**3GPP TSG-CT WG3 Meeting #108-eC3-201078**

[**E-Meeting**](https://www.3gpp.org/ftp/tsg_ct/WG3_interworking_ex-CN3/TSGC3_108_Sophia_Antipolis/)**, 19th -28th February 2020 (Revision of C3-200xyz)**

|  |
| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **29.521** | **CR** | 0055 | **rev** | **-** | **Current version:** | **16.2.0** |  |
|  |
| *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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |
| --- |
|  |
| ***Title:***  | Update of the same PCF selection |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | en5GPccSer |  | ***Date:*** | 2020-02-28 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-16 |
|  | *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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | The PCF instance id is optional parameter in the current TS. So it can’t be always available at the BSF.Moreover in current solution, it requires the PCF to retrieve the FQDN and/or IP endpoints of the existing PCF from the NRF based on the returned the PCF instance id.In order to avoid additional signalling, we propose that the PCF stores the QDN and/or IP endpoints of the PCF hosting the Npcf\_SMPolicyControl service if the "SamePcf" feature defined in subclause 5.8 is supported and the PCF determines that the same PCF shall be selected for the SM Policy associations to the parameter combination in the non-roaming or home-routed scenario based on operator's policies and configuration. |
|  |  |
| ***Summary of change:*** | 1. The PCF stores the FQDN and/or IP endpoints of the PCF hosting the Npcf\_SMPolicyControl service if the "SamePcf" feature is supported and the PCF determines that the same PCF shall be selected for the SM Policy associations to the parameter combination in the non-roaming or home-routed scenario based on operator's policies and configuration
2. the BSF returns the FQDN and/or IP endpoints of the existing PCF hosting the Npcf\_SMPolicyControl service.
 |
|  |  |
| ***Consequences if not approved:*** | 1. The PCF instance id is not available
2. Additional signalling is needed.
 |
|  |  |
| ***Clauses affected:*** | 4.2.2.2, 5.6.2.2, 5.6.2.4, 5.6.2.6, A.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | This CR introduces a backwards compatible feature to the OpenAPI file. |
|  |  |
| ***This CR's revision history:*** |  |

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

#### 4.2.2.2 Register a new PCF Session binding information

Figure 4.2.2.2-1: NF service consumer register a new PCF Session binding information

The NF service consumer shall invoke the Nbsf\_Management\_Register service operation to register the session binding information for a UE in the BSF. The NF service consumer shall send an HTTP POST request with "{apiRoot}/nbsf-management/v1/pcfBindings" as Resource URI representing the "PCF Session Bindings", as shown in figure 4.2.2.2-1, step 1, to create a binding information for an "Individual PCF Session Binding" according to the information (e.g. UE address(es), SUPI, GPSI, DNN, S-NSSAI) in message body. The PcfBinding data structure provided in the request body shall include:

- if the MultiUeAddr feature is not supported or if the feature not yet known, address information of the served UE consisting of:

(i) either IP address information consisting of:

+ the IPv4 address encoded as "ipv4Addr" attribute; and/or

+ the /128 IPv6 address, the IPv6 address prefix or an IPv6 prefix shorter than/64 encoded as "ipv6Prefix" attribute; or

(ii) the MAC address encoded as "macAddr48" attribute;

Otherwise, address information of the served UE consisting of:

(i) any IP address information consisting of:

+ the IPv4 address encoded as "ipv4Addr" attribute;

+ the IPv6 address prefix encoded as "ipv6Prefix" attribute; and/or

+ the additional IPv6 address prefixes encoded as "addIpv6Prefixes" attribute; or

(ii) the MAC address encoded as "macAddr48" attribute and/or the additional MAC addresses encoded as "addMacAddrs" attribute;

- PCF address information consisting of:

(i) if the PCF supports the Npcf\_PolicyAuthorization service:

+ the FQDN of the PCF encoded as "pcfFqdn" attribute; and/or

+ a description of IP endpoints at the PCF hosting the Npcf\_PolicyAuthorization service encoded as "pcfIpEndPoints" attribute; and

(ii) if the PCF supports the Rx interface:

+ the Diameter host id of the PCF encoded as "pcfDiamHost"; and

+ the Diameter realm of the PCF and "pcfDiamRealm" attributes;

- DNN encoded as "dnn" attribute; and

- S-NSSAI encoded as "snssai" attribute;

- If the "SamePcf" feature defined in subclause 5.8 is supported and the PCF determines based on operator policies that the same PCF shall be selected for the SM Policy associations:

(i) PCF address information for Npcf\_SMPolicyControl service consisting of:

+ the FQDN of the PCF encoded as "pcfSmFqdn" attribute; or

+ a description of IP endpoints at the PCF hosting the Npcf\_SMPolicyControl service encoded as "pcfSmIpEndPoints" attribute; and

(ii) the parameter combination for selecting the same PCF encoded within the "paraCom" attribute;

and may include:

- SUPI encoded as "supi" attribute;

- GPSI encoded as "gpsi" attribute; and

- IPv4 address domain encoded as "ipDomain" attribute.

Upon the reception of an HTTP POST request with: "{apiRoot}/nbsf-management/v1/pcfBindings" as Resource URI and PcfBinding data structure as request body, the BSF shall:

- create new binding information;

- assign a bindingId; and

- store the binding information.

The PCF as NF service consumer may provide PCF Id in "pcfId" attribute and recovery timestamp in "recoveryTime" attribute. The BSF may use the "pcfId" attribute to supervise the status of the PCF as described in subclause 5.2 of 3GPP TS 29.510 [12] and perform necessary cleanup upon status change of the PCF later, and/or both the "pcfId" attribute and the "recoveryTime" attribute in cleanup procedure as described in subclause 6.4 of 3GPP TS 23.527 [17].

If the BSF created an "Individual PCF Session Binding" resource, the BSF shall respond with "201 Created" with the message body containing a representation of the created binding information, as shown in figure 4.2.2.2.2-1, step 2. The BSF shall include a Location HTTP header field. The Location header field shall contain the URI of the created binding information i.e. "{apiRoot}/nbsf-management/v1/pcfBindings/{bindingId}".

If errors occur when processing the HTTP POST request, the PCF shall apply error handling procedures as specified in subclause 5.7.

If the "SamePcf" feature defined in subclause 5.8 is supported, and if the "paraCom" attribute is included in the HTTP POST meesage and the BSF checks there is an existing PCF binding information for the indicated combination within the "paraCom" attribute, the BSF shall reject the request with an HTTP "403 Forbidden" status code and include the ExtProblemDetails data structure within the response. Within the ExtProblemDetails data structure, the BSF shall include the FQDN of the existing PCF hosting the Npcf\_SMPolicyControl service within the "pcfSmFqdn" attribute and/or the description of IP endpoints at the existing PCF hosting the Npcf\_SMPolicyControl service within the "pcfSmIpEndPoints" attribute of BindingResp data structure and the "cause" attribute of the ProblemDetails data structure set to "EXISTING\_BINDING\_INFO\_FOUND".

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

### 5.6.1 General

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

Table 5.6.1-1 specifies the data types defined for the Nbsf service based interface protocol.

Table 5.6.1-1: Nbsf specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| BindingResp | 5.6.2.6 | Contains the binding information. | SamePcf |
| ParameterCombination | 5.6.2.4 | The combination used by the BSF to check whether there is an existing PCF binding information. | SamePcf |
| ExtProblemDetails | 5.6.2.5 | Contains the PCF instance identifier and cause value if there is an existing PCF binding information for the indicated combination. | SamePcf |
| PcfBinding | 5.6.2.2 | Identifies an Individual PCF binding. |  |
| PcfBindingPatch | 5.6.2.3 | Identifies an Individual PCF binding used for Patch method. | BindingUpdate |

Table 5.6.1-2 specifies data types re-used by the Nbsf 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 Nbsf service based interface.

Table 5.6.1-2: Nbsf re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| DateTime | 3GPP TS 29.571 [10] |  |  |
| DiameterIdentity | 3GPP TS 29.571 [10] |  |  |
| Dnn | 3GPP TS 29.571 [10] |  |  |
| Fqdn | 3GPP TS 29.510 [12] |  |  |
| Gpsi | 3GPP TS 29.571 [10] |  |  |
| IpEndPoint | 3GPP TS 29.510 [12] |  |  |
| Ipv4Addr | 3GPP TS 29.571 [10] |  |  |
| Ipv4AddrRm | 3GPP TS 29.571 [10] |  |  |
| Ipv6Prefix | 3GPP TS 29.571 [10] |  |  |
| Ipv6PrefixRm | 3GPP TS 29.571 [10] |  |  |
| MacAddr48 | 3GPP TS 29.571 [10] |  |  |
| NfInstanceId | 3GPP TS 29.571 [10] |  |  |
| ProblemDetails | 3GPP TS 29.571 [10] | Used in error responses to provide more detailed information about an error. |  |
| Snssai | 3GPP TS 29.571 [10] |  |  |
| Supi | 3GPP TS 29.571 [10] |  |  |
| SupportedFeatures | 3GPP TS 29.571 [10] | Used to negotiate the applicability of the optional features defined in table 5.8-1. |  |

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

#### 5.6.2.2 Type PcfBinding

Table 5.6.2.2-1: Definition of type PcfBinding

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| Supi | Supi | O | 0..1 | Subscription Permanent Identifier  |  |
| Gpsi | Gpsi | O | 0..1 | Generic Public Subscription Identifier |  |
| ipv4Addr | Ipv4Addr | C | 0..1 | The IPv4 Address of the served UE. (NOTE 4) |  |
| ipv6Prefix | Ipv6Prefix | C | 0..1 | The IPv6 Address Prefix of the served UE. (NOTE 4) (NOTE 5) |  |
| addIpv6Prefixes | array(Ipv6Prefix) | O | 1..N | The additional IPv6 Address Prefixes of the served UE. (NOTE 4) (NOTE 5) | MultiUeAddr |
| ipDomain | string | O | 0..1 | IPv4 address domain identifier. (NOTE 1) |  |
| macAddr48 | MacAddr48 | C | 0..1 | The MAC Address of the served UE.  |  |
| addMacAddrs | array(MacAddr48) | O | 1..N | The additional MAC Addresses of the served UE.  | MultiUeAddr |
| Dnn | Dnn | M | 1 | DNN  |  |
| pcfFqdn | Fqdn | C | 0..1 | FQDN of the PCF hosting the Npcf\_PolicyAuthorization service. (NOTE 2) |  |
| pcfIpEndPoints | array(IpEndPoint) | C | 1..N | IP end points of the PCF hosting the Npcf\_PolicyAuthorization service. (NOTE 2) |  |
| pcfDiamHost | DiameterIdentity | C | 0..1 | The diameter host for an individual PCF. (NOTE 3)  |  |
| pcfDiamRealm | DiameterIdentity | C | 0..1 | The diameter realm for an individual PCF. (NOTE 3)  |  |
| pcfSmFqdn | Fqdn | O | 0..1 | FQDN of the PCF hosting the Npcf\_SMPolicyControl service. (NOTE x) | SamePcf |
| pcfSmIpEndPoints | array(IpEndPoint) | O | 1..N | IP end points of the PCF hosting the Npcf\_SMPolicControl service. (NOTE x) | SamePcf |
| Snssai | Snssai | M | 1 | The identification of slice. |  |
| suppFeat | SupportedFeatures | O | 1 | Used to negotiate the supported optional features as described in subclause 5.8. |  |
| pcfId | NfInstanceId | O | 0..1 | PCF instance identifier |  |
| recoveryTime | DateTime | O | 0..1 | Recovery time of the PCF |  |
| paraCom | ParameterCombination | O | 0..1 | If it is included, the BSF shall check whether there is an existing PCF binding information for the indicated combination. (NOTE 6) | SamePcf |
| NOTE 1: The ipDomain attribute may only be provided if the ipv4Addr attribute is present.NOTE 2: At least one of pcfFqdn or pcfIpEndPoints shall be included if the PCF supports the Npcf\_PolicyAuthorization service.NOTE 3: Both pcfDiamHost and pcfDiamRealm are provided if the PCF supports Rx interface. NOTE 4: 5G-RG and FN-RG replaces UE for wireline access support. See 3GPP TS 23.316 [19].NOTE 5: An IPv6 prefix shorter than /64 or a full IPv6 address with a /128 prefix may be encoded as the "ipv6Prefix" attribute, according to 3GPP TS 23.316 [19], subclause 8.3.1.NOTE 6: If the BSF checks that there is an existing PCF binding information for the indicated combination, the BSF shall reject the ongoing registration and return the PCF instance identifier of the existing PCF binding information to the requesting PCF.NOTE x: Either the "pcfSmFqdn" attribute or the "pcfSmIpEndPoints" attribute shall be included if the "SamePcf" feature is supported and the PCF determines that the same PCF shall be selected for the SM Policy associations to the parameter combination in the non-roaming or home-routed scenario based on operator's policies and configuration. |

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

#### 5.6.2.4 Type ParameterCombination

Table 5.6.2.4-1: Definition of type ParameterCombination

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| supi | Supi | O | 0..1 | Subscription Permanent Identifier  |  |
| dnn | Dnn | O | 0..1 | DNN  |  |
| snssai | Snssai | O | 0..1 | The identification of slice. |  |
| NOTE: At least one of the attributes in this table shall be included. |

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

#### 5.6.2.6 Type BindingResp

Table 5.6.2.6-1: Definition of type BindingResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| pcfSmFqdn | Fqdn | O | 0..1 | FQDN of the PCF hosting the Npcf\_SMPolicyControl service. (NOTE) |  |
| pcfSmIpEndPoints | array(IpEndPoint) | O | 1..N | IP end points of the PCF hosting the Npcf\_SMPolicControl service. (NOTE) |  |
| NOTE: Either of the "pcfSmFqdn" attribute or the "pcfSmIpEndPoints" attribute shall be included. |

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

# A.2 Nbsf\_Management API

openapi: 3.0.0

info:

 version: 1.1.0.alpha-3

 title: Nbsf\_Management

 description: |

 Binding Support Management Service API.

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externalDocs:

 description: 3GPP TS 29.521 V16.2.0; 5G System; Binding Support Management Service.

 url: 'http://www.3gpp.org/ftp/Specs/archive/29\_series/29.521/'

servers:

 - url: '{apiRoot}/nbsf-management/v1'

 variables:

 apiRoot:

 default: https://example.com

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

security:

 - {}

 - oAuth2ClientCredentials:

 - nbsf-management

paths:

 /pcfBindings:

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: The creation of an individual PCF session binding.

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: 'Contains the URI of the newly created resource, according to the structure: {apiRoot}/nbsf-management/v1/pcfBindings/{bindingId}'

 required: true

 schema:

 type: string

 '400':

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

 '401':

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

 '403':

 description: The existing PCF binding information stored in the BSF for the indicated combination is returned.

 content:

 application/json:

 schema:

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 get:

 parameters:

 - name: ipv4Addr

 in: query

 description: The IPv4 Address of the served UE.

 required: false

 schema:

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

 - name: ipv6Prefix

 in: query

 description: The IPv6 Address of the served UE. The NF service consumer shall append '/128' to the IPv6 address in the attribute value. E.g. '2001:db8:85a3::8a2e:370:7334/128'.

 required: false

 schema:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

 - name: macAddr48

 in: query

 description: The MAC Address of the served UE.

 required: false

 schema:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

 - name: dnn

 in: query

 description: DNN.

 required: false

 schema:

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

 - name: supi

 in: query

 description: Subscription Permanent Identifier.

 required: false

 schema:

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

 - name: gpsi

 in: query

 description: Generic Public Subscription Identifier

 required: false

 schema:

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

 - name: snssai

 in: query

 description: The identification of slice.

 required: false

 content:

 application/json:

 schema:

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

 - name: ipDomain

 in: query

 description: The IPv4 address domain identifier.

 required: false

 schema:

 type: string

 - name: supp-feat

 in: query

 description: To filter irrelevant responses related to unsupported features

 schema:

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

 responses:

 '200':

 description: The individual PCF session binding session binding information resource matching the query parameter(s) is returned.

 content:

 application/json:

 schema:

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

 '204':

 description: There is no PCF session binding information matching the query parameter(s).

 '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'

 '414':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/414'

 '429':

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

 '500':

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

 '503':

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

 default:

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

 /pcfBindings/{bindingId}:

 delete:

 parameters:

 - name: bindingId

 in: path

 description: Represents the individual PCF Session Binding.

 required: true

 schema:

 type: string

 responses:

 '204':

 description: No Content. The Individual PCF session binding information resource is deleted.

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 patch:

 parameters:

 - name: bindingId

 in: path

 description: Represents the individual PCF Session Binding.

 required: true

 schema:

 type: string

 requestBody:

 description: Parameters to update the existing session binding

 required: true

 content:

 application/merge-patch+json:

 schema:

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

 responses:

 '200':

 description: OK (Successful update of the session binding)

 content:

 application/json:

 schema:

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 nbsf-management: Access to the Nbsf\_Management API

 schemas:

 PcfBinding:

 type: object

 properties:

 supi:

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

 gpsi:

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

 ipv4Addr:

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

 ipv6Prefix:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

 addIpv6Prefixes:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

 minItems: 1

 description: The additional IPv6 Address Prefixes of the served UE.

 ipDomain:

 type: string

 macAddr48:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

 addMacAddrs:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

 minItems: 1

 description: The additional MAC Addresses of the served UE.

 dnn:

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

 pcfFqdn:

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

 pcfIpEndPoints:

 type: array

 items:

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

 minItems: 1

 description: IP end points of the PCF hosting the Npcf\_PolicyAuthorization service.

 pcfDiamHost:

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

 pcfDiamRealm:

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

 pcfSmFqdn:

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

 pcfSmIpEndPoints:

 type: array

 items:

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

 minItems: 1

 description: IP end points of the PCF hosting the Npcf\_SMPolicyControl service.

 snssai:

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

 suppFeat:

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

 pcfId:

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

 recoveryTime:

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

 paraCom:

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

 required:

 - dnn

 - snssai

 oneOf:

 - anyOf:

 - required: [ipv4Addr]

 - required: [ipv6Prefix]

 - required: [addIpv6Prefixes]

 - anyOf:

 - required: [macAddr48]

 - required: [addMacAddrs]

 anyOf:

 - anyOf:

 - required: [pcfFqdn]

 - required: [pcfIpEndPoints]

 - required: [pcfDiamHost, pcfDiamRealm]

 PcfBindingPatch:

 type: object

 properties:

 ipv4Addr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4AddrRm'

 ipDomain:

 type: string

 nullable: true

 ipv6Prefix:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6PrefixRm'

 addIpv6Prefixes:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Prefix'

 minItems: 1

 description: The additional IPv6 Address Prefixes of the served UE.

 nullable: true

 macAddr48:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48Rm'

 addMacAddrs:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

 minItems: 1

 description: The additional MAC Addresses of the served UE.

 nullable: true

 ParameterCombination:

 type: object

 properties:

 supi:

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

 dnn:

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

 snssai:

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

 ExtProblemDetails:

 allOf:

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

 - $ref: '#/components/schemas/BindingResp'

 BindingResp:

 type: object

 properties:

 pcfSmFqdn:

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

 pcfSmIpEndPoints:

 type: array

 items:

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

 minItems: 1

 description: IP end points of the PCF hosting the Npcf\_SMPolicyControl service.

\*\*\* End of Change \*\*\*