**3GPP TSG CT WG3 Meeting #113eC3-210074**

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

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| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **29.525** | **CR** | 0139 | **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 the Individual UE Policy Association, custom methods, i.e. update, and the methods of Callback URIs.The support of the redirection is specified in the concerned service procedures.  |
|  |  |
| ***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 \*\*\*

#### 4.2.3.1 General

The procedure in the present subclause is applicable when the NF service consumer modifies an existing UE policy association (including the case where the AMF is relocated and the new AMF selects to maintain the policy association with the old PCF 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 UE policy association

NOTE 1: For the roaming case, the PCF represents the V-PCF if the NF service consumer is an AMF and the PCF represents the H-PCF if the NF service consumer is a V-PCF.

The AMF as NF service consumer invokes this procedure when a subscribed policy control request trigger (see subclause 4.2.3.2) occurs: When the location change trigger, the change of UE presence in PRA trigger, the PLMN change trigger or the UE connectivity state change trigger occurs, the AMF shall only invoke the procedure if the PCF has subscribed to that event trigger.

NOTE 2: The AMF uses the Namf\_Communication\_N1MessageNotify service operation specified in 3GPP TS 29.518 [14] to send a "MANAGE UE POLICY COMPLETE" message or a "MANAGE UE POLICY COMMAND REJECT" message, as defined in Annex D.5 of 3GPP TS 24.501 [15], to the V-PCF.

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.

NOTE 3: 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 UE Policy from the old AMF and selects the old PCF, the new AMF shall also invoke this procedure to update the Notification URI. The new AMF may also update the alternate or backup IP addresses.

The V-PCF as NF service consumer invokes this procedure when a policy control request trigger (see subclause 4.2.3.2) occurs. When the "UE\_POLICY", trigger occurs, the V-PCF shall always invoke the procedure. When the PLMN change trigger, the location change trigger, the change of UE presence in PRA trigger or the UE connectivity state change trigger occurs, the V-PCF shall only invoke the procedure if the H‑PCF has subscribed to that event trigger.

To request policies from the PCF or to update the Notification URI, or to update the trace control configuration, or to request the termination of trace, the NF Service Consumer shall request the update of an UE Policy Association by providing relevant parameters about the UE context by sending an HTTP POST request with "{apiRoot}/npcf-ue-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 UE location change occurred, the UE location encoded as "userLoc" attribute;

4. if a "MANAGE UE POLICY COMPLETE" message or a "MANAGE UE POLICY COMMAND REJECT" message of the UE policy delivery protocol defined in Annex D of 3GPP TS 24.501 [15] has been received by the V-PCF as NF service consumer, and at least parts of the contents relate to UPSIs of the HPLMN, the parts of that message that relate to UPSIs of the HPLMN encoded as "uePolDelResult" attribute;

5. 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 4: 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.

6. if the NF service consumer is an AMF, for AMF relocation scenarios, if available, alternate or backup IPv4 Address(es) where to send Notifications encoded as "altNotifIpv4Addrs" attribute;

7. if the NF service consumer is an AMF, for AMF relocation scenarios, if available, alternate or backup IPv6 Address(es) where to send Notifications encoded as "altNotifIpv6Addrs" attribute;

8. if the NF service consumer is an AMF, for AMF relocation scenarios, if available, alternate or backup FQDN(s) where to send Notifications encoded as "altNotifFqdns" attribute;

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

NOTE 5: 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.

10. if the NF service consumer is an AMF, for AMF relocation scenarios, the new serving AMF Id encoded in the "servingNfId" attribute;

11. if a UE PLMN change occurred, the PLMN identifier encoded as “plmnId” attribute;

12. if a "UE POLICY PROVISIONING REQUEST" message defined in subclause 7.2.1.1 of 3GPP TS 24.587 [24] has been received by the V-PCF as NF service consumer and the "V2X" feature defined in subclause 5.8 is supported, the message encoded as "uePolReq" attribute; and/or

13. if a UE Internal Group Identifier(s) change occurred and the "GroupIdListChange" feature defined in subclause 5.8 is supported, the Internal Group Identifier(s) of the served UE encoded as "groupIds" attribute.

Upon the reception of the HTTP POST request,

- if the PCF is a V-PCF and the V-PCF has an established policy association, the V-PCF shall determine based on the contents of a potentially received "uePolDelResult" attribute (see above) and requested event triggers of the H-PCF whether to send as the NF service consumer towards the H-PCF a request for the update of the policy association as described in the present clause;

- the (V-)(H-)PCF shall determine the applicable policy based on local policy and for the V-PCF any policy received from the H-PCF in the reply to the possible request for the update of a policy association;

- the (V-)(H-)PCF for the succesfull case shall send a HTTP "200 OK" response with the PolicyUpdate data type as body with possible updates for that applicable UE policy and N2 PC5 policy (for the H-PCF) and Policy Control Request Trigger(s) encoded as described in subclause 4.2.3.3;

- if the (V-)PCF determines that UE policy needs to be updated, it shall use the Namf\_Communication service specified in 3GPP TS 29.518 [14] to provision the UE policy according to subclause 4.2.2.2 and as follows:

(i) the (V-)PCF shall send the determined UE policy using Namf\_Communication\_N1N2MessageTransfer service operation(s); and

(ii) the (V-)PCF shall be prepared to receive UE Policy Delivery Results from the AMF within the Namf\_Communication\_N1MessageNotify service operation and for the V-PCF if the received UE Policy Delivery results relate to UE policy sections provided by the H-PCF shall use the Npcf\_UEPolicyControl\_Update Service Operation to send those UE Policy Delivery results to the H-PCF; and

NOTE 6: 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, shall send an HTTP error response or, if the feature "ES3XX" is supported, an HTTP redirect response as specified in subclause 5.7 and according to the following provisions:

- if the (V-)(H-)PCF is, due to incomplete, erroneous or missing information in the request not able to provision a UE 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".

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

NOTE: For the roaming case, the PCF represents the V-PCF if the NF service consumer is an AMF and the PCF represents the H-PCF if the NF service consumer is a V-PCF.

The (V-)(H)-PCF may decide to update policy control request trigger(s) and in the roaming case, the H-PCF may also decide to update the UE Policy, N2 PC5 policy if the "V2X" feature is supported and the (V-)(H-)PCF shall then send an HTTP POST request with "{notificationUri}/update" as URI (where the Notification URI was previously supplied by the NF service consumer) to 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:

- if the V-PCF is the NF service consumer, shall use the Namf\_Communication Service defined in 3GPP TS 29.518 [14] to send "MANAGE UE POLICY COMMAND" message(s) with the received UE policy to the UE via the AMF and/or with the received N2 PC5 policy to the NG-RAN via the AMF;

- if the V-PCF is the NF service consumer, shall provision the received policy control requested trigger(s) to the AMF using the Npcf\_UEPolicyControl\_UpdateNotify service operation according to the present clause;

- if the AMF is the NF service consumer, shall enforce the received policy control request trigger(s);

- shall either send a successful response indicating the success of the enforcement or an appropriate failure response, for the V-PCF as the NF service consumer taking into consideration a reply received from the possible Namf\_Communication Service service operation and from the possible Npcf\_UEPolicyControl\_UpdateNotify service operation according to the previous bullets. In case of a successful response:

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

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

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

If feature "ErrorResponse" is supported and 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, the AMF 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 (V-)PCF receives a "307 temporary redirect" response, the (V-)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 (V-)PCF becomes aware that a new AMF is requiring notifications (e.g. via the "404 Not found" response or via Namf\_Communication service AMFStatusChange Notifications, see 3GPP TS 29.518 [14], or via link level failures), and the (V-)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 or 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 query the other AMFs within the AMF set), the (V-)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 (V-)PCF received a "404 Not found" response, the (V-)PCF should resend the failed policy update notification request to that URI.

\*\*\* 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 theUE policy association

NOTE: For the roaming case, the PCF represents the V-PCF if the NF service consumer is an AMF and the PCF represents the H-PCF if the NF service consumer is a V-PCF.

The (V-)(H-)PCF may to request the termination of the UE 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 (V-)(H-)PCF requests the termination of the policy association encoded as "cause" attribute.

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

- if the V-PCF is the NF service consumer, shall send as NF service producer for the corresponding policy association (towards the AMF) a request for a termination of the policy association according to the present clause;

- shall either send a HTTP "204 No Content" response for the succesfull processing of the HTTP POST request or an appropriate failure response, for the V-PCF as the NF service consumer taking into consideration a reply received for the possible corresponding policy association termination request according to the previous bullet; and

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

After the succesfull processing of the HTTP POST request, any NF service consumer except for the V-PCF shall invoke the Npcf\_UEPolicyControl\_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 (V-)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 (V-)PCF becomes aware that a new AMF is requiring notifications (e.g. via the "404 Not found" response or via Namf\_Communication service AMFStatusChange Notifications, see 3GPP TS TS 29.518 [14], or via link level failures), and the (V-)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 or 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 query the other AMFs within the AMF set), the (V-)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 (V-)PCF received a "404 Not found" response, the (V-)PCF should resend the failed request for termination of the policy association to that URI.

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

### 4.2.5 Npcf\_UEPolicyControl\_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

NOTE: For the roaming case, the PCF represents the V-PCF if the NF service consumer is an AMF and the PCF represents the H-PCF if the NF service consumer is a V-PCF.

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.

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

- the resource URI of the individual UE Policy Association resource is not transferred to the new AMF; or

- the new AMF informs the old AMF that the individual UE Policy Association resource is not being reused.

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

Upon the reception of the HTTP DELETE request,

- the (V-)(H-)PCF shall delete the policy association;

- if the PCF is a V-PCF and has an established corresponding policy association towards the H-PCF, the V-PCF shall send as the NF service consumer towards the H-PCF a request for the deletion of that policy association as described in the present clause;

- the (V-)(H-)PCF shall send either an HTTP "204 No Content" response indicating the success of the deletion or an appropriate failure response, for the V-PCF as PCF taking into consideration a reply received for the possible policy association deletion request according to the previous bullet; and

- the (V-)(H-)PCF shall 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 UE 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 UE 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 UE 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 UE 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 UE 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 UE 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. |
| ProblemDetails | O | 0..1 | 307 temporary redirect | The NF service consumer shall generate a Location header field containing a URI pointing to another NF service consumer to which the notification should be sent.Applicable if the feature "ErrorResponse" or "ES3XX" is supported. ProblemDetails may be included if the feature "ES3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during UE 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.Applicable if the feature "ErrorResponse" is supported. |
| ProblemDetails | O | 0..1 | 400 Bad Request | (NOTE 2) |
| UeRequestedValueRep | O | 0..1 | 200 OK | The current applicable values corresponding to the policy control request trigger are reported. |
| 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 (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 | An alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification should be redirected.ProblemDetail may be included in the response if the feature "ES3XX" is supported. |
| ProblemDetails | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during UE 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 | 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 | A URI pointing to the endpoint of another NF service consumer to which the notification should be sent |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the notification request is redirected. It 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 (service) instance towards which the notification request is redirected |

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

### 5.7.1 General

For the Npcf\_UEPolicyControl 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\_UEPolicyControl API.

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

## 5.8 Feature negotiation

The optional features in table 5.8-1 are defined for the Npcf\_UEPolicyControl 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 | PendingTransaction | This feature indicates support for the race condition handling as defined in 3GPP TS 29.513 [7]. |
| 2 | PlmnChange | This feature indicates support for the change of PLMN trigger handling. |
| 3 | ConnectivityStateChange | This feature indicates support for the UE connectivity state change trigger handling. |
| 4 | V2X | This feature indicates support for the UE policy provisioning and N2 information provisioning for V2X communication. |
| 5 | GroupIdListChange | This feature indicates the support for the notification of changes in the list of internal group identifiers. |
| 6 | ImmediateReport | This feature indicates the support of the current applicable values report corresponding to the policy control request triggers for policy update notification. |
| 7 | ErrorResponse | This feature indicates support for “307 temporary redirect” and “404 Not Found” error response codes for policy update notification between AMF and (V-)PCF.  |
| 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\_UEPolicyControl API

openapi: 3.0.0

info:

 version: 1.2.0-alpha.2

 title: Npcf\_UEPolicyControl

 description: |

 UE Policy Control Service.

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externalDocs:

 description: 3GPP TS 29.525 V17.1.0; 5G System; UE Policy Control Service.

 url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.525/'

servers:

 - url: '{apiRoot}/npcf-ue-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-ue-policy-control

paths:

 /policies:

 post:

 operationId: CreateIndividualUEPolicyAssociation

 summary: Create individual UE policy association.

 tags:

 - UE 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-ue-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/UeRequestedValueRep'

 '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 another NF service consumer to which the notification should be sent.'

 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 AMF (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 another NF service consumer to which the notification should be sent.'

 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 AMF (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: ReadIndividualUEPolicyAssociation

 summary: Read individual UE policy association.

 tags:

 - Individual UE 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: DeleteIndividualUEPolicyAssociation

 summary: Delete individual UE policy association.

 tags:

 - Individual UE 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: ReportObservedEventTriggersForIndividualUEPolicyAssociation

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

 tags:

 - Individual UE 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-ue-policy-control: Access to the Npcf\_UEPolicyControl API

 schemas:

 PolicyAssociation:

 type: object

 properties:

 request:

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

 uePolicy:

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

 n2Pc5Pol:

 $ref: 'TS29518\_Namf\_Communication.yaml#/components/schemas/N2InfoContent'

 triggers:

 type: array

 items:

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

 minItems: 1

 description: Request Triggers that the PCF subscribes. Only values "LOC\_CH" and "PRA\_CH" are permitted.

 pras:

 type: object

 additionalProperties:

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

 minProperties: 1

 suppFeat:

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

 required:

 - suppFeat

 PolicyAssociationRequest:

 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'

 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'

 groupIds:

 type: array

 items:

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

 minItems: 1

 hPcfId:

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

 uePolReq:

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

 guami:

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

 serviceName:

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

 servingNfId:

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

 pc5Capab:

 $ref: '#/components/schemas/Pc5Capability'

 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.

 praStatuses:

 type: object

 additionalProperties:

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

 description: Map of PRA status information.

 minProperties: 1

 userLoc:

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

 uePolDelResult:

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

 uePolTransFailNotif:

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

 uePolReq:

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

 guami:

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

 servingNfId:

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

 plmnId:

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

 connectState:

 $ref: 'TS29518\_Namf\_EventExposure.yaml#/components/schemas/CmState'

 groupIds:

 type: array

 items:

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

 minItems: 1

 PolicyUpdate:

 type: object

 properties:

 resourceUri:

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

 uePolicy:

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

 n2Pc5Pol:

 $ref: 'TS29518\_Namf\_Communication.yaml#/components/schemas/N2InfoContent'

 triggers:

 type: array

 items:

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

 minItems: 1

 nullable: true

 description: Request Triggers that the PCF subscribes. Only values "LOC\_CH" and "PRA\_CH" are permitted.

 pras:

 type: object

 additionalProperties:

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

 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

 UePolicyTransferFailureNotification:

 type: object

 properties:

 cause:

 $ref: 'TS29518\_Namf\_Communication.yaml#/components/schemas/N1N2MessageTransferCause'

 ptis:

 type: array

 items:

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

 minItems: 1

 required:

 - cause

 - ptis

 UeRequestedValueRep:

 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.

 plmnId:

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

 connectState:

 $ref: 'TS29518\_Namf\_EventExposure.yaml#/components/schemas/CmState'

 UePolicy:

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

 UePolicyDeliveryResult:

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

 UePolicyRequest:

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

 RequestTrigger:

 anyOf:

 - type: string

 enum:

 - LOC\_CH

 - PRA\_CH

 - UE\_POLICY

 - PLMN\_CH

 - CON\_STATE\_CH

 - GROUP\_ID\_LIST\_CHG

 - 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.

 - UE\_POLICY: A MANAGE UE POLICY COMPLETE message or a MANAGE UE POLICY COMMAND REJECT message, as defined in Annex D.5 of 3GPP TS 24.501 or a "UE POLICY PROVISIONING REQUEST" message, as defined in subclause 7.2.1.1 of 3GPP TS 24.587 , has been received by the AMF and is being forwarded.

 - PLMN\_CH: PLMN change. the serving PLMN of UE has changed.

 - CON\_STATE\_CH: Connectivity state change: the connectivity state of UE has changed.

 - GROUP\_ID\_LIST\_CHG: UE Internal Group Identifier(s) has changed. This event does not require a subscription

 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 policy association 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 policy association.

 Pc5Capability:

 anyOf:

 - type: string

 enum:

 - LTE\_PC5

 - NR\_PC5

 - LTE\_NR\_PC5

 - 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

 - LTE\_PC5: This value is used to indicate that UE supports PC5 LTE RAT for V2X communication over PC5 reference point.

 - NR\_PC5: This value is used to indicate that UE supports PC5 NR RAT for V2X communication over PC5 reference point.

 - LTE\_NR\_PC5: This value is used to indicate that UE supports both PC5 LTE and NR RAT for V2X communication over PC5 reference point.

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