**3GPP TSG-CT3 Meeting #119bis-e C3-220150**

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

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **29.507** | **CR** | **0195** | **rev** | **-** | **Current version:** | **17.5.0** |  |
|  |
| *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:***  | 5G access stratum time distribution support |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | IIoT |  | ***Date:*** | 2022-01-21 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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:*** | As defined in table 6.5-1 of 23.503, the PCF may provision the 5G access stratum time distribution paramters to the AMF as AM Policy. |
|  |  |
| ***Summary of change:*** | 1. 5G access stratum time distribution paramters are defined.
2. Add the 5G access stratum time distribution parameters in the AM policy.
3. Define the new datat type to contain the 5G access stratum time distribution parameters.
4. Update the OpenAPI file.
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|  |  |
| ***Consequences if not approved:*** | Not aligned with stage 2. |
|  |  |
| ***Clauses affected:*** | 4.2.2.1, 4.2.2.3.x(new), 4.2.4.2, 5.6.1, 5.6.2.2, 5.6.2.5, 5.6.2.x(new), 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 introduce a backward compatible feature to the OpenAPI file. |
|  |  |
| ***This CR's revision history:*** |  |

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

#### 4.2.2.1 General

The procedure in the present subclause is applicable when the NF service consumer (e.g. AMF) creates an AM policy association when the UE registers to the network, and when the AMF is relocated (between the different AMF sets) and the new AMF selects a new PCF. The procedure for the case where the AMF is relocated and the new AMF selects the old PCF is defined in subclause 4.2.3.1.

The creation of an AM policy association only applies for normally registered UEs, i.e., it does not apply for Emergency Registered UEs.

Figure 4.2.2.1-1 illustrates the creation of a policy association.



Figure 4.2.2.1-1: Creation of a policy association

When a UE registers and a UE context is being established, the AMF can obtain Service Area Restrictions, RFSP index, subscribed UE-AMBR, subscribed UE-Slice-MBR(s) and GPSI(s) from the UDM during the Access and Mobility Subscription Data retrieval procedure, the list of NWDAF instance IDs used for the UE and their associated Analytic ID(s) consumed by the AMF and the allowed NSSAI and the Target NSSAI from local configuration or from the NSSF during the slice selection procedure and shall decide based on local policies whether to request policies from the PCF.

To request policies from the PCF, the NF service consumer (e.g. AMF) shall send an HTTP POST request with: "{apiRoot}/npcf-am-policy-control/v1/policies" as Resource URI and the PolicyAssociationRequest data structure as request body that shall include:

- Notification URI encoded as "notificationUri" attribute;

- SUPI encoded as "supi" attribute; and

- if the feature "SliceSupport" or the feature "DNNReplacementControl" is supported in the NF service consumer and the UE is registered via a 3GPP access, the allowed NSSAI in the 3GPP access encoded in the "allowedSnssais" attribute;

and that shall include when available:

- GPSI encoded as "gpsi" attribute;

- if the feature "MultipleAccessTypes" is not supported, the access type encoded as "accessType" attribute;

NOTE 1: In this Release, for SNPN-enabled UE registered in the SNPN, direct access to the SNPN is specified for 3GPP access only.

- Permanent Equipment Identifier (PEI) encoded as "pei" attribute;

- User Location Information encoded as "userLoc" attribute;

- UE Time Zone encoded as "timeZone" attribute;

- the identifier of the serving network (the PLMN Identifier or the SNPN Identifier)encoded as "servingPlmn" attribute;

NOTE 2: The SNPN Identifier consists of the PLMN Identifier and the NID.

- if the feature "MultipleAccessTypes" is not supported, the RAT type encoded as "ratType" attribute;

- Service Area Restrictions (see subclause 4.2.2.3.1) derived from the Service Area Restrictions obtained from the UDM by mapping any service areas denoted by geographical information into Tracking Area Identities (TAIs) and encoded as "servAreaRes" attribute;

- RFSP index (see subclause 4.2.2.3.2) as obtained from the UDM encoded as "rfsp" attribute;

- a list of Internal Group Identifiers encoded as "groupIds" attribute;

- if the NF service consumer is an AMF, the GUAMI encoded as "guami" attribute;

- if the NF service consumer is an AMF, the name of a service produced by the AMF that expects to receive information within Npcf\_AMPolicyControl\_UpdateNotify service operation encoded as "serviceName" attribute;

- Alternate or backup IPv4 Address(es) where to send Notifications encoded as "altNotifIpv4Addrs" attribute;

- Alternate or backup IPv6 Address(es) where to send Notifications encoded as "altNotifIpv6Addrs" attribute;

- Alternate or backup FQDN(s) where to send Notifications encoded as "altNotifFqdns" attribute;

- trace control and configuration parameters information encoded as "traceReq" attribute;

- if the feature "UE-AMBR\_Authorization" is supported in the NF service consumer, the subscribed UE-AMBR (see subclause 4.2.2.3.3) in the "ueAmbr" attribute;

- if the feature "DNNReplacementControl" is supported, the mapping of each S-NSSAI of the Allowed NSSAI to the corresponding S-NSSAI of the HPLMN encoded in the "mappingSnssais" attribute;

- if the feature "UE-Slice-MBR\_Authorization" is supported in the NF service consumer, the subscribed UE-Slice-MBR(s) for the allowed NSSAI (see subclause 4.2.2.3.5) in the "ueSliceMbrs" attribute; and.

- when the "EneNA" feature is supported, the list of NWDAF instance IDs used for the UE within the "nwdafInstanceIds" and their associated Analytic ID(s) within "nwdafEvents" consumed by the NF service consumer, included within the "nwdafDatas" attribute; and

- if the feature "TargetNSSAI" is supported in the NF service consumer, the Target NSSAI generated by the NF service consumer or received from the NSSF encoded in the "targetSnssais" attribute.Upon the reception of this HTTP POST request, the PCF shall:

- assign a policy association ID;

- determine the applicable policy (taking into consideration and optionally modifying the possibly received UE-AMBR, UE-Slice-MBR(s) for the allowed NSSAI, Service Area Restrictions and/or RFSP index);

- for the successful case, send a HTTP "201 Created" response with the URI for the created resource in the "Location" header field

NOTE 3: The assigned policy association ID is part of the URI for the created resource and is thus associated with the SUPI.

and the PolicyAssociation data type as response body including:

- conditionally AMF Access and Mobility Policy (see subclause 4.2.2.3), i.e.:

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

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

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

d) if the feature "UE-Slice-MBR\_Authorization" is supported and the PCF received the "ueSliceMbrs" attribute in the request, the authorized UE-Slice-MBR(s) for the allowed NSSAI encoded as "ueSliceMbrs" attribute; and/or

e) if the feature "AMInfluence" is supported, the PCF for the UE determines that the access and mobility policies may be influenced by the traffic of PDU session(s) and local operator policies indicate that the PCF for the UE shall subscribe with the PCF for the PDU session for established/terminated PDU session(s) event notifications via the AMF and the SMF, the PCF for the UE information within the "pcfUeInfo" attribute, and the DNN and S-NSSAI of the concerned PDU session(s) within the "matchPdus" attribute. The "pcfUeInfo" attribute shall include the PCF for the UE callback URI via which the PCF(s) for the PDU session shall send notifications about the related PDU session(s) established/terminated events within the "callbackUri" attribute, and if available, the associated PCF for the UE instance ID, PCF set ID, and the level of SBA binding within the "bindingInfo" attribute;

f) if the feature "5GAccessStratumTime" is supported and the PCF receives the policy data related to time synchronization from the UDR as defined in 3GPP TS 29.519 [17], the 5G access stratum time distribution parameters encoded as "asTimeDisParam" attribute;

- optionally one or several of the following Policy Control Request Trigger(s) encoded as "triggers" attribute (see subclause 4.2.3.2):

a) Location change (tracking area);

b) Change of UE presence in PRA;

c) if the "SliceSupport" feature or the "DNNReplacementControl" feature is supported, change of allowed NSSAI;

d) if the "DNNReplacementControl" feature is supported, change of SMF selection information; and

e) if the "EneNA" feature is supported, change of NWDAF data;

f) if the "TargetNSSAI" feature is supported, Generation of Target NSSAI; and

- if the Policy Control Request Trigger "Change of UE presence in PRA" is provided, the presence reporting areas for which reporting is required encoded as "pras" attribute;

NOTE 4: If the PCF uses a Presence Reporting Area identifier referring to a Set of Core Network predefined Presence Reporting Areas as defined in 3GPP TS 23.501 [2], the PCF includes the identifier of this Presence Reporting Area set within the "praId" attribute.

- if the Policy Control Request Trigger "Change of SMF selection information" is provided, the SMF selection information representing the conditions upon which the AMF shall request a DNN replacement (see subclause 4.2.2.3.4) encoded as "smfSelInfo" attribute;

- if the Policy Control Request Trigger "Generation of Target NSSAI" is provided, the RFSP Index associated with the Target NSSAI encoded as "targetRfsp" attribute;

Editor’s note: It is FFS whether the PCF can subscribe to the "Generation of Target NSSAI" Trigger when the "targetRfsp" attribute is provided in the response to the AM Policy Association creation.

- 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:

- if the user information received within the "supi" attribute is unknown, the PCF shall reject the request and include in an HTTP "400 Bad Request" response message the "cause" attribute of the ProblemDetails data structure set to "USER\_UNKNOWN";

- 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".

- if the PCF rejects the AM policy association establishment, the NF service consumer shall apply the policy retrieved from the UDM if available; otherwise, the NF service consumer shall apply the operator configured policy.

If the PCF received a 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.

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

If the PCF received the list of NWDAF instance IDs used for the UE in "nwdafInstanceIds" attribute and their associated Analytic IDs in "nwdafEvents" attribute included within the "nwdafDatas" attribute the PCF may select those NWDAF instances as described in 3GPP TS 29.513 [7].

The PCF may retrieve AF requirements on Access and Mobility policies from the UDR as specified in 3GPP TS 29.519 [17] and consider them for determining the Access and Mobility policies to be provisioned.

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

##### 4.2.2.3.x 5G access stratum time distribution

If the feature "5GAccessStratumTime" is supported and the PCF receives the policy data related to time synchronization from the UDR as defined in 3GPP TS 29.519 [17], the 5G access stratum time distribution parameters are encoded using the "asTimeDisParam" attribute of the "AsTimeDistributionParam" data type, which consists of:

* an indication of whether the 5G access stratum time distribution is enabled encoded in the "asTimeDistInd" attribute if applicable; and
* the Uu Time synchronization error budget encoded in the "uuErrorBudget" if applicable.

To remove the 5G access stratum time distribution parameters the PCF shall provide the "asTimeDisParam" attribute set to NULL

\*\*\* 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 related to an Individual AM Policy Association, e.g. in response to information provided to the PCF via the Npcf\_AMPolicyAuthorization service (see 3GPP TS 29.534 [26]) or to notifications provided by the Npcf\_PolicyAuthorization service (see 3GPP TS 29.514 [25]), in response to a notification received from UDR about new or updated AF requirements on Access and Mobility polices (see 3GPP TS 29.519 [17]), or in response to an internal trigger within the PCF. The PCF shall send for this purpose 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, the NF service consumer shall send an HTTP error response as specified in subclause 5.7.

If the feature "ES3XX" is supported, and the NF service consumer determines the received HTTP POST request needs to be redirected, the NF service consumer shall send an HTTP redirect response as specified in subclause 6.10.9 of 3GPP TS 29.500 [5].

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" 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.

If the feature "AMInfluence" is supported, the PCF determines that the access and mobility policies may be influenced by the traffic of a PDU session(s) based on an AF request, UDR notification or other internal policies, and local operator policies indicate the PCF for the UE shall subscribe with the PCF for the PDU session for established/terminated PDU session(s) event notifications, the PCF for the UE shall provision/update the AMF with the PCF for the UE information within the "pcfUeInfo" attribute and the complete list of S-NSSAI and DNN combinations within the "matchPdus" attribute. The AMF shall update the affected established PDU sesssions, forwarding the received PCF for the UE information for the PDU session(s) matching the new S-NSSAI and DNN combination(s), and removing the previously provided PCF for the UE information for the PDU session(s) matching the removed S-NSSAI and DNN combination(s).

When the feature "AMInfluence" is supported, and the SBA binding indication information for the PCF instance changes, the PCF may update the previously provided information in the AMF. The AMF shall apply the updated PCF callback information to the new PDU Sessions only, i.e., already established PDU sessions are not affected.

Editor's Note: It is FFS whether the forwanding via AMF and SMF of the change of SBA binding indication for the PCF instance would also apply to ongoing PDU sessions.

If the PCF changed the Service Area Restrictions as part of the policy update, it shall send notifications to any NF Service Consumer(s) (e.g. AF) that have subscribed to the related event by using the Npcf\_AMPolicyAuthorization service (see TS 29.534 [26]) and/or the Npcf\_EventExposure service ((see TS 29.523 [28]).

If the feature "5GAccessStratumTime" is supported and the PCF receives the policy data related to time synchronization from the UDR as defined in 3GPP TS 29.519 [17], the PCF may provision, update or remove the 5G access stratum time distribution parameters by provisioning the "asTimeDisParam" attribute as defined in subclause 4.2.2.3.x. The AMF shall provision the 5G access stratum time distribution parameters to the NG-RAN when receiving it from the PCF.

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

### 5.6.1 General

This subclause specifies the application data model supported by the API.

Table 5.6.1-1 specifies the data types defined for the Npcf\_AMPolicyControl service based interface protocol.

Table 5.6.1-1: Npcf\_AMPolicyControl specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| AsTimeDistributionParam | 5.6.2.x | Contains the 5G access stratum time distribution parameters. | 5GAccessStratumTime |
| CandidateForReplacement | 5.6.2.8 | Contains the list of candidate DNNs for replacement per S-NSSAI. | DNNReplacementControl |
| PolicyAssociation | 5.6.2.2 | Description of a policy association that is returned by the PCF when a policy Association is created, or read. |  |
| PolicyAssociationReleaseCause | 5.6.3.4 | The cause why the PCF requests the termination of the policy association. |  |
| PolicyAssociationRequest | 5.6.2.3 | Information that NF service consumer provides when requesting the creation of a policy association. |  |
| PolicyAssociationUpdateRequest | 5.6.2.4 | Information that NF service consumer provides when requesting the update of a policy association. |  |
| PolicyUpdate | 5.6.2.5 | Updated policies that the PCF provides in a notification or in the reply to an Update Request. |  |
| RequestTrigger | 5.6.3.3 | Enumeration of possible Request Triggers. |  |
| SmfSelectionData | 5.6.2.7 | Includes the SMF Selection information that may be replaced by the PCF. | DNNReplacementControl |
| TerminationNotification | 5.6.2.6 | Request to terminate a policy Association that the PCF provides in a notification. |  |
| AmRequestedValueRep | 5.6.2.9 | Contains the current applicable values corresponding to the policy control request triggers. | ImmediateReport |

Table 5.6.1-2 specifies data types re-used by the Npcf\_AMPolicyControl service based interface protocol from other specifications, including a reference to their respective specifications and when needed, a short description of their use within the Npcf\_AMPolicyControl service based interface.

Table 5.6.1-2: Npcf\_AMPolicyControl re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AccessType | 3GPP TS 29.571 [11] |  |  |
| Ambr | 3GPP TS 29.571 [11] | Aggregated Maximum Bit Rate. | UE-AMBR\_Authorization |
| Dnn | 3GPP TS 29.571 [11] | DNN | DNNReplacementControl |
| Fqdn | 3GPP TS 29.510 [13] | FQDN |  |
| Gpsi | 3GPP TS 29.571 [11] | Generic Public Subscription Identifier |  |
| GroupId | 3GPP TS 29.571 [11] |  |  |
| Guami | 3GPP TS 29.571 [11] | Globally Unique AMF Identifier |  |
| Ipv4Addr | 3GPP TS 29.571 [11] |  |  |
| Ipv6Addr | 3GPP TS 29.571 [11] |  |  |
| MappingOfSnssai | 3GPP TS 29.531 [24] | Identifies the mapping of an S-NSSAI of the Allowed NSSAI to the corresponding S-NSSAI of the HPLMN. | DNNReplacementControl |
| NwdafData | 3GPP TS 29.512 [27] | Indicates the list of NWDAF instance IDs used for the UE and their associated Analytics ID(s) consumed by the NF service consumer. | EneNA |
| PcfUeCallbackInfo | 3GPP TS 29.571 [11] | Contains the PCF for the UE information necessary for the PCF for the PDU session to send Establishment and Termination event. | AMInfluence |
| PduSessionInfo | 3GPP TS 29.571 [11] | Contains information related to a PDU session. | AMInfluence |
| Pei | 3GPP TS 29.571 [11] | Permanent Equipment Identifier |  |
| PlmnIdNid | 3GPP TS 29.571 [11] | Identifies the network: PLMN Identifier or the SNPN Identifier (the PLMN Identifier and the NID). |  |
| PresenceInfo | 3GPP TS 29.571 [11] | Presence reporting area information |  |
| PresenceInfoRm | 3GPP TS 29.571 [11] | This data type is defined in the same way as the "PresenceInfo" data type, but with the OpenAPI "nullable: true" property. |  |
| ProblemDetails | 3GPP TS 29.571 [11] |  |  |
| RedirectResponse | 3GPP TS 29.571 [11] | Contains redirection related information. | ES3XX |
| Uri | 3GPP TS 29.571 [11] |  |  |
| UserLocation | 3GPP TS 29.571 [11] |  |  |
| RatType | 3GPP TS 29.571 [11] |  |  |
| RfspIndex | 3GPP TS 29.571 [11] |  |  |
| ServiceAreaRestriction | 3GPP TS 29.571 [11] | Within the areas attribute, only tracking area codes shall be included. |  |
| ServiceName | 3GPP TS 29.510 [13] | Name of the service instance. |  |
| SliceMbr | 3GPP TS 29.571 [11] | Contains the slice Maximum Bit Rate including UL and DL. | UE-Slice-MBR\_Authorization |
| Snssai | 3GPP TS 29.571 [11] | Identifies an S-NSSAI. | SliceSupport, TargetNSSAI, DNNReplacementControl |
| Supi | 3GPP TS 29.571 [11] | Subscription Permanent Identifier |  |
| SupportedFeatures | 3GPP TS 29.571 [11] | Used to negotiate the applicability of the optional features defined in table 5.8-1. |  |
| TimeZone | 3GPP TS 29.571 [11] |  |  |
| TraceData | 3GPP TS 29.571 [11] |  |  |
| WirelineServiceAreaRestriction | 3GPP TS 29.571 [11] |  | WirelineWirelessConvergence |

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

#### 5.6.2.2 Type PolicyAssociation

Table 5.6.2.2-1: Definition of type PolicyAssociation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| request | PolicyAssociationRequest | O | 0..1 | The information provided by the NF service consumer when requesting the creation of a policy association |  |
| triggers | array(RequestTrigger) | O | 1..N | Request Triggers that the PCF subscribes. Only values "LOC\_CH", "ALLOWED\_NSSAI\_CH", "TARGET\_NSSAI", "SMF\_SELECT\_CH", "PRA\_CH" and "ACCESS\_TYPE\_CH" are permitted. | (NOTE ) |
| servAreaRes | ServiceAreaRestriction | O | 0..1 | Service Area Restriction as part of the AMF Access and Mobility Policy as determined by the PCF |  |
| wlServAreaRes | WirelineServiceAreaRestriction | O | 0..1 | Wireline Service Area Restriction as part of the AMF Access and Mobility Policy as determined by the PCF | WirelineWirelessConvergence |
| rfsp | RfspIndex | O | 0..1 | RFSP Index as part of the AMF Access and Mobility Policy as determined by the PCF. |  |
| targetRfsp | RfspIndex | C | 0..1 | RFSP Index associated with the Target NSSAI. It shall be present if the Target NSSAI was received in the request and the trigger "TARGET\_NSSAI" is provided. | TargetNSSAI |
| pras | map(PresenceInfo) | C | 1..N | If the Trigger "PRA\_CH" is provided, the presence reporting area(s) for which reporting is requested shall be provided. The "praId" attribute within the PresenceInfo data type shall also be the key of the map. The "presenceState" and the "additionalPraId" attributes within the PresenceInfo data type shall not be supplied. The "praId" attribute within the PresenceInfo data type shall include the identifier of either a presence reporting area or a presence reporting area set. |  |
| smfSelInfo | SmfSelectionData | O | 0..1 | If the trigger "SMF\_SELECT\_CH" is provided, the conditions for SMF selection information replacement, as determined by the PCF shall be provided. | DNNReplacementControl |
| ueAmbr | Ambr | O | 0..1 | UE-AMBR as part of the AMF Access and Mobility Policy as determined by the PCF. | UE-AMBR\_Authorization |
| ueSliceMbrs | map(SliceMbr) | O | 1..N | One or more UE-Slice-MBR(s) for S-NSSAI(s) within the allowed NSSAI as part of the AMF Access and Mobility Policy as determined by the PCF.The key of the map is the S-NSSAI to which the UE-Slice-MBR belongs. | UE-Slice-MBR\_Authorization |
| pcfUeInfo | PcfUeCallbackInfo | O | 0..1 | Contains the PCF for the UE information necessary for the PCF for the PDU session to send established/terminated events notifications to the PCF for the UE. | AMInfluence |
| matchPdus | array(PduSessionInfo) | C | 1..N | Indicates the matched PDU session(s) for which the PCF for the UE information in the "pcfUeInfo" attribute shall be forwarded to the SMF. It shall be present when the "pcfUeInfo" attribute is present. | AMInfluence |
| asTimeDisParam | AsTimeDistributionParam | O | 0..1 | Contains the 5G acess stratum time distribution parameters. | 5GAccessStratumTime |
| suppFeat | SupportedFeatures | M | 1 | Indicates the negotiated supported features. |  |
| NOTE: The "ALLOWED\_NSSAI\_CH", "TARGET\_NSSAI", "SMF\_SELECT\_CH" and "ACCESS\_TYPE\_CH" values in the "triggers" attribute apply under feature control as described in subclause 4.2.3.2. |

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

#### 5.6.2.5 Type PolicyUpdate

Table 5.6.2.5-1: Definition of type PolicyUpdate

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| resourceUri | Uri | M | 1 | The resource URI of the individual AM policy related to the notification.(NOTE 3) |  |
| triggers | array(RequestTrigger) | O | 1..N | Request Triggers that the PCF subscribes. Only values "LOC\_CH", "ALLOWED\_NSSAI\_CH", "SMF\_SELECT\_CH", "PRA\_CH" and "ACCESS\_TYPE\_CH" are permitted. | (NOTE 1)(NOTE 2) |
| servAreaRes | ServiceAreaRestriction | O | 0..1 | Service Area Restriction as part of the AMF Access and Mobility Policy as determined by the PCF. |  |
| wlServAreaRes | WirelineServiceAreaRestriction | O | 0..1 | Wireline Service Area Restriction as part of the AMF Access and Mobility Policy as determined by the PCF | WirelineWirelessConvergence |
| rfsp | RfspIndex | O | 0..1 | RFSP Index as part of the AMF Access and Mobility Policy as determined by the PCF. |  |
| targetRfsp | RfspIndex | C | 0..1 | RFSP Index associated with the Target NSSAI. It shall be present when the Target NSSAI was received in the request. | TargetNSSAI |
| smfSelInfo | SmfSelectionData | C | 0..1 | It may include updated conditions for SMF Selection information replacement. It shall include the PCF decision of the selected DNN when the "smfSelInfo" attribute containing the UE requested S-NSSAI and DNN was sent in the request. | DNNReplacementControl |
| ueAmbr | Ambr | C | 0..1 | UE-AMBR as part of the AMF Access and Mobility Policy. | UE-AMBR\_Authorization |
| ueSliceMbrs | map(SliceMbr) | O | 0..1 | One or more UE-Slice-MBR(s) for S-NSSAI(s) within the allowed NSSAI as part of the AMF Access and Mobility Policy.The key of the map is the S-NSSAI to which the UE-Slice-MBR belongs. | UE-Slice-MBR\_Authorization |
| pras | map(PresenceInfoRm) | C | 1..N | If the Trigger "PRA\_CH" is provided or if that trigger was already set but the requested presence reporting areas need to be changed, the presence reporting area(s) for which reporting is requested shall be provided. The "praId" attribute within the PresenceInfo data type shall also be the key of the map. The "presenceState" attribute within the PresenceInfo data type shall not be supplied. The "praId" attribute within the PresenceInfo data type shall include the identifier of either a presence reporting area or a presence reporting area set. |  |
| pcfUeInfo | PcfUeCallbackInfo | O | 0..1 | Contains the PCF for the UE information necessary for the PCF for the PDU session to send established/terminated event notifications to the PCF for the UE.  | AMInfluence |
| matchPdus | array(PduSessionInfo) | C | 1..N | Indicates the matched PDU session(s) for which the PCF for the UE information in the "pcfUeInfo" attribute shall be forwarded to the SMF.It shall be present when the "pcfUeInfo" attribute is present and was not previously provisioned by the PCF for the UE. | AMInfluence |
| asTimeDisParam | AsTimeDistributionParam | O | 0..1 | Contains the 5G acess stratum time distribution parameters. | 5GAccessStratumTime |
| NOTE 1: The "ALLOWED\_NSSAI\_CH", "TARGET\_NSSAI", "SMF\_SELECT\_CH" and "ACCESS\_TYPE\_CH" values in the "triggers" attribute apply under feature control as described in subclause 4.2.3.2.NOTE 2: The "SMF\_SELECT\_CH" trigger may be met only for new PDU sessions, i.e. it shall not apply to ongoing PDU sessions.NOTE 3: When the PolicyUpdate data type is used in a policy update notify service operation, either the complete resource URI included in the "resourceUri" attribute or the "apiSpecificResourceUriPart" component (see subclause 5.1) of the resource URI included in the "resourceUri" attribute may be used by the NF service consumer (e.g. AMF) for the identification of the Individual AM Policy Association resource related to the notification. |

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

#### 5.6.2.x Type: AsTimeDistributionParam

Table 5.6.2.x-1: Definition of type AsTimeDistributionParam

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| asTimeDistInd | boolean | O | 0..1 | When this attribute is included and set to true, it indicates that the access stratum time distribution via Uu reference point is activated. When present it shall be set as follows:- true: activated.- false (default): deactivated. |  |
| uuErrorBudget | Uinteger | O | 0..1 | Indicates the time synchronization error budget in terms of time units of nanoseconds. |  |

\*\*\* 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. |
| 8 | 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].  |
| 9 | UE-Slice-MBR\_Authorization | Indicates the support of UE-Slice-MBR control by the PCF in the serving network. It requires the support of SliceSupport feature. |
| 10 | AMInfluence | Indicates the support of the alternative mechanism to support informing the PCF for the UE of PDU session(s) established/terminated events via the delivery of the PCF for the UE information necessary for the PCF for the PDU session to send notifications on PDU session(s) established/terminated events through the AMF and the SMF. |
| 11 | EneNA | This feature indicates the support of NWDAF data reporting. |
| 12 | TargetNSSAI | Indicates the support for RFSP Index associated with the Target NSSAI. |
| x | 5GAccessStratumTime | This feature indicates the support of 5G acess stratum time distribution parameters provisioning. |

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

# A.2 Npcf\_AMPolicyControl API

openapi: 3.0.0

info:

 version: 1.2.0-alpha.6

 title: Npcf\_AMPolicyControl

 description: |

 Access and Mobility Policy Control Service.

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externalDocs:

 description: 3GPP TS 29.507 V17.5.0; 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':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 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':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 /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':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '406':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 delete:

 operationId: 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':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 /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':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

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

 schemas:

 PolicyAssociation:

 description: Represents an individual AM Policy Association resource.

 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'

 targetRfsp:

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

 smfSelInfo:

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

 ueAmbr:

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

 ueSliceMbrs:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: One or more UE-Slice-MBR(s) for the allowed NSSAI as part of the AMF Access and Mobility Policy as determined by the PCF. The key of the map is the S-NSSAI to which the UE-Slice-MBR belongs.

 pras:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: Contains the presence reporting area(s) for which reporting was requested. The praId attribute within the PresenceInfo data type is the key of the map.

 suppFeat:

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

 pcfUeInfo:

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

 matchPdus:

 type: array

 items:

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

 nullable: true

 asTimeDisParam:

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

 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'

 ueSliceMbrs:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: One or more subscribed UE-Slice-MBR(s) for the allowed NSSAI. Shall be provided when available. The key of the map is the S-NSSAI to which the UE-Slice-MBR belongs.

 allowedSnssais:

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

 type: array

 items:

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

 minItems: 1

 targetSnssais:

 description: array of target S-NSSAIs.

 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'

 nwdafDatas:

 type: array

 items:

 $ref: 'TS29512\_Npcf\_SMPolicyControl.yaml#/components/schemas/NwdafData'

 minItems: 1

 suppFeat:

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

 required:

 - notificationUri

 - suppFeat

 - supi

 PolicyAssociationUpdateRequest:

 description: Represents information that the NF service consumer provides when requesting the update of a policy association.

 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'

 ueSliceMbrs:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: One or more updated subscribed UE-Slice-MBR(s) for the allowed NSSAI. Shall be provided for the "UE\_SLICE\_MBR\_CH" policy control request trigger. The key of the map is the S-NSSAI to which the UE-Slice-MBR belongs.

 praStatuses:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: Contains the UE presence status for tracking area for which changes of the UE presence occurred. The praId attribute within the PresenceInfo data type is the key of the map.

 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

 targetSnssais:

 description: array of target S-NSSAIs.

 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'

 nwdafDatas:

 type: array

 items:

 $ref: 'TS29512\_Npcf\_SMPolicyControl.yaml#/components/schemas/NwdafData'

 minItems: 1

 nullable: true

 PolicyUpdate:

 description: Represents updated policies that the PCF provides in a notification or in a reply to an Update Request.

 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'

 targetRfsp:

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

 smfSelInfo:

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

 ueAmbr:

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

 ueSliceMbrs:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: One or more UE-Slice-MBR(s) for the allowed NSSAI as part of the AMF Access and Mobility Policy. The key of the map is the S-NSSAI to which the UE-Slice-MBR belongs.

 pras:

 type: object

 additionalProperties:

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

 description: Contains the presence reporting area(s) for which reporting was requested. The praId attribute within the PresenceInfo data type is the key of the map.

 minProperties: 1

 nullable: true

 pcfUeInfo:

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

 matchPdus:

 type: array

 items:

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

 nullable: true

 asTimeDisParam:

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

 required:

 - resourceUri

 TerminationNotification:

 description: Represents a request to terminate a policy Association that the PCF provides in a notification.

 type: object

 properties:

 resourceUri:

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

 cause:

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

 required:

 - resourceUri

 - cause

 SmfSelectionData:

 description: Represents the SMF Selection information that may be replaced by the PCF.

 type: object

 properties:

 unsuppDnn:

 type: boolean

 candidates:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: Contains the list of DNNs per S-NSSAI that are candidates for replacement. The snssai attribute within the CandidateForReplacement data type is the key of the map.

 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:

 description: Represents a list of candidate DNNs for replacement for an S-NSSAI.

 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:

 description: Represents the current applicable values corresponding to the policy control request triggers.

 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: Contains the UE presence statuses for tracking areas. The praId attribute within the PresenceInfo data type is the key of the map.

 accessTypes:

 type: array

 items:

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

 minItems: 1

 ratTypes:

 type: array

 items:

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

 AsTimeDistributionParam:

 description: Contains the 5G acess stratum time distribution parameters.

 type: object

 properties:

 asTimeDistInd:

 type: boolean

 uuErrorBudget:

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

 nullable: true

 nullable: true

 RequestTrigger:

 anyOf:

 - type: string

 enum:

 - LOC\_CH

 - PRA\_CH

 - SERV\_AREA\_CH

 - RFSP\_CH

 - ALLOWED\_NSSAI\_CH

 - UE\_AMBR\_CH

 - UE\_SLICE\_MBR\_CH

 - SMF\_SELECT\_CH

 - ACCESS\_TYPE\_CH

 - NWDAF\_DATA\_CH

 - TARGET\_NSSAI

 - 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.

 - UE\_SLICE\_MBR\_CH: UE-Slice-MBR change. The UDM notifies the AMF that the subscribed UE-Slice-MBR(s) for the allowed NSSAI has changed and the S-NSSAI(s) is within the allowed NSSAI.

 - NWDAF\_DATA\_CH: NDWAF DATA CHANGE. The AMF notifies that the NWDAF instance IDs used for the UE and/or associated Analytics IDs used for the UE and available in the AMF have changed.

 - TARGET\_NSSAI: Generation of Target NSSAI. The NF service consumer notifies that the Target NSSAI was generated.

 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 \*\*\*