3GPP TS 29.521 V18.3.0 (2023-12)

Technical Specification

3rd Generation Partnership Project;

Technical Specification Group Core Network and Terminals;

5G System; Binding Support Management Service;  
Stage 3

(Release 18)

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# Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

# 1 Scope

The present specification provides the stage 3 definition of the Binding Support Management Service of the 5G System.

The 5G System Architecture is defined in 3GPP TS 23.501 [2]. The stage 2 definition and related procedures for Binding Support Management Service is specified in 3GPP TS 23.502 [3] and 3GPP TS 23.503 [4].

The 5G System stage 3 call flows are provided in 3GPP TS 29.513 [5].

The Technical Realization of the Service Based Architecture and the Principles and Guidelines for Services Definition are specified in 3GPP TS 29.500 [6] and 3GPP TS 29.501 [7].

The Binding Support Management Service is provided by the Binding Support Function (BSF).

# 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 29.513: "5G System; Policy and Charging Control signalling flows and QoS parameter mapping; Stage 3".

[6] 3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[7] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[8] IETF RFC 9113: "HTTP/2".

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

[10] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".

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

[12] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".

[13] IETF RFC 9457: "Problem Details for HTTP APIs".

[14] 3GPP TS 29.213: " Policy and Charging Control signalling flows and Quality of Service (QoS) parameter mapping".

[15] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

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

[17] 3GPP TS 23.527: "5G System; Restoration Procedures".

[18] 3GPP TR 21.900: "Technical Specification Group working methods".

[19] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[20] IETF RFC 7396: "JSON Merge Patch".

[21] 3GPP TS 29.512: "5G System; Session Management Policy Control Service; Stage 3".

# 3 Definitions and abbreviations

## 3.1 Definitions

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

## 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 DDNMF 5G Direct Discovery Name Management Function

5G-RG 5G Residential Gateway

AF Application Function

AM Access and Mobility Management

BSF Binding Support Function

DNN Data Network Name

DRA Diameter Routing Agent

HTTP Hypertext Transfer Protocol

FN-RG Fixed Network Residential Gateway

FQDN Fully Qualified Domain Name

GPSI Generic Public Subscription Identifier

JSON JavaScript Object Notation HTTP Hypertext Transfer Protocol

MAC Media Access Control

MBSF Multicast/Broadcast Service Function

NEF Network Exposure Function

NRF Network Repository Function

NWDAF Network Data Analytics Function

PCF Policy Control Function

SMF Session Management Function

S-NSSAI Single Network Slice Selection Assistance Information

SUPI Subscription Permanent Identifier

TSCTSF Time Sensitive Communication and Time Synchronization Function

UDR Unified Data Repository

# 4 Binding Support Management Service

## 4.1 Service Description

### 4.1.1 Overview

The Binding Support Management Service as defined in 3GPP TS 23.502 [3] and 3GPP TS 23.503 [4], is provided by the Binding Support Function (BSF).

The Nbsf\_Management service is used to provide:

- a PCF for a PDU session binding functionality, which ensures that an AF request for a certain PDU Session reaches the relevant PCF holding that PDU Session information, or ensures that the same PCF is selected for multiple PDU sessions.

- a PCF for an MBS session binding functionality, which ensures that for location-dependent MBS services, an AF request for a certain MBS Session reaches the relevant PCF holding that MBS Session information.

- a PCF for a UE binding functionality, which ensures that an AF request for Access and Mobility related Policy Authorization for a UE reaches the relevant PCF for a UE holding the AM Policy Association.

- Subscription to notification events about a newly registered or deregistered PCF for a UE or PCF for a PDU session.

This service:

- allows NF service consumers to register, update and remove binding information;

- allows NF service consumers to retrieve binding information;

- allows NF service consumers to subscribe to notifications of registration/deregistration events of newly registered or deregistered PCF for a UE or PCF for a PDU session.

### 4.1.2 Service Architecture

The 5G System Architecture is defined in 3GPP TS 23.501 [2]. The Policy and Charging related 5G architecture is also described in 3GPP TS 23.503 [4] and 3GPP TS 29.513 [5].

The Binding Support Management Service (Nbsf\_Management) is exhibited by the Binding Support Function (BSF).

The known consumers of the Nbsf\_Management service are:

- Policy Control Function (PCF)

- Network Exposure Function (NEF)

- Application Function (AF);

- Multicast/Broadcast Service Function (MBSF);

- 5G Direct Discovery Name Management Function (5G DDNMF);

- Network Data Analytics Function (NWDAF); and

- Time Sensitivy Communication and Time Synchronization Function (TSCTSF).

As described in 3GPP TS 23.503 [4], the BSF is a function that can be deployed standalone or as a functionality provided by other network functions, such as PCF, UDR, NRF, SMF.

NOTE 1: The PCF accesses the Nbsf\_Management service at the BSF via an internal interface when it is collocated with BSF.

NOTE 2: The DRA decides to select a BSF based on user IP address range when the DRA has no binding information for the subscriber to get the relevant PCF for a PDU session address. DRA and BSF coexistence is described in 3GPP TS 29.513 [5], Annex A.

NOTE 2: The DRA decides to select a BSF based on user IP address range when the DRA has no binding information for the subscriber to get the relevant PCF for a PDU session address. DRA and BSF coexistence is described in 3GPP TS 29.513 [5], Annex A.



Figure 4.1.2-1: Reference Architecture for the Nbsf\_Management service; SBI representation

NOTE 3: The PCF in the figure represents both, the PCF for a UE and the PCF for a PDU session. The PCF for a UE and the PCF for a PDU session separately and independently register themselves at the BSF, regardless they are deployed in the same NF instance or separately in different NF instances.

### 4.1.3 Network Functions

#### 4.1.3.1 Binding Support Function (BSF)

The BSF:

- stores the binding information for a certain PDU Session;

- stores the binding information for a certain MBS Session;

- stores the binding information for a certain UE;

- enables the subscription to notifications of PCF for a PDU session registration/deregistration events;

- enables the subscription to notifications of PCF for a UE registration/deregistration events;and

- enables the discovery of binding information (e.g. the address information of the selected PCF for a PDU session).

The BSF allows NF service consumers (e.g. PCF) to register, update and remove a binding information, and allows NF service consumers (e.g. AF, NEF, NWDAF) to discover a binding information (e.g. the address information of the selected PCF). The BSF also allows NF service consumers (e.g. PCF for a UE, AF, NEF) to subscribe to notifications of PCF registration/deregistration events.

The BSF can be deployed standalone or collocated with other network functions, such as PCF, UDR, NRF and SMF.

#### 4.1.3.2 NF Service Consumers

The Policy Control Function (PCF):

- The PCF for a PDU session:

a. registers binding information in the BSF for a UE when an IPv4 address and/or IPv6 prefix is allocated, or a MAC address is used for the PDU session;

b. updates binding information in the BSF when a UE address information is changed for the PDU Session; and

c. removes binding information in the BSF when an IPv4 address and/or IPv6 prefix is released, or a MAC address is not used for the PDU Session.

- The PCF for an MBS session:

a. registers binding information in the BSF for an MBS session;

b. updates binding information in the BSF for the MBS session;

c. removes binding information in the BSF for the MBS session.

- The PCF for a UE:

a. registers binding information in the BSF for a UE when an AM/UE Policy Association is established;

b. updates binding information in the BSF when a new PCF instance for a UE is selected;

c. removes binding information in the BSF when the AM/UE Policy Association is terminated; and

d. subscribes with the BSF to notification of registration/deregistration events of the PCF for a PDU session.

The Network Exposure Function (NEF):

- provides means for the Application Functions to securely interact with the Policy framework for policy control to 3GPP network. During the procedure, it needs to discover the selected PCF for a PDU session, the selected PCF for an MBS Session (if applicable) or the selected PCF for a UE by using the Nbsf\_Management\_Discovery service operation and the selected PCF for a UE by using the Nbsf\_Management\_Subscribe/Notify service operations.

The Application Function (AF):

- discovers the selected PCF for a PDU session, the selected PCF for an MBS Session (if applicable) or the selected PCF for a UE by using the Nbsf\_Management\_Discovery service operation and the selected PCF for a UE by using the Nbsf\_Management\_Subscribe/Notify service operations when it is allowed to interact directly with the policy framework for policy control.

The Network Data Analytics Function (NWDAF):

- discovers the selected PCF for a PDU session by using the Nbsf\_Management\_Discovery service operation.

The Time Sensitive Communication and Time Synchronization Function (TSCTSF)

- discovers the selected PCF for a PDU session by using the Nbsf\_Management\_Discovery service operation and the selected PCF for a UE by using Nbsf\_Management\_Subscribe/Notify service operations when it is allowed to interact with the policy framework for time sensitive communication and time synchronization control.

The Multicast/Broadcast Service Function (MBSF):

- discovers the selected PCF for an MBS session by using the Nbsf\_Management\_Discovery service operation.

The 5G Direct Discovery Name Management Function (5G DDNMF):

- handles the discovery of the selected PCF for a UE by using the Nbsf\_Management\_(un)Subscribe/Notify service operations.

## 4.2 Service Operations

### 4.2.1 Introduction

Table 4.2.1-1: Operations of the Nbsf\_Management Service

| Service operation name | Description | Initiated by |
| --- | --- | --- |
| Nbsf\_Management\_Register | This service operation is used to register the binding information for a PDU session or an MBS session or a UE. | NF service consumer (PCF) |
| Nbsf\_Management\_Deregister | This service operation is used to deregister the binding information for a PDU session or an MBS session or a UE. | NF service consumer (PCF) |
| Nbsf\_Management\_Discovery | This service operation is used by an NF service consumer to discover a selected PCF for a PDU session or a selected PCF for an MBS session or a selected PCF for a UE. | NF service consumer (NEF, AF, NWDAF, MBSF, TSCTSF) |
| Nbsf\_Management\_Update | This service operation is used to update an existing binding information for a PDU session or an MBS session or a UE. | NF service consumer (PCF) |
| Nbsf\_Management\_Subscribe | This service operation is used by an NF service consumer to subscribe or to modify a subscription for event notifications of PCF for the UE or PCF for the PDU session binding related events. | NF service consumer (NEF, AF, PCF, TSCTSF, 5G DDNMF) |
| Nbsf\_Management\_Unsubscribe | This service operation is used by an NF service consumer to terminate a previous subscription. | NF service consumer (NEF, AF, PCF, TSCTSF, 5G DDNMF) |
| Nbsf\_Management\_Notify | This service operation is used by the BSF to notify binding related event(s) to the NF service consumer which has subscribed to such event(s). | BSF |

### 4.2.2 Nbsf\_Management\_Register Service Operation

#### 4.2.2.1 General

This service operation allows a NF service consumer (e.g. PCF for a PDU session) to register the session binding information for a UE in the BSF by providing the user identity, the DNN, the UE address(es) and the selected PCF address for a certain PDU Session to the BSF, and BSF stores the information.

If the BindingUpdate feature is not supported and the NF service consumer (e.g. PCF for a PDU session) receives a new UE address (e.g. IPv6 prefix) and has already registered session binding information for this PDU session, the NF service consumer (e.g. PCF for a PDU session) shall register a new session binding information in the BSF.

If the SamePcf feature or the ExtendedSamePcf feature is supported, this service operation allows the NF service consumer (e.g. PCF for a PDU session) to check whether PCF addressing information for Npcf\_SMPolicyControl service is already registered in the BSF by another PCF for a combination of the UE ID, DNN and S-NSSAI parameters of the PDU session.

This service operation also allows a NF service consumer (e.g. PCF for a UE) to register PCF for a UE binding information for a UE in the BSF, by providing to the BSF the user identity and the selected PCF address for a certain UE, and the BSF stores the information.

In addition, this service operation also allows a NF service consumer (e.g. PCF for an MBS session) to register the session binding information for an MBS Session at the BSF, by providing the MBS Session ID, the identifier of the selected PCF for the MBS Session and the related information (e.g. PCF (service) set information), and the BSF stores the information.

The following procedures using the Nbsf\_Management\_Registration service operation are supported:

- Register a new PCF for a PDU Session binding information.

- Register a new PCF for a UE binding information.

- Register a new PCF for an MBS Session binding information.

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



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

The NF service consumer shall invoke the Nbsf\_Management\_Register service operation to register the PDU session binding information for a UE in the BSF. The NF service consumer shall send for this an HTTP POST request with "{apiRoot}/nbsf-management/<apiVersion>/pcfBindings" as Resource URI representing the "PCF for a PDU Session Bindings", as shown in figure 4.2.2.2-1, step 1, to create a binding information for an "Individual PCF for a PDU Session Binding" according to the information (e.g. UE address(es), SUPI, GPSI, DNN, S-NSSAI) in the message body. When the "ExtendedSamePcf" feature is not supported, the "PcfBinding" data structure provided in the request body shall include:

- if the "MultiUeAddr" feature is not supported or 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 /128 IPv6 address, the IPv6 address prefix or an IPv6 prefix shorter than /64 encoded as "ipv6Prefix" attribute; and/or

NOTE 1: IPv6 prefix shorter than /64 are received when IPv6 Prefix Delegation applies, as specified in 3GPP TS 29.512 [21]. The /128 IPv6 address applies to wireline and wireless convergence, as described in 3GPP TS 29.512 [21], clause C.2.1.6.

+ the additional /128 IPv6 addresses, the IPv6 address prefixes or IPv6 prefixes shorter than /64 encoded as "addIpv6Prefixes" attribute; or

NOTE 2: Additional /128 IPv6 addresses and additional IPv6 prefixes shorter than /64 apply for wireline and wireless convergence, as specified in 3GPP TS 29.512 [21], clause C.2.1.6.

(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 encoded as"pcfDiamRealm" attributes;

- DNN encoded as "dnn" attribute;

- S-NSSAI encoded as "snssai" attribute; and

- If the "SamePcf" feature defined in clause 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 parameters combination for selecting the same PCF encoded within the "paraCom" attribute if the PCF registers the binding information for the indicated parameter combination for the first time.

NOTE 3: When the "SamePcf" feature is supported, the PCF omits the "paraCom" attribute when creates the corresponding binding information related to the subsequent PDU sessions for the same parameter combination.

and may include:

- SUPI encoded as "supi" attribute;

- GPSI encoded as "gpsi" attribute;

- IPv4 address domain encoded as "ipDomain" attribute; and

- framed routes consisting of:

(i) one or more framed routes within the "ipv4FrameRouteList" attribute for IPv4; and/or

(ii) one or more framed routes within the "ipv6FrameRouteList" attribute for IPv6.

When the "TimeSensitiveNetworking" feature or the "TimeSensitiveCommunication" feature is supported by the PCF as defined in clause 5.8 of 3GPP TS 29.512 [21], and for Ethernet type of PDU sessions, the address information of the served UE contains the MAC address of the DS-TT port encoded in the "macAddr48" attribute as received by the PCF when the SMF reports the bridge information of the detected TSC user plane node.

NOTE 4: For the integration with time sensitive communication networks using IP type of applications, the address information of the served UE contains the UE IP address of the corresponding PDU session.

When the "ExtendedSamePcf" feature is supported the address information of the served UE may be provided if available, i.e., the "ipv4Addr", the "ipv6Prefix" and/or "addIpv6Prefixes" attributes or the "macAddr48" and/or "addMacAddrs" attributes may be provided if available.

When the "ExtendedSamePcf" feature is supported the PCF address for the Npcf\_PolicyAuthorization and/or Rx interface may be provided if available, i.e., the "pcfFqdn" and/or the "pcfIpEndPoints" attributes, and/or the "pcfDiamHost" and/or the "pcfDiamRealm" attributes may be provided if available.

NOTE 5: Before requesting the BSF to check if there is an existing PCF binding information for the same UE ID, S-NSSAI and DNN combination registered by other PCF(s), the PCF determines whether the BSF supports the "SamePcf" and/or "ExtendedSamePcf" features either via local configuration or by checking the BSF profile retrieved from the NRF as specified in 3GPP TS 29.510 [12].

Upon the reception of an HTTP POST request with: "{apiRoot}/nbsf-management/<apiVersion>/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 clause 5.2 of 3GPP TS 29.510 [12] and perform necessary clean up upon status change of the PCF later, and/or both the "pcfId" attribute and the "recoveryTime" attribute in clean up procedure as described in clause 6.4 of 3GPP TS 23.527 [17].

The PCF as a NF service consumer may provide PCF Set Id within the "pcfSetId" attribute and "bindLevel" attribute set to NF\_SET or provide PCF Set Id within the "pcfSetId" attribute, PCF instance Id within the "pcfId" attribute and "bindLevel" attribute set to NF\_INSTANCE.

If the BSF created an "Individual PCF for a PDU Session Binding" resource, the BSF shall respond with "201 Created" status code with the message body containing a representation of the created binding information, as shown in figure 4.2.2.2-1, step 2. The BSF shall include a Location HTTP header field containing the URI of the created binding information, i.e. "{apiRoot}/nbsf-management/<apiVersion>/pcfBindings/{bindingId}".

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

If the "SamePcf" feature defined in clause 5.8 is supported and the "paraCom" attribute is included in the HTTP POST message, the BSF shall check the received "paraCom" attribute. If the BSF detects that there is an existing PCF binding information including the same "dnn", "snssai" and "supi" attribute values as each of the corresponding attribute values within the "paraCom" attribute, the BSF shall reject the request with an HTTP "403 Forbidden" status code and shall include in the response the "ExtProblemDetails" data structure including the FQDN of the existing PCF hosting the Npcf\_SMPolicyControl service within the "pcfSmFqdn" attribute 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".

#### 4.2.2.3 Register a new PCF for a UE binding information



Figure 4.2.2.3-1: NF service consumer registers a new PCF for a UE binding information

The NF service consumer shall invoke the Nbsf\_Management\_Register service operation to register the PCF for a UE binding information in the BSF. The NF service consumer shall send for this an HTTP POST request with "{apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings" as Resource URI representing the "PCF for a UE Bindings", as shown in figure 4.2.2.3-1, step 1, to create a binding information for an "Individual PCF for a UE Binding" according to the information in the message body.

The "PcfForUeBinding" data structure included in the request message body shall include:

- SUPI encoded as "supi" attribute; and

- if the PCF supports the Npcf\_AMPolicyAuthorization service, the Npcf\_AMPolicyAuthorization service address information consisting of:

a. the FQDN of the PCF encoded as "pcfForUeFqdn" attribute; and/or

b. a description of IP endpoints at the PCF hosting the Npcf\_AMPolicyAuthorization service encoded as "pcfForUeIpEndPoints" attribute;

NOTE: In this release of the specification the PCF for a UE registering the binding information in the BSF supports the Npcf\_AMPolicyAuthorization service.

and may include:

- GPSI encoded as "gpsi" attribute;

- PCF instance Id in "pcfId" attribute;

- the PCF Set identifier in the "pcfSetId" attribute; and

- the binding level in the "bindLevel" attribute.

Upon the reception of an HTTP POST request with: "{apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings" as Resource URI and "PcfForUeBinding" data structure as request body, the BSF shall:

- create new binding information;

- assign a bindingId; and

- store the binding information.

The PCF as a NF service consumer may provide information about the PCF Set and the binding level of subsequent request to the same or different PCF instances for the Npcf\_AMPolicyControl service. The PCF may provide the PCF Set Id within the "pcfSetId" attribute and "bindLevel" attribute set to NF\_SET, or may provide the PCF Set Id within the "pcfSetId" attribute, PCF instance Id within the "pcfId" attribute and "bindLevel" attribute set to NF\_INSTANCE.

If the BSF created an "Individual PCF for a UE Binding" resource, the BSF shall respond with "201 Created" status code with the message body containing a representation of the created binding information, as shown in figure 4.2.2.3-1, step 2. The BSF shall include a Location HTTP header field containing the URI of the created binding information, i.e. "{apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings/{bindingId}".

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

#### 4.2.2.4 Register a new PCF for an MBS Session binding information



Figure 4.2.2.4-1: PCF for an MBS Session Binding information Registration procedure

1. The NF service consumer (e.g. PCF for an MBS Session) shall invoke the Nbsf\_Management\_Register service operation to register a new PCF for an MBS Session binding at the BSF. The NF service consumer shall send for this purpose an HTTP POST request targeting the "PCF for an MBS Session Bindings" resource URI, i.e. "{apiRoot}/nbsf-management/<apiVersion>/pcf-mbs-bindings", with the request body containing the PcfMbsBinding data structure that shall include:

- the identifier of the MBS Session to which the MBS Session binding is related, within the "mbsSessionId" attribute;

- the FQDN of the PCF handling the MBS Session, if available, within the "pcfFqdn" attribute; and

- the IP end point(s) of the PCF handling the MBS Session, if available, within the "pcfIpEndPoints" attribute;

and may include:

- the identifier of the PCF instance handling the concerned MBS Session, within the "pcfId" attribute;

- the identifier of the PCF set to which the PCF instance handling the concerned MBS Session belongs, within the "pcfSetId" attribute;

- the level of binding of the PCF handling the concerned MBS Session, within the "bindLevel" attribute; and

- the recovery timestamp of the NF service consumer (e.g. PCF for an MBS Session), within the "recoveryTime" attribute.

If the NF service consumer (e.g. PCF for an MBS Session) provides the PCF instance ID within the "pcfId" attribute, and optionally the recovery timestamp within "recoveryTime" attribute, the BSF may use this information to carry out the clean-up procedures defined in subclause 6.4 of 3GPP TS 23.527 [17], if necessary.

2. Upon successful processing of the received HTTP POST request, the BSF shall check if there is an existing MBS Session Binding information with the same "mbsSessionId" attribute value. If it is the case, the the BSF shall reject the request with an HTTP "403 Forbidden" status code with the response body containing the MbsExtProblemDetails data structure that shall include the FQDN of the existing PCF within the "pcfFqdn" attribute or the description of the IP endpoints of the existing PCF within the "pcfIpEndPoints" attribute of the MbsBindingResp data structure, and the "cause" attribute of the ProblemDetails data structure set to "EXISTING\_BINDING\_INFO\_FOUND".

If there is not existing MBS Session Binding information for the provided "mbsSessionId" attribute, the BSF shall create a new "Individual PCF for an MBS Session Binding" resource to store the requested PCF for an MBS Session binding. The BSF shall then respond to the NF service consumer with an HTTP "201 Created" status code including an HTTP Location header field containing the URI of the created "Individual PCF for an MBS Session Binding" resource, and the response body containing a representation of the created resource within the PcfMbsBinding data structure.

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

### 4.2.3 Nbsf\_Management\_Deregister Service Operation

#### 4.2.3.1 General

This service operation allows the NF service consumer to delete existing PCF for a PDU session binding information for a UE at the BSF. It is executed by deleting the corresponding "Individual PCF for a PDU Session Binding" resource. The operation is invoked by issuing an HTTP DELETE request targeting the resource URI representing the specific PCF for a PDU session binding information that is to be deleted.

This service operation also allows the NF service consumer to delete existing PCF for a UE binding information for a UE at the BSF. It is executed by deleting the corresponding "Individual PCF for a UE Binding" resource. The operation is invoked by issuing an HTTP DELETE request targeting the resource URI representing the specific PCF for a UE binding information that is to be deleted.

This service operation also allows the NF service consumer to delete existing PCF for an MBS Session binding information for an MBS Session at the BSF. It is executed by deleting the corresponding "Individual PCF for an MBS Session Binding" resource. The operation is invoked by issuing an HTTP DELETE request targeting the resource URI representing the specific PCF for an MBS Session binding information that is to be deleted.

The following procedures using the Nbsf\_Management\_Deregistration service operation are supported:

- Deregister an individual PCF for a PDU Session binding information.

- Deregister an individual PCF for a UE binding information.

- Deregister an individual PCF for an MBS Session binding information.

#### 4.2.3.2 Deregister an individual PCF for a PDU Session binding information



Figure 4.2.3.2-1: PCF for a PDU Session Binding Information Deregistration

The NF service consumer shall invoke the Nbsf\_Management\_Deregister service operation to deregister the PCF for a PDU session binding information for a UE in the BSF. The NF service consumer shall send an HTTP DELETE request with "{apiRoot}/nbsf-management/<apiVersion>/pcfBindings/{bindingId}" as Resource URI, where "{bindingId}" is the "Individual PCF for a PDU Session Binding" resource identifier that is to be deleted, as shown in figure 4.2.3.2-1, step 1.

Upon the reception of an HTTP DELETE request with: "{apiRoot}/nbsf-management/<apiVersion>/pcfBindings/{bindingId}" as Resource URI, the BSF shall:

- remove the corresponding binding information.

If the HTTP DELETE request message from the NF service consumer is accepted, the BSF shall respond with "204 No Content" status code, as shown in figure 4.2.3.2-1, step 2.

If errors occur when processing the HTTP DELETE request, the BSF shall send an HTTP error response as specified in clause 5.7.

If the Individual PCF for a PDU Session Binding resource does not exist, the BSF shall respond with "404 Not Found" error code.

If the feature "ES3XX" is supported, and the BSF determines the received HTTP DELETE request needs to be redirected, the BSF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [6].

#### 4.2.3.3 Deregister an individual PCF for a UE binding information



Figure 4.2.3.3-1: PCF for a UE Binding Information Deregistration

The NF service consumer shall invoke the Nbsf\_Management\_Deregister service operation to deregister the session binding information for a UE in the BSF. The NF service consumer shall send an HTTP DELETE request with "{apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings/{bindingId}" as Resource URI, where "{bindingId}" is the "Individual PCF for a UE Binding" resource identifier that is to be deleted, as shown in figure 4.2.3.3-1, step 1.

Upon the reception of an HTTP DELETE request with: "{apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings/{bindingId}" as Resource URI, the BSF shall:

- remove the corresponding binding information.

If the HTTP DELETE request message from the NF service consumer is accepted, the BSF shall respond with "204 No Content" status code, as shown in figure 4.2.3.3-1, step 2.

If errors occur when processing the HTTP DELETE request, the BSF shall send an HTTP error response as specified in clause 5.7.

If the Individual PCF for a UE Binding resource does not exist, the BSF shall respond with "404 Not Found" error code.

If the BSF determines the received HTTP DELETE request needs to be redirected, the BSF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [6].

#### 4.2.3.4 Deregister an individual PCF for an MBS Session binding information



Figure 4.2.3.4-1: PCF for an MBS Session Binding information Deregistration procedure

1. The NF service consumer shall invoke the Nbsf\_Management\_Deregister service operation to deregister an existing PCF for an MBS Session Binding at the BSF. The NF service consumer shall send for this purpose an HTTP DELETE request targeting the URI of the concerned "Individual PCF for an MBS Session Binding" resource, i.e. "{apiRoot}/nbsf-management/<apiVersion>/pcf-mbs-bindings/{bindingId}".

2. Upon success, the BSF shall delete the concerned "Individual PCF for an MBS Session Binding" resource and respond to the NF service consumer with an HTTP "204 No Content" status code.

If errors occur when processing the HTTP DELETE request, the BSF shall apply the error handling procedures specified in subclause 5.7.

If the BSF determines the received HTTP DELETE request needs to be redirected, the BSF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [6].

If the "Individual PCF for an MBS Session Binding" resource does not exist, the BSF shall respond with "404 Not Found" error code.

### 4.2.4 Nbsf\_Management\_Discovery Service Operation

#### 4.2.4.1 General

This service operation allows the service consumer to use the HTTP GET method to obtain the address information of the selected PCF.

- Retrieve the PCF binding information for a PDU session.

- Retrieve the PCF binding information for a UE.

- Retrieve the PCF binding information for an MBS Session.

#### 4.2.4.2 Retrieve the PCF binding information for a PDU session



Figure 4.2.4.2-1: NF service consumer retrieve the PCF binding information for a PDU session

The NF service consumer shall invoke the Nbsf\_Management\_Discovery service operation to obtain address information of the selected PCF for a PDU session in the BSF. The NF service consumer shall send an HTTP GET request with "{apiRoot}/nbsf-management/<apiVersion>/pcfBindings" as Resource URI, and "query parameters" that shall include:

- UE address;

and may include:

- SUPI or GPSI;

- DNN and optionally S-NSSAI; and

- IPv4 address domain.

NOTE 1: The query parameters S-NSSAI and/or IPv4 address domain are helpful in the scenario of IPv4 address overlapping where the same IPv4 address may be allocated to UE PDU sessions.

Upon the reception of an HTTP GET request with: "{apiRoot}/nbsf-management/<apiVersion>/pcfBindings" as Resource URI, the BSF shall search the corresponding binding information.

If "ipv6Prefix" is used as an UE IPv6 address in the query parameters, the BSF shall use the longest prefix match to find a matching IPv6 prefix so that the IPv6 address in the query parameters is within the address range covered by that matching IPv6 prefix.

NOTE 2: The matching is done by comparing the /128 IPv6 address of the query parameter with the IPv6 prefix of the PDU session. The management of the IPv6 prefix of the PDU session is specified in 3GPP TS 29.512 [9], clause 4.2.8, and the differences and additions in wireline and wireless convergence scenarios specified in 3GPP TS 23.512 [9], clause C.2.1.6. For IPv6 prefix delegation, the IPv6 network prefix of the PDU session is shorter than /64.

The IPv6 address in the query parameters shall be formatted as an IPv6 prefix value including the trailing prefix length "/128". If the framed routes exist in the binding information, the BSF shall use framed routes to match the UE address in the query parameters.

If the HTTP request message from the NF service consumer is accepted and a session binding resource matching the query parameters exists, the BSF shall reply with an HTTP "200 OK" response, as shown in figure 4.2.4.2-1, step 2, containing the corresponding "PcfBinding" data structure, as provided by the PCF during the Nbsf\_Management\_Register Service Operation, in the response body containing PCF addressing information, and if available, the related PCF Set Id and PCF instance Id. If there is no PCF binding information for a PDU session matching the query parameters, the BSF shall respond with an HTTP "204 No Content".

NOTE 3: The NF service consumer (such as the AF or NEF) uses the PCF binding information as described in 3GPP TS 29.513 [5] clause 8.4.2 (see bullets d) and e) in that clause). If the NF service consumer (such as the AF or NEF) is not able to reach the received PCF address(es), the NF service consumer can use the PCF Set Id and the PCF instance Id as specified in 3GPP TS 29.513 [5] clause 8.4.2.

If the "PCF for a PDU Session Bindings" resource does not exist, the BSF shall respond with "404 Not Found" HTTP error code. If an invalid combination of query parameters (i.e. a combination without UE address) is contained in the request URI, the BSF shall respond with an HTTP "400 Bad Request" error code containing "MANDATORY\_QUERY\_PARAM\_MISSING" as application error within the ProblemDetails IE. If more than one Individual PCF for a PDU Session Binding resources are found, the BSF shall respond with an HTTP "400 Bad Request" error code containing "MULTIPLE\_BINDING\_INFO\_FOUND" as application error within the ProblemDetails IE.

#### 4.2.4.3 Retrieve the PCF binding information for a UE



Figure 4.2.4.3-1: NF service consumer retrieve the PCF binding information for a UE

The NF service consumer shall invoke the Nbsf\_Management\_Discovery service operation to obtain address information of the selected PCF for a UE in the BSF. The NF service consumer shall send an HTTP GET request with "{apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings" as Resource URI, and "query parameters" that shall include:

- SUPI and/or GPSI;

Upon the reception of an HTTP GET request with: "{apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings" as Resource URI, the BSF shall search the corresponding binding information.

If the HTTP request message from the NF service consumer is accepted and a binding resource matching the query parameters exists, the BSF shall reply with an HTTP "200 OK" response, as shown in figure 4.2.4.3-1, step 2, containing the corresponding "PcfForUeBinding" data structure(s), as provided by the PCF during the Nbsf\_Management\_Register Service Operation, in the response body containing PCF addressing information, and if available, the related PCF Set Id and PCF instance Id. If there is no PCF binding information for a UE matching the query parameters, the BSF shall respond with an HTTP "200 OK" response with an empty array (i.e. "[ ]" in JSON).

NOTE: If the NF service consumer (such as the AF or NEF) is not able to reach the received PCF address(es), the NF service consumer can use the PCF Set Id and the PCF instance Id as specified in 3GPP TS 29.513 [5] clause 6.2.

If the "PCF for a UE Bindings" resource does not exist, the BSF shall respond with a "404 Not Found" HTTP error code.

#### 4.2.4.4 Retrieve the PCF binding information for an MBS Session



Figure 4.2.4.4-1: PCF for an MBS Session Binding Retrieval procedure

1. The NF service consumer (e.g. NEF, MBSF, AF) shall invoke the Nbsf\_Management\_Discovery service operation to obtain from the BSF the addressing information of the selected PCF for an MBS Session. The NF service consumer shall send for this purpose an HTTP GET request targeting the "PCF for an MBS Session Bindings" resource URI, i.e. "{apiRoot}/nbsf-management/<apiVersion>/pcf-mbs-bindings", which shall include the following query parameters:

- the identifier of the MBS Session to which the requested MBS Session binding is related, within the "mbs-session-id" query parameter; and

2. Upon reception of the HTTP GET request with: "{apiRoot}/nbsf-management/<apiVersion>/pcf-mbs-bindings" as Resource URI, the BSF shall search the corresponding binding information. Then,

- if the HTTP GET request from the NF service consumer is accepted and a corresponding "Individual PCF for an MBS Session Binding" resource matching the provided query parameters exists, the BSF shall respond with an HTTP "200 OK" response, as shown in figure 4.2.4.4-1, step 2, containing the corresponding "PcfMbsBinding" data structure, as provided by the PCF during the Nbsf\_Management\_Register Service Operation, in the response body containing PCF addressing information, and if available, the related PCF Set Id and PCF instance Id; and

- if there is no PCF binding information for an MBS Session matching the received query parameters, the BSF shall respond with an HTTP "200 OK" response with an empty array (i.e. "[ ]" in JSON).

NOTE: If the NF service consumer (such as the AF, NEF or MBSF) is not able to reach the received PCF address(es), the NF service consumer can use the PCF Set Id and the PCF instance Id as specified in subclause 8.6 of 3GPP TS 29.513 [5].

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

If an invalid combination of query parameters (i.e. a combination without MBS Session Id) is contained in the request URI, the BSF shall respond with an HTTP "400 Bad Request" error code containing "MANDATORY\_QUERY\_PARAM\_MISSING" as application error within the ProblemDetails IE. If more than one Individual PCF for an MBS Session Binding resources are found, the BSF shall respond with an HTTP "400 Bad Request" error code containing "MULTIPLE\_BINDING\_INFO\_FOUND" as application error within the ProblemDetails IE.

If the "PCF for an MBS Session Bindings" resource does not exist, the BSF shall respond with a "404 Not Found" HTTP error code.

### 4.2.5 Nbsf\_Management\_Update Service Operation

#### 4.2.5.1 General

This service operation allows the NF service consumer to update an existing PCF for a PDU session binding information for a UE in the BSF by providing the information to be updated (e.g. the UE address(es)), and the BSF updates the PDU session binding information.

This service operation also allows the NF service consumer to update an existing PCF for a UE binding information for a UE in the BSF by providing the information to be updated (e.g. PCF instance, and related PCF address), and the BSF updates the UE binding information.

This service operation also allows the NF service consumer to update existing PCF for an MBS Session binding information for an MBS Session at the BSF by providing the information to be updated (e.g. PCF instance, PCF addresses), and the BSF update the MBS session binding information.

The following procedures using the Nbsf\_Management\_Update service operation are supported:

- Update an existing PCF for a PDU Session binding information.

- Update an existing PCF for a UE binding information.

- Update an existing PCF for an MBS Session binding information.

#### 4.2.5.2 Update an existing PCF for a PDU Session binding information



Figure 4.2.5.2-1: NF service consumer update an existing PCF for a PDU Session binding information

If the feature "BindingUpdate" is supported, the NF service consumer shall invoke the Nbsf\_Management\_Update service operation to update PCF for a PDU the session binding information for a UE in the BSF. The NF service consumer shall send an HTTP PATCH request with "{apiRoot}/nbsf-management/<apiVersion>/pcfBindings/{bindingId}" as Resource URI, where "{bindingId}" is the "Individual PCF for a PDU Session Binding" resource identifier that is to be updated, as shown in figure 4.2.5.2-1, step 1. The "PcfBindingPatch" data structure provided in the request body shall contain the information to be updated as follows.

The "PcfBindingPatch" data structure:

- for the IP address information of the served UE:

a) shall contain the "ipv4Addr" attribute if the IPv4 address is modified, or if the "ExtendedSamePcf" feature is supported, if the IPv4 address was not previously provided, and may contain the "ipDomain" attribute if the IPv4 address domain is modified or if the "ExtendedSamePcf" feature is supported, if the IPv4 address domain was not previously provided and applies. To remove the IPv4 address the "ipv4Addr" attribute shall be set to "null" and if applicable, the "ipDomain" attribute shall be set to "null"; and/or

b) shall contain the "ipv6Prefix" attribute if the IPv6 address information is modified, or if the "ExtendedSamePcf" feature is supported, if the IPv6 address information was not previously provided. The "ipv6Prefix" attribute shall be set to "null" if the IPv6 address information is removed; and/or

c) if the "MultiUeAddr" feature is supported, shall contain:

1) the "addIpv6Prefixes" attribute containing the new complete list of additional IPv6 Address Prefixes if the additional IPv6 address information is modified, or if the "ExtendedSamePcf" feature is supported, the current list of IPv6 address prefixes if it was not previously provided; or

2) the "addIpv6Prefixes" attribute set to "null" if all additional IPv6 Address Prefixes are removed; or

- for the MAC address information of the served UE:

a) shall contain the "macAddr48" attribute if the MAC address is modified, or if the "ExtendedSamePcf" feature is supported, if the MAC address was not previously provided. The "macAddr48" attribute shall be set to "null" if the MAC address is removed; and/or

b) if the "MultiUeAddr" feature is supported, shall contain:

1) the "addMacAddrs" attribute containing the new complete list of additional MAC addresses if the additional MAC address information is modified, or if the "ExtendedSamePcf" feature is supported, the current list of MAC address(es) if it was not previously provided; or

2) the "addMacAddrs" attribute set to "null" if all additional MAC addresses are removed; or

- for the PCF instance and the associated PCF address information of the PCF holding the SM policy association, should contain if a new PCF instance is selected:

a) the PCF instance ID encoded as "pcfId" attribute;

b) if the PCF supports the Npcf\_PolicyAuthorization service:

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

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

c) if the PCF supports the Rx interface:

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

2) the Diameter realm of the PCF and "pcfDiamRealm" attributes; and/or

- for the S-NSSAI of the PDU session, if the S-NSSAI has been replaced:

a) shall contain the "snssai" attribute containing the alternate S-NSSAI used to replace the existing S-NSSAI if the "NetSliceRepl" feature is supported.

If the BSF cannot successfully fulfil the received HTTP PATCH request due to the internal BSF error or due to the error in the HTTP PATCH request, the BSF shall send the HTTP error response as specified in clause 5.7.

Otherwise, upon the reception of the HTTP PATCH request with: "{apiRoot}/nbsf-management/<apiVersion>/pcfBindings/{bindingId}" as Resource URI and the "PcfBindingPatch" data structure as request body, the BSF shall update the binding information.

If the BSF successfully updated an "Individual PCF for a PDU Session Binding" resource, the BSF shall respond with "200 OK" status code with the message body containing the resource representation with the updated PCF for a PDU session binding information in the "PcfBinding" data structure, as shown in figure 4.2.5.2-1, step 2.

If errors occur when processing the HTTP PATCH request, the BSF shall send an HTTP error response as specified in clause 5.7.

If the feature "ES3XX" is supported, and the BSF determines the received HTTP PATCH request needs to be redirected, the BSF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [6].

#### 4.2.5.3 Update an existing PCF for a UE binding information



Figure 4.2.5.3-1: NF service consumer update an existing PCF for a UE binding information

The NF service consumer shall invoke the Nbsf\_Management\_Update service operation to update the PCF for a UE binding information for a UE in the BSF. The NF service consumer shall send an HTTP PATCH request with "{apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings/{bindingId}" as Resource URI, where "{bindingId}" is the "Individual PCF for a UE Binding" resource identifier that is to be updated, as shown in figure 4.2.5.3-1, step 1. The "PcfForUeBindingPatch" data structure provided in the request body shall contain the information to be updated as follows.

The "PcfForUeBindingPatch" data structure, for the PCF instance and the associated PCF address information of the PCF holding the AM policy association, shall contain if a new PCF instance is selected:

a) the PCF instance ID encoded as "pcfId" attribute; and

b) if the PCF supports the Npcf\_AMPolicyAuthorization service, the Npcf\_AMPolicyAuthorization service address information consisting of:

1) the FQDN of the PCF encoded as "pcfForUeFqdn" attribute; and/or

2) a description of IP endpoints at the PCF hosting the Npcf\_AMPolicyAuthorization service encoded as "pcfForUeIpEndPoints" attribute.

NOTE: In this release of the specification the PCF for a UE registering the binding information in the BSF supports the Npcf\_AMPolicyAuthorization service.

If the BSF cannot successfully fulfill the received HTTP PATCH request due to the internal BSF error or due to the error in the HTTP PATCH request, the BSF shall send the HTTP error response as specified in clause 5.7.

Otherwise, upon the reception of the HTTP PATCH request with: "{apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings/{bindingId}" as Resource URI and the "PcfForUeBindingPatch" data structure as request body, the BSF shall update the binding information.

If the BSF successfully updated an "Individual PCF for a UE Binding" resource, the BSF shall respond with "200 OK" status code with the message body containing the resource representation with the updated PCF for a UEbinding information in the "PcfForUeBinding" data structure, as shown in figure 4.2.5.3-1, step 2.

If the BSF determines the received HTTP PATCH request needs to be redirected, the BSF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [6].

#### 4.2.5.4 Update an existing PCF for an MBS Session binding information



Figure 4.2.5.4-1: NF service consumer updates an existing PCF for an MBS Session binding information

1. The NF service consumer (e.g. PCF handling the MBS Session) shall invoke the Nbsf\_Management\_Update service operation to request the modification of an existing PCF for an MBS Session binding information for an MBS Session at the BSF. The NF service consumer shall send for this purpose an HTTP PATCH request targeting the URI of the concerned "Individual PCF for an MBS Session Binding" resource, i.e. "{apiRoot}/nbsf-management/<apiVersion>/pcf-mbs-bindings/{bindingId}", with the request body containing the PcfMbsBindingPatch data structure including the requested modifications.

2. Upon successful modification of the PCF for an MBS Session binding, the BSF shall respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual PCF for an MBS Session Binding" resource wihin the PcfMbsBinding data structure; or

- an HTTP "204 No Content" status code.

If errors occur when processing the HTTP PATCH request, the BSF shall apply the error handling procedures specified in subclause 5.7.

If the BSF determines the received HTTP PATCH request needs to be redirected, the BSF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [6].

### 4.2.6 Nbsf\_Management\_Subscribe Service Operation

#### 4.2.6.1 General

This service operation is used by an NF service consumer to subscribe to the notifications of registration/deregistration events for the PCF for a PDU Session or PCF for a UE.

The following procedures using the Nbsf\_Management\_Subscribe service operation are supported:

- Creating a new subscription;

- Modifying an existing subscription.

#### 4.2.6.2 Creating a new subscription

Figure 4.2.6.2-1 illustrates the creation of a subscription.



Figure 4.2.6.2-1: Creation of a subscription

To subscribe to event notifications, the NF service consumer shall send an HTTP POST request with: "{apiRoot}/nbsf-management/<apiVersion>/subscriptions" as Resource URI and the BsfSubscription data structure as request body that shall include:

- an URI where to receive the requested notifications within the "notifUri" attribute;

- a Notification Correlation Identifier provided by the NF service consumer for the requested notifications within the "notifCorreId" attribute;

- identification of the events to subscribe as "events" attribute;

- the SUPI within the "supi" attribute;

- if the NF service consumer subscribes to event notifications of newly registered and deregistered PCF for a PDU session, the "events" attribute indicating "PCF\_PDU\_SESSION\_BINDING\_REGISTRATION"/"PCF\_PDU\_SESSION\_BINDING\_DEREGISTRATION" and/or subscribes to the event notifications of binding registration of the first PDU session and deregistration of the last PDU session for a S-NSSAI and DNN combination indicating "SNSSAI\_DNN\_BINDING\_REGISTRATION"/"SNSSAI\_DNN\_BINDING\_DEREGISTRATION" respectively, and one DNN and S-NSSAI pair to which the subscription applies within the "snssaiDnnPairs" attribute and, when the subscription applies to more than one DNN and S-NSSAI, the list of the remaining DNN and S-NSSAI pairs to which the subscription applies within the "addSnssaiDnnPairs" attribute, which includes the DNN within the "dnn" attribute and the S-NSSAI within the "snssai" attribute;

NOTE 1: When the subscribed event is SNSSAI\_DNN\_BINDING\_REGISTRATION and SNSSAI\_DNN\_BINDING\_DEREGISTRATION, only the status of the binding for the concerned S-NSSAI and DNN combination is reported, i.e., it is not needed to report the complete binding related information, but only an indication of registration or deregistration event.

- if the NF service consumer subscribes to event notifications of newly registered and deregistered PCF for a UE, the "events" attribute indicating "PCF\_UE\_BINDING\_REGISTRATION"/"PCF\_UE\_BINDING\_DEREGISTRATION".

The BsfSubscription data structure as request body may also include:

- the GPSI within the "gpsi" attribute.

If the BSF cannot successfully fulfil the received HTTP POST request due to an internal BSF error or an error in the HTTP POST request, the PCF shall send an HTTP error response as specified in clause 5.7.

Upon successful reception of the HTTP POST request with "{apiRoot}/nbsf-management/<apiVersion>/subscriptions" as request URI and "BsfSubscription" data structure as request body, the BSF shall create a new "Individual Binding Subscription" resource, store the subscription and send a HTTP "201 Created" response as shown in figure 4.2.6.2-1, step 2. The BSF shall include in the "201 Created" response:

- a Location header field; and

- a "BsfSubscriptionResp" data type in the content.

The Location header field shall contain the URI of the created individual application session context resource i.e., "{apiRoot}/nbsf-management/<apiVersion>/subscriptions/{subId}".

The "BsfSubscriptionResp" data type shall contain:

- the representation of the created "Individual Binding Subscription" resource within the "BsfSubscription" data type; and

- when the BSF already has available the requested information at the time of the event subscription request, the related notification information within the "BsfNotification" data type as specified in clause 4.2.8.2.

The subscription to any event lasts till the NF service consumer terminates it as described in subsclause 4.2.7.2. For every subscribed event, the continuous reporting notification method shall apply.

#### 4.2.6.3 Modifying an existing subscription

Figure 4.2.6.3-1 illustrates the modification of an existing subscription.



Figure 4.2.6.3-1: Modification of an existing subscription

To modify an existing subscription to event notifications, the NF service consumer shall send an HTTP PUT request with: "{apiRoot}/nbsf-management/<apiVersion>/subscriptions/{subId}" as Resource URI, where "{subId}" is the subscription correlation ID of the existing subscription, and BsfSubscription data structure as request body as described in clause 4.2.6.2.

NOTE 1: The "notifUri" attribute within the BsfSubscription data structure can be modified to request that subsequent notifications are sent to a new NF service consumer.

NOTE 2: This service operation does not allow the unsubscription of all subscribed events. The unsubscription of all subscribed events is described in clause 4.2.7.2.

Upon the reception of an HTTP PUT request with: "{apiRoot}/nbsf-management/<apiVersion>/subscriptions/{subId}" as Resource URI and BsfSubscription data structure as request body, if the received HTTP request is successfully processed and accepted, the BSF shall:

- update the concerned subscription; and

- send an HTTP "200 OK" response with a response body containing a representation of the updated subscription in the BsfSubscriptionResp data structure or send an HTTP "204 No Content".

If errors occur when processing the HTTP PUT request, the BSF shall send an HTTP error response as specified in clause 5.7.

If the BSF determines the received HTTP PUT request needs to be redirected, the BSF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [5].

### 4.2.7 Nbsf\_Management\_Unsubscribe Service Operation

#### 4.2.7.1 General

This service operation is used by an NF service consumer to unsubscribe from event notifications.

The following procedure using the Nbsf\_Management\_Unsubscribe service operation is supported:

- Unsubscription from event notifications.

#### 4.2.7.2 Unsubscription from event notifications

Figure 4.2.7.2-1 illustrates the unsubscription from event notifications.



Figure 4.2.7.2-1: Unsubscription from event notifications

To unsubscribe from all event(s) notifications, the NF service consumer shall send an HTTP DELETE request with: "{apiRoot}/nbsf-management/<apiVersion>/subscriptions/{subId}" as Resource URI, where "{subId}" is the subscription correlation ID of the existing subscription that is to be deleted.

Upon the reception of the HTTP DELETE request with: "{apiRoot}/nbsf-management/<apiVersion>/subscriptions/{subId}" as Resource URI, if the received HTTP request is successfully processed and accepted, the BSF shall:

- remove the corresponding subscription; and

- send an HTTP "204 No Content" response.

If errors occur when processing the HTTP DELETE request, the BSF shall send an HTTP error response as specified in clause 5.7.

If the BSF determines the received HTTP DELETE request needs to be redirected, the BSF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [5].

### 4.2.8 Nbsf\_Management\_Notify Service Operation

#### 4.2.8.1 General

The Nbsf\_Management\_Notify service operation enables the BSF to send notifications to NF service consumers upon the occurrence of a previously subscribed event.

The following procedure using the Nbsf\_Management\_Notify service operation is supported:

- Notification about subscribed events.

#### 4.2.8.2 Notification about subscribed events

The present "notification about subscribed events" procedure is performed by the BSF when any of the subscribed events occur.

Figure 4.2.8.2-1 illustrates the notification about subscribed events.



Figure 4.2.8.2-1: Notification about subscribed events

If the BSF observes event(s) for which an NF service consumer has subscribed, the BSF shall send an HTTP POST request as shown in figure 4.2.8.2-1, step 1, with the "{notifUri}" as request URI containing the value previously provided by the NF service consumer within the corresponding subscription, and the BsfNotification data structure.

The BsfNotification data structure shall include:

- the notification correlation ID provided by the NF service consumer during the subscription within "notifCorreId" attribute;

- the list of the reported events within the "eventNotifs" attribute. For each reported event, the BsfEventNotification data type shall include the event identifier and may include additional event information.

Within each instance of BsfEventNotification data type, the BSF shall include:

- When a subscription to "PCF\_PDU\_SESSION\_BINDING\_REGISTRATION" and "PCF\_PDU\_SESSION\_BINDING\_DEREGISTRATION" exists:

a. When the BSF detects the registration of a PCF for a PDU session for a DNN and S-NSSAI, SUPI, and GPSI, if available, matching one of the DNN, S-NSSAI pairs, the SUPI and the GPSI, if available, provided during subscription, the BSF shall set the "event" attribute to "PCF\_PDU\_SESSION\_BINDING\_REGISTRATION" and shall include the "pcfForPduSessInfos" with the binding information of the detected PDU session.

b. When the BSF detects the deregistration of a PCF for a PDU session for a DNN and S-NSSAI, SUPI, and GPSI, if available, matching one of the DNN, S-NSSAI pairs, the SUPI and the GPSI, if available, provided during subscription, the BSF shall set the "event" attribute to "PCF\_PDU\_SESSION\_BINDING\_DEREGISTRATION" and shall include the "pcfForPduSessInfos" with the binding information of the removed PDU session.

- When a subscription to "PCF\_UE\_BINDING\_REGISTRATION" and "PCF\_UE\_BINDING\_DEREGISTRATION"exists:

a. When the BSF detects the registration of a PCF for a UE for a SUPI and, if available, GPSI matching the SUPI and, if available, GPSI provided during subscription, the BSF shall set the "event" attribute to "PCF\_UE\_BINDING\_REGISTRATION" and shall include the "pcfForUeInfo" with the binding information of the detected UE.

b. When the BSF detects the deregistration of a PCF for a UE for a SUPI and, if available, GPSI matching the SUPI and, if available, GPSI provided during subscription, the BSF shall set the "event" attribute to "PCF\_UE\_BINDING\_DEREGISTRATION" and shall include the "pcfForUeInfo" with the binding information of the removed UE.

- When a subscription to "SNSSAI\_DNN\_BINDING\_REGISTRATION" and "SNSSAI\_DNN\_BINDING\_DEREGISTRATION"exists:

a. When the BSF detects the registration of PCF for a PDU session for a DNN and S-NSSAI, SUPI, and GPSI, if available, matching one of the DNN, S-NSSAI pairs, the SUPI and the GPSI, if available, provided during subscription, and this is the first PDU session for the DNN and S-NSSAI, SUPI, and GPSI, if available, combination, the BSF shall set the "event" attribute to "SNSSAI\_DNN\_BINDING\_REGISTRATION" and the "matchSnssaiDnns" attribute with the matching S-NSSAI and DNN pairs.

b. When the BSF detects the deregistration of PCF for a PDU session for a DNN and S-NSSAI, SUPI, and GPSI, if available, matching one of the DNN, S-NSSAI pairs, the SUPI and the GPSI, if available, provided during subscription, and this is the last PDU session for the DNN and S-NSSAI, SUPI, and GPSI, if available, combination, the BSF shall set the "event" attribute to "SNSSAI\_DNN\_BINDING\_DEREGISTRATION" and the removed S-NSSAI and DNN combinations within the "matchSnssaiDnns" attribute.

If the HTTP POST request from the BSF is accepted, the NF service consumer shall acknowledge the receipt of the event notification with a "204 No Content" response to HTTP POST request, as shown in figure 4.2.8.2-1, step 2.

If the HTTP POST request from the BSF is not accepted, the NF service consumer shall indicate in the response to HTTP POST request the cause for the rejection as specified in clause 5.7. If 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].

# 5 Nbsf\_Management Service API

## 5.1 Introduction

The Nbsf\_Management Service shall use the Nbsf\_Management API.

The API URI of the Nbsf\_Management API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests from the NF service consumer towards the BSF shall have the Resource URI structure defined in clause 4.4.1 of 3GPP TS 29.501 [7], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificResourceUriPart>**

with the following components:

- The {apiRoot} shall be set as described in 3GPP TS 29.501 [7].

- The <apiName> shall be "nbsf-management".

- The <apiVersion> shall be "v1".

- The <apiSpecificResourceUriPart> shall be set as described in clause 5.3.

## 5.2 Usage of HTTP

### 5.2.1 General

HTTP/2, IETF RFC 9113 [8], shall be used as specified in clause 5 of 3GPP TS 29.500 [6].

HTTP/2 shall be transported as specified in clause 5.3 of 3GPP TS 29.500 [6].

The OpenAPI [11] specification of HTTP messages and content bodies for the Nbsf\_Management is contained in Annex A.

### 5.2.2 HTTP standard headers

#### 5.2.2.1 General

See clause 5.2.2 of 3GPP TS 29.500 [6] for the usage of HTTP standard headers.

#### 5.2.2.2 Content type

JSON, IETF RFC 8259 [9], shall be used as content type of the HTTP bodies specified in the present specification as specified in clause 5.4 of 3GPP TS 29.500 [6]. The use of the JSON format shall be signalled by the content type "application/json".

"Problem Details" JSON object shall be used to indicate additional details of the error in a HTTP response body and shall be signalled by the content type "application/problem+json", as defined in IETF RFC 9457 [13].

JSON object used in the HTTP PATCH request shall be encoded according to "JSON Merge Patch" and shall be signalled by the content type "application/merge-patch+json", as defined in IETF RFC 7396 [20].

### 5.2.3 HTTP custom headers

#### 5.2.3.1 General

The Nbsf\_Management Service API shall support the mandatory HTTP custom header fields specified in clause 5.2.3.2 of 3GPP TS 29.500 [6] and may support the optional HTTP custom header fields specified in clause 5.2.3.3 of 3GPP TS 29.500 [6].

In this release of the specification, no specific custom headers are defined for the Nbsf\_Management Service API.

## 5.3 Resources

### 5.3.1 Resource Structure

This clause describes the structure for the Resource URIs, the resources and methods used for the service.

The structure of the Resource URI of the Nbsf\_Management service is shown in figure 5.3.1-1.



Figure 5.3.1-1: Resource URI structure of the Nbsf\_Management API

Table 5.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 5.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| PCF for a PDU Session Bindings | /pcfBindings  (NOTE) | POST | Register a new PCF for a PDU Session binding information of a given UE address in the BSF. |
| GET | Retrieve the PCF for a PDU Session binding information i.e. PCF address information of a given tuple (UE address, SUPI; GPSI, DNN, S-NSSAI). |
| Individual PCF for a PDU Session Binding | /pcfBindings /{bindingId}  (NOTE) | DELETE | Deregister an existing PCF for a PDU Session binding information from the BSF. |
| PATCH | Update an existing PCF for a PDU Session binding information in the BSF. |
| PCF for a UE Bindings | /pcf-ue-bindings | POST | Register a new PCF for a UE binding information of a given UE identity in the BSF. |
| GET | Retrieve the PCF for a UE binding information i.e. PCF address information of a UE. |
| Individual PCF for a UE Binding | pcf-ue-bindings /{bindingId} | DELETE | Deregister an existing PCF for a UE binding information from the BSF. |
| PATCH | Update an existing PCF for a UE binding information in the BSF. |
| PCF for an MBS Session Bindings | /pcf-mbs-bindings | POST | Register a new PCF for an MBS Session Binding. |
| GET | Retrieve PCF for an MBS Session Binding information. |
| Individual PCF for an MBS Session Binding | /pcf-mbs-bindings/{bindingId} | PATCH | Modify an existing PCF for an MBS Session Binding. |
| DELETE | Deregister an existing PCF for an MBS Session Binding. |
| Binding Subscriptions | /subscriptions | POST | Create a new Individual Binding Subscription resource. |
| Individual Binding Subscription | /subscriptions /{subId} | PUT | Modify an existing Individual Binding Subscription resource. |
| DELETE | Delete an Individual Binding Subscription resource and cancel the related subscription. |
| NOTE: The path segment does not follow the related naming convention defined in 3GPP TS 29.501 [7]. The path segment is kept though as defined in the current specification for backward compatibility considerations. | | | |

### 5.3.2 Resource: PCF for a PDU Session Bindings

#### 5.3.2.1 Description

This resource represents a collection of the different PCF for a PDU Session binding information of given UE address(es) registered in the BSF.

#### 5.3.2.2 Resource definition

Resource URI: {apiRoot}/nbsf-management/<apiVersion>/pcfBindings

The <apiVersion> shall be set as described in clause 5.1.

This resource shall support the resource URI variables defined in table 5.3.2.2-1.

Table 5.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.1 |

#### 5.3.2.3 Resource Standard Methods

##### 5.3.2.3.1 POST

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

Table 5.3.2.3.1-1: URI query parameters supported by the POST method on this resource

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

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

Table 5.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PcfBinding | M | 1 | Register a new Individual PCF for a PDU Session binding information. |

Table 5.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| PcfBinding | M | 1 | 201 Created | The creation of an individual PCF for a PDU Session binding. |
| ExtProblemDetails | O | 0..1 | 403 Forbidden | The existing PCF binding information stored in the BSF for the indicated combination is returned. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply. | | | | |

Table 5.3.2.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/nbsf-management/<apiVersion>/pcfBindings/{bindingId} |

##### 5.3.2.3.2 GET

This method shall support the URI query parameters specified in table 5.3.2.3.2-1.

Table 5.3.2.3.2-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| ipv4Addr  (NOTE 7) | Ipv4Addr | C | 0..1 | The IPv4 Address of the served UE. (NOTE 1) (NOTE 3) (NOTE 4) |
| ipv6Prefix  (NOTE 7) | Ipv6Prefix | C | 0..1 | The IPv6 Address of the served UE. (NOTE 1) (NOTE 3) (NOTE 4)  The NF service consumer shall append '/128' to the IPv6 address in the attribute value. E.g. '2001:db8:85a3::8a2e:370:7334/128'. |
| macAddr48  (NOTE 7) | MacAddr48 | C | 0..1 | The MAC Address of the served UE. (NOTE 1) |
| dnn | Dnn | O | 0..1 | Data Network Name, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only.  (NOTE 6) |
| supi | Supi | O | 0..1 | Subscription Permanent Identifier |
| gpsi | Gpsi | O | 0..1 | Generic Public Subscription Identifier |
| snssai | Snssai | O | 0..1 | The identification of slice. (NOTE 2) |
| ipDomain  (NOTE 7) | string | O | 0..1 | The IPv4 address domain identifier. (NOTE 2) |
| supp-feat | SupportedFeatures | O | 0..1 | To filter irrelevant responses related to unsupported features. (NOTE 5) |
| NOTE 1: One and only one of query parameter ipv4Addr, ipv6Prefix or macAddr48 shall be present.  NOTE 2: The query parameters snssai and/or ipDomain, if applicable (IPv4 address overlapping), shall be present with query parameter ipv4Addr.  NOTE 3: 5G-RG and FN-RG replaces UE for wireline access support. See 3GPP TS 23.316 [19].  NOTE 4: The ipv4Addr and ipv6Prefix query parameters may include the IP address of devices in networks behind the UE (see clauses 5.6.14 and 5.8.2.2 of 3GPP TS 23.501 [2] and clause 4.6.2.3 of 3GPP TS 23.316 [19]).  NOTE 5: This query parameter may be present when there are supported features that apply to the retrieval of the "Individual PCF for a PDU Session Binding" resource as defined in clause 4.2.4.2. Otherwise, it shall be omitted.  NOTE 6: The BSF uses the DNN as received from the NF service consumer without applying any transformation. To successfully perform DNN matching, in a specific deployment a DNN shall always be encoded either with the full DNN (e.g., because there are multiple Operator Identifiers for a Network Identifier) or the DNN Network Identifier only. The NF service consumer may include the DNN Operator Identifier based on local configuration.  NOTE 7: The query parameter does not follow the related naming convention (i.e. "lower-with-hyphen") defined in clause 5.1.3.3 of 3GPP TS 29.501 [7]. This query parameter is however kept as currently defined in this specification for backward compatibility considerations. | | | | |

This method shall support the request data structures specified in table 5.3.2.3.2-2 and the response data structures and response codes specified in table 5.3.2.3.2-3.

Table 5.3.2.3.2-2: Data structures supported by the GET Request Body on this resource

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

Table 5.3.2.3.2-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| PcfBinding | M | 1 | 200 OK | The individual PCF for a PDU Session binding information resource matching the query parameter(s) is returned. |
| n/a |  |  | 204 No Content | There is no PCF for a PDU Session binding information matching the query parameter(s). |
| ProblemDetails | O | 0..1 | 400 Bad Request | More than one binding information is found. (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the GET method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply.  NOTE 2: Failure cases are described in clause 5.7. | | | | |

### 5.3.3 Resource: Individual PCF for a PDU Session Binding

#### 5.3.3.1 Description

This resource represents an individual PCF for a PDU Session binding information of a given UE address(es) registered in the BSF.

#### 5.3.3.2 Resource definition

Resource URI: **{apiRoot}/nbsf-management/<apiVersion>/pcfBindings/{bindingId}**

The <apiVersion> shall be set as described in clause 5.1.

This resource shall support the resource URI variables defined in table 5.3.3.2-1.

Table 5.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.1 |
| bindingId | string | Represents the individual PCF for a PDU Session Binding.  To enable that the value is used as part of a URI, the string shall only contain characters allowed according to the "lower-with-hyphen" naming convention defined in 3GPP TS 29.501 [7]. |

#### 5.3.3.3 Resource Standard Methods

##### 5.3.3.3.1 DELETE

This method shall support the URI query parameters specified in table 5.3.3.3.1-1.

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

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

This method shall support the request data structures specified in table 5.3.3.3.1-2 and the response data structures and response codes specified in table 5.3.3.3.1-3.

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

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

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case: The Individual PCF for a PDU Session binding information resource is deleted. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual PCF for a PDU Session Binding deletion.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual PCF for a PDU Session Binding deletion.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [6]). | | | | |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

Table 5.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

##### 5.3.3.3.2 PATCH

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

Table 5.3.3.3.2-1: URI query parameters supported by the PATCH method on this resource

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

This method shall support the request data structures specified in table 5.3.3.3.2-2 and the response data structures and response codes specified in table 5.3.3.3.2-3.

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

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PcfBindingPatch | M | 1 | Update an individual PCF binding information. |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| PcfBinding | M | 1 | 200 OK | Successful case: The Individual PCF for a PDU Session binding information resource is updated. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual PCF for a PDU Session Binding modification.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual PCF for a PDU Session Binding modification.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the PATCH method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [6]). | | | | |

Table 5.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

Table 5.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

### 5.3.4 Resource: Binding Subscriptions

#### 5.3.4.1 Description

The Binding Subscriptions resource represents the collection of subscriptions to events in the Nbsf\_Management service.

#### 5.3.4.2 Resource definition

Resource URI: {apiRoot}/nbsf-management/<apiVersion>/subscriptions

The <apiVersion> shall be set as described in clause 5.1.

This resource shall support the resource URI variables defined in table 5.3.4.2-1.

Table 5.3.4.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.1 |

#### 5.3.4.3 Resource Standard Methods

##### 5.3.4.3.1 POST

This method shall support the URI query parameters specified in table 5.3.4.3.1-1.

Table 5.3.4.3.1-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 5.3.4.3.1-2 and the response data structures and response codes specified in table 5.3.4.3.1-3.

Table 5.3.4.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| BsfSubscription | M | 1 | Create a new Individual binding Subscription resource. |

Table 5.3.4.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| BsfSubscriptionResp | M | 1 | 201 Created | The creation of an Individual Binding Subscription resource is confirmed. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] also apply. | | | | |

Table 5.3.4.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/nbsf-management/<apiVersion>/subscriptions/{subId} |

#### 5.3.4.4 Resource Custom Operations

None.

### 5.3.5 Resource: Individual Binding Subscription

#### 5.3.5.1 Description

The Individual Binding Subscription resource represents a single subscription to the event notification in the service.

#### 5.3.5.2 Resource definition

Resource URI: {apiRoot}/nbsf-management/<apiVersion>/subscriptions/{subId}

The <apiVersion> shall be set as described in clause 5.1.

This resource shall support the resource URI variables defined in table 5.3.5.2-1.

Table 5.3.5.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.1 |
| subId | string | Identifies a subscription to event notification. |

#### 5.3.5.3 Resource Standard Methods

##### 5.3.5.3.1 PUT

This method shall support the URI query parameters specified in table 5.3.5.3.1-1.

Table 5.3.5.3.1-1: URI query parameters supported by the PUT method on this resource

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

This method shall support the request data structures specified in table 5.3.5.3.1-2 and the response data structures and response codes specified in table 5.3.5.3.1-3.

Table 5.3.5.3.1-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| BsfSubscription | M | 1 | Modify the existing Individual Binding Subscription resource matching the subId according to the representation in the BsfSubscription. |

Table 5.3.5.3.1-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Data type | P | | Cardinality | | Response codes | | Description | |
| BsfSubscriptionResp | M | | 1 | | 200 OK | | Successful case: The Individual Binding Subscription resource matching the subId was modified and a representation is returned. | |
| n/a |  | |  | | 204 No Content | | Successful case: The Individual Binding Subscription resource matching the subId was modified. | |
| RedirectResponse | | O | | 0..1 | | 307 Temporary Redirect | | Temporary redirection, during Individual Binding Subscription modification.  (NOTE 2) | |
| RedirectResponse | | O | | 0..1 | | 308 Permanent Redirect | | Permanent redirection, during Individual Binding Subscription modification.  (NOTE 2) | |
| NOTE 1: The mandatory HTTP error status codes for the PUT method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [6]). | | | | | | | | |

Table 5.3.5.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

Table 5.3.5.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

##### 5.3.5.3.2 DELETE

This method shall support the URI query parameters specified in table 5.3.5.3.2-1.

Table 5.3.5.3.2-1: URI query parameters supported by the DELETE method on this resource

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

This method shall support the request data structures specified in table 5.3.5.3.2-2 and the response data structures and response codes specified in table 5.3.5.3.2-3.

Table 5.3.5.3.2-2: Data structures supported by the DELETE Request Body on this resource

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

Table 5.3.5.3.2-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description | |
| n/a |  |  | 204 No Content | Successful case: The Individual Binding Subscription resource matching the subId was deleted. | |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | | Temporary redirection, during Individual PCF for a PDU Session Binding deletion.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) | |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | | Permanent redirection, during Individual PCF for a PDU Session Binding deletion.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) | |
| NOTE 1: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [6]). | | | | | |

Table 5.3.5.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

Table 5.3.5.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

#### 5.3.5.4 Resource Custom Operations

None.

### 5.3.6 Void

### 5.3.7 Resource: PCF for a UE Bindings

#### 5.3.7.1 Description

This resource represents a collection of the different PCF for a UE binding information of given UE identifier (i.e., SUPI) registered in the BSF.

#### 5.3.7.2 Resource definition

Resource URI: {apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings

The <apiVersion> shall be set as described in clause 5.1.

This resource shall support the resource URI variables defined in table 5.3.7.2-1.

Table 5.3.7.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.1 |

#### 5.3.7.3 Resource Standard Methods

##### 5.3.7.3.1 POST

This method shall support the URI query parameters specified in table 5.3.7.3.1-1.

Table 5.3.7.3.1-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 5.3.7.3.1-2 and the response data structures and response codes specified in table 5.3.7.3.1-3.

Table 5.3.7.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PcfForUeBinding | M | 1 | Register a new Individual PCF for a UE Binding information. |

Table 5.3.7.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| PcfForUeBinding | M | 1 | 201 Created | The creation of an individual PCF for a UE Binding. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply. | | | | |

Table 5.3.7.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings/{bindingId} |

##### 5.3.7.3.2 GET

This method shall support the URI query parameters specified in table 5.3.7.3.2-1.

Table 5.3.7.3.2-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| supi | Supi | O | 0..1 | Subscription Permanent Identifier. (NOTE 1) |
| gpsi | Gpsi | O | 0..1 | Generic Public Subscription Identifier. (NOTE 1) |
| supp-feat | SupportedFeatures | O | 0..1 | To filter irrelevant responses related to unsupported features. (NOTE 2) |
| NOTE 1: At least one parameter shall be present.  NOTE 2: This query parameter may be present when there are supported features that apply to the retrieval of the "Individual PCF for a UE Binding" resource as defined in clause 4.2.4.3. Otherwise, it shall be omitted. | | | | |

This method shall support the request data structures specified in table 5.3.7.3.2-2 and the response data structures and response codes specified in table 5.3.7.3.2-3.

Table 5.3.7.3.2-2: Data structures supported by the GET Request Body on this resource

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

Table 5.3.7.3.2-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| array(PcfForUeBinding) | M | 0..N | 200 OK | The individual PCF for a UE binding resource(s) matching the query parameter(s) are returned. |
| NOTE: The mandatory HTTP error status codes for the GET method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply. | | | | |

### 5.3.8 Resource: Individual PCF for a UE Binding

#### 5.3.8.1 Description

This resource represents an individual PCF for a UE binding information of given UE identifier (i.e SUPI) registered in the BSF.

#### 5.3.8.2 Resource definition

Resource URI: **{apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings/{bindingId}**

The <apiVersion> shall be set as described in clause 5.1.

This resource shall support the resource URI variables defined in table 5.3.8.2-1.

Table 5.3.8.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 5.1 |
| bindingId | string | Represents the individual PCF for a UE Binding.  To enable that the value is used as part of a URI, the string shall only contain characters allowed according to the "lower-with-hyphen" naming convention defined in 3GPP TS 29.501 [7]. |

#### 5.3.8.3 Resource Standard Methods

##### 5.3.8.3.1 DELETE

This method shall support the URI query parameters specified in table 5.3.8.3.1-1.

Table 5.3.8.3.1-1: URI query parameters supported by the DELETE method on this resource

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

This method shall support the request data structures specified in table 5.3.8.3.1-2 and the response data structures and response codes specified in table 5.3.8.3.1-3.

Table 5.3.8.3.1-2: Data structures supported by the DELETE Request Body on this resource

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

Table 5.3.8.3.1-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case: The Individual PCF for a UE Binding information resource is deleted. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual PCF for a UE Binding deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative BSF (service) instance. |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual PCF for a UE Binding deletion. The response shall include a Location header field containing an alternative URI of the resource located in an alternative BSF (service) instance. |
| NOTE: The mandatory HTTP error status codes for the DELETE method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply. | | | | |

Table 5.3.8.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative BSF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the request is redirected. |

Table 5.3.8.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative BSF (service) instance. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the request is redirected. |

##### 5.3.8.3.2 PATCH

This method shall support the URI query parameters specified in table 5.3.8.3.2-1.

Table 5.3.8.3.2-1: URI query parameters supported by the PATCH method on this resource

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

This method shall support the request data structures specified in table 5.3.8.3.2-2 and the response data structures and response codes specified in table 5.3.8.3.2-3.

Table 5.3.8.3.2-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PcfForUeBindingPatch | M | 1 | Update an individual PCF for a UE binding information. |

Table 5.3.8.3.2-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| PcfForUeBinding | M | 1 | 200 OK | Successful case: The Individual PCF for a UE binding information resource is updated. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual PCF for a PDU Session Binding modification.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual PCF for a PDU Session Binding modification.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the PATCH method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [6]). | | | | |

Table 5.3.8.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

Table 5.3.8.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

### 5.3.9 Resource: PCF for an MBS Session Bindings

#### 5.3.9.1 Description

This resource represents the collection of PCF for an MBS Session Bindings registered at the BSF.

#### 5.3.9.2 Resource definition

Resource URI: **{apiRoot}/nbsf-management/<apiVersion>/pcf-mbs-bindings**

The <apiVersion> shall be set as described in clause 5.1.

This resource shall support the resource URI variables defined in table 5.3.9.2-1.

Table 5.3.9.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.1. |

#### 5.3.9.3 Resource Standard Methods

##### 5.3.9.3.1 POST

This method shall support the URI query parameters specified in table 5.3.9.3.1-1.

Table 5.3.9.3.1-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 5.3.9.3.1-2 and the response data structures and response codes specified in table 5.3.9.3.1-3.

Table 5.3.9.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PcfMbsBinding | M | 1 | Contains the parameters to request to register a new PCF for an MBS Session Binding. |

Table 5.3.9.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| PcfMbsBinding | M | 1 | 201 Created | Successful case. A new "Individual PCF for an MBS Session Binding" resource is created and the corresponding URI is returned in an HTTP Location header. |
| MbsExtProblemDetails | O | 0..1 | 403 Forbidden | The existing PCF binding information stored in the BSF for the MBS session shall be returned within the MbsExtProblemDetails data structure.  (NOTE 2) |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply.  NOTE 2: Failure cases are described in clause 5.7. | | | | |

Table 5.3.9.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/nbsf-management/<apiVersion>/pcf-mbs-bindings/{bindingId} |

##### 5.3.9.3.2 GET

This method shall support the URI query parameters specified in table 5.3.9.3.2-1.

Table 5.3.9.3.2-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| mbs-session-id | MbsSessionId | M | 1 | Contains the identifier of the MBS Session to which the requested MBS Session binding is related. |
| supp-feat | SupportedFeatures | C | 0..1 | Contains the list of features supported by the NF service consumer and used to filter irrelevant responses related to unsupported features.  This query parameter shall be included if feature negocation needs to take place. |

This method shall support the request data structures specified in table 5.3.9.3.2-2 and the response data structures and response codes specified in table 5.3.9.3.2-3.

Table 5.3.9.3.2-2: Data structures supported by the GET Request Body on this resource

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

Table 5.3.9.3.2-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| array(PcfMbsBinding)  (NOTE 2) | M | 0..N | 200 OK | Successful case. The "Individual PCF for an MBS Session Binding" resource matching the provided query parameter(s) is returned. |
| ProblemDetails | O | 0..1 | 400 Bad Request | More than one binding information matching the provided query parameter(s) is found.  (NOTE 3) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply.  NOTE 2: In this release of the specification, only a single element shall be provided within the array.  NOTE 3: Failure cases are described in clause 5.7. | | | | |

#### 5.3.9.4 Resource Custom Operations

None.

### 5.3.10 Resource: Individual PCF for an MBS Session Binding

#### 5.3.10.1 Description

This resource represents an "Individual PCF for an MBS Session Binding" registered at the BSF.

#### 5.3.10.2 Resource definition

Resource URI: **{apiRoot}/nbsf-management/<apiVersion>/pcf-mbs-bindings/{bindingId}**

The <apiVersion> shall be set as described in clause 5.1.

This resource shall support the resource URI variables defined in table 5.3.10.2-1.

Table 5.3.10.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.1. |
| bindingId | string | Represents the identifier of the "Individual PCF for an MBS Session Binding" resource.  To enable that the value is used as part of a URI, the string shall only contain characters allowed according to the "lower-with-hyphen" naming convention defined in 3GPP TS 29.501 [7]. |

#### 5.3.10.3 Resource Standard Methods

##### 5.3.10.3.1 PATCH

This method shall support the URI query parameters specified in table 5.3.10.3.1-1.

Table 5.3.10.3.1-1: URI query parameters supported by the PATCH method on this resource

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

This method shall support the request data structures specified in table 5.3.10.3.1-2 and the response data structures and response codes specified in table 5.3.10.3.1-3.

Table 5.3.10.3.1-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PcfMbsBindingPatch | M | 1 | Contains the requested modifications to the PCF for an MBS Session Binding. |

Table 5.3.10.3.1-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| PcfMbsBinding | M | 1 | 200 OK | Successful case: The "Individual PCF for an MBS Session Binding" resource is successfully modified and a representation of the updated resource is returned in the response body. |
| n/a |  |  | 204 No Content | Successful case: The "Individual PCF for an MBS Session Binding" resource is successfully modified and no content is returned in the response body. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual PCF for a PDU Session Binding modification.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual PCF for a PDU Session Binding modification.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the PATCH method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [6]). | | | | |

Table 5.3.10.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

Table 5.3.10.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

##### 5.3.10.3.2 DELETE

This method shall support the URI query parameters specified in table 5.3.10.3.2-1.

Table 5.3.10.3.2-1: URI query parameters supported by the DELETE method on this resource

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

This method shall support the request data structures specified in table 5.3.10.3.2-2 and the response data structures and response codes specified in table 5.3.10.3.2-3.

Table 5.3.10.3.2-2: Data structures supported by the DELETE Request Body on this resource

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

Table 5.3.10.3.2-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case: The "Individual PCF for an MBS Session Binding" resource is successfully deleted. |
| RedirectResponse | O | 0..1 | 307 Temporary Redirect | Temporary redirection, during Individual PCF for a PDU Session Binding deletion.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| RedirectResponse | O | 0..1 | 308 Permanent Redirect | Permanent redirection, during Individual PCF for a PDU Session Binding deletion.  Applicable if the feature "ES3XX" is supported.  (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] shall also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [6]). | | | | |

Table 5.3.10.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

Table 5.3.10.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative BSF (service) instance towards which the request is redirected.  For the case where the request is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target BSF (service) instance towards which the request is redirected. |

#### 5.3.10.4 Resource Custom Operations

None.

## 5.4 Custom Operations without associated resources

None in this release of this specification.

## 5.5 Notifications

### 5.5.1 General

Notifications shall comply to clause 6.2 of 3GPP TS 29.500 [6] and clause 4.6.2.3 of 3GPP TS 29.501 [7].

Table 5.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description (service operation) |
| BSF Notification | {notifUri} | POST | Provides information about observed BSF events. |

### 5.5.2 BSF Notification

#### 5.5.2.1 Description

The BSF Notification is used by the BSF to report one or several observed events to an NF service consumer that has subscribed to such Notifications via the Individual Binding Subscription Resource.

#### 5.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 5.5.2.2-1.

Table 5.5.2.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | The Notification Uri as assigned within the Individual Binding Subscription Resource and described within the BsfSubscription type (see table 5.6.2.7-1). |

#### 5.5.2.3 Standard Methods

##### 5.5.2.3.1 POST

This method shall support the URI query parameters specified in table 5.5.2.3.1-1.

Table 5.5.2.3.1-1: URI query parameters supported by the POST method on this resource

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

This method shall support the request data structures specified in table 5.5.2.3.1-2 and the response data structures and response codes specified in table 5.5.2.3.1-3.

Table 5.5.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| BsfNotification | M | 1 | Provides Information about observed events |

Table 5.5.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Data type | P | | Cardinality | | Response codes | | Description | |
| n/a |  | |  | | 204 No Content | | The receipt of the Notification is acknowledged. | |
| RedirectResponse | O | | 0..1 | | 307 temporary redirect | | Temporary redirection, during the event notification.  (NOTE 2) | |
| RedirectResponse | | O | | 0..1 | | 308 Permanent Redirect | | Permanent redirection, during the event notification.  (NOTE 2) | |
| NOTE 1: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] also apply.  NOTE 2: The RedirectResponse data structure may be provided by an SCP (cf. clause 6.10.9.1 of 3GPP TS 29.500 [6]). | | | | | | | | |

Table 5.5.2.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification is redirected.  For the case where the notification is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the notification request is redirected |

Table 5.5.2.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative NF consumer (service) instance towards which the notification is redirected.  For the case where the notification is redirected to the same target via a different SCP, refer to clause 6.10.9.1 of 3GPP TS 29.500 [6]. |
| 3gpp-Sbi-Target-Nf-Id | string | O | 0..1 | Identifier of the target NF (service) instance towards which the notification request is redirected |

## 5.6 Data Model

### 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 Nbsf\_Management service based interface protocol.

Table 5.6.1-1: Nbsf\_Management specific Data Types

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Data type | | Section defined | | Description | | Applicability | |
| BindingLevel | | 5.6.3.3 | | Contains the binding level. | |  | |
| BindingResp | | 5.6.2.6 | | Contains the binding information. | | SamePcf | |
| BsfEvent | | 5.6.3.5 | | Contains the event notified by the BSF. | |  | |
| BsfEventNotification | | 5.6.2.9 | | Contains an event notification. | |  | |
| BsfNotification | | 5.6.2.8 | | Contains the notification to the events. | |  | |
| BsfSubscription | | 5.6.2.7 | | Contains the event subscription data. | |  | |
| BsfSubscriptionResp | | 5.6.4.1 | | Contains the response to the subscription request. It consists of the resource representation within BsfSubscription data type and, if available, the matched observed event within the BsfNotification data type. | |  | |
| ExtProblemDetails | | 5.6.2.5 | | Contains the FQDN or IP endpoints of the existing PCF and cause value if there is an existing PCF binding information for the indicated combination. | | SamePcf | |
| ParameterCombination | | 5.6.2.4 | | The combination used by the BSF to check whether there is an existing PCF binding information. | | SamePcf | |
| PcfBinding | | 5.6.2.2 | | Identifies an Individual PCF for a PDU session binding. | |  | |
| PcfBindingPatch | | 5.6.2.3 | | Identifies an Individual PCF for a PDU session binding used for Patch method. | | BindingUpdate | |
| PcfMbsBinding | | 5.6.2.15 | | Represents an Individual PCF for an MBS Session binding. | |  | |
| PcfMbsBindingPatch | | 5.6.2.16 | | Represents the requested modifications to an Individual PCF for an MBS Session binding. | |  | |
| PcfForPduSessionInfo | | 5.6.2.13 | | The information of the PCF for a PDU session. | |  | |
| PcfForUeBinding | | 5.6.2.10 | | Identifies an Individual PCF for a UE binding. | |  | |
| PcfForUeBindingPatch | | 5.6.2.11 | | Identifies the updates to an Individual PCF for a UE binding. | |  | |
| PcfForUeInfo | | 5.6.2.14 | | The information of the PCF for a UE. | |  | |
| SnssaiDnnPair | | 5.6.2.12 | | Represents a S-NSSAI and DNN pair. | |  | |

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

Table 5.6.1-2: Nbsf\_Management 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 29.571 [10] | |  | |  | |
| Gpsi | | 3GPP TS 29.571 [10] | |  | |  | |
| IpEndPoint | | 3GPP TS 29.510 [12] | |  | |  | |
| Ipv4Addr | | 3GPP TS 29.571 [10] | |  | |  | |
| Ipv4AddrMask | | 3GPP TS 29.571 [10] | | String identifying an IPv4 address mask. | |  | |
| Ipv4AddrRm | | 3GPP TS 29.571 [10] | |  | |  | |
| Ipv6Prefix | | 3GPP TS 29.571 [10] | |  | |  | |
| Ipv6PrefixRm | | 3GPP TS 29.571 [10] | |  | |  | |
| MacAddr48 | | 3GPP TS 29.571 [10] | |  | |  | |
| MacAddr48Rm | | 3GPP TS 29.571 [10] | |  | |  | |
| MbsSessionId | | 3GPP TS 29.571 [10] | | Represents the identifier of an MBS Session. | |  | |
| NfInstanceId | | 3GPP TS 29.571 [10] | |  | |  | |
| NfSetId | | 3GPP TS 29.571 [10] | |  | |  | |
| ProblemDetails | | 3GPP TS 29.571 [10] | | Used in error responses to provide more detailed information about an error. | |  | |
| RedirectResponse | | 3GPP TS 29.571 [10] | | Contains redirection related information. | | ES3XX | |
| 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. | |  | |

### 5.6.2 Structured data types

#### 5.6.2.1 Introduction

This clause defines the structures to be used in resource representations.

#### 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) (NOTE 8) |  |
| ipv6Prefix | Ipv6Prefix | C | 0..1 | The IPv6 Address Prefix of the served UE. (NOTE 4) (NOTE 5) (NOTE 8) |  |
| addIpv6Prefixes | array(Ipv6Prefix) | O | 1..N | The additional IPv6 Address Prefixes of the served UE. (NOTE 4) (NOTE 5) (NOTE 8) (NOTE 10) | MultiUeAddr |
| ipDomain | string | O | 0..1 | IPv4 address domain identifier. (NOTE 1) (NOTE 8) |  |
| macAddr48 | MacAddr48 | C | 0..1 | The MAC Address of the served UE. (NOTE 8) |  |
| addMacAddrs | array(MacAddr48) | O | 1..N | The additional MAC Addresses of the served UE. (NOTE 8) (NOTE 10) | MultiUeAddr |
| dnn | Dnn | M | 1 | DNN, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only.  (NOTE 11) |  |
| pcfFqdn | Fqdn | C | 0..1 | FQDN of the PCF hosting the Npcf\_PolicyAuthorization service. (NOTE 2) (NOTE 9) |  |
| pcfIpEndPoints | array(IpEndPoint) | C | 1..N | IP end points of the PCF hosting the Npcf\_PolicyAuthorization service. (NOTE 2) (NOTE 9) |  |
| pcfDiamHost | DiameterIdentity | C | 0..1 | The diameter host for an individual PCF. (NOTE 3) (NOTE 9) |  |
| pcfDiamRealm | DiameterIdentity | C | 0..1 | The diameter realm for an individual PCF. (NOTE 3) (NOTE 9) |  |
| pcfSmFqdn | Fqdn | O | 0..1 | FQDN of the PCF hosting the Npcf\_SMPolicyControl service. (NOTE 7) (NOTE 10) | SamePcf |
| pcfSmIpEndPoints | array(IpEndPoint) | O | 1..N | IP end points of the PCF hosting the Npcf\_SMPolicyControl service. (NOTE 7) (NOTE 10) | SamePcf |
| snssai | Snssai | M | 1 | The identification of slice. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Used to negotiate the supported optional features as described in clause 5.8.  Shall be present in the HTTP POST request/response; or in the HTTP GET response if the "supp-feat" attribute query parameter is included in the HTTP GET request. |  |
| pcfId | NfInstanceId | O | 0..1 | PCF instance identifier |  |
| pcfSetId | NfSetId | O | 0..1 | The PCF set Id |  |
| 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) (NOTE 10) | SamePcf |
| bindLevel | BindingLevel | O | 0..1 | Contains the level of binding. |  |
| ipv4FrameRouteList | array(Ipv4AddrMask) | O | 1..N | List of Framed Route information of IPv4. |  |
| ipv6FrameRouteList | array(Ipv6Prefix) | O | 1..N | List of Framed Route information of IPv6. |  |
| NOTE 1: The ipDomain attribute may only be provided if the ipv4Addr attribute is present.  NOTE 2: When the "ExtendedSamePcf" feature is not supported, at least one of "pcfFqdn" or "pcfIpEndPoints" shall be included if the PCF supports the Npcf\_PolicyAuthorization service. When the "ExtendedSamePcf" feature is supported these attributes may be provided if available.  NOTE 3: When the "ExtendedSamePcf" feature is not supported, both pcfDiamHost and pcfDiamRealm are provided if the PCF supports Rx interface. When the "ExtendedSamePcf" feature is supported these attributes may provided if available.  NOTE 4: 5G-RG and FN-RG replaces UE for wireline access support. See 3GPP TS 23.316 [19].  NOTE 5: IPv6 prefix(es) shorter than /64, according to 3GPP TS 23.501 [2], clause 5.8.2.2 and 3GPP TS 23.316 [19], clause 8.3.1, or full IPv6 address(es) with a /128 prefix, according to 3GPP TS 23.316 [19], clause 8.3.1, may be encoded as the "ipv6Prefix" and "addIpv6Prefixes" attributes.  NOTE 6: If the BSF finds that there is an existing Individual PCF for a PDU Session Binding resource for the indicated combination containing Npcf\_SMPolicyControl service addressing information, the BSF shall not check other Individual PCF for a PDU Session Binding resources and shall reject the ongoing registration, and return the FQDN or IP endpoints of the Npcf\_SMPolicyControl service of the matching Individual PCF for a PDU Session Binding resource to the requesting PCF.  NOTE 7: At least one of the "pcfSmFqdn" attribute or the "pcfSmIpEndPoints" attribute shall be included in the binding information, if the binding refers to an SM Policy association and if the "SamePcf" feature is supported and the PCF determines that the same PCF shall be selected for the SM Policy associations with the same SUPI/DNN/S-NSSAI parameter combination in the non-roaming or home-routed scenario based on operator's policies and configuration.  NOTE 8: When the "ExtendedSamePcf" feature is not supported the address information of the served UE shall be provided, i.e., either the "ipv4Addr", the "ipv6Prefix" and/or "addIpv6Prefixes" attributes or the "macAddr48" and/or "addMacAddrs" attributes shall be provided as specified in clause 4.2.2.2.  NOTE 9: When the "ExtendedSamePcf" feature is not supported the address information of the Npcf\_PolicyAuthorization service and/or Rx interface shall be provided, i.e., both "pcfDiamHost" and "pcfDiamRealm" and/or at least one of the "pcfFqdn" or "pcfEndPoints" shall be provided as specified in clause 4.2.2.2.  NOTE 10: This attribute does not apply when the NF service consumer is an AF/NEF.  NOTE 11: The BSF uses the DNN as received from the NF service consumer without applying any transformation. To successfully perform DNN matching, in a specific deployment a DNN shall always be encoded either with the full DNN (e.g., because there are multiple Operator Identifiers for a Network Identifier) or the DNN Network Identifier only. The NF service consumer may include the DNN Operator Identifier based on local configuration. | | | | | |

#### 5.6.2.3 Type PcfBindingPatch

Table 5.6.2.3-1: Definition of type PcfBindingPatch

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Attribute name | | Data type | | P | | Cardinality | | Description | | Applicability | |
| ipv4Addr | | Ipv4AddrRm | | O | | 0..1 | | The IPv4 Address of the served UE. (NOTE 2) | |  | |
| ipDomain | | string | | O | | 0..1 | | IPv4 address domain identifier. (NOTE 1) | |  | |
| ipv6Prefix | | Ipv6PrefixRm | | O | | 0..1 | | The IPv6 Address Prefix of the served UE. (NOTE 2) (NOTE 3) | |  | |
| addIpv6Prefixes | | array(Ipv6Prefix) | | O | | 1..N | | The additional IPv6 Address Prefixes of the served UE. (NOTE 2) (NOTE 3) | | MultiUeAddr | |
| macAddr48 | | MacAddr48Rm | | O | | 0..1 | | The MAC Address of the served UE. | |  | |
| addMacAddrs | | array(MacAddr48) | | O | | 1..N | | The additional MAC Addresses of the served UE. | | MultiUeAddr | |
| pcfId | | NfInstanceId | | O | | 0..1 | | PCF instance identifier | |  | |
| pcfFqdn | | Fqdn | | O | | 0..1 | | FQDN of the PCF hosting the Npcf\_PolicyAuthorization service. | |  | |
| pcfIpEndPoints | | array(IpEndPoint) | | O | | 1..N | | IP end points of the PCF hosting the Npcf\_PolicyAuthorization service. | |  | |
| pcfDiamHost | | DiameterIdentity | | O | | 0..1 | | The diameter host for an individual PCF. | |  | |
| pcfDiamRealm | | DiameterIdentity | | O | | 0..1 | | The diameter realm for an individual PCF. | |  | |
| snssai | | Snssai | | O | | 0..1 | | The updated S-NSSAI. | | NetSliceRepl | |
| NOTE 1: If applicable, the consumer (e.g. PCF) shall also request to remove the ipDomain attribute if the ipv4Addr attribute is requested to be removed.  NOTE 2: 5G-RG and FN-RG replaces UE for wireline access support. See 3GPP TS 23.316 [19].  NOTE 3: IPv6 prefix(es) shorter than /64, according to 3GPP TS 23.501 [2], clause 5.8.2.2 and 3GPP TS 23.316 [19], clause 8.3.1, or full IPv6 address(es) with a /128 prefix, according to 3GPP TS 23.316 [19], clause 8.3.1, can be encoded as the "ipv6Prefix" and "addIpv6Prefixes" attributes. | | | | | | | | | | | |

#### 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, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only.  (NOTE 3) |  |
| snssai | Snssai | O | 0..1 | The identification of slice. |  |
| NOTE 1: At least one of the attributes in this table shall be included.  NOTE 2: The applicable parameter combinations in a given deployment shall be disjoint combinations. E.g., if a deployment requires a parameter combination that includes a SUPI value for a DNN/S-NSSAI combination, subsequent parameter combinations of that DNN/S-NSSAI combination shall also include the corresponding SUPI attribute.  NOTE 3: The BSF uses the DNN as received from the NF service consumer without applying any transformation. To successfully perform DNN matching, in a specific deployment a DNN shall always be encoded either with the full DNN (e.g., because there are multiple Operator Identifiers for a Network Identifier) or the DNN Network Identifier only. The NF service consumer may include the DNN Operator Identifier based on local configuration. | | | | | |

#### 5.6.2.5 Type ExtProblemDetails

Table 5.6.2.5-1: Definition of type ExtProblemDetails as a list of to be combined data types

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data Type | P | Cardinality | Description | Applicability |
| ProblemDetails | O | 0..1 | Problem Details |  |
| BindingResp | O | 0..1 | PCF Binding Information |  |

#### 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\_SMPolicyControl service. (NOTE) |  |
| NOTE: Either the "pcfSmFqdn" attribute or the "pcfSmIpEndPoints" attribute shall be included. | | | | | |

#### 5.6.2.7 Type BsfSubscription

Table 5.6.2.7-1: Definition of type BsfSubscription

| Attribute name | Data type | P | Cardinality | Description | Applicability |
| --- | --- | --- | --- | --- | --- |
| events | array(BsfEvent) | M | 1..N | Subscribed Events. |  |
| notifUri | Uri | M | 1 | Notification URI. |  |
| notifCorreId | string | M | 1 | It is used to set the value of Notification Correlation ID in the corresponding notification. |  |
| supi | Supi | M | 1 | Subscription Permanent Identifier. |  |
| gpsi | Gpsi | O | 0..1 | Identifies a GPSI. |  |
| snssaiDnnPairs | SnssaiDnnPair | C | 0..1 | Represents the S-NSSAI and DNN pair for which the binding event report(s) shall apply.  (NOTE) |  |
| addSnssaiDnnPairs | array(SnssaiDnnPair) | C | 1..N | Represents the additional S-NSSAI and DNN pairs for which the binding event report(s) shall apply.  (NOTE) | AddSnssaiDnnPair |
| suppFeat | SupportedFeatures | C | 0..1 | List of Supported features used as described in clause 5.8.  This parameter shall be supplied by NF service consumer and BSF in the POST request that request the creation of an Individual Binding Subscription resource and the related reply, respectively. |  |
| NOTE: If the NF service consumer needs to subscribe to notifications for more than one S-NSSAI and DNN pairs and the "AddSnssaiDnnPair" feature is supported, the NF service consumer shall include one S-NSSAI and DNN pair in the "snssaiDnnPairs" attribute and the remaining S-NSSAI and DNN pairs in the "addSnssaiDnnPairs" attribute. | | | | | |

#### 5.6.2.8 Type BsfNotification

Table 5.6.2.8-1: Definition of type BsfNotification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifCorreId | string | M | 1 | Notification correlation ID used to identify the subscription to which the notification relates. It shall be set to the same value as the "notifCorreId" attribute of BsfSubscription data type. |  |
| eventNotifs | array(BsfEventNotification) | M | 1..N | Notifications about Individual Events. |  |

#### 5.6.2.9 Type BsfEventNotification

Table 5.6.2.9-1: Definition of type BsfEventNotification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| event | BsfEvent | M | 1 | Event that is notified. |  |
| pcfForUeInfo | PcfForUeInfo | C | 0..1 | The binding information of the PCF for a UE.  It shall be included if the BSF is subscribed to the notification of "PCF\_UE\_BINDING\_REGISTRATION" and "PCF\_UE\_BINDING\_DEREGISTRATION" event and the registration or deregistration of PCF for a UE is detected. |  |
| pcfForPduSessInfos | array(PcfForPduSessionInfo) | C | 1..N | The binding information of the PCF for a PDU session.  It shall be included if the BSF is subscribed to the notification of PCF\_PDU\_SESSION\_BINDING\_REGISTRATION event and the registration of the PCF for the PDU session is detected, and the BSF is subscribed to the notification of PCF\_PDU\_SESSION\_BINDING\_DEREGISTRATION and the deregistration of the PCF for the PDU session is detected. |  |
| matchSnssaiDnns | array(SnssaiDnnPair) | C | 1..N | Matching S-NSSAI and DNN pairs. It shall be included if the BSF is subscribed to the notification of SNSSAI\_DNN\_BINDING\_REGISTRATION and a PCF registration for the first PDU session for the DNN and SNSSAI combination is detected, and the BSF is subscribed to the notification of SNSSAI\_DNN\_BINDING\_DEREGISTRATION and a PCF deregistration for the last PDU session for the DNN and SNSSAI combination is detected . |  |

#### 5.6.2.10 Type PcfForUeBinding

Table 5.6.2.10-1: Definition of type PcfForUeBinding

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| supi | Supi | M | 1 | Subscription Permanent Identifier |  |
| gpsi | Gpsi | O | 0..1 | Generic Public Subscription Identifier |  |
| pcfForUeFqdn | Fqdn | C | 0..1 | FQDN of the PCF hosting the Npcf\_AMPolicyAuthorization service, if available. (NOTE) |  |
| pcfForUeIpEndPoints | array(IpEndPoint) | C | 1..N | IP end points of the PCF hosting the Npcf\_AMPolicyAuthorization service, if available. (NOTE) |  |
| pcfId | NfInstanceId | O | 0..1 | PCF instance identifier |  |
| pcfSetId | NfSetId | O | 0..1 | The PCF set Id |  |
| bindLevel | BindingLevel | O | 0..1 | Contains the level of binding. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Used to negotiate the supported optional features as described in clause 5.8.  Shall be present in the HTTP POST request/response or in the HTTP GET response if the "supp-feat" query parameter is included in the HTTP GET request. |  |
| NOTE: At least one of the "pcfForUeFqdn" attribute or "pcfForUeIpEndPoints" attribute shall be provided. | | | | | |

#### 5.6.2.11 Type PcfForUeBindingPatch

Table 5.6.2.11-1: Definition of type PcfForUeBindingPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| pcfForUeFqdn | Fqdn | O | 0..1 | FQDN of the PCF hosting the Npcf\_AMPolicyAuthorization service, if available. |  |
| pcfForUeIpEndPoints | array(IpEndPoint) | O | 1..N | IP end points of the PCF hosting the Npcf\_AMPolicyAuthorization service, if available. |  |
| pcfId | NfInstanceId | O | 0..1 | PCF instance identifier |  |

#### 5.6.2.12 Type SnssaiDnnPair

Table 5.6.2.12-1: Definition of type SnssaiDnnPair

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| snssai | Snssai | M | 1 | S-NSSAI |  |
| dnn | Dnn | M | 1 | Data Network Name, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only.  .(NOTE) |  |
| NOTE: The BSF uses the DNN as received from the NF service consumer without applying any transformation. To successfully perform DNN matching, in a specific deployment a DNN shall always be encoded either with the full DNN (e.g., because there are multiple Operator Identifiers for a Network Identifier) or the DNN Network Identifier only. The NF service consumer may include the DNN Operator Identifier based on local configuration. | | | | | |

#### 5.6.2.13 Type PcfForUeInfo

Table 5.6.2.13-1: Definition of type PcfForUeInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| pcfId | NfInstanceId | O | 0..1 | PCF instance identifier. |  |
| pcfSetId | NfSetId | O | 0..1 | The PCF set ID. |  |
| bindLevel | BindingLevel | O | 0..1 | Contains the level of binding. |  |
| pcfFqdn | Fqdn | O | 0..1 | FQDN of the PCF hosting the Npcf\_AMPolicyAuthorization service. |  |
| pcfIpEndPoints | array(IpEndPoint) | O | 1..N | IP end points of the PCF hosting the Npcf\_AMPolicyAuthorization service. |  |
| NOTE: Either the "pcfFqdn" attribute or the "pcfIpEndPoints" attribute shall be included. | | | | | |

#### 5.6.2.14 Type PcfForPduSessionInfo

Table 5.6.2.14-1: Definition of type PcfForPduSessionInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| snssai | Snssai | M | 1 | S-NSSAI |  |
| dnn | Dnn | M | 1 | Data Network Name, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only.  (NOTE 3) |  |
| pcfId | NfInstanceId | O | 0..1 | PCF instance identifier. |  |
| pcfSetId | NfSetId | O | 0..1 | The PCF set ID. |  |
| bindLevel | BindingLevel | O | 0..1 | Contains the level of binding. |  |
| ipv4Addr | Ipv4Addr | O | 0..1 | The IPv4 Address of the served UE. |  |
| ipDomain | string | O | 0..1 | IPv4 address domain identifier. (NOTE 2) |  |
| ipv6Prefixes | array(Ipv6Prefix) | O | 1..N | The IPv6 Address Prefixes of the served UE. |  |
| macAddrs | array(MacAddr48) | O | 1..N | The MAC Addresses of the served UE. |  |
| pcfFqdn | Fqdn | O | 0..1 | FQDN of the PCF hosting the Npcf\_PolicyAuthorization service. |  |
| pcfIpEndPoints | array(IpEndPoint) | O | 1..N | IP end points of the PCF hosting the Npcf\_PolicyAuthorization service. |  |
| NOTE 1: Either the "pcfFqdn" attribute or the "pcfIpEndPoints" attribute shall be included.  NOTE 2: The "ipDomain" attribute may only be provided if the "ipv4Addr" attribute is present.  NOTE 3: The BSF uses the DNN as received from the NF service consumer without applying any transformation. To successfully perform DNN matching, in a specific deployment a DNN shall always be encoded either with the full DNN (e.g., because there are multiple Operator Identifiers for a Network Identifier) or the DNN Network Identifier only. The NF service consumer may include the DNN Operator Identifier based on local configuration. | | | | | |

#### 5.6.2.15 Type PcfMbsBinding

Table 5.6.2.15-1: Definition of type PcfMbsBinding

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| mbsSessionId | MbsSessionId | M | 1 | Contains the identifier of the MBS Session to which the MBS Session binding is related. |  |
| pcfFqdn | Fqdn | C | 0..1 | Contains the FQDN of the PCF handling the MBS Session.  This attribute shall be provided, if available.  (NOTE) |  |
| pcfIpEndPoints | array(IpEndPoint) | C | 1..N | Contains the IP end points of the PCF handling the MBS Session.  This attribute shall be provided, if available.  (NOTE) |  |
| pcfId | NfInstanceId | O | 0..1 | Contains the identifier of the PCF instance handling the concerned MBS Session. |  |
| pcfSetId | NfSetId | O | 0..1 | Contains the identifier of the PCF set to which the PCF instance handling the MBS Session belongs. |  |
| bindLevel | BindingLevel | O | 0..1 | Contains the level of binding of the PCF handling the MBS Session. |  |
| recoveryTime | DateTime | O | 0..1 | Contains the recovery timestamp of the NF service consumer (e.g. PCF handling the MBS Session).  This attribute may be present only in the HTTP POST request. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the supported features and is used to negotiate the supported optional features as described in clause 5.8.  This attribute may be present in the HTTP POST request. It shall be present in the HTTP POST response, if it is included in the corresponding HTTP POST request, or in the HTTP GET response, if the "supp-feat" query parameter is included in the corresponding HTTP GET request. |  |
| NOTE: At least one of the "pcfFqdn" attribute or the "pcfIpEndPoints" attribute shall be present. | | | | | |

#### 5.6.2.16 Type PcfMbsBindingPatch

Table 5.6.2.16-1: Definition of type PcfMbsBindingPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| pcfFqdn | Fqdn | O | 0..1 | Contains the updated FQDN of the PCF handling the MBS Session. |  |
| pcfIpEndPoints | array(IpEndPoint) | O | 1..N | Contains the updated IP end points of the PCF handling the MBS Session. |  |
| pcfId | NfInstanceId | O | 0..1 | Contains the updated identifier of the PCF instance handling the concerned MBS Session. |  |

#### 5.6.2.17 Type MbsExtProblemDetails

Table 5.6.2.17-1: Definition of type MbsExtProblemDetails as a list of to be combined data types

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data Type | P | Cardinality | Description | Applicability |
| ProblemDetails | O | 0..1 | Problem Details |  |
| MbsBindingResp | O | 0..1 | PCF Binding Information for the MBS Session. |  |

#### 5.6.2.18 Type MbsBindingResp

Table 5.6.2.18-1: Definition of type MbsBindingResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| pcfFqdn | Fqdn | O | 0..1 | FQDN of the PCF handling the MBS Session.  (NOTE) |  |
| pcfIpEndPoints | array(IpEndPoint) | O | 1..N | IP end points of the PCF handling the MBS Session.  (NOTE) |  |
| NOTE: At least one of the "pcfFqdn" attribute or the "pcfIpEndPoints" attribute shall be present. | | | | | |

### 5.6.3 Simple data types and enumerations

#### 5.6.3.1 Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

#### 5.6.3.2 Simple data types

The simple data types defined in table 5.6.3.2-1 shall be supported.

Table 5.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

#### 5.6.3.3 Enumeration: BindingLevel

Table 5.6.3.3-1: Enumeration BindingLevel

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| NF\_SET | Indicates the NF set level of binding. |  |
| NF\_INSTANCE | Indicates the NF instance level of binding. |  |

#### 5.6.3.4 Void

#### 5.6.3.5 Enumeration: BsfEvent

Table 5.6.3.5-1: Enumeration BsfEvent

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| PCF\_PDU\_SESSION\_BINDING\_REGISTRATION | Indicates the binding of a PCF for a PDU session is registered. |  |
| PCF\_PDU\_SESSION\_BINDING\_DEREGISTRATION | Indicates the binding of a PCF for a PDU session is deregistered. |  |
| PCF\_UE\_BINDING\_REGISTRATION | Indicates the binding of a PCF for a UE is registered. |  |
| PCF\_UE\_BINDING\_DEREGISTRATION | Indicates the binding of a PCF for a UE is deregistered. |  |
| SNSSAI\_DNN\_BINDING\_REGISTRATION | Indicates the binding of a PCF for a PDU session corresponding to the first PDU session for a DNN and S-NSSAI combination is registered. |  |
| SNSSAI\_DNN\_BINDING\_DEREGISTRATION | Indicates the binding of a PCF for a PDU session corresponding to the last PDU session for a DNN and S-NSSAI combination is deregistered. |  |

### 5.6.4 Data types describing alternative data types or combinations of data types

#### 5.6.4.1 Type: BsfSubscriptionResp

Table 5.6.4.1-1: Definition of type BsfSubscriptionResp as a list of non-exclusive alternatives

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Cardinality | Description | Applicability |
| BsfNotification | 0..1 | It represents the notification of a match event during the creation or modification of the Individual Binding Subscription resource. |  |
| BsfSubscription | 1 | It represents the Individual PCFBinding Subscription resource. |  |

## 5.7 Error handling

### 5.7.1 General

HTTP error handling shall be supported as specified in clause 5.2.4 of 3GPP TS 29.500 [6].

For the Nbsf\_Management Service API, HTTP error responses shall be supported as specified in clause 4.8 of 3GPP TS 29.501 [7]. Protocol errors and application errors specified in table 5.2.7.2-1 of 3GPP TS 29.500 [6] shall be supported for an HTTP method if the corresponding HTTP status codes are specified as mandatory for that HTTP method in table 5.2.7.1-1 of 3GPP TS 29.500 [6].

In addition, the requirements in the following clauses shall apply.

### 5.7.2 Protocol Errors

In this Release of the specification, there are no additional protocol errors applicable for the Nbsf\_Management Service API.

### 5.7.3 Application Errors

The application errors defined for the Nbsf\_Management Service API are listed in table 5.7.3-1.

Table 5.7.3-1: Application errors

|  |  |  |
| --- | --- | --- |
| Application Error | HTTP status code | Description |
| MULTIPLE\_BINDING\_INFO\_FOUND | 400 Bad Request | Indicates that the BSF found more than one binding resource so it cannot provide the selected PCF to the consumer. (NOTE 1) |
| EXISTING\_BINDING\_INFO\_FOUND | 403 Forbidden | Indicates that the BSF found an existing PCF binding information for the indicated combination or for the applicable MBS Session. (NOTE 2) |
| NOTE 1: This application error is included in the responses to the GET request.  NOTE 2: This application error is included in the responses to the POST request.  NOTE 3: Including a "ProblemDetails" data structure with the "cause" attribute in the HTTP response is optional unless explicitly mandated in the service operation clauses. | | |

## 5.8 Feature negotiation

The optional features in table 5.8-1 are defined for the Nbsf\_Management Service API. They shall be negotiated using the extensibility mechanism defined in clause 6.6 of 3GPP TS 29.500 [6].

Table 5.8-1: Supported Features

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Feature number | | Feature Name | | Description | |
| 1 | | MultiUeAddr | | This feature indicates the support of multiple UE addresses (IPv6 prefixes or MAC addresses) in the same binding information. | |
| 2 | | BindingUpdate | | The consumer can use this feature for updating the session binding information. | |
| 3 | | SamePcf | | This feature indicates the support of same PCF selection for the indicated combination. (NOTE) | |
| 4 | | 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 [6] and according to HTTP redirection principles for indirect communication, as specified in clause 6.10.9 of 3GPP TS 29.500 [6]. | |
| 5 | | ExtendedSamePcf | | This feature extends the support of same PCF selection for the indicated combination. This feature requires the support of SamePcf feature. (NOTE) | |
| 6 | | AddSnssaiDnnPair | | This feature indicates the support of additional S-NSSAI and DNN pair(s) for which the binding event report(s) apply. | |
| 7 | | NetSliceRepl | | This feature indicates the support of the network slice replacement functionality introduced in this specification as part of the end-to-end network slicing functionality.  The following functionalities are supported:  - Support the reporting of the network slice replacement information to the BSF. | |
| NOTE: The "SamePcf" feature is applicable to the deployments where the N5 and/or Rx interface apply and the UE address is available in the PCF at the creation of the SM Policy Association. The "ExtendedSamePcf" feature is applicable for any PCF deployment, regardless of UE address availability at the creation of SM Policy association and/or N5 and/or Rx applicability. | | | | | |

## 5.9 Security

As indicated in 3GPP TS 33.501 [15] and 3GPP TS 29.500 [6], the access to the Nbsf\_Management API may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [16]), based on local configuration, using the "Client Credentials" authorization grant, where the NRF (see 3GPP TS 29.510 [12]) plays the role of the authorization server.

If OAuth2 is used, a n NF Service Consumer, prior to consuming services offered by the Nbsf\_Management API, shall obtain a "token" from the authorization server, by invoking the Access Token Request service, as described in 3GPP TS 29.510 [12], clause 5.4.2.2.

NOTE: When multiple NRFs are deployed in a network, the NRF used as authorization server is the same NRF that the NF Service Consumer used for discovering the Nbsf\_Management service.

The Nbsf\_Management API defines a single scope "nbsf-management" for the entire service, and it does not define any additional scopes at resource or operation level.

Annex A (normative):  
OpenAPI specification

# A.1 General

The present Annex contains an OpenAPI [11] specification of HTTP messages and content bodies used by the Nbsf\_Management API.

This Annex shall take precedence when being discrepant to other parts of the specification with respect to the encoding of information elements and methods within the API.

NOTE: The semantics and procedures, as well as conditions, e.g. for the applicability and allowed combinations of attributes or values, not expressed in the OpenAPI definitions but defined in other parts of the specification also apply.

Informative copies of the OpenAPI specification file contained in this 3GPP Technical Specification are available on a Git-based repository, that uses the GitLab software version control system (see clause 5B of the 3GPP TR 21.900 [18] and clause 5.3.1 of the 3GPP TS 29.501 [7] for further information).

# A.2 Nbsf\_Management API

openapi: 3.0.0

info:

version: 1.4.0-alpha.3

title: Nbsf\_Management

description: |

Binding Support Management Service API.

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externalDocs:

description: 3GPP TS 29.521 V18.2.0; 5G System; Binding Support Management Service.

url: 'https://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 clause 4.4 of 3GPP TS 29.501.

security:

- {}

- oAuth2ClientCredentials:

- nbsf-management

paths:

/pcfBindings:

post:

summary: Create a new Individual PCF for a PDU Session binding information

operationId: CreatePCFBinding

tags:

- PCF Bindings (Collection)

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'201':

description: The creation of an individual PCF for a PDU 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/<apiVersion>/pcf-mbs-bindings/{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/problem+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'

'502':

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

'503':

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

default:

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

get:

summary: Read PCF for a PDU Session Bindings information

operationId: GetPCFBindings

tags:

- PCF Bindings (Collection)

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 for a PDU 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 for a PDU 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'

'502':

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

'503':

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

default:

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

/pcfBindings/{bindingId}:

delete:

summary: Delete an existing Individual PCF for a PDU Session Binding information

operationId: DeleteIndPCFBinding

tags:

- Individual PCF Binding (Document)

parameters:

- name: bindingId

in: path

description: Represents the individual PCF for a PDU Session Binding.

required: true

schema:

type: string

responses:

'204':

description: >

No Content. The Individual PCF for a PDU Session Binding information resource is

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'

patch:

summary: Update an existing Individual PCF for a PDU Session Binding information

operationId: UpdateIndPCFBinding

tags:

- Individual PCF for a PDU Session Binding (Document)

parameters:

- name: bindingId

in: path

description: Represents the individual PCF for a PDU Session Binding.

required: true

schema:

type: string

requestBody:

description: Parameters to update the existing PCF for a PDU Session binding.

required: true

content:

application/merge-patch+json:

schema:

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

responses:

'200':

description: OK (Successful update of the PCF for a PDU Session binding).

content:

application/json:

schema:

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

'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'

/subscriptions:

post:

operationId: CreateIndividualSubcription

summary: Create an individual subscription for event notifications from the BSF

tags:

- Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'201':

description: Created.

headers:

Location:

description: >

Contains the URI of the newly created resource, according to the structure

{apiRoot}/nsmf-management/<apiVersion>/subscriptions/{subId}

required: true

schema:

type: string

content:

application/json:

schema:

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

'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:

myNotification:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

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

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'

/subscriptions/{subId}:

put:

operationId: ReplaceIndividualSubcription

summary: Replace an individual subscription for event notifications from the BSF

tags:

- IndividualSubscription (Document)

requestBody:

required: true

content:

application/json:

schema:

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

parameters:

- name: subId

in: path

description: Subscription correlation ID

required: true

schema:

type: string

responses:

'200':

description: OK. Resource was successfully modified and representation is returned.

content:

application/json:

schema:

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

'204':

description: No Content. Resource was successfully modified.

'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'

delete:

operationId: DeleteIndividualSubcription

summary: Delete an individual subscription for event notifications from the BSF

tags:

- IndividualSubscription (Document)

parameters:

- name: subId

in: path

description: Subscription correlation ID

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'

/pcf-ue-bindings:

post:

summary: Create a new Individual PCF for a UE binding information

operationId: CreatePCFforUEBinding

tags:

- PCF for a UE Bindings (Collection)

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'201':

description: The creation of an individual PCF for a UE binding.

content:

application/json:

schema:

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

headers:

Location:

description: >

Contains the URI of the newly created resource, according to the structure

{apiRoot}/nbsf-management/<apiVersion>/pcf-ue-bindings/{bindingId}

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'

get:

summary: Read PCF for a UE Bindings information

operationId: GetPCFForUeBindings

tags:

- PCF for a UE Bindings (Collection)

parameters:

- 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: 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 for a UE binding session binding information resource matching the

query parameter(s) is returned.

content:

application/json:

schema:

type: array

items:

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

minItems: 0

'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'

'502':

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

'503':

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

default:

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

/pcf-ue-bindings/{bindingId}:

delete:

summary: Delete an existing Individual PCF for a UE Binding information

operationId: DeleteIndPCFforUEBinding

tags:

- Individual PCF for a UE Binding (Document)

parameters:

- name: bindingId

in: path

description: Represents the individual PCF for a UE Binding.

required: true

schema:

type: string

responses:

'204':

description: >

No Content. The Individual PCF for a UE binding information resource is 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'

patch:

summary: Update an existing Individual PCF for a UE Binding information

operationId: UpdateIndPCFforUEBinding

tags:

- Individual PCF for a UE Binding (Document)

parameters:

- name: bindingId

in: path

description: Represents the individual PCF for a UE Binding.

required: true

schema:

type: string

requestBody:

description: Parameters to update the existing PCF for a UE binding.

required: true

content:

application/merge-patch+json:

schema:

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

responses:

'200':

description: OK. Successful update of the PCF for a PDU Session binding.

content:

application/json:

schema:

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

'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'

/pcf-mbs-bindings:

post:

summary: Create a new Individual PCF for an MBS Session binding.

operationId: CreatePCFMbsBinding

tags:

- PCF for an MBS Session Bindings (Collection)

requestBody:

required: true

content:

application/json:

schema:

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

responses:

'201':

description: >

Created. A new Individual PCF for an MBS Session Binding resource is created

and the corresponding URI is returned in an HTTP Location header.

content:

application/json:

schema:

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

headers:

Location:

description: >

Contains the URI of the newly created resource, according to the structure

{apiRoot}/nbsf-management/v1/pcf-mbs-bindings/{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 MBS session is

returned.

content:

application/problem+json:

schema:

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

'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'

get:

summary: Retrieve an existing PCF for an MBS Session binding.

operationId: GetPCFMbsBinding

tags:

- PCF for an MBS Session Bindings (Collection)

parameters:

- name: mbs-session-id

in: query

description: >

Contains the identifier of the MBS Session to which the requested MBS Session

binding is related.

required: true

content:

application/json:

schema:

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

- name: supp-feat

in: query

description: >

Contains the list of features supported by the NF service consumer and used to

filter irrelevant responses related to unsupported features.

content:

application/json:

schema:

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

responses:

'200':

description: >

OK. The Individual PCF for an MBS Session Binding resource(s) matching the provided

query parameter(s) are returned.

content:

application/json:

schema:

type: array

items:

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

minItems: 0

'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'

'502':

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

'503':

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

default:

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

/pcf-mbs-bindings/{bindingId}:

parameters:

- name: bindingId

in: path

description: >

Represents the identifier of the Individual PCF for an MBS Session Binding resource.

required: true

schema:

type: string

patch:

summary: Request the modification of an existing Individual PCF for an MBS Session Binding resource.

operationId: ModifyIndPCFMbsBinding

tags:

- Individual PCF for an MBS Session Binding (Document)

requestBody:

description: Parameters to request the modification of the PCF for an MBS Session Binding.

required: true

content:

application/merge-patch+json:

schema:

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

responses:

'200':

description: >

OK. The Individual PCF for an MBS Session Binding resource is successfully modified and

a representation of the updated resource is returned in the response body.

content:

application/json:

schema:

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

'204':

description: >

No Content. The Individual PCF for an MBS Session Binding resource is successfully

modified and no content is returned in the response body.

'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'

delete:

summary: Request the deletion of an existing Individual PCF for an MBS Session Binding.

operationId: DeleteIndPCFMbsBinding

tags:

- Individual PCF for an MBS Session Binding (Document)

responses:

'204':

description: >

No Content. The Individual PCF for an MBS Session Binding resource is 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'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{nrfApiRoot}/oauth2/token'

scopes:

nbsf-management: Access to the Nbsf\_Management API

schemas:

PcfBinding:

description: Identifies an Individual PCF for a PDU Session binding.

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: 'TS29571\_CommonData.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: 'TS29571\_CommonData.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'

pcfSetId:

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

recoveryTime:

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

paraCom:

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

bindLevel:

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

ipv4FrameRouteList:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4AddrMask'

minItems: 1

ipv6FrameRouteList:

type: array

items:

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

minItems: 1

required:

- dnn

- snssai

PcfBindingPatch:

description: Identifies an Individual PCF binding used in an HTTP Patch method.

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

pcfId:

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

pcfFqdn:

$ref: 'TS29571\_CommonData.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'

snssai:

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

ParameterCombination:

description: >

Represents the combination used by the BSF to check whether there is an existing PCF binding

information.

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:

description: >

Contains the FQDN or IP endpoints of the existing PCF and the cause value if there is an

existing PCF binding information for the indicated combination.

allOf:

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

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

MbsExtProblemDetails:

description: >

Contains the FQDN or IP endpoints of the existing PCF and the cause value if there is an

existing PCF binding information for the MBS session.

allOf:

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

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

BindingResp:

description: Contains the binding information for a PCF for a PDU Session.

type: object

properties:

pcfSmFqdn:

$ref: 'TS29571\_CommonData.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.

MbsBindingResp:

description: Contains the binding information for a PCF for an MBS Session.

type: object

properties:

pcfFqdn:

$ref: 'TS29571\_CommonData.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 handling the MBS Session.

anyOf:

- required: [pcfFqdn]

- required: [pcfIpEndPoints]

BsfSubscription:

description: Contains the event subscription data.

type: object

properties:

events:

type: array

items:

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

minItems: 1

description: Contain te subscribed events.

notifUri:

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

notifCorreId:

type: string

description: Notification Correlation ID assigned by the NF service consumer.

supi:

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

gpsi:

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

snssaiDnnPairs:

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

addSnssaiDnnPairs:

type: array

items:

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

minItems: 1

description: >

Represents the additional S-NSSAI and DNN pair(s) for which the binding event report(s)

shall apply.

suppFeat:

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

required:

- events

- notifUri

- notifCorreId

- supi

BsfNotification:

description: Contains the event notifications.

type: object

properties:

notifCorreId:

type: string

description: Notification Correlation ID assigned by the NF service consumer.

pcfId:

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

pcfSetId:

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

bindLevel:

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

eventNotifs:

type: array

items:

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

minItems: 1

description: Notifications about Individual Events.

required:

- notifCorreId

- eventNotifs

BsfEventNotification:

description: Contains an event notification.

type: object

properties:

event:

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

pcfForUeInfo:

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

pcfForPduSessInfos:

type: array

items:

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

minItems: 1

description: The information of the PCF for a PDU session.

matchSnssaiDnns:

type: array

items:

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

minItems: 1

description: Matching S-NSSAI and DNN pairs.

required:

- event

PcfForUeInfo:

description: Contains the information of the PCF for a UE.

type: object

properties:

pcfFqdn:

$ref: 'TS29571\_CommonData.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\_AmPolicyAuthorization service.

pcfId:

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

pcfSetId:

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

bindLevel:

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

PcfForPduSessionInfo:

description: Contains the informaiton of the PCF for a PDU session.

type: object

properties:

dnn:

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

snssai:

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

pcfFqdn:

$ref: 'TS29571\_CommonData.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\_AmPolicyAuthorization service.

ipv4Addr:

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

ipDomain:

type: string

ipv6Prefixes:

type: array

items:

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

minItems: 1

description: The IPv6 Address Prefixes of the served UE.

macAddrs:

type: array

items:

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

minItems: 1

description: The MAC Addresses of the served UE.

pcfId:

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

pcfSetId:

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

bindLevel:

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

required:

- snssai

- dnn

PcfForUeBinding:

description: Identifies an Individual PCF for a UE binding.

type: object

properties:

supi:

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

gpsi:

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

pcfForUeFqdn:

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

pcfForUeIpEndPoints:

type: array

items:

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

minItems: 1

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

pcfId:

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

pcfSetId:

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

bindLevel:

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

suppFeat:

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

required:

- supi

anyOf:

- required: [pcfForUeFqdn]

- required: [pcfForUeIpEndPoints]

PcfForUeBindingPatch:

description: Identifies the updates of an Individual PCF for a UE binding.

type: object

properties:

pcfForUeFqdn:

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

pcfForUeIpEndPoints:

type: array

items:

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

minItems: 1

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

pcfId:

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

SnssaiDnnPair:

description: Contains a S-NSSAI and DNN combination.

type: object

required:

- snssai

- dnn

properties:

dnn:

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

snssai:

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

PcfMbsBinding:

description: Represents an Individual PCF for an MBS Session binding.

type: object

properties:

mbsSessionId:

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

pcfFqdn:

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

pcfIpEndPoints:

type: array

items:

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

minItems: 1

pcfId:

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

pcfSetId:

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

bindLevel:

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

recoveryTime:

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

suppFeat:

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

required:

- mbsSessionId

anyOf:

- required: [pcfFqdn]

- required: [pcfIpEndPoints]

PcfMbsBindingPatch:

description: >

Represents the requested modification to an Individual PCF for an MBS Session binding.

type: object

properties:

pcfFqdn:

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

pcfIpEndPoints:

type: array

items:

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

minItems: 1

pcfId:

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

BindingLevel:

anyOf:

- type: string

enum:

- NF\_SET

- NF\_INSTANCE

- 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 binding level.

Possible values are:

- NF\_SET: Indicates the NF set level of binding.

- NF\_INSTANCE: Indicates the NF instance level of binding.

BsfEvent:

description: Represents an event to be notified by the BSF.

anyOf:

- type: string

enum:

- PCF\_PDU\_SESSION\_BINDING\_REGISTRATION

- PCF\_PDU\_SESSION\_BINDING\_DEREGISTRATION

- PCF\_UE\_BINDING\_REGISTRATION

- PCF\_UE\_BINDING\_DEREGISTRATION

- SNSSAI\_DNN\_BINDING\_REGISTRATION

- SNSSAI\_DNN\_BINDING\_DEREGISTRATION

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

BsfSubscriptionResp:

description: >

It represents a response to a modification or creation request of an Individual Binding

Subscription resource. It may contain the notification of the already met events.

anyOf:

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

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

Annex B (informative):  
Deployment option to support BSF and DRA coexistence due to network migration

As described in Annex B of 3GPP TS 23.503 [4], the Diameter Routing Agent (DRA) and the BSF can coexist in an operator's network during the network migration to 5GC. The DRA is described in 3GPP TS 29.213 [14] and can be a service consumer of the Nbsf\_Management service.

During the Rx session establishment, the DRA can discover the selected PCF for the related subscriber by using the Nbsf\_Management\_Discovery service operation to obtain the related PCF address if it has no stored binding information derived from an ongoing Gx session for that subscriber.

NOTE 1: For a UE in the EPC there is a Gx session and the DRA stores the binding information. For a UE in the 5GC the Npcf\_SmPolicyControl service is used and the BSF stores the binding information.

NOTE 2: If the DRA has no stored binding information derived from an ongoing Gx session for a subscriber, the DRA needs to request new binding information for each Rx session establishment because the information in the BSF could have changed compared to any previous binding information the DRA requested.

Annex C (informative):  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2018-01 |  |  |  |  |  | TS skeleton of Binding Support Management Service specification | 0.0.0 |
| 2018-01 |  |  |  |  |  | Inclusion of documents agreed in CT3#94 C3-180301, C3-180191, C3-180192 and C3-180193. | 0.1.0 |
| 2018-03 |  |  |  |  |  | Inclusion of documents agreed in CT3#95 C3-181350 and C3-181352. | 0.2.0 |
| 2018-04 |  |  |  |  |  | Inclusion of documents agreed in CT3#96 C3-182424 and C3-182510. | 0.3.0 |
| 2018-05 |  |  |  |  |  | Inclusion of documents agreed in CT3#97 C3-183287, C3-183500, C3-183881, C3-183502 and C3-183733. | 0.4.0 |
| 2018-06 | CT#80 | CP-181031 |  |  |  | TS sent to plenary for approval. | 1.0.0 |
| 2018-06 | CT#80 | CP-181031 |  |  |  | TS approved by plenary | 15.0.0 |
| 2018-09 | CT#81 | CP-182015 | 0001 | 2 | F | PCF id correction for BSF | 15.1.0 |
| 2018-09 | CT#81 | CP-182015 | 0002 |  | F | Reference update: OpenAPI specification | 15.1.0 |
| 2018-09 | CT#81 | CP-182015 | 0004 | 2 | F | Clarification on mandatory HTTP error status codes | 15.1.0 |
| 2018-09 | CT#81 | CP-182015 | 0005 | 6 | B | OpenAPI for TS 29.521 | 15.1.0 |
| 2018-09 | CT#81 | CP-182015 | 0006 | 1 | F | Description of Structured data types | 15.1.0 |
| 2018-09 | CT#81 | CP-182015 | 0007 | 1 | B | Support of IPv4 overlapping | 15.1.0 |
| 2018-09 | CT#81 | CP-182015 | 0008 |  | F | Correction of the service name | 15.1.0 |
| 2018-09 | CT#81 | CP-182015 | 0009 | 1 | F | Resource structure presentation | 15.1.0 |
| 2018-12 | CT#82 | CP-183205 | 0011 |  | F | Default value for apiRoot Default value for apiRoot | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0012 |  | F | Correction to DELETE Method for Nbsf\_Management Service API | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0013 |  | F | Correction to Typos in URI Paths | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0015 |  | F | API version | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0016 |  | F | ExternalDocs OpenAPI field | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0017 |  | F | Location header field in OpenAPI | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0018 | 1 | F | Security | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0019 | 1 | F | supported content types | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0020 | 2 | F | HTTP Error responses | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0021 | 2 | F | DRA as service consumer | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0023 |  | F | Change presence in BSF binding | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0024 | 1 | F | Presence conditions in yaml file | 15.2.0 |
| 2018-12 | CT#82 | CP-183205 | 0025 | 1 | F | Missing 201 response body for POST to /pcfBindings | 15.2.0 |
| 2019-03 | CT#83 | CP-190113 | 0028 | 2 | F | Handling of unsupported query parameter combinations | 15.3.0 |
| 2019-03 | CT#83 | CP-190113 | 0029 | 1 | F | Correction of description of the Nbsf\_Management\_Register Service and Nbsf\_Management\_Discovery service operations | 15.3.0 |
| 2019-03 | CT#83 | CP-190113 | 0030 |  | F | BSF resource cleanup | 15.3.0 |
| 2019-03 | CT#83 | CP-190113 | 0031 | 1 | F | Formatting of structured data types in query parameters | 15.3.0 |
| 2019-03 | CT#83 | CP-190113 | 0032 | 1 | F | Correction on the handling of UE addresses | 15.3.0 |
| 2019-03 | CT#83 | CP-190110 | 0033 | 2 | F | Miscellaneous BSF correction | 15.3.0 |
| 2019-03 | CT#83 | CP-190140 | 0034 | 1 | F | OpenAPI Version number update | 15.3.0 |
| 2019-06 | CT#84 | CP-191079 | 0036 |  | F | Remove NSI ID | 15.4.0 |
| 2019-06 | CT#84 | CP-191106 | 0037 | 5 | B | Support multiple UE addresses in one binding | 16.0.0 |
| 2019-06 | CT#84 | CP-191106 | 0038 | 5 | B | Binding update support | 16.0.0 |
| 2019-06 | CT#84 | CP-191079 | 0039 | 1 | F | Precedence of OpenAPI file | 15.4.0 |
| 2019-06 | CT#84 | CP-191079 | 0040 | 1 | F | Copyright Note in YAML files | 15.4.0 |
| 2019-06 | CT#84 | CP-191089 | 0041 | 1 | F | Correction of Location header in Nbsf\_Management OpenAPI | 16.0.0 |
| 2019-06 | CT#84 | CP-191101 | 0043 | 2 | F | OpenAPI version number update | 16.0.0 |
| 2019-09 | CT#85 | CP-192199 | 0045 | 2 | F | Session binding for IPv6 addresses | 16.1.0 |
| 2019-09 | CT#85 | CP-192156 | 0046 |  | F | Support multiple UE addresses in BSF | 16.1.0 |
| 2019-09 | CT#85 | CP-192152 | 0047 | 1 | B | IP address handling in wireline access | 16.1.0 |
| 2019-09 | CT#85 | CP-192234 | 0050 | 2 | F | OpenAPI version update TS 29.521 Rel-16 | 16.1.0 |
| 2019-12 | CT#86 | CP-193197 | 0053 | 3 | B | Same PCF selection for the same UE ID, S-NSSAI and DNN combination | 16.2.0 |
| 2019-12 | CT#86 | CP-193197 | 0054 |  | F | Update of API version and TS version in OpenAPI file | 16.2.0 |
| 2020-03 | CT#87e | CP-200207 | 0055 | 1 | B | Update of the same PCF selection | 16.3.0 |
| 2020-03 | CT#87e | CP-200207 | 0056 |  | B | DNN Clarification | 16.3.0 |
| 2020-03 | CT#87e | CP-200208 | 0058 | 2 | B | Adding NWDAF as Nbsf\_management service consumer | 16.3.0 |
| 2020-03 | CT#87e | CP-200207 | 0059 |  | F | Resolve editor note for PATCH | 16.3.0 |
| 2020-03 | CT#87e | CP-200207 | 0060 | 1 | F | Miscellaneous errors | 16.3.0 |
| 2020-03 | CT#87e | CP-200253 | 0061 | 1 | F | Support of the Update service operation | 16.3.0 |
| 2020-03 | CT#87e | CP-200214 | 0062 |  | F | OpenAPI: usage of the "tags" keyword | 16.3.0 |
| 2020-03 | CT#87e | CP-200260 | 0063 | 1 | B | PCF set Id/PCF Id in Nbsf\_Management\_Register/Update | 16.3.0 |
| 2020-03 | CT#87e | CP-200215 | 0064 |  | F | Correction on PcfBinding | 16.3.0 |
| 2020-03 | CT#87e | CP-200216 | 0065 |  | F | Update of OpenAPI version and TS version in externalDocs field | 16.3.0 |
| 2020-06 | CT#88e | CP-201233 | 0066 | 1 | F | Corrections on SamePcf | 16.4.0 |
| 2020-06 | CT#88e | CP-201246 | 0067 | 1 | F | Corrections related to UEaddr | 16.4.0 |
| 2020-06 | CT#88e | CP-201259 | 0068 | 3 | B | Update of PCF address(es) | 16.4.0 |
| 2020-06 | CT#88e | CP-201275 | 0069 | 2 | B | Clarification of the DS-TT MAC address | 16.4.0 |
| 2020-06 | CT#88e | CP-201228 | 0070 | 3 | B | Support of full Frame Routing feature | 16.4.0 |
| 2020-06 | CT#88e | CP-201212 | 0071 | 1 | F | Binding information retrieval: PCF set ID and PCF instance ID | 16.4.0 |
| 2020-06 | CT#88e | CP-201296 | 0073 | 2 | F | Correct use of application error | 16.4.0 |
| 2020-06 | CT#88e | CP-201228 | 0074 | 1 | F | Correct IPv6 prefix | 16.4.0 |
| 2020-06 | CT#88e | CP-201244 | 0076 | 1 | F | Storage of YAML files in ETSI Forge | 16.4.0 |
| 2020-06 | CT#88e | CP-201246 | 0080 | 1 | F | Adding DRA as Nbsf\_management service consumer | 16.4.0 |
| 2020-06 | CT#88e | CP-201258 | 0081 | 1 | B | Update of PCF address(es) | 16.4.0 |
| 2020-06 | CT#88e | CP-201256 | 0083 | 1 | F | URI of the Nbsf\_Management service | 16.4.0 |
| 2020-06 | CT#88e | CP-201222 | 0085 | 1 | A | Correction to the condition of BSF service operations | 16.4.0 |
| 2020-06 | CT#88e | CP-201244 | 0086 | 1 | F | Optionality of ProblemDetails | 16.4.0 |
| 2020-06 | CT#88e | CP-201233 | 0087 | 1 | F | suppFeat attribute within PcfBinding data | 16.4.0 |
| 2020-06 | CT#88e | CP-201244 | 0088 | 1 | F | Supported headers, Resource Data type and yaml mapping | 16.4.0 |
| 2020-06 | CT#88e | CP-201255 | 0090 |  | F | Update of OpenAPI version and TS version in externalDocs field | 16.4.0 |
| 2020-09 | CT#89e | CP-202077 | 0092 |  | F | Data type corrections | 16.5.0 |
| 2020-12 | CT#90e | CP-203139 | 0093 | 1 | F | Essential Corrections and alignments | 16.6.0 |
| 2021-03 | CT#91e | CP-210191 | 0094 | 1 | F | Support of stateless NFs | 16.7.0 |
| 2021-03 | CT#91e | CP-210202 | 0095 |  | F | Correction to Framed Routing feature | 16.7.0 |
| 2021-03 | CT#91e | CP-210217 | 0096 |  | F | Storage of YAML files in ETSI Forge | 16.7.0 |
| 2021-03 | CT#91e | CP-210205 | 0098 | 1 | F | Correction to SamePcf feature | 16.7.0 |
| 2021-03 | CT#91e | CP-210219 | 0097 |  | F | Adding some missing description fields to data type definitions in OpenAPI specification files | 17.0.0 |
| 2021-03 | CT#91e | CP-210221 | 0099 | 1 | F | OpenAPI reference | 17.0.0 |
| 2021-03 | CT#91e | CP-210240 | 0102 |  | F | Update of OpenAPI version and TS version in externalDocs field | 17.0.0 |
| 2021-06 | CT#92e | CP-211234 | 0103 | 1 | F | Support of optional HTTP custom header fields | 17.1.0 |
| 2021-06 | CT#92e | CP-211219 | 0105 |  | A | Correction to Overview and Introduction | 17.1.0 |
| 2021-06 | CT#92e | CP-211200 | 0107 | 1 | A | Redirect responses with "application/json" media type | 17.1.0 |
| 2021-06 | CT#92e | CP-211219 | 0109 | 1 | A | Correction to ExtendedSamePcf feature | 17.1.0 |
| 2021-06 | CT#92e | CP-211265 | 0111 |  | F | Update of OpenAPI version and TS version in externalDocs field | 17.1.0 |
| 2021-09 | CT#93e | CP-212225 | 0113 | 1 | B | Subscription to notification of PCF registration | 17.2.0 |
| 2021-09 | CT#93e | CP-212224 | 0114 |  | F | Correcting CR #0107 implementation | 17.2.0 |
| 2021-09 | CT#93e | CP-212225 | 0115 | 1 | B | DCAMP related update of BSF services | 17.2.0 |
| 2021-09 | CT#93e | CP-212225 | 0116 | 1 | B | DCAMP related updates in the resource structure | 17.2.0 |
| 2021-09 | CT#93e | CP-212225 | 0119 | 1 | B | Registration and Deregistration of the PCF for a UE | 17.2.0 |
| 2021-09 | CT#93e | CP-212225 | 0120 | 1 | B | DCAMP related updates in the OpenAPI file | 17.2.0 |
| 2021-09 | CT#93e | CP-212223 | 0121 |  | F | Update of OpenAPI version and TS version in externalDocs field | 17.2.0 |
| 2021-12 | CT#94e | [CP-213194](https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=CP-213194) | 0122 |  | F | Correction to PCF for a UE binding update procedure | 17.3.0 |
| 2021-12 | CT#94e | [CP-213194](https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=CP-213194) | 0123 | 1 | B | Subscription to PCF registration/deregistration events for multiple DNN and SNNSAI | 17.3.0 |
| 2021-12 | CT#94e | [CP-213234](https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=CP-213234) | 0124 |  | B | Update of BSF NF service consumers | 17.3.0 |
| 2021-12 | CT#94e | [CP-213234](https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=CP-213234) | 0125 |  | B | Clarification to the registered UE address for TSN and non-TSN scenarios. | 17.3.0 |
| 2021-12 | CT#94e | [CP-213239](https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=CP-213239) | 0126 |  | F | Aligning API URI with SBI template | 17.3.0 |
| 2021-12 | CT#94e | [CP-213200](https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=CP-213200) | 0130 | 1 | B | Discover a PCF for a UE | 17.3.0 |
| 2021-12 | CT#94e | [CP-213224](https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=CP-213224) | 0132 |  | A | Correction to PCF Session binding update procedure | 17.3.0 |
| 2021-12 | CT#94e | [CP-213239](https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=CP-213239) | 0135 | 1 | F | Naming Convention | 17.3.0 |
| 2021-12 | CT#94e | [CP-213246](https://portal.3gpp.org/ngppapp/CreateTdoc.aspx?mode=view&contributionUid=CP-213246) | 0136 |  | F | Update of OpenAPI version and TS version in externalDocs field | 17.3.0 |
| 2022-03 | CT#95e | CP-220197 | 0137 | 1 | B | Completion of subscription to notification of PCF registration | 17.4.0 |
| 2022-03 | CT#95e | CP-220197 | 0138 | 1 | F | Clarification of table 4.2.1-1 | 17.4.0 |
| 2022-03 | CT#95e | CP-220176 | 0139 | 2 | A | Alignment of "Application Errors" clause with SBI TS template | 17.4.0 |
| 2022-03 | CT#95e | CP-220197 | 0140 |  | F | Correction of references to the PCF Session binding resource | 17.4.0 |
| 2022-03 | CT#95e | CP-220197 | 0142 |  | F | Removal of BindingSubscription data type | 17.4.0 |
| 2022-03 | CT#95e | CP-220194 | 0143 |  | F | Update of info and externalDocs fields | 17.4.0 |
| 2022-06 | CT#96 | CP-221159 | 0144 | 1 | F | Correction to subscription procedures | 17.5.0 |
| 2022-06 | CT#96 | CP-221155 | 0145 | 1 | F | Update of Fqdn data type definition | 17.5.0 |
| 2022-06 | CT#96 | CP-221154 | 0146 |  | F | Formatting of description fields | 17.5.0 |
| 2022-06 | CT#96 | CP-221155 | 0147 | 1 | F | Update the apiVersion placeholder | 17.5.0 |
| 2022-06 | CT#96 | CP-221151 | 0148 |  | F | Update of info and externalDocs fields | 17.5.0 |
| 2022-09 | CT#97e | CP-222125 | 0149 | 1 | F | Correction in the handling of features for Nbsf | 17.6.0 |
| 2022-09 | CT#97e | CP-222125 | 0150 | 2 | F | Routing binding indication in the interactions with the PCF | 17.6.0 |
| 2022-09 | CT#97e | CP-222127 | 0151 | 1 | F | Corrections to Nbsf\_Management\_Subscribe service operation | 17.6.0 |
| 2022-09 | CT#97e | CP-222127 | 0152 |  | F | Corrections to Nbsf\_Management\_Notify service operation | 17.6.0 |
| 2022-09 | CT#97e | CP-222127 | 0153 | 1 | F | Replacement of subsId with subId | 17.6.0 |
| 2022-09 | CT#97e | CP-222127 | 0154 |  | F | Alignment of ipDomain in PcfForPduSessionInfo data type | 17.6.0 |
| 2022-09 | CT#97e | CP-222127 | 0155 | 1 | F | Correction to PCF address in PcfForUeBinding | 17.6.0 |
| 2022-09 | CT#97e | CP-222127 | 0156 | 1 | F | Corrections to UE binding information update procedure | 17.6.0 |
| 2022-09 | CT#97e | CP-222127 | 0157 |  | F | incorrect data structure in PUT response for subscription modification | 17.6.0 |
| 2022-09 | CT#97e | CP-222095 | 0158 | 1 | B | Updating the service description clauses to support the PCF for a MBS Session binding | 17.6.0 |
| 2022-09 | CT#97e | CP-222095 | 0159 | 1 | B | Defining the resources part to support the PCF for an MBS Session binding | 17.6.0 |
| 2022-09 | CT#97e | CP-222095 | 0160 | 1 | B | Defining the data model part to support the PCF for an MBS Session binding | 17.6.0 |
| 2022-09 | CT#97e | CP-222208 | 0161 | 1 | B | Updating the OpenAPI description part to support the PCF for an MBS Session binding | 17.6.0 |
| 2022-09 | CT#97e | CP-222121 | 0162 | 1 | F | Update of info and externalDocs fields | 17.6.0 |
| 2022-12 | CT#98e | CP-223167 | 0164 | 1 | F | adding MBSF as a consumer of Nbsf\_Management\_Discovery service | 17.7.0 |
| 2022-12 | CT#98e | CP-223167 | 0165 | 1 | F | missing MBS session binding functionality related description | 17.7.0 |
| 2022-12 | CT#98e | CP-223167 | 0169 | 1 | F | Correction in Registration of a new PCF for an MBS Session | 17.7.0 |
| 2022-12 | CT#98e | CP-223167 | 0170 | 1 | F | Correction to service description clauses to support the PCF for a MBS Session binding | 17.7.0 |
| 2022-12 | CT#98e | CP-223197 | 0173 | 1 | F | Corrections for Nbsf\_Management API | 17.7.0 |
| 2022-12 | CT#98e | CP-223188 | 0174 |  | F | Update of info and externalDocs fields | 17.7.0 |
| 2022-12 | CT#98e | CP-223191 | 0163 |  | F | Adding the mandatory error code 502 Bad Gateway | 18.0.0 |
| 2022-12 | CT#98e | CP-223200 | 0167 | 3 | F | Update of 4.2.1 to add TSCTSF | 18.0.0 |
| 2022-12 | CT#98e | CP-223192 | 0168 | 1 | F | Indication of API version and BsfEvent enumeration | 18.0.0 |
| 2022-12 | CT#98e | CP-223199 | 0171 | 1 | F | Correction to DNN encoding | 18.0.0 |
| 2022-12 | CT#98e | CP-223189 | 0175 |  | F | Update of info and externalDocs fields | 18.0.0 |
| 2023-03 | CT#99 | CP-230166 | 0176 |  | F | Correction of the description fields in enumerations | 18.1.0 |
| 2023-03 | CT#99 | CP-230131 | 0178 | 1 | A | Miscellaneous essential corrections to the MBS related procedures | 18.1.0 |
| 2023-03 | CT#99 | CP-230166 | 0179 |  | F | Corrections to query parameters not respecting the naming convention | 18.1.0 |
| 2023-03 | CT#99 | CP-230177 | 0180 |  | B | Support of IPv6 prefix delegation | 18.1.0 |
| 2023-03 | CT#99 | CP-230161 | 0181 |  | F | Update of info and externalDocs fields | 18.1.0 |
| 2023-06 | CT#100 | CP-231133 | 0182 | 1 | F | Corrections related to DCAMP | 18.2.0 |
| 2023-06 | CT#100 | CP-231133 | 0183 |  | F | Missing description of 404 Not Found in procedures | 18.2.0 |
| 2023-06 | CT#100 | CP-231131 | 0184 | 2 | F | Missing description of HTTP redirect response for 5MBS | 18.2.0 |
| 2023-06 | CT#100 | CP-231152 | 0185 | 1 | B | updating the S-NSSAI of the session binding information | 18.2.0 |
| 2023-06 | CT#100 | CP-231133 | 0187 | 1 | F | Error response for BSF notification | 18.2.0 |
| 2023-06 | CT#100 | CP-231179 | 0189 | 1 | A | Adding 5G DDNMF as consumer | 18.2.0 |
| 2023-06 | CT#100 | CP-231132 | 0190 | 1 | F | Corrections to the redirection mechanism description | 18.2.0 |
| 2023-06 | CT#100 | CP-231141 | 0191 |  | F | Update of info and externalDocs fields | 18.2.0 |
| 2023-12 | CT#102 | CP-233250 | 0192 | 1 | F | feature naming for network slice replacement | 18.3.0 |
| 2023-12 | CT#102 | CP-233229 | 0194 | 1 | F | IETF RFC 7540 and 9457 obsoleted by RFC 9113 and 7807 | 18.3.0 |