PCF Session Binding with Binding Support Function

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Feature Summary Revision History

Summary Data

Table 1: Summary Data

Applicable Product(s) or Functional Area	PCF
Applicable Platform(s)	SMI
Feature Default Setting	Enabled – Configuration required to disable
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
First introduced.	2022.04.0

Feature Description

The Cisco Policy Control Function (PCF) supports the Binding Support Function (BSF) to provide a packet data unit (PDU) session binding functionality. PCF ensures that an AF request for a PDU session reaches the relevant PCF holding the PDU session information.

The Nbsf Management Register service enables the PCF to register the session binding information for a User Equipment (UE) in the BSF. The BSF maintains and provides the user identity, the Data Network Name (DNN), the UE addresses, and the PCF address for the PDU session.

The PCF registers a new session binding information in the BSF and obtains a unique BSF binding ID for the existing PDU session. If PCF receives a new UE address (for example, an IPv4 address) and the session binding information is registered for this PDU session.

The PCF deletes the session binding data for a UE in the BSF using the Nbsf Management De-Register service operation and deletes a specific resource with the resource identifier by Individual PCF Session Binding (for example Binding ID).

How it Works

This section describes how this feature works.

Call Flows

This section describes the key call flow for this feature.

Creating Call Flow for Nbsf Management Register Service

This section describes the creating call flow for a Nbsf management register service.

Figure 1: Registering a New PDU Session Binding with BSF

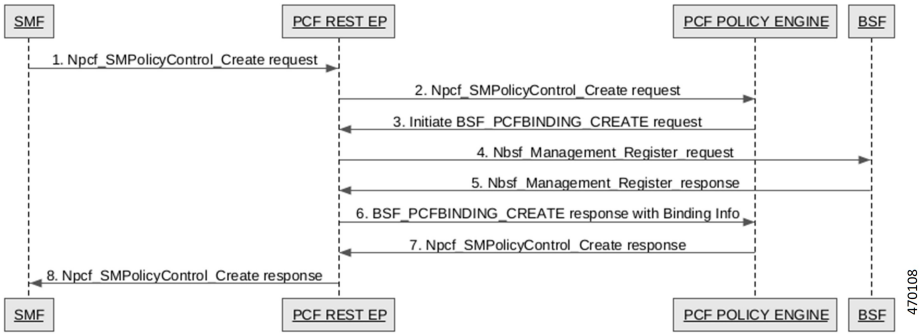

Table 3: Registering a new PDU Session Binding with BSF Call Flow Description

Step	Description
1	The SMF sends a Npcf SMPolicy Control Create Request to the PCF-REST-EP.
2	The PCF-REST-EP sends the Npcf sSMPolicy Control Create Request to the PCF Policy Engine.
3	The PCF Policy Engine initiates the BSF PCF binding create request to the PCF-REST-EP.
4	The PCF-REST-EP sends the Nbsf management register request to the BSF.
5	The BSF sends the Nbsf management register response to the PCF-REST-EP.
6	The PCF-REST-EP sends the BSF PCF binding create response with binding info to the PCF Policy Engine.
7	The PCF Policy Engine sends the Npcf SMPolicy Control Create Request to the PCF REST EP.
8	The PCF REST EP sends the Npcf SMPolicy Control Create Request to the SMF.

Updating Call Flow for Nbsf Management Register Service

This section describes the updating call flow for a Nbsf management register service.

Figure 2: Registering an existing PDU Session as New Binding with BSF

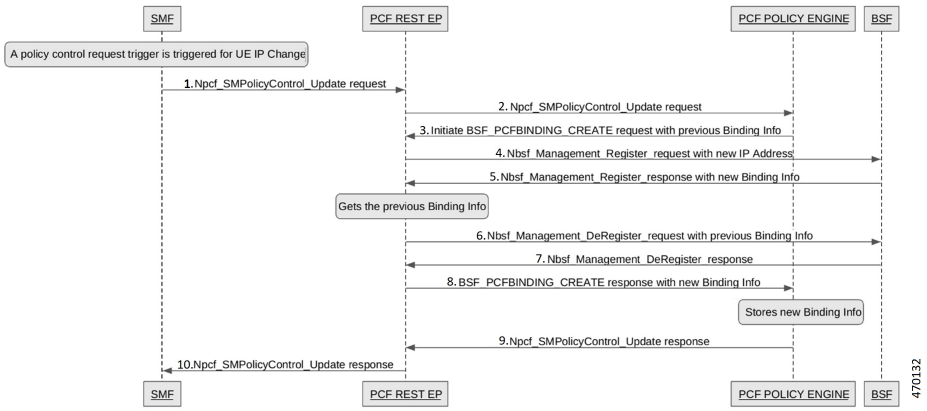

Table 4: Registering an existing PDU Session as New Binding with BSF Call Flow Description

Step	Description
1	After the policy control request trigger is triggered for UE IP Change, the SMF send a Npcf SMPolicy Control Update Request to the PCF REST EP.
2	The PCF REST EP sends the Npcf SMPolicy Control Update Request to the PCF POLICY ENGINE.
3	The PCF POLICY ENGINE initiates the BSF PCF Binding Create request with previous Binding Info to the PCF REST EP.

Step	Description
4	The PCF REST EP sends the Nbsf Management register request with a new IP Address to the BSF.
5	The BSF sends the Nbsf Management register response with new Binding Info to the PCF REST EP.
6	After getting the previous binding info, the PCF REST EP sends the Nbsf Management Deregister request with Previous Binding Info to the BSF.
7	The BSF sends the Nbsf Management Deregister response to the PCF REST EP.
8	The PCF REST EP sends the BSF PCFBinding Create response with new Binding Info to the PCF POLICY ENGINE.
9	After storing new Binding Info, the Npcf SMPolicy Control Update Response to the PCF REST EP.
10	The PCF REST EP sends the Npcf SMPolicy Control Update Response to the SMF.

Deleting Call Flow for Nbsf Management Register Service

This section describes the deleting call flow for a Nbsf management register service.

Figure 3: Deregistering a PDU Session with the BSF

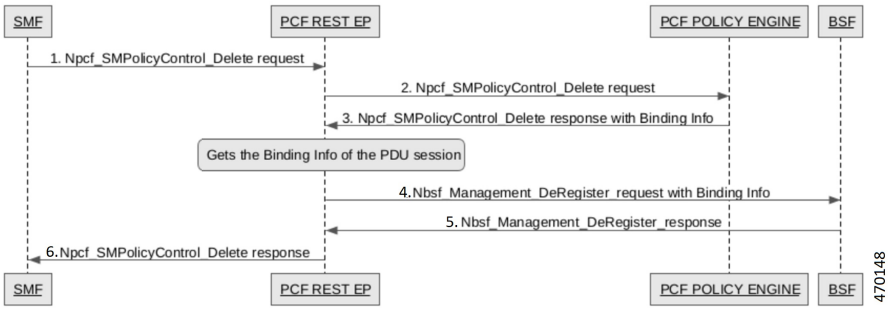

Table 5: Deregistering a PDU Session with the BSF Call Flow Description

Step	Description
1	The SMF sends a Npcf SMPolicy Control Delete Request to the PCF REST EP.
2	The PCF REST EP sends the Npcf SMPolicy Control Delete Request to the PCF Policy Engine.
3	The PCF Policy Engine sends the Npcf SMPolicy Control Delete response with Binding Info to the PCF REST EP.
4	After getting the Binding Info of the PDU session, the PCF REST EP sends the Nbsf Management Deregister request with Binding Info to the BSF.
5	The BSF sends the Nbsf Management Deregister response to the PCF REST EP.

Step	Description
6	The PCF REST EP sends the Npcf SMPolicy control Delete response to the SMF.

Feature configuration

Configuring BSF at OPS Center

To configure this feature, use the following configuration:

```
config
   engine pcf-green properties bsf.pcfbinding.enabled value true
   profile nf-client nf-type bsf bsf-profile bsfprofile locality default
 service name type nbsf-management endpoint-profile profile-1 endpoint-name
 ep1 capacity 10 properties bsf.pcfbinding.enabled
   primary ip-address ipv4 {config.Core.HostIpAddress.QPS1} port 8090
   profile nf-client nf-type bsf bsf-profile bsfprofile locality default
 service name type nbsf-management endpoint-profile profile-1
   uri-scheme http version uri-version v1
   service-registration profile locality default capacity 20 priority 10
 nf-status REGISTERED plmn-list 100 010
   service-registration profile snssais embb sst 1
   profile nf-pair nf-type BSF locality client default
   profile nf-pair nf-type BSF locality preferred-server default
   profile nf-pair nf-type BSF locality geo-server geoLocality
   profile nf-pair nf-type BSF subscription-enabled false
end
```

Notes:

- **engine pcf-green properties bsf.pcfbinding.enabled value [true | false]** —The value is set to true to enable the BSF.

Standards Compilance

This feature complies with the following standards specifications:

- *3GPP TS 29.521 "Binding Support Management Service"*
- *3GPP 29.513 "Policy and Charging Control signaling flows and QoS parameter mapping"*

OAM Support

This section describes operations, administration, and maintenance support for this feature.

Statistics

This section provides the counter that gets generated for the BSF.

outgoing_request_total—Collects the outgoing request total for the BSF.

The outgoing_request_total counter supports the following labels:

- interface_name—Indicates the name of the Service Based Interface (SBI) such as BSF.
- service_name—Indicates the name of the service such as nbsf-management.
- command—Indicates the command type such as Register|Deregister.

outgoing_request_time—Collects the outgoing request time for the BSF.

The outgoing_request_time counter supports the following labels:

- service_name—Indicates the name of the service such as nbsf-management.
- command—Indicates the command type such as Register|Deregister.

incoming_rpc_request_total—Collects the incoming rpc request total for the BSF.

The incoming_rpc_request_total counter supports the following labels:

- interface_name—Indicates the name of the Service Based Interface (SBI) such as BSF.
- service_name—Indicates the name of the service such as nbsf-management.
- command—Indicates the command type such as Register.

incoming_rpc_request_time—Collects the incoming rpc request time for the BSF.

The incoming_rpc_request_time counter supports the following labels:

- interface_name—Indicates the name of the Service Based Interface (SBI) such as BSF.
- service_name—Indicates the name of the service such as nbsf-management.
- command—Indicates the command type such as Register.

async_svc_runnable_total—Collects the async svc runnable total for the BSF.

The async_svc_runnable_total counter supports the following labels:

- service_name—Indicates the name of the service such as nbsf-management.
- command—Indicates the command type such as Register.

async_svc_runnable_time—Collects the async svc runnable time for the BSF.

The async_svc_runnable_time counter supports the following labels:

- service_name—Indicates the name of the service such as nbsf-management.
- command—Indicates the command type such as Register.