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Contents

Foreword

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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 7540: "Hypertext Transfer Protocol Version 2 (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 3.0.0 Specification", https://github.com/OAI/OpenAPI-Specification/blob/master/versions/3.0.0.md.

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

[13] IETF RFC 7807: "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".

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].

AF	Application Function
BSF	Binding Support Function
DNN	Data Network Name
DRA	Diameter Routing Agent
HTTP	Hypertext Transfer Protocol
FQDN	Fully Qualified Domain Name
GPSI	Generic Public Subscription Identifier
JSON	JavaScript Object Notation HTTP Hypertext Transfer Protocol
MAC	Media Access Control
NEF	Network Exposure Function
NRF	Network Repository Function
PCF	Policy Control Function
SMF	Session Management Function
S-NSSAI	Single Network Slice Selection Assistance Information
SUPI	Subscription Permanent Identifier
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 for the BSF to provide a PDU session binding functionality, which ensures that an AF request for a certain PDU Session reaches the relevant PCF holding the PDU Session information.

This service:

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

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).

Known consumers of the Nbsf_management service are:

- Policy Control Function (PCF)
- Network Exposure Function (NEF)
- Application Function (AF)

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

NOTE: The PCF accesses the Nbsf_management service at the BSF via an internal interface when it is collocated with BSF.

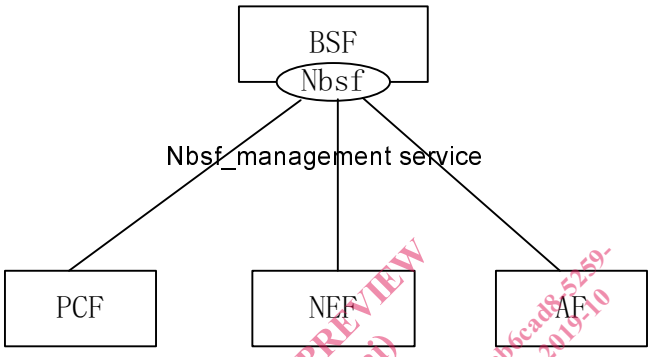

Figure 4.1.2-1: Reference Architecture for the Nbsf_management service; SBI representation

4.1.3 Network Functions

4.1.3.1 Binding Support Function (BSF)

The BSF:

- stores the binding information for a certain PDU Session; and
- discovers the binding information (e.g. the address information of the selected PCF).

The BSF allows NF service consumers (e.g.PCF) to register, update and remove the binding information, and allows NF service consumers (e.g. AF, NEF) to discover the binding information (e.g the address information of the selected PCF).

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

4.1.3.2 NF Service Consumers

The Policy Control Function (PCF):

- registers the 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; and,
- removes the 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 Network Exposure Function (NEF):

- provides a 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 by using the Nbsf_Management_Discovery service operation.

The Application Function (AF):

- discover the selected PCF by using the Nbsf_Management_Discovery service operation when it is allowed to interact directly with the policy framework for policy control.

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 UE when an IPv4 address and/or an IPv6 prefix is allocated for an IP PDU Session or a MAC address is used for an Ethernet PDU session.	NF service consumer (PCF)
Nbsf_Management_Deregister	This service operation is used to deregister the binding information for a UE when the PDU Session is released.	NF service consumer (PCF)
Nbsf_Management_Discovery	This service operation is used by an NEF or AF to discover a selected PCF .	NF service consumer (NEF, AF)

4.2.2 Nbsf_Management_Register Service Operation

4.2.2.1 General

This service operation allows the NF service consumer (e.g. PCF) 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 NF service consumer (e.g. PCF) receives a new UE address (e.g. IPv6 prefix) and already registered session binding information for this PDU session, the NF service consumer (e.g. PCF) shall register a new session binding information in the BSF.

NOTE: For a PDU session, the PCF can receive a new UE address by Npcf_SMPolicyControl_Update service operation.

4.2.2.2 Register a new PCF Session binding information

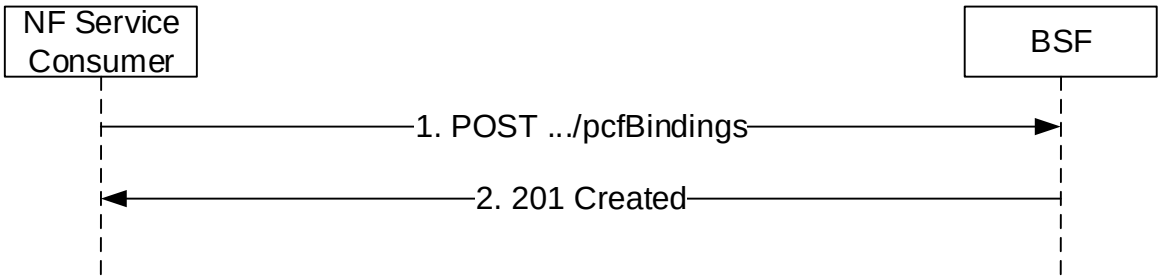

Figure 4.2.2.2-1: NF service consumer register a new PCF Session binding information

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

- address information of the served UE consisting of: