**3GPP TSG-CT WG3 Meeting #130 *C3-234312***

**Xiamen, China, 9 - 13 October, 2023**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **29.525** | **CR** | **0293** | **rev** | **-** | **Current version:** | **18.3.0** |  |
|  |
| *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:***  | Update UE Policy Control Service for Ranging\_SL |
|  |  |
| ***Source to WG:*** | Xiaomi |
| ***Source to TSG:*** | C3 |
|  |  |
| ***Work item code:*** | Ranging\_SL |  | ***Date:*** | 2023-09-27 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | Rel-18 |
|  | *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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | Authorization and Provisioning for Ranging/SL positioning service is defined in stage 2 in the TS 23.586:*For Authorisation and policy/parameter provisioning to UE, the procedures for service authorization and provisioning to UE may be initiated by the PCF (as described in clause 6.2.2), by the UE (as described in clause 6.2.4), or by the AF (as described in clause 6.2.5).**For Authorisation and policy/parameter provisioning to NG-RAN, In order to support PC5 radio resource control in NG-RAN, UE authorization status about Ranging/SL Positioning over PC5 and PC5 QoS parameters related to Ranging/SL positioning need to be made available in NG-RAN.* *The corresponding procedures and aspects are defiend in clasue 6.3.*So the related update in UE Policy Control service is required. |
|  |  |
| ***Summary of change:*** | Provide the related update in UE Policy Control service to support Ranging\_SL. |
|  |  |
| ***Consequences if not approved:*** | Not aligned with stage 2 to support the UE policy control for Ranging\_SL. |
|  |  |
| ***Clauses affected:*** | 2, 3.2, 4.11, 4.1.3.1, 4.1.3.2, 4.2.2.1, 4.2.2.2.1.0, 4.2.2.2.1.X, 4.2.2.X, 4.2.3.1, 4.2.3.3, 4.2.4.1, 4.2.4.2, 4.2.4.X, 5.6.1, 5.6.2.2, 5.6.2.3, 5.6.2.4, 5.6.2.5, 5.6.3.3, 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 backward compatible feature in Npcf\_UEPolicyControl API. |
|  |  |
| ***This CR's revision history:*** |  |

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

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[3] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[4] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System; Stage 2".

[5] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[6] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[7] 3GPP TS 29.513: "5G System; Policy and Charging Control signalling flows and QoS parameter mapping; Stage 3".

[8] IETF RFC 7540: "Hypertext Transfer Protocol Version 2 (HTTP/2)".

[9] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[10] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.

[11] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[12] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".

[13] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[14] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[15] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[16] 3GPP TS 24.526: "UE policies for 5G System (5GS); Stage 3".

[17] 3GPP TS 29.519: "5G System; Usage of the Unified Data Repository service for Policy Data, Application Data and Structured Data for Exposure; Stage 3".

[18] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".

[19] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[20] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[21] IETF RFC 7807: "Problem Details for HTTP APIs".

[22] 3GPP TR 21.900: "Technical Specification Group working methods".

[23] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[24] 3GPP TS 24.587: "Vehicle-to-Everything (V2X) services in 5G System (5GS); Stage 3".

[25] 3GPP TS 24.588: "Vehicle-to-Everything (V2X) services in 5G System (5GS); User Equipment (UE) policies; Stage 3".

[26] 3GPP TS 29.505: "5G System; Usage of the Unified Data Repository service for Subscription Data; Stage 3".

[27] 3GPP TS 29.504:"5G System; Unified Data Repository Services; Stage 3".

[28] 3GPP TS 24.554: "Proximity based services (ProSe) in 5G system (5GS) protocol aspects; Stage 3".

[29] 3GPP TS 24.555: "Proximity based services (ProSe) in 5G system (5GS); User Equipment (UE) policies; Stage 3".

[30] 3GPP TS 29.523: "5G System; Policy Control Event Exposure Service; Stage 3".

[31] 3GPP TS 29.512: "5G System; Session Management Policy Control Service; Stage 3".

[32] 3GPP TS 24.577: "Aircraft-to-Everything (A2X) services in 5G System (5GS) protocol aspects; Stage 3".

[33] 3GPP TS 24.588: "Aircraft-to-Everything (A2X) services in 5G System (5GS); UE policies".

[34] 3GPP TS 29.531: "5G System; Network Slice Selection Services; Stage 3"

[35] 3GPP TS 29.521: "5G System; Binding Support Management Service; Stage 3".

[36] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[37] 3GPP TS 29.514: "5G System; Policy Authorization Service; Stage 3".

[38] 3GPP TS 29.520: "5G System; Network Data Analytics Services; Stage 3".

[39] 3GPP TS 29.594: "5G System; Spending Limit Control Service; Stage 3".

[40] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".

[41] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[xx] 3GPP TS 24.514: "Ranging based services and sidelink positioning in 5G system(5GS); Stage 3".

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

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

5G-BRG 5G Broadband Residential Gateway

5G-CRG 5G Cable Residential Gateway

5G-RG 5G Residential Gateway

5G-VN 5G Virtual Network

A2X Aircraft-to-Everything

A2XP Aircraft-to-Everything Policy

AMF Access and Mobility Management Function

ANDSP Access Network Discovery and Selection Policy

API Application Programming Interface

CHF Charging Function

DNN Data Network Name

EPS Evolved Packet Core System

FN-RG Fixed Network Residential Gateway

FN-BRG Fixed Network Broadband Residential Gateway

FN-CRG Fixed Network Cable Residential Gateway

FQDN Fully Qualified Domain Name

GPSI Generic Public Subscription Identifier

GUAMI Globally Unique AMF Identifier

HFC Hybrid Fiber-Coaxial

HTTP Hypertext Transfer Protocol

H-PCF Home Policy Control Function

JSON JavaScript Object Notation

N3AN Non-3GPP access network

N3IWF Non-3GPP InterWorking Function

NID Network Identifier

NF Network Function

NRF Network Repository Function

NSWO Non-Seamless WLAN Offload

OS Operating System

OSId Operating System Identity

PCF Policy Control Function

PDU Packet Data Unit

PEI Permanent Equipment Identifier

PIN Personal IoT Network

PRA Presence Reporting Area

ProSeP 5G ProSe Policy

PTI Procedure Transaction Identity

RSLPP Ranging and Sidelink Positioning Policy

RSN Redundancy Sequence Number

SL Sidelink

SMF Session Management Function

SNPN Stand-alone Non-Public Network

SSC Service and Session Continuity

SUPI Subscription Permanent Identifier

TNGF Trusted Non-3GPP Gateway Function

UDR Unified Data Repository

UPSC UE policy section code

UPSI UE policy section identifier

URSP UE Route Selection Policy

V2X Vehicle-to-Everything

V2XP Vehicle-to-Everything Policy

V-PCF Visited Policy Control Function

VPS VPLMN Specific

W-5GAN Wireline 5G Access Network

W-5GCAN Wireline 5G Cable Access Network

W-AGF Wireline Access Gateway Function

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

### 4.1.1 Overview

The UE Policy Control Service, as defined in 3GPP TS 23.502 [3] and 3GPP TS 23.503 [4], is provided by the Policy Control Function (PCF).

This service is used as part of the provisioning of UE policies (e.g. ANDSP, URSP, V2XP, A2XP, ProSeP, RSLPP) determined by the PCF to the UE via the AMF and as part of the provisioning of N2 PC5 policy for V2X communications and/or A2X communications and/or 5G ProSe and/or Ranging/SL determined by the PCF to the NG-RAN via the AMF. In case of URSP provisioning in EPS this service may be used as part of the provisioning of URSP determined by the PCF to the UE via a PCF for a PDU session. This service hence offers the following functionalities:

- creation of a UE Policy Association as requested by the NF service consumer (e.g. AMF);

- provisioning of policy control request trigger(s) to the NF service consumer (e.g. AMF);

- provisioning of the UE policy (e.g. ANDSP, URSP, V2XP, A2XP,ProSeP, RSLPP) to the V-PCF by the H-PCF in the roaming case;

- provisioning of the N2 PC5 policy for V2X communications and/or A2X communications and/or 5G ProSe and/or Ranging/SL to the V-PCF by the H-PCF in the roaming case;

- update of a UE Policy Association as requested by the NF service consumer (e.g. AMF);

- reporting of the met policy control request trigger(s) by the NF service consumer;

- update of policy control request trigger(s) by the PCF to the NF service consumer (e.g. AMF);

- deletion of a UE Policy Association as requested by the NF service consumer (e.g. AMF);

- enable the PCF to request the termination of a UE Policy Association to the NF service consumer (e.g. AMF) ; and

- provisioning of the URSP to a PCF for a PDU session in case of URSP provisioning in EPS.

- support of N3IWF/TNGF selection based on the UE requested NSSAI.

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

#### 4.1.3.1 Policy Control Function (PCF)

For non-roaming scenarios, the Policy Control Function (PCF):

- supports unified policy framework to govern network behaviour;

- provides UE policy, including Access Network Discovery and Selection Policy (ANDSP), UE Route Selection Policy (URSP), Vehicle-to-Everything Policy (V2XP), Aircraft-to-Everything Policy (A2XP), 5G ProSe Policy (ProSeP) and/or Ranging and Sidelink Positioning Policy (RSLPP) via the AMF transparently to the UE;

- provides policy control request trigger(s) to the AMF;

NOTE 1: The PCF invokes the Namf\_Communication service specified in 3GPP TS 29.518 [14] to provide the UE Policy.

- provides N2 PC5 policy, containing the PC5 QoS parameters used by NG-RAN for V2X communications and/or A2X communications and/or 5G ProSe and/or Ranging/SL via the AMF to the NG-RAN;

NOTE 2: The PCF invokes the Namf\_Communication service specified in 3GPP TS 29.518 [14] to provide the N2 PC5 Policy for V2X communications and/or A2X communications and/or 5G ProSe and/or Ranging/SL.

- provides URSP via a PCF for a PDU session transparently to the UE in case of URSP provisioning in EPS; and

- provides policy control request trigger(s) to a PCF for a PDU session in case of URSP provisioning in EPS.

- support of N3IWF/TNGF selection based on the UE requested NSSAI.

For roaming scenarios, the Visited Policy Control Function (V-PCF):

- provides policy control request trigger(s) to the AMF;

- provides the ANDSP of the VPLMN via the AMF transparently to the UE;

- forwards the ANDSP, URSP, V2XP, A2XP, ProSeP and/or RSLPP received from the H-PCF via the AMF to the UE;

NOTE 3: The V-PCF invokes the Namf\_Communication service specified in 3GPP TS 29.518 [14] to provide the UE Policy.

- forwards the N2 PC5 policy for V2X communications and/or A2X communications and/or 5G ProSe and/or Ranging/SL received from the H-PCF via the AMF to the NG-RAN;

NOTE 4: The V-PCF invokes the Namf\_Communication service specified in 3GPP TS 29.518 [14] to provide the N2 PC5 Policy for V2X communications and/or A2X communications and/or 5G ProSe and/or Ranging/SL.

- for the LBO roaming scenarios, provides policy control request trigger(s) to a V-PCF for a PDU session in case of URSP provisioning in EPS; and

- for the LBO roaming scenarios, forwards the URSP received from the H-PCF via a V-PCF for a PDU session to the UE in case of URSP provisioning in EPS.

For roaming scenarios, the Home Policy Control Function (H-PCF):

- provides policy control request trigger(s) to the V-PCF;

- provides the UE policy (e.g. ANDSP, URSP, V2XP, A2XP, ProSeP or RSLPP) of the HPLMN to the V-PCF for forwarding to the UE via the the AMF;

- provides the N2 PC5 policy for V2X communications and/or A2X communications and/or 5G ProSe and/or Ranging/SL to the V-PCF for forwarding to the NG-RAN via the AMF; and

- in case of URSP provisioning in EPS:

a. for the LBO roaming scenarios, provides URSP to the V-PCF for forwarding to the UE via a V-PCF for a PDU session.

b. for the Home Routed scenarios, provides URSP to the PCF for the PDU session in the HPLMN, for forwarding to the UE via the H-SMF.

The policy decisions made by the PCF may also be based on one or more of the following:

- Information obtained from the UDR (e.g., UE Policy Subscription data and/or Service Parameter Data provided by the AF/NEF via the UDR);

- Information obtained from the AMF, e.g. UE related and access related information;

- Information obtained from the NWDAF;

- Information from the CHF about spending limits control; and

NOTE 5: In this release of the specification, policy decisions based on spending limits control apply to URSP only.

- PCF pre-configured policy context.

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

#### 4.1.3.2 NF Service Consumers

The known NF service consumers of the Npcf\_UEPolicyControl are the AMF, the V-PCF in the roaming case, and a PCF for a PDU session in case of URSP provisioning in EPS.

The Access and Mobility Management function (AMF) performs:

- registration management;

- connection management;

- reachability management;

- mobility Management;

- forwarding of UE Policy towards the served UE;

- reporting of the UE state to the (V-)PCF;

- forwarding of the UE policy enforcement result received from the UE to the (V-)PCF; and

NOTE: The AMF invokes the Namf\_Communication service specified in 3GPP TS 29.518 [14] to report the UE policy enforcement result.

- forwarding of the N2 PC5 policy for V2X communications and/or A2X communications and/or 5G ProSe and/or Ranging/SL towards the NG-RAN.

The Visited Policy Control Function (V-PCF) provides the functions described in clause 4.1.3.1 towards the visited network as NF service producer and acts as NF Service consumer toward the H-PCF, performing the following functions:

- receiving policy control request trigger(s) and/or UE policy (e.g. ANDSP, URSP, V2XP, A2XP, ProSeP, RSLPP) from the H-PCF;

- receiving the N2 PC5 policy for V2X communications and/or A2X communications and/or 5G ProSe and/or Ranging/SL from the H-PCF; and

- reporting of the UE state and UE policy enforcement result to the H-PCF.

The V-PCF may also provide the URSP enforcement report received from the UE, if requested by the H-PCF as described in clause 4.2.2.2.3.

The PCF for a PDU session in case of URSP provisioning in EPS performs:

- forwarding of URSP towards the served UE.

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

#### 4.2.2.1 General

The procedure in the present clause is applicable when the NF service consumer creates a UE policy association in the following cases:

- UE performs initial registration to the network, as defined in clause 5.5.1.2.2 of 3GPP TS 24.501 [15];

- UE performs a mobility registration, if the UE operating in single-registration mode performs inter-system change from S1 mode to N1 mode, as defined in clause 5.5.1.3.2 of 3GPP TS 24.501 [15], and there is no existing UE Policy Association between AMF and PCF for this UE; and

- 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 clause 4.2.3.1.

To support the delivery of URSP in EPC, the procedure in the present clause is also applicable when:

- When the UE triggers a BEARER RESOURCE MODIFICATION REQUEST message with a UE policy container IE after the UE performs ePCO capability negotiation during PDN connection establishment (during the Initial Attach with default PDN connection establishment or the first PDN connection establishment) procedure as defined in 3GPP TS 24.301 [33], and both, the UE and the network support URSP provisioning in EPS PCO; and

- 5GS to EPS handover or 5GS to EPS Idle Mode mobility (both referred as 5GS to EPS mobility in the present document) as defined in 3GPP TS 24.501 [15].

The creation of a UE 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 procedure used for the creation of a policy association.



Figure 4.2.2.1-1: Creation of a UE policy association

NOTE 1: For the roaming scenario, 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.

When a UE registers to the network and a UE context is being established, if the AMF obtains from the UE a UE policy delivery protocol message as defined in Annex D of 3GPP TS 24.501 [15] and/or the authorized PC5 capability for 5G ProSe, and/or the authorized PC5 capability for V2X communications and/or A2X communications, and/or the authorized PC5 capability for Ranging/SL, the AMF shall establish a UE policy association with the (V-)PCF, in case there is no existing UE policy association for the UE; otherwise, the AMF may establish a UE Policy Association with the (V-)PCF based on AMF local configuration.

NOTE 2: In the roaming scenario, the visited AMF's local configuration can indicate whether UE Policy delivery is needed based on the roaming agreement with the home PLMN of the UE.

During UE Initial Attach with default PDN connection or the etablishment of the first PDN connection in EPS, if the UE and the SMF+PGW support URSP provisioning in EPS PCO, and the "EpsUrsp" feature is supported between the SMF+PGW-C and the PCF for the PDU session, the PCF for a PDU session associated with the SMF+PGW-C serving the PDN connection obtains from the UE a UE policy container in a Npcf\_SMPolicyControl\_Update procedure triggered by a bearer resource modification procedure as described in 3GPP TS 29.512 [31]. Then, if the "EpsUrsp" feature described in clause 5.8 is supported, the PCF for a PDU session shall establish a UE policy association with the (V-)PCF for the UE for the delivery of URSP only.

During 5GS to EPS mobility with N26, and if the "EpsUrsp" feature described in clause 5.8 is supported, the PCF for the PDU session determines whether 5GS to EPS mobility applies based on the received RAT and/or Access-Type change event as described in 3GPP TS 29.512 [31]. Then, for non-roaming and Home Routed roaming scenarios, the PCF for a PDU session shall determine whether the UE supports URSP provisioning in EPS by checking the UE Policy Set information in UDR as specified in 3GPP TS 29.519 [17], and if supported, shall establish a UE policy association with the PCF for the UE that is handling the UE policy association with the source AMF. For LBO roaming scenarios, the V-PCF for the PDU session determines based on local configuration whether to establish a UE Policy Association towards the V-PCF for the UE.

NOTE 3: The PCF for the PDU session discovers the address of the PCF for the UE handling the UE policy association with the source AMF by querying the BSF as described in 3GPP TS 29.521 [22].

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

- the Notification URI encoded as "notificationUri" attribute;

- the SUPI encoded as "supi" attribute; and

- the features supported by the NF service consumer encoded as "suppFeat" attribute,

shall also include, when available:

- the GPSI encoded as "gpsi" attribute;

- the Access type encoded as "accessType" attribute;

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

- the User Location Information encoded as "userLoc" attribute;

- the 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 4: The SNPN Identifier consists of the PLMN Identifier and the NID.

- the RAT type encoded as "ratType" attribute;

- the received UE policy delivery protocol message defined in Annex D of 3GPP TS 24.501 [15] encoded as "uePolReq" attribute;

- for the roaming scenario, if the NF service consumer is an AMF, the H-PCF ID encoded as "hPcfId" attribute;

- the Internal Group Identifier(s) encoded as "groupIds" attribute;

- the PC5 capability for V2X encoded as "pc5Capab" attribute if the "V2X" feature defined in clause 5.8 is supported;

- the 5G ProSe capability within the "proSeCapab" attribute, if the "ProSe" feature defined in clause 5.8 is supported;

- the Ranging/SL capability within the "rangingSlCapab" attribute, if the "Ranging\_SL" feature defined in clause 5.8 is supported;

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

- if the NF service consumer is an AMF, the serving AMF Id encoded as "servingNfId" attribute;

NOTE 5: If the PCF received the "servingNfId" attribute, the PCF can use the Nnrf\_NFDiscovery Service specified in 3GPP TS 29.510 [13] to retrieve the NF profile of the Namf\_Communication service available in the indicated AMF instance Id.

- if the NF service consumer is an AMF, the "SliceAwareANDSP" feature is supported, and the AMF has determined that the UE has selected a non-3gpp access node (i.e. TNGF or N3IWF) that does not match its subscribed S-NSSAI(s) (or Configured NSSAI, in the roaming case), the wrongly selected non-3gpp access node encoded as "n3gNodeReSel" attribute, and, in the roaming case, also the Configured NSSAI for the serving PLMN encoded as "confSnssais" attribute;

- if the NF service consumer is an AMF, the Satellite Backhaul Category encoded as "satBackhaulCategory" attribute, if the "EnSatBackhaulCategoryChg" feature defined in clause 5.8 is supported

- if the NF service consumer is the PCF for the PDU session, and the "EpsUrsp" feature defined in clause 5.8 is supported, the indication that the trigger for the UE Policy Association Establishment is the 5GS to EPS mobility scenario encoded as the "5gsToEpsMob" attribute.

- for the roaming scenario, if the NF service consumer is an AMF and the "NssaiChange" feature is supported, the configured NSSAI for the serving PLMN encoded as "confSnssais" attribute and optionally the mapped each S-NSSAI value of home network corresponding to the configured S-NSSAI values in the serving PLMN encoded as "mappedHomeSnssai" attribute within the "confSnssais" attribute;

- the PC5 capability for A2X encoded as "pc5CapA2x" attribute if the "A2X" feature defined in clause 5.8 is supported;

- for the roaming scenario, if the NF service consumer is a V-PCF and the "VPLMNSpecificURSP" feature is supported, the VPLMN AF guidance on VPLMN-specific URSP rules related information, if applicable, within the "vpsUrspGuidance" attribute; and

- for the roaming scenario, if the NF service consumer is an AMF, and the "VPLMNSpecificURSP" feature is supported, LBO information within the "lboRoamingInfo" attribute.

and may include:

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

- if the NF service consumer is an AMF, the alternate or backup IPv4 Address(es) where to send Notifications encoded as "altNotifIpv4Addrs" attribute;

- if the NF service consumer is an AMF, the alternate or backup IPv6 Address(es) where to send Notifications encoded as "altNotifIpv6Addrs" attribute;

- if the NF service consumer is an AMF, the alternate or backup FQDN(s) where to send Notifications encoded as "altNotifFqdns" attribute;

Upon the reception of the HTTP POST request,

- the (V-)(H-)PCF shall assign a UE policy association ID;

- for the roaming scenario and based on operator policy, the V-PCF (as the NF service consumer) should send to the H-PCF a request for the Creation of a UE policy association as described in the present clause;

- the (V-)(H-)PCF shall determine the applicable UE policy as detailed in clause 4.2.2.2. For the V-PCF, any policy received from the H-PCF in the reply to the possible request for the Creation of a policy association should be taken into consideration;

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

(i) the (V-)PCF shall subscribe to the AMF to notifications on N1 messages for UE Policy Delivery Results using the Namf\_Communication\_N1N2MessageSubscribe service operation;

(ii) the (V-)PCF shall send the determined UE policy (e.g. ANDSP, URSP, V2XP, A2XP, ProSeP, RSLPP) using Namf\_Communication\_N1N2MessageTransfer service operation(s); and

(iii) the (V-)PCF shall be prepared to receive UE Policy Delivery Results from the AMF and/or subsequent UE policy requests (e.g. for V2XP and/or A2XP and/or ProSeP and/or RSLPP) within the Namf\_Communication\_N1MessageNotify service operation. For the V-PCF, if the received UE Policy Delivery results relate to UE policy sections provided by the H-PCF, the V-PCF shall use the Npcf\_UEPolicyControl\_Update Service Operation defined in clause 4.2.3 to send those UE Policy Delivery results to the H-PCF;

- if the UE indicates the support of V2X communications over PC5 reference point and the "V2X" feature is supported, the (H-)PCF shall determine the applicable V2XP, as detailed in clause 4.2.2.2.1.2, and V2X N2 PC5 policy, as detailed in clause 4.2.2.3 and based on the operator's policy;

- if the UE indicates the support of 5G ProSe and the "ProSe" feature is supported, the (H-)PCF shall determine the applicable ProSeP, as detailed in clause 4.2.2.2.1.3, and 5G ProSe N2 PC5 policy, as detailed in clause 4.2.2.4 and based on the operator's policy;

- if the UE indicates the support of Ranging/SL and the "Ranging\_SL" feature is supported, the (H-)PCF shall determine the applicable RSLPP, as detailed in clause 4.2.2.2.1.X, and Ranging/SL N2 PC5 policy, as detailed in clause 4.2.2.X and based on the operator's policy;

- if the PCF determines that N2 PC5 policy (e.g. for V2X communications, for 5G ProSe, for Ranging/SL) needs to be provisioned, including the case of the V-PCF when receiving the N2 PC5 policy from the H-PCF, the PCF shall use the Namf\_Communication service specified in 3GPP TS 29.518 [14] to provision the N2 PC5 policy according to clause 4.2.2.3 and/or clause 4.2.2.4;

- if the UE indicates support for URSP provisionng in EPS, the "EpsUrsp" feature is supported, and the (V-)PCF determines that UE policy needs to be provisioned via a PCF for a PDU session, the (V-)PCF shall provision the UE policy according to clause 4.2.2.2 and as follows:

(i) the (V-)PCF shall send a UE policy container with the determined URSP using Npcf\_UEPolicyControl\_Create response service operation(s); and

(ii) the (V-)PCF shall be prepared to receive UE Policy Delivery Results from the PCF for a PDU session. The PCF for a PDU session shall use the Npcf\_UEPolicyControl\_Update service operation defined in clause 4.2.3 to send those UE Policy Delivery results to the (V-)PCF;

- if the UE indicates the support of A2X communications over PC5 reference point and the "A2X" feature is supported, the (H-)PCF shall determine the applicable A2XP, as detailed in clause 4.2.2.2.1.4, and V2X N2 PC5 policy, as detailed in clause 4.2.2.5 and based on the operator's policy;

 for the successful case, the (V-)(H-)PCF shall send a HTTP "201 Created" response with the URI for the created resource in the "Location" header field.

NOTE 6: 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:

- mandatorily, the negotiated supported features encoded as "suppFeat" attribute;

- optionally, the information provided by the NF service consumer when requesting the creation of this policy association encoded as "request" attribute;

- optionally, for the H-PCF as service producer communicating with the V-PCF, UE policy (see clause 4.2.2.2) encoded as "uePolicy" attribute;

- optionally, for the H-PCF as service producer communicating with the V-PCF, N2 PC5 policy (see clause 4.2.2.3 and/or clause 4.2.2.4 and/or clause 4.2.2.X) encoded as "n2Pc5Pol" attribute (for V2X communications) and/or "n2Pc5PolA2x" attribute (for A2X communications) and/or "n2Pc5ProSePol" attribute (for 5G ProSe) and/or "n2Pc5RsppPol" attribute (for Ranging/SL);

- optionally, if the UE indicates support for URSP provisionng in EPS and the "EpsUrsp" feature is supported, for the (V-)PCF as service producer communicating with the PCF for a PDU session, UE policy (see clause 4.2.2.2) encoded as "uePolicy" attribute;

- optionally, for the H-PCF as service producer communicating with the V-PCF, and when the feature "UECapabilityIndication" is supported, if the H-PCF did not receive from the UE information about ANDSP support and the information is available and reliable in the UDR (see clause 4.2.2.2.1.1), the ANDSP support indication retrieved from UDR encoded as "andspInd" attribute;

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

a) Location change (tracking area);

b) Change of UE presence in PRA;

c) Change of PLMN, if the "PlmnChange" feature is supported;

d) Change of UE connectivity state, if the "ConnectivityStateChange" feature is supported;

e) URSP enforcement information, if the "URSPEnforcement" feature is supported;

f) Change of Satellite Backhaul Category, if the "EnSatBackhaulCategoryChg" feature is supported;

g) LBO information change, applicable to roaming scenarios, if the "VPLMNSpecificURSP" feature is supported and the NF service consumer is an AMF; and

h) Change of Configured NSSAI, in roaming scenarios, if the "NssaiChange" feature is supported and the NF service consumer is the AMF;

- 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;

- if the Policy Control Request Trigger "LBO information change" is provided, optionally, the DNNs(s) and S-NSSAI(s) for which LBO information is required encoded as "pduSessions" attribute;

NOTE 7: 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 SliceAwareANDSP feature is supported, the PCF received the "n3gNodeReSel" attribute and the PCF has successfully delivered the updated ANDSP/WLANSP to the UE with the slice information for the corresponding non-3gpp node, the notification of this successful delivery by providing the "andspDelInd" attribute with the value "true".

- if errors occur when processing the HTTP POST request, the (V-)(H-)PCF shall apply error handling procedures as specified in clause 5.7 and according to the following provisions:

- if the user information received within the "supi" attribute is unknown, the (V-)(H-)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"; and

- 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 (V-)(H-)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 (V-)PCF received a GUAMI, the (V-)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 (service) set.

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

###### 4.2.2.2.1.0 General

The UE policy consists of

- UE Access Network discovery and selection policies (ANDSP). It is used by the UE for selecting non-3GPP accesses networks. The encoding of ANDSP is defined in 3GPP TS 24.526 [16];

- UE Route Selection Policy (URSP). This UE policy is used by the UE to determine how to route outgoing traffic. Traffic can be routed to an established PDU Session, offloaded to non-3GPP access outside a PDU Session, can be routed via a ProSe Layer-3 UE-to-Network Relay outside a PDU session or trigger the establishment of a new PDU Session. The encoding of URSP is defined in 3GPP TS 24.526 [16];

- UE Vehicle-to-Everything Policy (V2XP). This UE policy provides configuration information to the UE for V2X communications over PC5 reference point or over Uu reference point or both. The encoding of V2XP is defined in 3GPP TS 24.588 [25];

- UE 5G Proximity based Services Policy (ProSeP). This UE policy provides configuration information to the UE for 5G ProSe direct discovery, 5G ProSe direct communications, 5G ProSe UE-to-network relay, 5G ProSe usage reporting configuration and rules and/or 5G ProSe UE-to-UE relay; and

- UE Aircraft-to-Everything Policy (A2XP). This UE policy provides configuration information to the UE for A2X communications over PC5 reference point or A2X communications over Uu reference point or both. The encoding of A2XP is defined in 3GPP TS 24.578 [33];

- UE Ranging and Sidelink Positioning Policy (RSLPP). The UE policy provides configuration information to the UE for Ranging/SL over PC5 reference point. The encoding of RSLPP is defined in 3GPP TS 24.514 [xx];

The UE Policy is transferred to the UE using the UE policy delivery protocol defined in Annex D of 3GPP TS 24.501 [15]. The (V-)(H-)PCF shall send UE policy using the "MANAGE UE POLICY COMMAND" message and will receive the "MANAGE UE POLICY COMPLETE"or the "MANAGE UE POLICY COMMAND REJECT" messages in the response. Those messages are transparently forwarded by the AMF.

The (V-)PCF shall use the Namf\_Communication\_N1N2MessageTransfer service operation defined in clause 5.2.2.3.1 of 3GPP TS 29.518 [14] to send "MANAGE UE POLICY COMMAND" messages to the UE and use the Namf\_Communication\_N1MessageNotify service operation defined in clause 5.2.2.3.5 of 3GPP TS 29.518 [14] to receive "MANAGE UE POLICY COMPLETE" and "MANAGE UE POLICY COMMAND REJECT" messages from the UE. The (V-)PCF shall only send "MANAGE UE POLICY COMMAND" messages below a predefined size limit.

The H-PCF shall use service operations as defined in the present specification to receive "MANAGE UE POLICY COMPLETE" and "MANAGE UE POLICY COMMAND REJECT" messages from the V-PCF and to send MANAGE UE POLICY COMMAND" messages to the V-PCF. The H-PCF shall encode the "MANAGE UE POLICY COMMAND" message in a "uePolicy" attribute. The H-PCF shall only send "MANAGE UE POLICY COMMAND" messages below a predefined size limit.

The (V-)(H-)PCF may deliver the UE policy to the UE in several "MANAGE UE POLICY COMMAND" messages.

For the purpose of such fragmented delivery and subsequent partial updates of UE policies, the UE policy is divided into policy sections. Such policy sections may be predefined in the (V-)(H-)PCF, may be retrieved by the (V-)(H-)PCF from the UDR as specified in 3GPP TS 29.519 [17], or may be dynamically generated by the (V-)(H-)PCF, but shall comply to the rules detailed below. The (V-)(H-)PCF may combine several policy sections into one "MANAGE UE POLICY COMMAND" message, if the predefined size limit is observed.

The following rules apply to policy sections:

- The size shall be below the predefined size limit.

- The policy section shall only contain complete URSP rule(s), WLANSP rule(s), N3AN node configuration information, V2XP, A2XP, ProSeP and/or RSLPP info content, but no fractions of such rules, configuration information, or info contents.

- To ease a subsequent partial update of UE policies, policy sections should only contain a small number of policies, e.g. URSP rule(s), and/or WLANSP rule(s).

- The entire content of a policy section shall be provided by a single PLMN.

A PCF shall only determine policy sections of its own PLMN. However, a V-PCF may forward UE policy sections received from the H-PCF to the UE.

Each UE policy section is identified by a UE policy section identifier (UPSI). The UPSI is composed of two parts:

a) a PLMN ID part containing the PLMN ID of the PLMN or SNPN of the PCF which provides the UE policies; and

b) a UE policy section code (UPSC) containing a unique value within the PLMN or SNPN selected by the PCF.

NOTE 1: When the UE is operating in SNPN access operation mode, the UE associates the PLMN ID with the NID of the SNPN to differentiate between PLMN UPSI(s) and SNPN UPSI(s).

The (V-)(H-)PCF provides an UPSI when providing a new UE policy section and may then identify that policy section using that UPSI when requesting that that UE policy section is modified or deleted, as specified in Annex D of 3GPP TS 24.501 [15].

If the (V-)(H-)PCF determines that changes are required and/or the V-PCF receives possible new or modified policy sections determined by the H-PCF in the roaming case, it shall send the determined new, updated or deleted policy sections using one or several "MANAGE UE POLICY COMMAND" messages towards the NF service consumer. In the roaming case, the V-PCF may either combine policy sections received from the H-PCF and policy sections the V-PCF selected in the same "MANAGE UE POLICY COMMAND" (as long as the predefined size limit is observed), or use separate "MANAGE UE POLICY COMMAND" messages; however, the V-PCF shall not distribute the policy sections received in one "MANAGE UE POLICY COMMAND" from the H-PCF into several "MANAGE UE POLICY COMMAND" messages as long as the predefined size limit is observed for the policy sections received from the H-PCF. The V-PCF shall allocate a new PTI for the "MANAGE UE POLICY COMMAND" sent by the V-PCF and store the mapping between the new PTI and the PTI within the "MANAGE UE POLICY COMMAND" received from the H-PCF.

After sending a "MANAGE UE POLICY COMMAND" messages, the (V-)(H-)PCF shall wait for a related confirmation in a "MANAGE UE POLICY COMPLETE" messages or failure indication in a "MANAGE UE POLICY COMMAND REJECT" message. When receiving no such message until the expiry of a supervision timer specified in Annex D of 3GPP TS 24.501 [15], or when receiving a failure indication, the PCF should re-send related instructions for the policy sections. In the roaming case, the H-PCF and the V-PCF shall each be responsible for resending those policy sections that it originally supplied. In the case that the V-PCF combined policy sections received from the H-PCF and policy sections the V-PCF selected in the same "MANAGE UE POLICY COMMAND" described below, the V-PCF shall wait for the H-PCF to resend the policy sections of HPLMN, and then resend the combined policy sections. The (V-)(H-)PCF shall always include the initially supplied policy sections when resending the UE policy.

The (V-)(H-)PCF shall determine that a received "MANAGE UE POLICY COMPLETE" message or "MANAGE UE POLICY COMMAND REJECT" message is related to the result of a "MANAGE UE POLICY COMMAND" based on the PTI within that message. In the roaming case, the V-PCF shall determine that the received message is related to the result of the UE policy provided by the H-PCF if the PTI within the message belongs to one of the stored PTI mapping(s).

If the V-PCF combined policy sections received from the H-PCF and policy sections the V-PCF selected in the same "MANAGE UE POLICY COMMAND", upon reception of a "MANAGE UE POLICY COMPLETE" message or "MANAGE UE POLICY COMMAND REJECT" message the V-PCF shall:

- forward the corresponding "MANAGE UE POLICY COMPLETE" message to the H-PCF;

- if a "MANAGE UE POLICY COMMAND REJECT" message with UPSI(s) of the HPLMN is received, forward the parts of the "MANAGE UE POLICY COMMAND REJECT" message that relate to the UPSI(s) of the HPLMN to the H-PCF;

- if a "MANAGE UE POLICY COMMAND REJECT" message without UPSI(s) of the HPLMN is received, send a "MANAGE UE POLICY COMPLETE" message to the H-PCF; and

- provide the stored PTI received from the HPLMN in the corresponding "MANAGE UE POLICY COMMAND" within the "MANAGE UE POLICY COMPLETE" message or "MANAGE UE POLICY COMMAND REJECT" message towards the H-PCF.

If the V-PCF sent a separate "MANAGE UE POLICY COMMAND" containing only the policy sections received from the H-PCF, the V-PCF shall forward the corresponding "MANAGE UE POLICY COMPLETE" or "MANAGE UE POLICY COMMAND REJECT" message to the H-PCF and provide the stored PTI received from the HPLMN in the corresponding "MANAGE UE POLICY COMMAND" within the "MANAGE UE POLICY COMPLETE" message or "MANAGE UE POLICY COMMAND REJECT" message towards the H-PCF.If the V-PCF distributed the policy sections received in one "MANAGE UE POLICY COMMAND" from the H-PCF into several "MANAGE UE POLICY COMMAND" messages to the UE (because the predefined size limit of the VPLMN was exceeded), the V-PCF shall aggregate all corresponding "MANAGE UE POLICY COMPLETE" or "MANAGE UE POLICY COMMAND REJECT" messages received from the UE into one "MANAGE UE POLICY COMPLETE" or "MANAGE UE POLICY COMMAND REJECT" message towards the H-PCF.

When the (V-)PCF receives an Namf\_Communication\_N1N2MessageTransfer failure response as defined in clause 5.2.2.3.1.2 of 3GPP TS 29.518 [14], or an N1N2 Transfer Failure Notification as defined in clause 5.2.2.3.2 of 3GPP TS 29.518 [14], the (V-)PCF shall stop the supervision timer specified in Annex D of 3GPP TS 24.501 [15] corresponding to the affected PTIs. For the N1N2 Transfer Failure Notification case, the (V-)PCF determines the affected PTIs allocated by the V-PCF based on the resource URI within the "n1n2MsgDataUri" attribute of the N1N2MsgTxfrFailureNotification data structure as defined in clause 6.1.6.2.30 of 3GPP TS 29.518 [14].

NOTE 2: The (V-)PCF correlates the Namf\_Communication\_N1N2MessageTransfer request and the corresponding N1N2 Transfer Failure Notification based on the resource URI within the "Location" header included in the response HTTP status code "202 Accepted" of the Namf\_Communication\_N1N2MessageTransfer response and the resource URI within the "n1n2MsgDataUri" attribute of and N1N2 Transfer Failure Notification. And then the V-PCF determines the affected PTIs related with the resource URI.

For the roaming case and if the V-PCF determines that the affected UE policy is related with the UE policy delivered by the H-PCF, the V-PCF shall send a POST message as defined in clause 4.2.3.1 to notify the H-PCF of the failure of UE policy transfer by including the "uePolTransFailNotif" attribute within the PolicyAssociationUpdateRequest data structure. Within the UePolicyTransferFailureNotification data structure, the V-PCF shall include the cause of the UE Policy Transfer Failure within the "cause" attribute and the PTI(s) allocated by the H-PCF corresponding to the PTI(s) allocated by the V-PCF within the "ptis" attribute. The H-PCF shall stop the supervision timer corresponding to the affected PTIs.

In the failure case described above, the (H-)(V-)PCF may provision the policy control request trigger "CON\_STATE\_CH" if not provisioned yet. Upon receiving the notification of UE connectivity state change indicating that the UE enters the CM-Connected state, the (H-)(V-)PCF may retry to deliver the UE Policy.

When the (H-)PCF receives the "MANAGE UE POLICY COMPLETE" or the "MANAGE UE POLICY COMMAND REJECT" message and determines that this message indicates a UE Policy Delivery outcome to which an NF service consumer has subscribed via a request for service specific parameters, the (H-)PCF shall invoke the Npcf\_EventExposure\_Notify service operation as defined in clause 4.2.4.2 of 3GPP TS 29.523 [30].

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

###### 4.2.2.2.1.X Provisioning of Ranging and Sidelink Positioning Policy

When the UE registers to the network and the UE supports Ranging/SL, if the AMF receives from the UE the Ranging/SL Capability in the Registration Request message, the UE is authorized to use Ranging/SL service based on the UE's subscription information and the "Ranging\_SL" feature defined in clause 5.8 is supported, the AMF further reports to the PCF this Ranging/SL Capability of the UE within the "rangingSlCapab" attribute, as per the procedures defined in clause 4.2.2.X. The PCF may determine the RSLPP over PC5 interface based on the received UE's PC5 capability for Ranging/SL, the Service specific parameter information retrieved from UE's Application Data in the UDR as defined in clause 6.2.15 of 3GPP TS 29.519 [17] and the operator's policy.

After UE registration, if the UE does not have valid RSLPP, the UE includes a "UE POLICY PROVISIONING REQUEST" message defined in 3GPP TS 24.514 [xx] during the NAS transport procedure. The PCF may either reject the request by sending back a "UE POLICY PROVISIONING REJECT" message defined in 3GPP TS 24.514 [xx] or provision the policy, as defined in clause 4.2.2.2.1, based on the service specific parameter information retrieved from the UE's Application Data in the UDR as defined in clause 6.2.15 of 3GPP TS 29.519 [17] and the operator's policy.

For both scenarios mentioned above, in the roaming case, the H-PCF may include the RSLPP within the "uePolicy" attribute in the policy association create and update response to the V-PCF and in the policy association update request initiated by the H-PCF.

In the roaming or non-roaming case, the (V-)PCF shall use the Namf\_Communication\_N1N2MessageTransfer service operation defined in clause 5.2.2.3.1 of 3GPP TS 29.518 [14] to send the RSLPP to the UE.

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

##### 4.2.2.2.X Ranging and Sidelink Positioning Policy (RSLPP)

RSLPP includes the Ranging/SL Policy over PC5 interface. The RSLPP over PC5 interface is defined in 3GPP TS 24.514 [xx].

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

#### 4.2.2.X Ranging/SL N2 PC5 Policy

The Ranging/SL N2 PC5 policy consists of Ranging/SL PC5 QoS parameters used by the NG-RAN.

When the (H-)PCF derives the UE policy for Ranging/SL over PC5 reference point as defined in clause 4.2.2.2.X, the (H-)PCF shall derive the corresponding Ranging/SL PC5 QoS parameters used by the NG-RAN.

In the roaming case, the H-PCF:

- if PC5 UE capabilities and UE Policy Provisioning request messages are received, and Ranging/SL policies are derived, shall include the Ranging/SL N2 PC5 Policy within the "n2Pc5RsppPol" attribute in the policy association creation response towards the V-PCF; or

- shall include the Ranging/SL N2 PC5 Policy within the "n2Pc5RsppPol" attribute, if changes apply, in the policy association update response towards the V-PCF; or

- may include the Ranging/SL N2 PC5 Policy within the "n2Pc5RsppPol" attribute in the the policy association update request initiated by the H-PCF.

In the roaming or non-roaming case, the (V-)PCF shall use the Namf\_Communication\_N1N2MessageTransfer service operation defined in clause 5.2.2.3.1 of 3GPP TS 29.518 [14] to send Ranging/SL N2 PC5 policy to the NG-RAN.

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

#### 4.2.3.1 General

The procedure in the present clause 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 clause 4.2.3.2) occurs. When a policy control request trigger that requires the subscription as defined in table 5.6.3.3-1 (e.g. LOC\_CH trigger) occurs, the NF service consumer (AMF) shall only invoke this procedure if the PCF has explicitly subscribed to that event trigger. When a policy control request trigger that does not require the subscription as defined in table 5.6.3.3-1 (e.g. GROUP\_ID\_LIST\_CHG trigger) occurs, the NF service consumer (AMF) shall always invoke the procedure.

NOTE 2: The AMF uses the Namf\_Communication\_N1MessageNotify service operation specified in 3GPP TS 29.518 [14] to send to the V-PCF 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] or a "UE POLICY PROVISIONING REQUEST" message as defined in clause 7.2.1.1 of 3GPP TS 24.587 [24].

If an AMF as NF service consumer 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, and if service discovery via NRF applies, the AMF Id. If the feature "FeatureRenegotation" is supported, the new AMF may perform feature renegotiation, as described in clause 4.2.3.4.

NOTE 4: During inter-AMF mobility, the N1N2 Individual Subscription context is transferred from the source AMF to the target AMF as specified in 3GPP TS 29.518 [14]. When the target AMF determines to reuse the UE Policy Association indicated by the source AMF, the PCF can keep the N1N2 Individual Subscription context and, for subsequent interactions, replace in the request URI the {apiRoot} of the N1N2 Individual Subscription resource with the one of the target AMF.

The V-PCF, as NF service consumer, invokes this procedure when a policy control request trigger (see clause 4.2.3.2) occurs. When a policy control request trigger that does not require the subscription as defined in table 5.6.3.3-1 (e.g. UE\_POLICY trigger) occurs, the V-PCF shall always invoke the procedure. When a policy control request trigger that requires the subscription as defined in table 5.6.3.3-1 (e.g. LOC\_CH trigger) occurs, the V-PCF shall only invoke this procedure if the H‑PCF has subscribed to that event trigger.

To request policies (e.g. policy control request trigger(s) is/are met) from the PCF, to update the Notification URI, to renegotiate features, to update the trace control configuration or to request the termination of trace, the NF Service Consumer shall request the update of the associated UE Policy Association by providing the relevant parameters about the UE context in 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 clause 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 5: 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, the GUAMI encoded as "guami" attribute;

NOTE 6: 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;

NOTE 7: If the PCF received the "servingNfId" attribute, the PCF can use the Nnrf\_NFDiscovery Service specified in 3GPP TS 29.510 [13] to retrieve the NF profile of the Namf\_Communication service available in the indicated AMF instance Id.

11. if a UE PLMN change occurred and the "PlmnChange" feature defined in clause 5.8 is supported, the PLMN Identifier or the SNPN Identifier of the new serving network encoded as "plmnId" attribute;

NOTE 8: The SNPN Identifier consists of the PLMN Identifier and the NID.

NOTE 9: When the UE moves between PLMNs, the trigger reports changes of equivalent PLMNs.

NOTE 10: Mobility between non-equivalent SNPNs, and between SNPN and PLMN is not supported. When the UE is operating in SNPN access mode, the trigger reports changes of equivalent SNPNs.

12. if a "UE POLICY PROVISIONING REQUEST" message defined in clause 7.2.1.1 of 3GPP TS 24.587 [24] has been received by the V-PCF as NF service consumer and respectively the "V2X" feature , and/or the "A2X" feature and/or the "ProSe" feature and/or the "Ranging\_SL" feature defined in clause 5.8 is/are supported, the message encoded as "uePolReq" attribute;

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

14. if a change of PC5 capablity for 5G ProSe occurred and the "ProSe" feature defined in clause 5.8 is supported, the PC5 capability for 5G ProSe encoded as "proSeCapab" attribute.

15. if a change of the connectivity state of the UE occurred and the "ConnectivityStateChange" feature defined in clause 5.8 is supported, the connectivity state of the served UE encoded as "connectState" attribute; and/or

16. when a response with HTTP status code 4xx or 5xx as defined in clause 5.2.2.3.1.2 of 3GPP TS 29.518 [14] or a N1N2 Transfer Failure Notification as defined in clause 5.2.2.3.2 of 3GPP TS 29.518 [14] is received by the V-PCF after provisioning the UE policy by invoking the Namf\_Communication\_N1N2MessageTransfer service operation to the AMF, this UE policy transfer failure notification encoded as "uePolTransFailNotif" attribute;

17. if the NF service consumer is an AMF, the "SliceAwareANDSP" feature is supported, and the "NON\_3GPP\_NODE\_RESELECTION" trigger is reported within the "triggers" attribute, the wrongly selected non-3gpp access node encoded as "n3gNodeReSel" attribute, and, in the roaming case, also the Configured NSSAI for the serving PLMN encoded as "confSnssais" attribute;

18. if satellite backhaul category change occurred and the "EnSatBackhaulCategoryChg" feature defined in clause 5.8 is supported, the satellite backhaul category or non-satellite backhaul encoded as "satBackhaulCategory" attribute.

19. for the roaming scenario, if the NF service consumer is an AMF, Configured NSSAI change occurred and the "NssaiChange" feature is supported, the configured NSSAI for the serving PLMN encoded as "confSnssais" attribute and optionally the mapped each S-NSSAI value of home network corresponding to the configured S-NSSAI values in the serving PLMN encoded as "mappedHomeSnssai" attribute within the "confSnssais" attribute;

20 for the roaming scenario, if the NF service consumer is a V-PCF, the "URSPEnforcement" feature is supported, and the URSP enforcement information policy control request trigger is met, the URSP enforcement information within the "urspEnfReport" attribute.

21. for the roaming scenario, if the NF service consumer is a V-PCF the "VPLMNSpecificURSP" feature is supported, the VPLMN AF guidance on VPLMN-specific URSP rules related information within the "vpsUePolGuidance" attribute;

22. for the roaming scenario, if the NF service consumer is an AMF, the "VPLMNSpecificURSP" feature is supported and the "LBO\_INFO\_CH" policy control request trigger is met, the LBO roaming information within the "lboRoamingInfo" 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 with the H-PCF, the V-PCF shall determine based on the contents of a potentially received "uePolDelResult" attribute to be sent to the H-PCF (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 UE policy based on the contents of the received HTTP POST request, the UE Policy Sections stored in UDR, local policy and, for the H-PCF, taking into consideration the information received within the UE policy delivery protocol encoded in the "uePolReq" attribute, if available, and for the V-PCF, taking into consideration any policy received from the H-PCF encoded in the "uePolicy" attribute in the reply to the possible request for the update of the associated policy association. When the "ProSe" feature is supported, the H-PCF shall determine the applicable ProSeP based on the received PC5 capability for 5G ProSe. When the UE disables a 5G ProSe capability the PCF may stop updating the corresponding ProSeP, and when the UE enables a 5G ProSe capability the PCF may update the corresponding ProSeP;

- if the UE indicated the support of A2X communications over PC5 reference point, "A2X" feature is supported, and for the H-PCF, if the UE POLICY PROVISIONING REQUEST message was included in the "uePolReq" attribute, the (H-)PCF shall determine the applicable A2XP and A2X N2 PC5 policy as detailed in clauses 4.2.2.2.1.4 and 4.2.2.5, based on the operator's policy;

- if the UE indicates the support of 5G ProSe communications over PC5 reference point, the "ProSe" feature is supported, and for the H-PCF, if the UE POLICY PROVISIONING REQUEST message with the requested 5G ProSe policies was included in the "uePolReq" attribute, the (H-)PCF shall determine the applicable ProSeP and 5G ProSe N2 PC5 policy, as detailed in clauses 4.2.2.2.1.3 and 4.2.2.4, based on the operator's policy;

- if the UE indicated the support of V2X communications over PC5 reference point, "V2X" feature is supported, and for the H-PCF, if the UE POLICY PROVISIONING REQUEST message was included in the "uePolReq" attribute, the (H-)PCF shall determine the applicable V2XP and V2X N2 PC5 policy as detailed in clauses 4.2.2.2.1.2 and 4.2.2.3, based on the operator's policy;

- if the UE indicated the support of Ranging/SL over PC5 reference point, "Ranging\_SL" feature is supported, and for the H-PCF, if the UE POLICY PROVISIONING REQUEST message was included in the "uePolReq" attribute, the (H-)PCF shall determine the applicable RSLPP and Ranging/SL N2 PC5 policy as detailed in clauses 4.2.2.2.1.X and 4.2.2.X, based on the operator's policy;

- for the succesfull case, the (V-)(H-)PCF shall send a HTTP "200 OK" response with the PolicyUpdate data type as response body with the possibly updated of UE policy (for the H-PCF), and/or ProSe N2 PC5 policy (for the H-PCF) as specified in clause 4.2.2.4, N2 PC5 policy for V2X communications and/or A2X communications and/or 5G ProSe (for the H-PCF) as specified in clause 4.2.2.3, and/or the Ranging/SL N2 PC5 policy (for the H-PCF) as specified in clause 4.2.2.X and/or Policy Control Request Trigger(s) encoded as described in clause 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 clause 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, the V-PCF shall use the Npcf\_UEPolicyControl\_Update Service Operation to send those UE Policy Delivery results to the H-PCF; and

NOTE 11: 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 the PCF determines that the V2XP and N2 PC5 policy (e.g. for V2X communications, for 5G ProSe) for V2X communications need to be updated, and for the V-PCF when receiving the updated V2XP and N2 PC5 policy for V2X communications from the H-PCF, it shall use the Namf\_Communication service specified in 3GPP TS 29.518 [14] to provision the V2XP to the UE and the V2X N2 PC5 policy to NG-RAN according to clauses 4.2.2.2.1.2 and 4.2.2.3;

- if the PCF determines that the A2XP (e.g. for A2X communications) for A2X communications need to be updated, and for the V-PCF when receiving the updated A2XP and N2 PC5 policy for A2X communications from the H-PCF, it shall use the Namf\_Communication service specified in 3GPP TS 29.518 [14] to provision the A2XP to the UE and the A2X N2 PC5 policy to NG-RAN according to clauses 4.2.2.2.1.4 and 4.2.2.5;

- if the PCF determines that ProSeP and 5G ProSe N2 PC5 policy needs to be updated, and for the V-PCF when receiving the updated ProSeP and 5G ProSe N2 PC5 policy from the H-PCF, it shall use the Namf\_Communication service specified in 3GPP TS 29.518 [14] to provision the ProSeP to the UE and 5G ProSe N2 PC5 policy to NG-RAN according to clauses 4.2.2.2.1.3 and 4.2.2.4;

- if the PCF determines that RSLPP and Ranging/SL N2 PC5 policy needs to be updated, and for the V-PCF when receiving the updated RSLPP and Ranging/SL N2 PC5 policy from the H-PCF, it shall use the Namf\_Communication service specified in 3GPP TS 29.518 [14] to provision the RSLPP to the UE and Ranging/SL N2 PC5 policy to NG-RAN according to clauses 4.2.2.2.1.X and 4.2.2.X;

- if the SliceAwareANDSP feature is supported, the PCF received the "NON\_3GPP\_NODE\_RESELECTION" trigger, and the PCF has successfully delivered the updated ANDSP/WLANSP to the UE with the slice information for the corresponding non-3gpp node, the notification of this successful delivery by providing the "andspDelInd" attribute with the value "true".

- if errors occur when processing the HTTP POST request, the (V-)(H-)PCF shall:

- send an HTTP error response as specified in clause 5.7; or

- if the feature "ES3XX" is supported, and the (V-)(H-)PCF determines the received HTTP POST request needs to be redirected, send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [5];

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 \* \* \* \*

#### 4.2.3.3 Encoding of updated policy

Updated policies shall be encoded within the PolicyUpdate data type that may include:

- only when the updated policy is supplied by the H-PCF in the roaming scenario, UE policy (see clause 4.2.2.2) encoded as "uePolicy" attribute, and N2 PC5 policy for V2X communications (see clause 4.2.2.3) encoded as "n2Pc5Pol" attribute and/or the N2 PC5 policy for A2X communications (see clause 4.2.2.5) encoded as "n2Pc5PolA2x" attribute and/or the N2 PC5 policy for 5G ProSe (see clause 4.2.2.4) encoded as "n2Pc5ProSePo" attribute and/or the N2 PC5 policy for Ranging/SL (see clause 4.2.2.X) encoded as "n2Pc5RsppPol" attribute;

- when the updated policy is supplied via PCF of a PDU session by the (V-)PCF in case of URSP provisioning in EPS, UE policy (see clause 4.2.2.2) encoded as "uePolicy" attribute;

- updated Policy Control Request Trigger(s) (see clause 4.2.3.2) encoded as "triggers" attribute, i.e.:

1) either a new complete list of applicable Policy Control Request Trigger(s) including one or several of the following:

a) Location change (tracking area);

b) Change of UE presence in PRA;

c) Change of PLMN, if the "PlmnChange" feature is supported;

d) Change of UE connectivity state, if the "ConnectivityStateChange" feature is supported;

e) Change of Satellite Backhaul Category, if the "EnSatBackhaulCategoryChg" feature is supported;

f) Change of configured NSSAI, in roaming scenarios, if the "NssaiChange" feature is supported and the NF service consumer is the AMF; or

g) LBO information change, applicable to roaming scenarios, if the "VPLMNSpecificURSP" feature is supported and the NF service consumer is an AMF;

2) a "NULL" value to request the removal of all previously installed Policy Control Request Trigger(s); and

- if the Policy Control Request Trigger "Change of UE presence in PRA" is provided or if that trigger was already set but the requested presence reporting areas need to be changed, the presence reporting areas for which reporting is required encoded as "pras" attribute encoded as follows:

a) A new entry shall be added by supplying a new identifier as key and the corresponding PresenceInfo data type instance with complete contents as value as an entry within the map.

b) An existing entry shall be modified by supplying the existing identifier as key and the PresenceInfo data type instance with complete contents as value as an entry within the map.

c) An existing entry shall be deleted by supplying the existing identifier as key and "NULL" as value as an entry within the map.

d) For an unmodified entry, no entry needs to be provided within the map.

- if the Policy Control Request Trigger "LBO information change" is provided or if that trigger was already set but the requested LBO information needs to be changed, the requested LBO information encoded in the "pduSessions" attribute, a list of DNN and S-NSSAI combinations previously provided is updated by providing either a new complete list within the"pduSessions" attribute or by setting it to "NULL". If the "pduSessions" attribute is not provided or the previously provided "pduSessions" attribute is deleted, the LBO information change policy control request trigger applies to any S-NSSAI and DNN combination.

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

#### 4.2.4.1 General

The (V-)(H)-PCF may decide to update policy control request triggers, and in the roaming case, the H-PCF may decide to update the UE Policy, the V2X N2 PC5 policy, if the "V2X" feature is supported, and/or the A2X N2 PC5 policy, if the "A2X" feature is supported, and/or the 5G ProSe N2 PC5 policy, if the "ProSe" feature is supported and/or the Ranging/SL N2 PC5 policy, if the "Ranging\_SL" feature is supported. The PCF (H-PCF in the roaming case) may decide to request the termination of the policy association.

IIf the "EpsUrsp" feature is supported and the NF consumer is a PCF for a PDU session the PCF (H-PCF in the LBO roaming scenario) may decide to update policy control request triggers and/or to update the URSP. The PCF (H-PCF in the LBO roaming scenario) may decide to request the termination of the policy association.

The(V-)(H-)PCF shall then use an Npcf\_UEPolicyControl\_UpdateNotify service operation.

The following procedures using the Npcf\_UEPolicyControl\_UpdateNotify service operation are supported:

- Policy update notification.

- Request the termination of the UE policy association.

- URSP provisioning for background Data Transfer policy.

- UE policy provisioning for V2X communications over PC5 and Uu reference points.

- UE policy provisioning for 5G ProSe.

- UE policy provisioning for Ranging/SL.

- N2 PC5 Policy (e.g. for V2X communications, for A2X communications, for 5G ProSe, for Ranginging/SL) provisioning.

- UE policy provisioning for A2X communications over PC5 reference point or A2X communications over Uu reference point or both.

NOTE: The PCF derives the URSP and invokes the Namf\_Communication\_N1N2MessageTransfer service operation to provision it to the UE.

- URSP provisioning in EPS.

\* \* \* 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, based on external triggers (e.g. notifications received from UDR about new or updated service parameter data as described in 3GPP TS 29.519 [17]) or internal triggers (e.g., the activation of a pending policy counter provided via the Nchf\_SpendingLimitControl Service as described in 3GPP TS 29.594 [33]) policy control request trigger(s) and in the roaming case, the H-PCF may also decide to update the UE Policy, the N2 PC5 policy for V2X communications if the "V2X" feature is supported and/or the N2 PC5 policy for A2X communications if the "A2X" feature is supported and/or the N2 PC5 policy for 5G ProSe if the "ProSe" feature is supported and/or the N2 PC5 policy for Ranging/SL if the "Ranging\_SL" feature is supported.

NOTE: In this release of the specification, policy decisions based on policy counters provided via Nchf\_SpendingLimitControl service apply only for non-roaming cases and UE policies refer to URSP only.

If the "EpsUrsp" feature is supported and the NF consumer is a PCF for a PDU session the PCF (H-PCF in the LBO roaming scenario) may decide to update policy control request triggers and/or to update the URSP.

If the SliceAwareANDSP feature is supported and the PCF has successfully delivered the updated ANDSP/WLANSP to the UE with the slice information for the corresponding non-3gpp node, the PCF may decide to notify the NF service consumer about this successful delivery.

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 clause 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 for V2X communications and/or A2X communications and/or 5G ProSe and/or Ranging/SL 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, if applicable, 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);

- if the "EpsUrsp" feature is supported and a PCF for a PDU session is the NF service consumer, shall behave as specified in clause 4.2.4.8;

- 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:

a. 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, and/or the feature "EnSatBackhaulCategoryChg" is supported and the PCF provisioned the policy control request trigger related to change of satellite backhaul category, and/or the feature "URSPEnforcement" is supported and the PCF provisioned the policy control request trigger related to URSP enforcement information, 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;

b.- 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 as specified in clause 5.7; or

- 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 clause 6.10.9 of 3GPP TS 29.500 [5].

If the feature "ErrorResponse" is supported and if the AMF as NF service consumer 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.X UE policy provisioning for Ranging/SL

After the UE policy association establishment and if the "Ranging\_SL" feature is supported, the (H-)PCF may receive the service specific parameter information via a notification on the change of UE's Application Data from the UDR, as defined in clause 6.3.4 of 3GPP TS 29.519 [17]. In this case:

- for the roaming case, the H-PCF shall derive the RSLPP and provision it to the V-PCF as defined in clause 4.2.4.2; and/or

- for the roaming and non-roaming case, the (H-)PCF shall derive the RSLPP and the (V-)PCF shall use the Namf\_Communication Service defined in 3GPP TS 29.518 [14] to convey it to the UE via the AMF by sending "MANAGE UE POLICY COMMAND" message(s).

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

### 5.6.1 General

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

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

Table 5.6.1-1: Npcf\_UEPolicyControl specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| LboRoamingInformation | 5.6.2.10 | LBO roaming information for a DNN and S-NSSAI | VPLMNSpecificURSP |
| Non3gppAccess | 5.6.3.7 | Represents a Non-3gpp access node. | SliceAwareANDSP |
| Pc5Capability | 5.6.3.5 | Indicates the specific PC5 RAT(s) which the UE supports for V2X communications and/or A2X communications over PC5 reference point. | V2X, A2X |
| ProSeCapability | 5.6.3.6 | Indicates the 5G ProSe capabilities. | ProSe |
| PolicyAssociation | 5.6.2.2 | Description of a policy association that is returned by the PCF when a policy Association is created, updated, 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. |  |
| TerminationNotification | 5.6.2.6 | Request to terminate a policy Association that the PCF provides in a notification. |  |
| UeRequestedValueRep | 5.6.2.8 | Contains the current applicable values corresponding to the policy control request triggers. | ImmediateReport |
| UePolicy | 5.6.3.2 | UE Policies |  |
| UePolicyDeliveryResult | 5.6.3.2 | UE Policy delivery Result |  |
| UePolicyParameters | 5.6.2.9 | Contains the service parameters used to guide the VPLMN-specific URSP rule determination. | VPLMNSpecificURSP |
| UePolicyRequest | 5.6.3.2 | Request for UE Policies |  |
| UePolicyTransferFailureNotification | 5.6.2.7 | Information that the UE policy is failure to be transferred to the UE because the UE is not reachable.  |  |
| UrspEnforcemenPduSession | 5.6.2.11 | Represents URSP enforcement information for a PDU session. | URSPEnforcement |

Table 5.6.1-2 specifies data types re-used by the Npcf\_UEPolicyControl 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\_UEPolicyControl service based interface.

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

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AccessType | 3GPP TS 29.571 [11] |  |  |
| Bytes | 3GPP TS 29.571 [11] | String with format "byte". |  |
| ConfiguredSnssai | 3GPP TS 29.531 [34] | Contains the configured S-NSSAI and optionally mapped home S-NSSA. | SliceAwareANDSP,NssaiChange |
| CmState | 3GPP TS 29.518 [14] | Connectivity state of UE | ConnectivityStateChange |
| Fqdn | 3GPP TS 29.571 [11] | 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] |  |  |
| N1N2MessageTransferCause | 3GPP TS 29.518 [14] |  |  |
| N2InfoContent | 3GPP TS 29.518 [14] | Represents a transparent N2 information content to be relayed by AMF. | V2X, A2X,ProSe,Ranging\_SL |
| NfInstanceId | 3GPP TS 29.571 [11] |  |  |
| PduSessionInfo | 3GPP TS 29.571 [11] | Contains a DNN and SNSSAI combination | VPLMNSpecificURSP |
| PduSessionInformation | 3GPP TS 29.523 [30] | Contains PDU session identification information. | URSPEnforcement |
| Pei | 3GPP TS 29.571 [11] | Permanent Equipment Identifier |  |
| PlmnId | 3GPP TS 29.571 [11] |  |  |
| 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 |  |
| ProblemDetails | 3GPP TS 29.571 [11] |  |  |
| RatType | 3GPP TS 29.571 [11] |  |  |
| RedirectResponse | 3GPP TS 29.571 [11] | Contains redirection related information. | ES3XX |
| RedundantPduSessionInformation | 3GPP TS 29.502 [40] | Contains the Redundant PDU session information, i.e, the RSN and the PDU Session Pair ID. | URSPEnforcement |
| ServiceName | 3GPP TS 29.510 [13] | Name of the service instance. |  |
| SatelliteBackhaulCategory | 3GPP TS 29.571 [11] | Indicates the satellite backhaul category or non-satellite backhaul. | EnSatBackhaulCategoryChg |
| Snssai | 3GPP TS 29.571 [11] | Represents an S-NSSAI | SliceAwareANDSP |
| 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] |  |  |
| Uinteger | 3GPP TS 29.571 [11] |  |  |
| Uri | 3GPP TS 29.571 [11] |  |  |
| UrspEnforcementInfo | 3GPP TS 29.512 [31] | URSP enforcement information as received from the UE. | URSPEnforcement |
| UrspRuleRequest | 3GPP TS 29.522 [41] | URSP rule guidance information | VPLMNSpecificURSP |
| UserLocation | 3GPP TS 29.571 [11] |  |  |

\* \* \* 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 |  |
| uePolicy | UePolicy | O | 0..1 | The UE policy as determined by the H-PCF (for the H-PCF as NF service producer). |  |
| n2Pc5Pol | N2InfoContent | O | 0..1 | The N2 PC5 policy for V2X communications as determined by the H-PCF. | V2X |
| n2Pc5PolA2x | N2InfoContent | O | 0..1 | The N2 PC5 policy for A2X communications as determined by the H-PCF. | A2X |
| n2Pc5ProSePol | N2InfoContent | O | 0..1 | The N2 PC5 policy for 5G ProSe as determined by the PCF. | ProSe |
| triggers | array(RequestTrigger) | O | 1..N | Request Triggers to which the PCF subscribes. Only the values "LOC\_CH", "PRA\_CH", "PLMN\_CH", "CONF\_NSSAI\_CH", "SAT\_CATEGORY\_CHG", "URSP\_ENF\_INFO", "LBO\_INFO\_CH" , and "CON\_STATE\_CH" are permitted. | (NOTE) |
| pras | map(PresenceInfo) | C | 1..N | If the Request 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. |  |
| andspDelInd | boolean | O | 0..1 | Indication that the updated ANDSP/WLANSP has been successfully delivered to the UE. "true" means that it has been successfully delivered. The default value is "false". | SliceAwareANDSP |
| andspInd | boolean | O | 0..1 | Indication of UE support of ANDSP.True: The UE supports ANDSP; False: The UE does not support ANDSP. | UECapabilityIndication |
| pduSessions | array(PduSessionInfo) | O | 1..N | Contains the DNNs and S-NSSAIs for which LBO information is being requested. It may be provided when the "LBO\_INFO\_CH" request trigger is provided. | VPLMNSpecificURSP |
| suppFeat | SupportedFeatures | M | 1 | Indicates the negotiated supported features. |  |
| n2Pc5RsppPol | N2InfoContent | O | 0..1 | The N2 PC5 policy for Ranging/SL as determined by the H-PCF. | Ranging\_SL |
| NOTE: The "PLMN\_CH", "CONF\_NSSAI\_CH", "LBO\_INFO\_CH", "SAT\_CATEGORY\_CHG", "URSP\_ENF\_INFO" and "CON\_STATE\_CH" values in the "triggers" attribute apply under feature control as described in clause 4.2.3.2. |

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

#### 5.6.2.3 Type PolicyAssociationRequest

Table 5.6.2.3-1: Definition of type PolicyAssociationRequest

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notificationUri | Uri | M | 1 | Identifies the recipient of Notifications sent by the PCF. |  |
| altNotifIpv4Addrs | array(Ipv4Addr) | O | 1..N | Alternate or backup IPv4 Addess(es) where to send Notifications. |  |
| altNotifIpv6Addrs | array(Ipv6Addr) | O | 1..N | Alternate or backup IPv6 Addess(es) where to send Notifications. |  |
| altNotifFqdns | array(Fqdn) | O | 1..N | Alternate or backup FQDN(s) where to send Notifications. |  |
| supi | Supi | M | 1 | Subscription Permanent Identifier.  |  |
| gpsi | Gpsi | C | 0..1 | Generic Public Subscription Identifier. Shall be provided when available. |  |
| accessType | AccessType | C | 0..1 | The Access Type where the served UE is camping. Shall be provided when available. |  |
| pei | Pei | C | 0..1 | The Permanent Equipment Identifier of the served UE. Shall be provided when available. |  |
| userLoc | UserLocation | C | 0..1 | The location of the served UE. Shall be provided when available. |  |
| timeZone | TimeZone | C | 0..1 | The time zone where the served UE is camping. Shall be provided when available. |  |
| servingPlmn | PlmnIdNid | C | 0..1 | The serving network (a PLMN or an SNPN) where the served UE is camping. For the SNPN the NID together with the PLMN ID identifies the SNPN. Shall be provided when available. |  |
| ratType | RatType | C | 0..1 | The RAT Type where the served UE is camping. Shall be provided when available. |  |
| groupIds | array(GroupId) | C | 1..N | Internal Group Identifier(s) of the served UE. Shall be provided when available. |  |
| hPcfId | NfInstanceId | C | 0..1 | H-PCF Identifier. Shall be provided when available. |  |
| uePolReq | UePolicyRequest  | C | 0..1 | A request for UE Policies. Shall be provided when the AMF receives an "UE STATE INDICATION" message, as defined in Annex D.5.4 of 3GPP TS 24.501 [15]. |  |
| guami | Guami | C | 0..1 | The Globally Unique AMF Identifier (GUAMI) shall be provided by an AMF as NF service consumer. |  |
| serviceName | ServiceName | O | 0..1 | If the NF service consumer is an AMF, it should provide the name of a service produced by the AMF that makes use of information received within the Npcf\_UEPolicyControl\_UpdateNotify service operation. |  |
| servingNfId | NfInstanceId | C | 0..1 | If the NF service consumer is an AMF, it shall contain the identifier of the serving AMF. |  |
| pc5Capab | Pc5Capability | C | 0..1 | Indicates the PC5 Capability for V2X communications supported by the UE. It shall be provided when available at the NF service consumer. | V2X |
| pc5CapA2x | Pc5Capability | C | 0..1 | Indicates the PC5 Capability for A2X communications supported by the UE. It shall be provided when available at the NF service consumer. | A2X |
| proSeCapab | array(ProSeCapability) | C | 1..N | Indicates whether the UE is capable of one or more of the the following 5G ProSe Capabilities: 5G ProSe Direct Discovery, 5G ProSe Direct Communication, Layer-2 and/or Layer 3 5G ProSe UE-to-Network Relay and Layer-2 and/or Layer 3 5G ProSe Remote UE, and when the "ProSe\_Ph2" feature is supported, Layer-2 and/or Layer-3 5G ProSe UE-to-UE Relay and Layer-2 and/or Layer-3 5G ProSe End UE.. It shall be provided when available at the NF service consumer. | ProSe |
| confSnssais | array(ConfiguredSnssai) | C | 1..N | The Configured NSSAI for the serving PLMN, and optionally the mapped S-NSSAI value of home network corresponding to the configured S-NSSAI in the serving PLMN. . It shall be provided in the roaming case when available at the NF service consumer. It shall be provided in the roaming case when available at the NF service consumer and the "NON\_3GPP\_NODE\_RESELECTION" trigger is reported within the "triggers" attribute.It shall be provided for trigger "CONF\_NSSAI\_CH". (NOTE) | SliceAwareANDSP, NssaiChange |
| n3gNodeReSel | Non3gppAccess | O | 0..1 | A wrongly selected non-3gpp access node. It shall be provided in the roaming case when available at the NF service consumer, i.e. when the UE has selected a non-3gpp access node that does not match its subscribed or configured NSSAI.  | SliceAwareANDSP |
| satBackhaulCategory | SatelliteBackhaulCategory | C | 0..1 | Indicates types of the satellite backhaul based on satellite types (when satellite backhaul is used) or non-satellite backhaul (when satellite backhaul is not used)..The default value "NON\_SATELLITE" shall apply if the attribute is not present. | EnSatBackhaulCategoryChg |
| vpsUePolGuidance | map(UePolicyParameters) | O | 1..N | Contains the service parameter used to guide the VPLMN-specific URSP. The key of the map represents the AF request to guide the VPLMN-specific URSP rules.This attribute only applies in roaming and when the V-PCF is the NF service consumer. | VPLMNSpecificURSP |
| lboRoamInfo | array(LboRoamingInformation) | O | 1..N | Contains LBO roaming information for DNN and S-NSSAI combination(s).This attribute only applies in roaming and when the AMF is the NF service consumer. | VPLMNSpecificURSP |
| 5gsToEpsMob | boolean | O | 0..1 | When it is set to true, it indicates the UE Policy Association creation is triggered by a 5GS to EPS mobility scenario.Default value is false. | EpsUrsp |
| suppFeat | SupportedFeatures | M | 1 | Indicates the features supported by the service consumer. |  |
| rangingSlCapab | boolean | C | 0..1 | Indicates whether the PC5 Capability for Ranging/SL is supported by the UE or not."true": Indicates that the PC5 Capability for Ranging/SL is supported by the UE."false": Indicates that the PC5 Capability for Ranging/SL is not supported by the UE.Default value when omitted is "false".It shall be provided when available at the NF service consumer. | Ranging\_SL |
| NOTE: The "mappedHomeSnssai" attribute within the ConfiguredSnssai data type may only be provided if the "NssaiChange" feature is supported. |

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

#### 5.6.2.4 Type PolicyAssociationUpdateRequest

Table 5.6.2.4-1: Definition of type PolicyAssociationUpdateRequest

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notificationUri | Uri | O | 0..1 | Identifies the recipient of Notifications sent by the PCF. |  |
| altNotifIpv4Addrs | array(Ipv4Addr) | O | 1..N | Alternate or backup IPv4 Address(es) where to send Notifications. |  |
| altNotifIpv6Addrs | array(Ipv6Addr) | O | 1..N | Alternate or backup IPv6 Address(es) where to send Notifications. |  |
| altNotifFqdns | array(Fqdn) | O | 1..N | Alternate or backup FQDN(s) where to send Notifications. |  |
| triggers | array(RequestTrigger) | C | 1..N | Request Triggers that the NF service consumer observes. |  |
| praStatuses | map(PresenceInfo) | C | 1..N | If the Trigger "PRA\_CH" is reported, the UE presence status for tracking area for which changes of the UE presence occurred 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 be supplied. The "additionalPraId" attribute within the PresenceInfo data type shall not be supplied. The "praId" attribute within the PresenceInfo data type shall include the identifier of an individual presence reporting area. |  |
| userLoc | UserLocation | C | 0..1 | The location of the served UE shall be provided for trigger "LOC\_CH". |  |
| uePolDelResult | UePolicyDeliveryResult | C | 0..1 | UE Policy Delivery Result. Shall be provided together with trigger "UE\_POLICY" when 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], has been received by the V-PCF and is being forwarded to the H-PCF. |  |
| uePolTransFailNotif | UePolicyTransferFailureNotification | C | 0..1 | The UE policy transfer failure notification. Shall be the provided together with trigger "UE\_POLICY" when a response with HTTP status code 4xx or 5xx as defined in clause 5.2.2.3.1.2 of 3GPP TS 29.518 [14] or a N1N2 Transfer Failure Notification as defined in clause 5.2.2.3.2 of 3GPP TS 29.518 [14] is received after the V-PCF provisioned the UE policy by invoking the Namf\_Communication\_N1N2MessageTransfer service operation to the AMF and is notifying the H-PCF. |  |
| uePolReq | UePolicyRequest  | C | 0..1 | A request for UE Policies. Shall be provided together with trigger "UE\_POLICY" when the V-PCF receives an "UE POLICY PROVISIONING REQUEST" message, as defined in clause 7.2.1.1 of 3GPP TS 24.587 [24], if the "V2X" feature is supported, and/or when the V-PCF receives an "UE POLICY PROVISIONING REQUEST" message for 5G ProSe, as defined in clause 10.4.1 of 3GPP TS 24.554 [28], if the "ProSe" feature is supported and/or when the V-PCF receives an "UE POLICY PROVISIONING REQUEST" message for A2X, as defined 3GPP TS 24.577 [32], if the "A2X" feature is supported and/or when the V-PCF receives an "UE POLICY PROVISIONING REQUEST" message for Ranging/SL, as defined 3GPP TS 24.514 [xx], if the "Ranging\_SL" feature is supported.. | V2X, A2X, ProSe, Ranging\_SL |
| guami | Guami | C | 0..1 | The Globally Unique AMF Identifier (GUAMI) shall be provided by an AMF as NF service consumer during the AMF relocation. |  |
| servingNfId | NfInstanceId | C | 0..1 | It shall contain the identifier of the new AMF during the AMF relocation. |  |
| plmnId | PlmnIdNid | C | 0..1 | The serving network identity (a PLMN or an SNPN) of the served UE shall be provided for trigger "PLMN\_CH". | PlmnChange |
| connectState | CmState | C | 0..1 | The connectivity state of the served UE shall be provided for trigger "CON\_STATE\_CH". | ConnectivityStateChange |
| groupIds | array(GroupId) | C | 1..N | Internal Group Identifier(s) of the served UE. Shall be provided for trigger "GROUP\_ID\_LIST\_CHG". | GroupIdListChange |
| proSeCapab | array(ProSeCapability) | O | 1..N | Indicates whether the UE is capable of one or more of the the following 5G ProSe Capabilities: 5G ProSe Direct Discovery, 5G ProSe Direct Communication, Layer-2 and/or Layer 3 5G ProSe UE-to-Network Relay and Layer-2 and/or Layer 3 5G ProSe Remote UE, and when the "ProSe\_Ph2" feature is supported, Layer-2 and/or Layer-3 5G ProSe UE-to-UE Relay and Layer-2 and/or Layer-3 5G ProSe End UE. | ProSe |
| confSnssais | array(ConfiguredSnssai) | C | 1..N | The Configured NSSAI for the serving PLMN, and optionally the mapped S-NSSAI value of home network corresponding to the configured S-NSSAI in the serving PLMN.It shall be provided for trigger "CONF\_NSSAI\_CH". (NOTE) | SliceAwareANDSP, NssaiChange |
| n3gNodeReSel | Non3gppAccess | O | 0..1 | A wrongly selected non-3gpp access node. It shall be provided in the roaming case when available at the NF service consumer and the "NON\_3GPP\_NODE\_RESELECTION" trigger is reported within the "triggers" attribute.  | SliceAwareANDSP |
| satBackhaulCategory | SatelliteBackhaulCategory | C | 0..1 | Indicates types of the satellite backhaul based on satellite types (when satellite backhaul is used) or non-satellite backhaul (when satellite backhaul is not used).It shall be provided for trigger "SAT\_CATEGORY\_CHG". | EnSatBackhaulCategoryChg |
| urspEnfReport | map(UrspEnforcementPduSession) | O | 1..N | Represents information about the enforced URSP rule(s) in one or more PDU sessions for the affected UE. The key of the map is a character string that represents an integer value (it may correspond with a PDU session identifier).It shall be present when the notified policy control request trigger is "URSP\_ENF\_INFO". | URSPEnforcement |
| vpsUePolGuidance | map(UePolicyParameters) | O | 1..N | Contains the service parameter used to guide the VPLMN-specific URSP rule determination. The key of the map represents the AF request to guide VPLMN-specific URS rules.This attribute only applies in roaming and when the V-PCF is the NF service consumer. | VPLMNSpecificURSP |
| lboRoamInfo | array(LboRoamingInformation) | O | 1..N | Contains LBO roaming information for a DNN and S-NSSAI combination(s).This attribute only applies in roaming and when the AMF is the NF service consumer. | VPLMNSpecificURSP |
| suppFeat | SupportedFeatures | C | 0..1 | Indicates the features supported by the NF service consumer.It shall be included by the target AMF in inter-AMF mobility scenarios for trigger "FEAT\_RENEG". |  |
| rangingSlCapab | boolean | O | 0..1 | Indicates whether the PC5 Capability for Ranging/SL is supported by the UE or not. | Ranging\_SL |
| NOTE: The "mappedHomeSnssai" attribute within the ConfiguredSnssai data type may only be provided if the "NssaiChange" feature is supported. |

Editor's Note: The reference to CT1 specification for A2X related UE messages to be updated.

\* \* \* 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 UE policy association related to the notification. (NOTE 2) |  |
| uePolicy | UePolicy | O | 0..1 | The UE policy as determined by the H-PCF. |  |
| n2Pc5Pol | N2InfoContent | O | 0..1 | The N2 PC5 policy for V2X communications as determined by the H-PCF. | V2X |
| n2Pc5PolA2x | N2InfoContent | O | 0..1 | The N2 PC5 policy for A2X communications as determined by the H-PCF. | A2X |
| n2Pc5ProSePol | N2InfoContent | O | 0..1 | The N2 PC5 policy for 5G ProSe as determined by the PCF. | ProSe |
| triggers | array(RequestTrigger) | O | 1..N | Request Triggers that the PCF subscribes. Only values "LOC\_CH", "PRA\_CH", "PLMN\_CH", "CONF\_NSSAI\_CH", "SAT\_CATEGORY\_CHG", "URSP\_ENF\_INFO","LBO\_INFO\_CH" and "CON\_STATE\_CH" are permitted. | (NOTE 1) |
| 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 PresenceInfoRm 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. | PresenceInfo |
| andspDelInd | boolean | O | 0..1 | Indication that the updated ANDSP/WLANSP has been successfully delivered to the UE. "true" means that it has been successfully delivered. The default value is "false". | SliceAwareANDSP |
| pduSessions | array(PduSessionInfo) | O | 1..N | Contains the list of the DNN and SNSSAI pairs for which LBO information is being requested. It may be provided when the "LBO\_INFO\_CH" request trigger is provided. | VPLMNSpecificURSP |
| suppFeat | SupportedFeatures | C | 0..1 | Indicates the negotiated supported features.It shall be included in the HTTP POST response when the NF service consumer provided the supported features in the HTTP POST request. | FeatureRenegotiation |
| n2Pc5RsppPol | N2InfoContent | O | 0..1 | The N2 PC5 policy for Ranging/SL as determined by the H-PCF. | Ranging\_SL |
| NOTE 1: The "PLMN\_CH", "CONF\_NSSAI\_CH", "LBO\_INFO\_CH", "SAT\_CATEGORY\_CHG",,"URSP\_ENF\_INFO" and "CON\_STATE\_CH" values in the "triggers" attribute apply under feature control as described in clause 4.2.3.2.NOTE 2: 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 clause 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 UE Policy Association resource related to the notification. |

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

#### 5.6.3.3 Enumeration: RequestTrigger

The enumeration RequestTrigger represents the possible Policy Control Request Triggers.. It shall comply with the provisions defined in table 5.6.3.3-1.

Table 5.6.3.3-1: Enumeration RequestTrigger

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| LOC\_CH | Location change (tracking area): the tracking area of the UE has changed. (NOTE) |  |
| 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. (NOTE) |  |
| UE\_POLICY | A "MANAGE UE POLICY COMPLETE" message, a "MANAGE UE POLICY COMMAND REJECT" message, as defined in Annex D.5 of 3GPP TS 24.501 [15] has been received by the V-PCF and is being forwarded to the H-PCF, or has been received by a PCF for a PDU session and is being forwarded to the (V-)PCF (and then from the V-PCF to the H-PCF) when the "EpsUrsp" feature is supported. A Namf\_Communication\_N1N2MessageTransfer failure response as defined in clause 5.2.2.3.1.2 of 3GPP TS 29.518 [14], an N1N2 Transfer Failure Notification as defined in clause 5.2.2.3.2 of 3GPP TS 29.518 [14], a UE Policy transfer failure is notifying to the H-PCF, or a UE Policy transfer failure is notifying to the (V-)PCF when the "EpsUrsp" feature is supported. When the "ProSe" feature is supported it indicates that a "UE POLICY PROVISIONING REQUEST" message, as defined in clause 10.4 of 3GPP TS 24.554 [28] has been received by the V-PCF and is being forwarded to the H-PCF.When the "V2X" feature is supported it indicates that a "UE POLICY PROVISIONING REQUEST" message, as defined in clause 7.2 of 3GPP TS 24.587 [24] has been received by the V-PCF and is being forwarded to the H-PCF.When the "A2X" feature is supported it indicates that a "UE POLICY PROVISIONING REQUEST" message, as defined in 3GPP TS 24.577 [32] has been received by the V-PCF and is being forwarded to the H-PCF.When the "Ranging\_SL" feature is supported it indicates that a "UE POLICY PROVISIONING REQUEST" message, as defined in 3GPP TS 24.514 [xx] has been received by the V-PCF and is being forwarded to the H-PCF.This event does not require a subscription and is only applicable for the V‑PCF as NF service consumer and the H‑PCF as NF service producer or a PCF for a PDU session as NF service consumer and the (V-)PCF as NF service producer when the “EpsUrsp” feature is supported. |  |
| PLMN\_CH | PLMN change: the serving network (a PLMN or an SNPN) of UE has changed. (NOTE) | PlmnChange |
| CON\_STATE\_CH | Connectivity state change: the connectivity state of UE has changed. (NOTE) | ConnectivityStateChange |
| GROUP\_ID\_LIST\_CHG | UE Internal Group Identifier(s) has changed: the AMF reports that UDM provided list of group Ids has changed. This policy control request trigger does not require a subscription. | GroupIdListChange |
| UE\_CAP\_CH | UE Capabilities change: the UE provided 5G ProSe capabilities have changed. This policy control request trigger does not require subscription. | ProSe |
| SAT\_CATEGORY\_CHG | Satellite Backhaul Category change: the AMF has detected a change between different satellite backhaul category, or a change between satellite and non-satellite backhaul. (NOTE) | EnSatBackhaulCategoryChg |
| CONF\_NSSAI\_CH | Configured NSSAI change: the configured NSSAI has changed. This policy control request trigger only applies in roaming scenarios when the NF service consumer is the AMF.(NOTE) | NssaiChange |
| NON\_3GPP\_NODE\_RESELECTION | Wrong TNGF or N3IWF: the UE has connected to a wrong non-3GPP access node that does not match its subscribed S-NSSAI(s). This policy control request trigger does not require a subscription. | SliceAwareANDSP |
| FEAT\_RENEG | The target AMF determines feature re-negotiation is required. This policy control request trigger does not require subscription. | FeatureRenegotiation |
| URSP\_ENF\_INFO | The V-PCF has received URSP enforcement information for one or more URSP rules. This trigger only applies in roaming scenarios and to the V-PCF.(NOTE)  | URSPEnforcement |
| LBO\_INFO\_CH | LBO information change. The AMF reports LBO roaming allowed or not allowed for the requested DNN(s) and S-NSSAI(s). This policy control request trigger only applies in roaming scenarios when the NF service consumer is the AMF.(NOTE) | VPLMNSpecificURSP |
| NOTE: The report of this trigger includes reporting the current value at the time the trigger is provisioned during the update or update notification of the policy association. |

Editor's Note: The reference to CT1 specification for A2X related UE messages to be updated.

\* \* \* 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 clause 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 communications. |
| 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 "404 Not Found" error response code for policy update notification between AMF and (V-)PCF.  |
| 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 clauses 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 clause 6.10.9 of 3GPP TS 29.500 [5].  |
| 9 | ProSe | This feature indicates support of UE policy and N2 information provisioning for 5G ProSe. |
| 10 | FeatureRenegotiation | This feature indicates the support of feature renegotiation during the update of a policy association triggered by UE mobility with AMF change. |
| 11 | SliceAwareANDSP | This feature indicates the support of ANDSP/WLANSP policies that consider the slices supported by the UE. |
| 12 | EpsUrsp | This feature indicates support of URSP provisioning in EPS and is only applicable in the case of of 5GC and EPC interworking. |
| 13 | EnSatBackhaulCategoryChg | This feature indicates the support of notification of a change between different satellite backhaul categories, or dynamic satellite backhaul categories, or between satellite backhaul and non-satellite backhaul. |
| 14 | UECapabilityIndication | This feature indicates the support of the provisioning by the H-PCF to the V-PCF of the UE Capability for UE Policy, when the UE Capability is not received from the UE and the information is available and reliable in the UDR. |
| 15 | A2X | This feature indicates support of A2X communications. |
| 16 | NssaiChange | This feature indicates support for the change of Configured NSSAI trigger handling. |
| 17 | ProSe\_Ph2 | This feature indicates the support of UE policy and N2 information provisioning for 5G ProSe UE-to-UE Relay function.This feature requires that the ProSe feature is also supported. |
| 18 | PresenceInfo | The feature indicates the support of policy update to remove the existing presence reporting areas entry. |
| 19 | URSPEnforcement | This feature indicates the support of the report of URSP rule enforcement information by the V-PCF to the H-PCF. |
| 20 | VPLMNSpecificURSP | This feature indicates the support of AF guidance on VPLMN-specific URSP rules. It requires the support of NssaiChange feature. |
| xx | Ranging\_SL | This feature indicates the support for the UE policy provisioning and N2 information provisioning for Ranging and sidelink positioning. |

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

# A.2 Npcf\_UEPolicyControl API

openapi: 3.0.0

info:

 version: 1.3.0-alpha.4

 title: Npcf\_UEPolicyControl

 description: |

 UE Policy Control Service.

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externalDocs:

 description: 3GPP TS 29.525 V18.3.0; 5G System; UE Policy Control Service.

 url: 'https://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 clause 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'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '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':

 $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'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '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'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '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':

 $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'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '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':

 $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'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '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':

 $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'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '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:

 description: >

 Contains the description of a policy association that is returned by the PCF when a policy

 Association is created, updated, or read.

 type: object

 properties:

 request:

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

 uePolicy:

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

 n2Pc5Pol:

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

 n2Pc5PolA2x:

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

 n2Pc5ProSePol:

 $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.

 pras:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: >

 Contains the presence reporting area(s) for which reporting was requested.

 The praId attribute within the PresenceInfoRm data type is the key of the map.

 andspDelInd:

 type: boolean

 description: >

 Indication that the updated ANDSP/WLANSP has been successfully delivered to the UE.

 andspInd:

 description: >

 Indication of UE support of ANDSP. When set to true, it indicates the UE supports ANDSP,

 when set to false it indicates the UE does not support ANDSP.

 type: boolean

 pduSessions:

 type: array

 items:

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

 minItems: 1

 description: Combination of DNN and S-NSSAIs for which LBO information is requested.

 suppFeat:

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

 n2Pc5RsppPol:

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

 required:

 - suppFeat

 PolicyAssociationRequest:

 description: >

 Represents information that the NF service consumer provides when requesting the creation 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: 'TS29571\_CommonData.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'

 pc5CapA2x:

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

 proSeCapab:

 type: array

 items:

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

 minItems: 1

 confSnssais:

 type: array

 items:

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

 minItems: 1

 description: >

 The Configured NSSAI for the serving PLMN, and the mapped S-NSSAI value of home

 network corresponding to the configured S-NSSAI in the serving PLMN.

 n3gNodeReSel:

 $ref: '#/components/schemas/Non3gppAccess'

 satBackhaulCategory:

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

 5gsToEpsMob:

 type: boolean

 description: >

 It indicates the UE Policy Association is triggered by a 5GS to EPS mobility

 scenario.

 vpsUePolGuidance:

 type: object

 additionalProperties:

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

 minProperties: 1

 description: >

 Contains the service parameter used to guide the VPLMN-specific URSP.

 The key of the map represents the AF request to guide VPLMN-specific URS rules.

 This attribute only applies in roaming and when the V-PCF is the NF service consumer.

 lboRoamInfo:

 type: array

 items:

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

 minItems: 1

 description: >

 Contains LBO roaming information for DNN and S-NSSAI combination(s).

 This attribute only applies in roaming and when the AMF is the NF service consumer.

 suppFeat:

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

 rangingSlCapab:

 type: boolean

 description: >

 It indicates whether the PC5 Capability for Ranging/SL is supported by the UE or not.

 "true": Indicates that the PC5 Capability for Ranging/SL is supported by the UE.

 "false": Indicates that the PC5 Capability for Ranging/SL is not supported by the UE.

 Default value when omitted is "false".

 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: 'TS29571\_CommonData.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: >

 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.

 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/PlmnIdNid'

 connectState:

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

 groupIds:

 type: array

 items:

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

 minItems: 1

 proSeCapab:

 type: array

 items:

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

 minItems: 1

 confSnssais:

 type: array

 items:

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

 minItems: 1

 description: >

 The Configured NSSAI for the serving PLMN, and the mapped S-NSSAI value of home

 network corresponding to the configured S-NSSAI in the serving PLMN.

 satBackhaulCategory:

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

 urspEnfRep:

 type: object

 additionalProperties:

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

 description: >

 Contains information about the enforced URSP rule(s) in one or more PDU sessions.

 The key of the map is a character string that represents an integer value.

 minProperties: 1

 suppFeat:

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

 rangingSlCapab:

 type: boolean

 description: >

 It indicates whether the PC5 Capability for Ranging/SL is supported by the UE or not.

 PolicyUpdate:

 description: >

 Represents updated policies that the PCF provides in a notification or in the reply to an

 Update Request.

 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'

 n2Pc5PolA2x:

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

 n2Pc5ProSePol:

 $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.

 pras:

 type: object

 additionalProperties:

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

 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

 andspDelInd:

 type: boolean

 description: >

 Indication that the updated ANDSP/WLANSP has been successfully delivered to the UE.

 pduSessions:

 type: array

 items:

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

 minItems: 1

 description: >

 Combination of DNN and S-NSSAIs for which LBO information is requested.

 nullable: true

 suppFeat:

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

 n2Pc5RsppPol:

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

 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

 UePolicyTransferFailureNotification:

 description: >

 Represents information on the failure of a UE policy transfer to the UE because the UE is not

 reachable.

 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:

 description: >

 Contains 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.

 plmnId:

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

 connectState:

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

 confSnssais:

 type: array

 items:

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

 minItems: 1

 description: >

 The Configured NSSAI for the serving PLMN, and the mapped S-NSSAI value of home

 network corresponding to the configured S-NSSAI in the serving PLMN.

 satBackhaulCategory:

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

 urspEnfRep:

 type: object

 additionalProperties:

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

 description: >

 Contains information about the enforced URSP rule(s) in one or more PDU sessions.

 The key of the map is a character string that represents an integer value.

 minProperties: 1

 lboRoamInfo:

 type: array

 items:

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

 minItems: 1

 description: >

 Contains LBO roaming information for DNN and S-NSSAI combination(s).

 UePolicyParameters:

 description: >

 Contains the service parameters used to guide the VPLMN-specific URSP rule determination.

 type: object

 properties:

 urspGuidance:

 type: array

 items:

 $ref: 'TS29522\_ServiceParameter.yaml#/components/schemas/UrspRuleRequest'

 minItems: 1

 description: Contains the service parameter used to guide the URSP.

 LboRoamingInformation:

 description: >

 Contains LBO roaming information for a DNN and S-NSSAI.

 type: object

 properties:

 lboRoamAllowed:

 type: boolean

 description: >

 Indicates whether LBO for the DNN and S-NSSAI is allowed when roaming.

 dnn:

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

 snssai:

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

 required:

 - dnn

 - snssai

 UrspEnforcementPduSession:

 description: >

 Represents URSP enforcement information for a PDU session.

 type: object

 required:

 - urspEnfInfo

 properties:

 urspEnfInfo:

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

 sscMode:

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

 ueReqDnn:

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

 redundantPduSessionInfo:

 $ref: 'TS29502\_Nsmf\_PDUSession.yaml#/components/schemas/RedundantPduSessionInformation'

 accessType:

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

 ratType:

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

 pduSessInfo:

 $ref: 'TS29523\_Npcf\_EventExposure.yaml#/components/schemas/PduSessionInformation'

 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

 - UE\_CAP\_CH

 - SAT\_CATEGORY\_CHG

 - NON\_3GPP\_NODE\_RESELECTION

 - CONF\_NSSAI\_CH

 - LBO\_INFO\_CH

 - FEAT\_RENEG

 - URSP\_ENF\_INFO

 - 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: |

 Represents the possible request triggers.

 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 clause 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 policy control request

 trigger does not require a subscription.

 - UE\_CAP\_CH: UE Capabilities change: the UE provided 5G ProSe capabilities have changed.

 This policy control request trigger does not require subscription.

 - SAT\_CATEGORY\_CHG: Indicates that the AMF has detected a change between different satellite

 category, or non-satellite backhaul.

 - NON\_3GPP\_NODE\_RESELECTION: The UE has connected to a wrong non-3GPP access node that

 does not match its subscribed S-NSSAI(s). This policy control request trigger does not

 require a subscription.

 - CONF\_NSSAI\_CH: Configured NSSAI change. Indicates that the configured NSSAI has changed.

 - LBO\_INFO\_CH: LBO information change. The AMF reports LBO roaming allowed or not allowed

 for the requested DNN(s) and S-NSSAI(s). This policy control request trigger only applies

 in roaming scenarios when the NF service consumer is the AMF.

 - FEAT\_RENEG: The NF service consumer notifies that the target AMF is requesting feature

 re-negotiation.

 - URSP\_ENF\_INFO: The V-PCF has received URSP enforcement information for one or more URSP

 rules. This trigger applies in roaming scenarios and to the V-PCF.

 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: |

 Represents the cause why the PCF requests the policy association termination.

 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: |

 Represents the specific PC5 RAT(s) which the UE supports for V2X or A2X communications over

 PC5 reference point.

 Possible values are:

 - LTE\_PC5: This value is used to indicate that UE supports PC5 LTE RAT for V2X

 communications or A2X communications over the PC5 reference point

 over the PC5 reference point.

 - NR\_PC5: This value is used to indicate that UE supports PC5 NR RAT for V2X communications

 or A2X communications over the PC5 reference point.

 - LTE\_NR\_PC5: This value is used to indicate that UE supports both PC5 LTE and NR RAT for

 V2X communications or A2X communications over the PC5 reference point.

 ProSeCapability:

 anyOf:

 - type: string

 enum:

 - PROSE\_DD

 - PROSE\_DC

 - PROSE\_L2\_U2N\_RELAY

 - PROSE\_L3\_U2N\_RELAY

 - PROSE\_L2\_REMOTE\_UE

 - PROSE\_L3\_REMOTE\_UE

 - PROSE\_L2\_U2U\_RELAY

 - PROSE\_L3\_U2U\_RELAY

 - PROSE\_L2\_END\_UE

 - PROSE\_L3\_END\_UE

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 the content defined in the present version of this API.

 description: |

 Represents the 5G ProSe capabilities.

 Possible values are:

 - PROSE\_DD: This value is used to indicate that 5G ProSe Direct Discovery is supported

 by the UE.

 - PROSE\_DC: This value is used to indicate that 5G ProSe Direct Communication is supported

 by the UE.

 - PROSE\_L2\_U2N\_RELAY: This value is used to indicate that Layer-2 5G ProSe UE-to-Network

 Relay is supported by the UE.

 - PROSE\_L3\_U2N\_RELAY: This value is used to indicate that Layer-3 5G ProSe UE-to-Network

 Relay is supported by the UE.

 - PROSE\_L2\_REMOTE\_UE: This value is used to indicate that Layer-2 5G ProSe Remote UE is

 supported by the UE.

 - PROSE\_L3\_REMOTE\_UE: This value is used to indicate that Layer-3 5G ProSe Remote UE is

 supported by the UE.

 - PROSE\_L2\_U2U\_RELAY: This value is used to indicate that Layer-2 5G ProSe UE-to-UE

 Relay is supported by the UE.

 - PROSE\_L3\_U2U\_RELAY: This value is used to indicate that Layer-3 5G ProSe UE-to-UE

 Relay is supported by the UE.

 - PROSE\_L2\_END\_UE: This value is used to indicate that Layer-2 5G ProSe End UE is

 supported by the UE.

 - PROSE\_L3\_END\_UE: This value is used to indicate that Layer-3 5G ProSe End UE is

 supported by the UE.

 Non3gppAccess:

 anyOf:

 - type: string

 enum:

 - N3IWF

 - TNGF

 - 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: |

 Represents a non-3gpp access node.

 Possible values are:

 - N3IWF: Non-3gpp Interworking Function.

 - TNGF: Trusted Non-3gpp Gateway Function.

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