They shall be negotiated using the extensibility mechanism defined in subclause 6.6 of 3GPP TS 29.500 [5].

Table 5.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | SliceSupport | Indicates the support of AM policies differentiation based on the awareness of the allowed NSSAI. |
| 2 | PendingTransaction | This feature indicates support for the race condition handling as defined in 3GPP TS 29.513 [7]. |
| 3 | UE-AMBR\_Authorization | Indicates the support of UE-AMBR control by the PCF in the serving network. |
| 4 | DNNReplacementControl | Indicates the support of DNN replacement control. |
| 5 | MultipleAccessTypes | Indicates the support of AM policies for the multiple access types where the served UE is camping. |
| 6 | WirelineWirelessConvergence | Indicates the support of Wireline and Wireless access convergence. |
| 7 | ImmediateReport | Indicates the support of the current applicable values report corresponding to the policy control request triggers for policy update notification. |
| x1 | ES3XX | Extended Support for 3xx redirections. This feature indicates the support of redirection for any service operation, according to Stateless NF procedures as specified in subclauses 6.5.3.2 and 6.5.3.3 of 3GPP TS 29.500 [5] and according to HTTP redirection principles for indirect communication, as specified in subclause 6.10.9 of 3GPP TS 29.500 [5].  |

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

# A.2 Npcf\_AMPolicyControl API

openapi: 3.0.0

info:

 version: 1.2.0-alpha.2

 title: Npcf\_AMPolicyControl

 description: |

 Access and Mobility Policy Control Service.

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externalDocs:

 description: 3GPP TS 29.507 V17.1.0; 5G System; Access and Mobility Policy Control Service.

 url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.507/'

servers:

 - url: '{apiRoot}/npcf-am-policy-control/v1'

 variables:

 apiRoot:

 default: https://example.com

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

security:

 - {}

 - oAuth2ClientCredentials:

 - npcf-am-policy-control

paths:

 /policies:

 post:

 operationId: CreateIndividualAMPolicyAssociation

 summary: Create individual AM policy association.

 tags:

 - AM Policy Associations (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: Created

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'Contains the URI of the newly created resource, according to the structure: {apiRoot}/npcf-am-policy-control/v1/policies/{polAssoId}'

 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/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'

 callbacks:

 policyUpdateNotification:

 '{$request.body#/notificationUri}/update':

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '200':

 description: OK. The current applicable values corresponding to the policy control request trigger is reported

 content:

 application/json:

 schema:

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

 '204':

 description: No Content, Notification was successful.

 '307':

 description: temporary redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'A URI pointing to the endpoint of an alternative NF consumer (service) instance towards which the notification should be redirected.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance towards which the notification request is redirected'

 schema:

 type: string

 '308':

 description: Permanent Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 required: true

 description: 'A URI pointing to the endpoint of an alternative NF consumer (service) instance towards which the notification should be redirected.'

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance towards which the notification request is redirected'

 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/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'

 policyAssocitionTerminationRequestNotification:

 '{$request.body#/notificationUri}/terminate':

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: No Content, Notification was successful.

 '307':

 description: temporary redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'A URI pointing to the endpoint of an alternative NF consumer (service) instance towards which the notification should be redirected.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance towards which the notification request is redirected'

 schema:

 type: string

 '308':

 description: Permanent Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 required: true

 description: 'A URI pointing to the endpoint of an alternative NF consumer (service) instance towards which the notification should be redirected.'

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance towards which the notification request is redirected'

 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/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'

 /policies/{polAssoId}:

 get:

 operationId: ReadIndividualAMPolicyAssociation

 summary: Read individual AM policy association.

 tags:

 - Individual AM Policy Association (Document)

 parameters:

 - name: polAssoId

 in: path

 description: Identifier of a policy association

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK. Resource representation is returned

 content:

 application/json:

 schema:

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

 '307':

 description: Temporary Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance towards which the request is redirected'

 schema:

 type: string

 '308':

 description: Permanent Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance towards which the request is redirected'

 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/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: DeleteIndividualAMPolicyAssociation

 summary: Delete individual AM policy association.

 tags:

 - Individual AM Policy Association (Document)

 parameters:

 - name: polAssoId

 in: path

 description: Identifier of a policy association

 required: true

 schema:

 type: string

 responses:

 '204':

 description: No Content. Resource was successfully deleted.

 '307':

 description: Temporary Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance towards which the request is redirected'

 schema:

 type: string

 '308':

 description: Permanent Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance towards which the request is redirected'

 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/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'

 /policies/{polAssoId}/update:

 post:

 operationId: ReportObservedEventTriggersForIndividualAMPolicyAssociation

 summary: Report observed event triggers and obtain updated policies for an individual AM policy association.

 tags:

 - Individual AM Policy Association (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 parameters:

 - name: polAssoId

 in: path

 description: Identifier of a policy association

 required: true

 schema:

 type: string

 responses:

 '200':

 description: OK. Updated policies are returned

 content:

 application/json:

 schema:

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

 '307':

 description: Temporary Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance towards which the request is redirected'

 schema:

 type: string

 '308':

 description: Permanent Redirect

 content:

 application/problem+json:

 schema:

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

 headers:

 Location:

 description: 'An alternative URI of the resource located on an alternative PCF (service) instance.'

 required: true

 schema:

 type: string

 3gpp-Sbi-Target-Nf-Id:

 description: 'Identifier of the target NF (service) instance towards which the request is redirected'

 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/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'

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 npcf-am-policy-control: Access to the Npcf\_AMPolicyControl API

 schemas:

 PolicyAssociation:

 type: object

 properties:

 request:

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

 triggers:

 type: array

 items:

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

 minItems: 1

 description: Request Triggers that the PCF subscribes.

 servAreaRes:

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

 wlServAreaRes:

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

 rfsp:

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

 smfSelInfo:

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

 ueAmbr:

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

 pras:

 type: object

 additionalProperties:

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

 minProperties: 1

 suppFeat:

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

 required:

 - suppFeat

 PolicyAssociationRequest:

 description: Information which the NF service consumer provides when requesting the creation of a policy association. The serviveName property corresponds to the serviceName in the main body of the specification.

 type: object

 properties:

 notificationUri:

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

 altNotifIpv4Addrs:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 minItems: 1

 description: Alternate or backup IPv4 Address(es) where to send Notifications.

 altNotifIpv6Addrs:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

 minItems: 1

 description: Alternate or backup IPv6 Address(es) where to send Notifications.

 altNotifFqdns:

 type: array

 items:

 $ref: 'TS29510\_Nnrf\_NFManagement.yaml#/components/schemas/Fqdn'

 minItems: 1

 description: Alternate or backup FQDN(s) where to send Notifications.

 supi:

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

 gpsi:

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

 accessType:

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

 accessTypes:

 type: array

 items:

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

 minItems: 1

 pei:

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

 userLoc:

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

 timeZone:

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

 servingPlmn:

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

 ratType:

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

 ratTypes:

 type: array

 items:

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

 minItems: 1

 groupIds:

 type: array

 items:

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

 minItems: 1

 servAreaRes:

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

 wlServAreaRes:

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

 rfsp:

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

 ueAmbr:

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

 allowedSnssais:

 description: array of allowed S-NSSAIs for the 3GPP access.

 type: array

 items:

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

 minItems: 1

 mappingSnssais:

 description: mapping of each S-NSSAI of the Allowed NSSAI to the corresponding S-NSSAI of the HPLMN.

 type: array

 items:

 $ref: 'TS29531\_Nnssf\_NSSelection.yaml#/components/schemas/MappingOfSnssai'

 minItems: 1

 n3gAllowedSnssais:

 description: array of allowed S-NSSAIs for the Non-3GPP access.

 type: array

 items:

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

 minItems: 1

 guami:

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

 serviveName:

 $ref: 'TS29510\_Nnrf\_NFManagement.yaml#/components/schemas/ServiceName'

 traceReq:

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

 suppFeat:

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

 required:

 - notificationUri

 - suppFeat

 - supi

 PolicyAssociationUpdateRequest:

 type: object

 properties:

 notificationUri:

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

 altNotifIpv4Addrs:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

 minItems: 1

 description: Alternate or backup IPv4 Address(es) where to send Notifications.

 altNotifIpv6Addrs:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

 minItems: 1

 description: Alternate or backup IPv6 Address(es) where to send Notifications.

 altNotifFqdns:

 type: array

 items:

 $ref: 'TS29510\_Nnrf\_NFManagement.yaml#/components/schemas/Fqdn'

 minItems: 1

 description: Alternate or backup FQDN(s) where to send Notifications.

 triggers:

 type: array

 items:

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

 minItems: 1

 description: Request Triggers that the NF service consumer observes.

 servAreaRes:

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

 wlServAreaRes:

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

 rfsp:

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

 smfSelInfo:

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

 ueAmbr:

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

 praStatuses:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: Map of PRA status information.

 userLoc:

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

 allowedSnssais:

 description: array of allowed S-NSSAIs for the 3GPP access.

 type: array

 items:

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

 minItems: 1

 mappingSnssais:

 description: mapping of each S-NSSAI of the Allowed NSSAI to the corresponding S-NSSAI of the HPLMN.

 type: array

 items:

 $ref: 'TS29531\_Nnssf\_NSSelection.yaml#/components/schemas/MappingOfSnssai'

 minItems: 1

 accessTypes:

 type: array

 items:

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

 minItems: 1

 ratTypes:

 type: array

 items:

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

 minItems: 1

 n3gAllowedSnssais:

 description: array of allowed S-NSSAIs for the Non-3GPP access.

 type: array

 items:

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

 minItems: 1

 traceReq:

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

 guami:

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

 PolicyUpdate:

 type: object

 properties:

 resourceUri:

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

 triggers:

 type: array

 items:

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

 minItems: 1

 nullable: true

 description: Request Triggers that the PCF subscribes.

 servAreaRes:

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

 wlServAreaRes:

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

 rfsp:

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

 smfSelInfo:

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

 ueAmbr:

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

 pras:

 type: object

 additionalProperties:

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

 description: Map of PRA information.

 minProperties: 1

 nullable: true

 required:

 - resourceUri

 TerminationNotification:

 type: object

 properties:

 resourceUri:

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

 cause:

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

 required:

 - resourceUri

 - cause

 SmfSelectionData:

 type: object

 properties:

 unsuppDnn:

 type: boolean

 candidates:

 type: object

 additionalProperties:

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

 minProperties: 1

 nullable: true

 snssai:

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

 mappingSnssai:

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

 dnn:

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

 nullable: true

 CandidateForReplacement:

 type: object

 properties:

 snssai:

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

 dnns:

 type: array

 items:

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

 minItems: 1

 nullable: true

 required:

 - snssai

 nullable: true

 AmRequestedValueRep:

 type: object

 properties:

 userLoc:

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

 praStatuses:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: Map of PRA status information.

 accessTypes:

 type: array

 items:

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

 minItems: 1

 ratTypes:

 type: array

 items:

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

 RequestTrigger:

 anyOf:

 - type: string

 enum:

 - LOC\_CH

 - PRA\_CH

 - SERV\_AREA\_CH

 - RFSP\_CH

 - ALLOWED\_NSSAI\_CH

 - UE\_AMBR\_CH

 - SMF\_SELECT\_CH

 - ACCESS\_TYPE\_CH

 - 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

 - LOC\_CH: Location change (tracking area). The tracking area of the UE has changed.

 - PRA\_CH: Change of UE presence in PRA. The AMF reports the current presence status of the UE in a Presence Reporting Area, and notifies that the UE enters/leaves the Presence Reporting Area.

 - SERV\_AREA\_CH: Service Area Restriction change. The UDM notifies the AMF that the subscribed service area restriction information has changed.

 - RFSP\_CH: RFSP index change. The UDM notifies the AMF that the subscribed RFSP index has changed.

 - ALLOWED\_NSSAI\_CH: Allowed NSSAI change. The AMF notifies that the set of UE allowed S-NSSAIs has changed.

 - UE\_AMBR\_CH: UE-AMBR change. The UDM notifies the AMF that the subscribed UE-AMBR has changed.

 - SMF\_SELECT\_CH: SMF selection information change. The UE requested for an unsupported DNN or UE requested for a DNN within the list of DNN candidates for replacement per S-NSSAI.

 - ACCESS\_TYPE\_CH: Access Type change. The AMF notifies that the access type and the RAT type combinations available in the AMF for a UE with simultaneous 3GPP and non-3GPP connectivity has changed.

 PolicyAssociationReleaseCause:

 anyOf:

 - type: string

 enum:

 - UNSPECIFIED

 - UE\_SUBSCRIPTION

 - INSUFFICIENT\_RES

 - 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

 - UNSPECIFIED: This value is used for unspecified reasons.

 - UE\_SUBSCRIPTION: This value is used to indicate that the session needs to be terminated because the subscription of UE has changed (e.g. was removed).

 - INSUFFICIENT\_RES: This value is used to indicate that the server is overloaded and needs to abort the session.

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