Dedicated Bearer Support

- Feature Summary and Revision History, on page 1
- Feature Description, on page 1
- Setup and Update Dedicated Bearers, on page 2
- Delete Dedicated Bearers, on page 9

Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Product(s) or Functional Area	cnSGW-C
Applicable Platform(s)	SMI
Feature Default Setting	Enabled - Always-on
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
First introduced.	2021.01.0

Feature Description

Setup and Update Dedicated Bearers

cnSGW-C supports creating and updating single/multiple dedicated bearers.

Delete Dedicated Bearers

cnSGW-C supports deletion of single/multiple dedicated bearers.

Setup and Update Dedicated Bearers

Feature Description

cnSGW-C supports creating and updating dedicated bearers for both single and multiple PDN subscribers. It also supports multiple bearer contexts as part of single create bearer procedure.

How it Works

This section describes how this feature works.

Call Flows

This section describes the key call flows for this feature.

Dedicated Bearer Setup – Request Accepted Call Flow

This section describes the Dedicated Bearer Setup – Request Accepted call flow.

Figure 1: Dedicated Bearer Setup – Request Accepted Call Flow

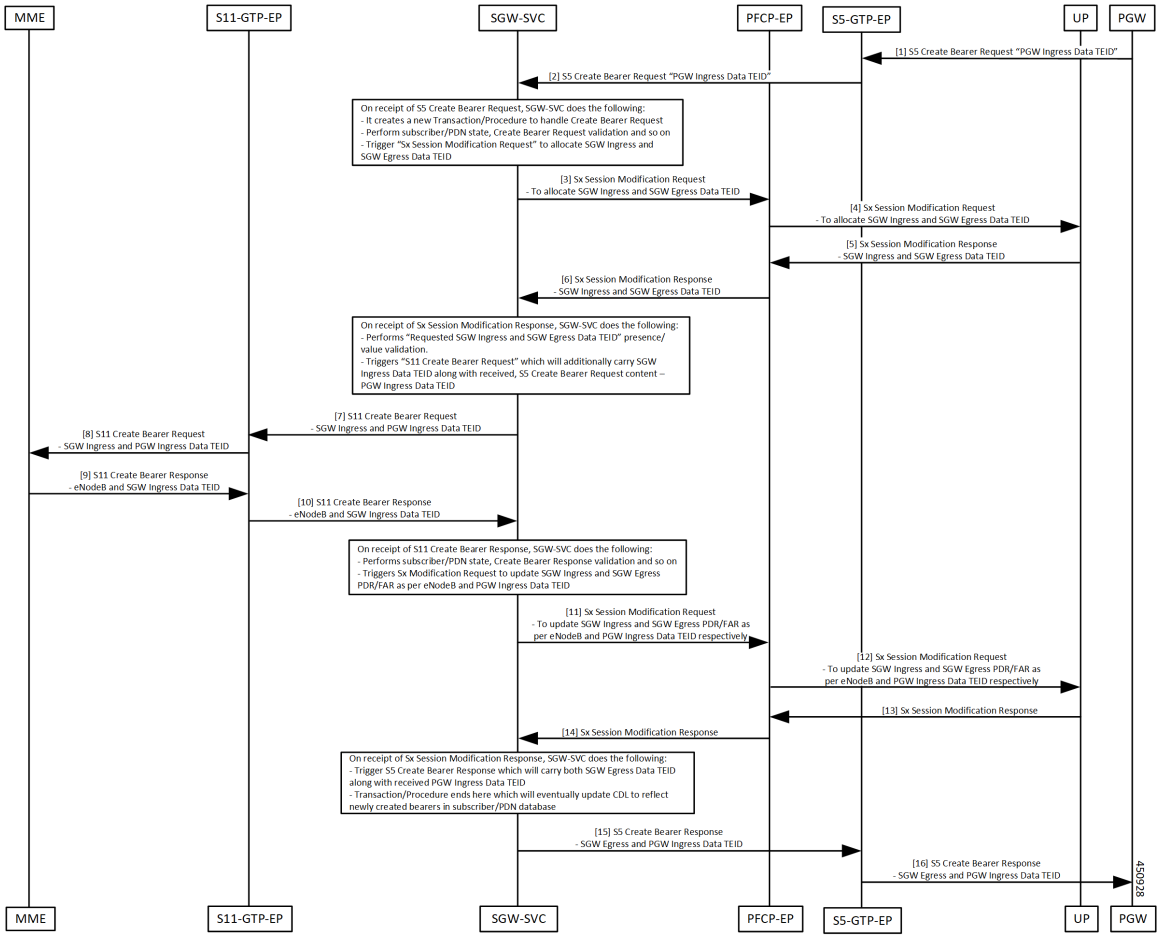

Table 3: Dedicated Bearer Setup – Request Accepted Call Flow Description

Step	Description
1	The PGW sends the S5 Create Bearer Request to the S5-GTPC-EP pod.
2	The S5-GTPC-EP pod forwards the S5 Create Bearer Request to the SGW-SVC pod.
3	The SGW-SVC receives the S5 Create Bearer request and performs the following: • Creates a new transaction • Performs GTP validations • Triggers the Sx Modification Request to the PFCP-EP pod
4	The PFCP-EP pod forwards the Sx Modification Request to the UP for allocating SGW Ingress and SGW Egress TEIDs.
5	The PFCP-EP pod receives the Sx Modification Response with SGW Ingress and SGW Egress TEIDs, from the UP.

Step	Description
6	The PFCP-EP pod forwards the Sx Modification Response with SGW Ingress and SGW Egress TEIDs, to the SGW-SVC.
7	The SGW-SVC receives the Sx Modification response and performs the following: • Validates the received SGW Ingress and SGW Egress TEIDs • Triggers the S11 Create Bearer Request with the SGW Ingress TEID to the S11-GTPC-EP pod
8	The S11-GTPC-EP pod forwards the S11 Create Bearer Request with the SGW Ingress TEID, to the MME.
9	The MME sends the S11 Create Bearer Response to the S11-GTPC-EP pod.
10	The S11-GTPC-EP pod forwards the S11 Create Bearer Response to the SGW-SVC.
11	The SGW-SVC receives the S11 Create Bearer response and performs the following: • GTP validations • Triggers the Sx Modification Request to the PFCP-EP pod to update SGW Ingress and SGW Egress PDR/FAR, with the MME and the PGW GTPU-TEID
12	The PFCP-EP pod forwards the Sx Modification Request to the UP.
13	The UP sends the Sx Modification Response to the PFCP-EP pod.
14	The PFCP-EP pod forwards the Sx Modification Response to the SGW-SVC pod.
15, 16	The SGW-SVC pod receives the Sx Modification Response and performs the following: • Ends the transaction/procedure • Updates the CDL • Sends the S5 Create Bearer Response with SGW Egress TEIDs with matching PGW GTPU TEIDs, and with the cause as Accepted.

Dedicated Bearer Setup – Request Accepted Partially Call Flow

This section describes the Dedicated Bearer set up call flow. In this procedure, the MME sends the Create Bearer Response with the GTP cause as Request Accepted Partially.

Prerequisite: Create Bearer Procedure with two bearer contexts.

Figure 2: Dedicated Bearer Setup – Request Accepted Partially Call Flow

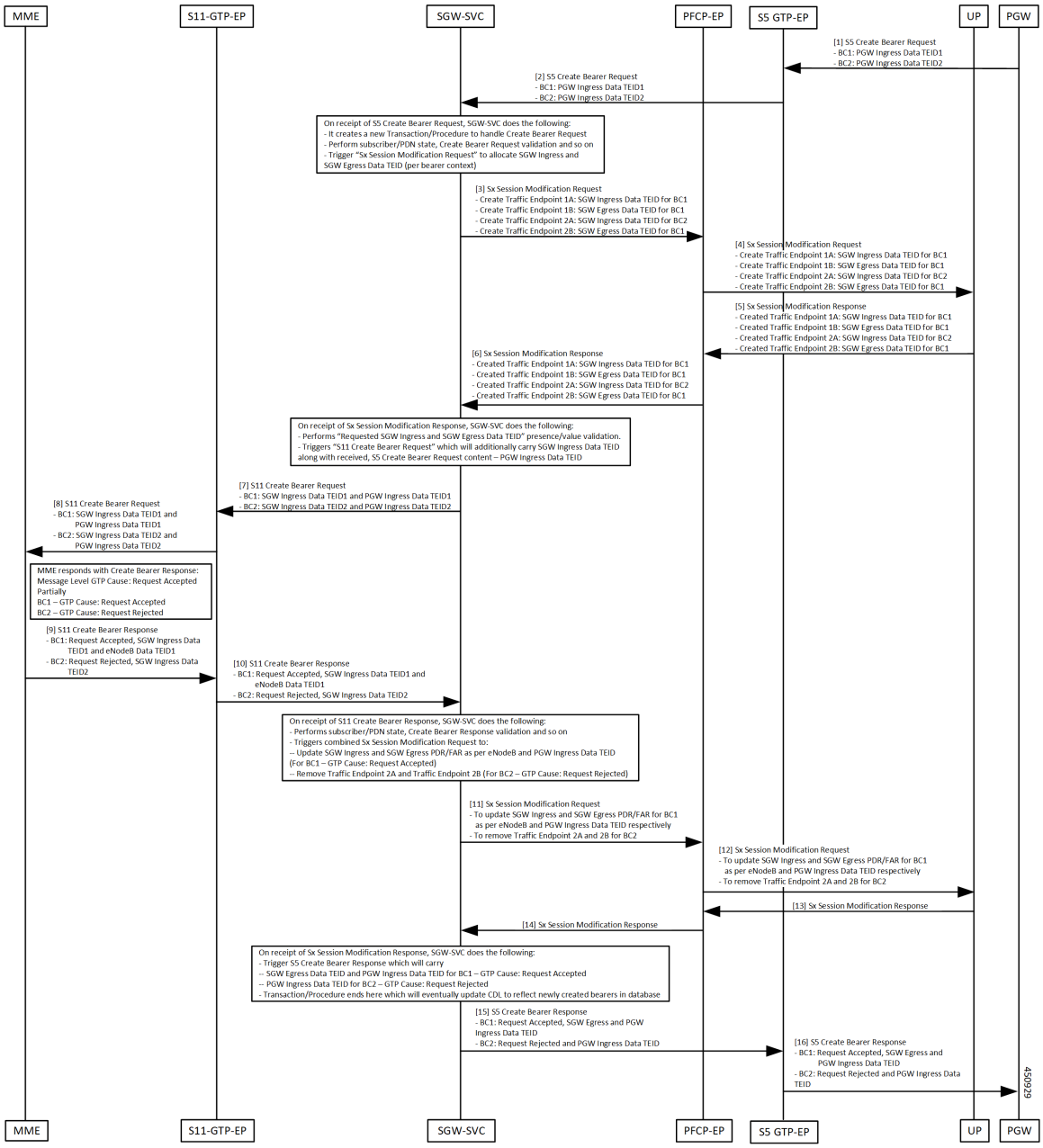

Table 4: Dedicated Bearer Setup – Request Accepted Partially Call Flow Description

Step	Description
1	The PGW sends the S5 Create Bearer Request with multiple bearer contexts to the S5-GTPC-EP pod.
2	The S5-GTPC-EP pod forwards the S5 Create Bearer Request to the SGW-SVC pod.

Step	Description
3	The SGW-SVC pod receives the S5 Create Bearer request and performs the following: • Creates a new transaction • Performs GTP validations • Triggers the Sx Modification Request to allocate SGW Ingress and SGW Egress TEIDs to the PFCP-EP pod.
4	The PFCP-EP pod forwards the Sx Modification Request to the UP.
5	The UP sends the Sx Modification Response to the PFCP-EP pod.
6	The PFCP-EP pod forwards the Sx Modification Response to the SGW-SVC pod.
7	The SGW-SVC receives the Sx Modification Response and performs the following: • Validates the received SGW Ingress and SGW Egress TEIDs • Triggers an S11 Create Bearer Request with the SGW Ingress TEID to the S11-GTPC-EP pod
8	The S11-GTPC-EP pod forwards the S11 Create Bearer Request to the MME.
9	The S11-GTPC-EP receives the S11 Create Bearer Response from the MME, with the Message Level GTP cause as Request Accepted Partially: • For some Bearer Contexts, GTP cause is Request Accepted • For some Bearer Contexts, GTP cause is Request Rejected
10	The S11-GTPC-EP pod forwards the S11 Create Bearer Response to the SGW-SVC pod.
11	The SGW-SVC pod receives the S11 Create Bearer response and performs the following: • GTP validations • For successful bearers: Triggers the Sx Modification Request to the PFCP-EP pod for updating SGW Ingress and SGW Egress PDR/FAR with the MME and the PGW GTPU-TEID • For failed bearers: Removes the traffic endpoints
12	The PFCP-EP pod forwards the Sx Modification Request to the UP.
13	The UP sends the Sx Modification Response to the PFCP-EP pod.
14	The PFCP-EP pod forwards the Sx Modification Response to the SGW-SVC pod.

Step	Description
15, 16	The SGW-SVC pod receives the Sx Modification Response and performs the following: • Ends the transaction/procedure • Updates the CDL • For successful bearers: Sends the S5 Create Bearer Response with SGW Egress TEIDs with matching PGW GTPU TEIDs. • For failed bearers: Sends the bearer contexts as is with the message level cause as Partially Accepted.

Dedicated Bearer Update – Request Accepted Call Flow

This section describes the Default/Dedicated Bearer Update Procedure call flow.

Single Update Bearer Procedure supports:

- Default bearer QoS/TFT change
- Single/Multiple dedicated bearer QoS/TFT change
- APN-AMBR change

Note The call flow doesn't contain Sx Communication Messages related to the Default/Dedicated Bearer Update procedure.

Figure 3: Default/Dedicated Bearer Update (Single/Multiple Bearers) Support Call Flow

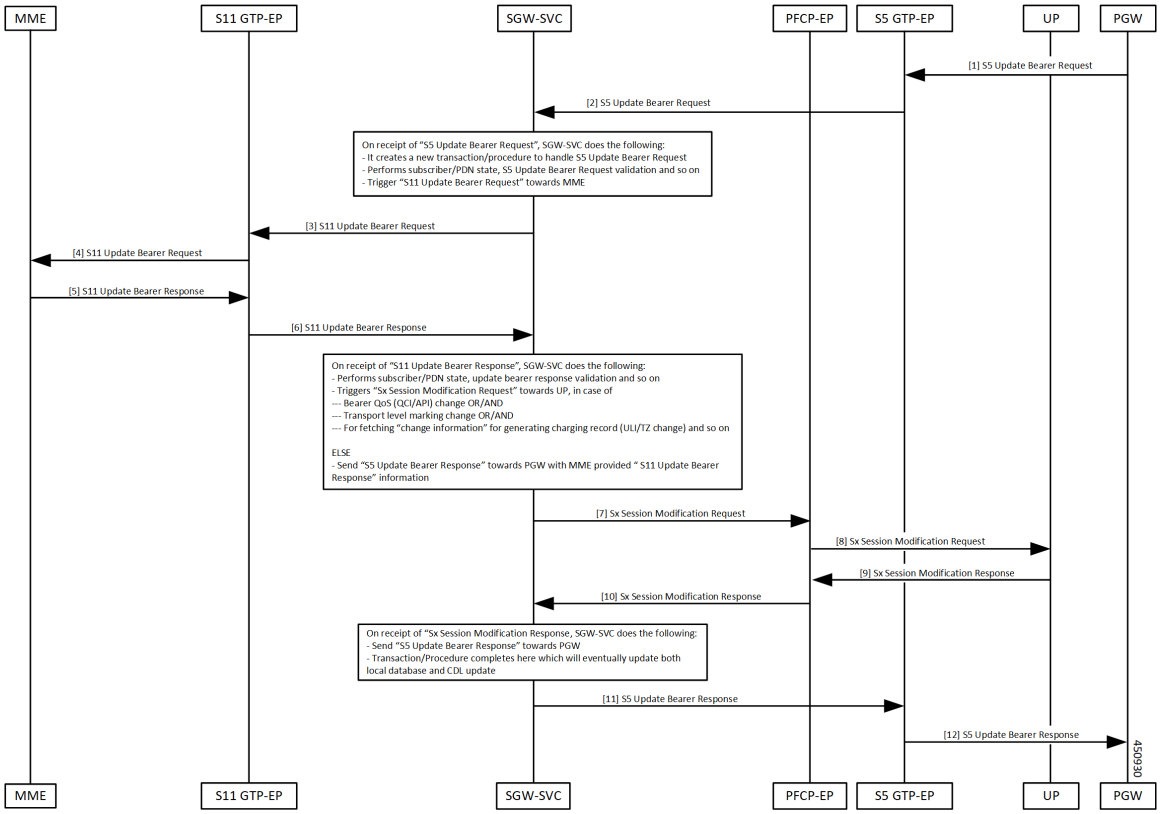

Table 5: Default/Dedicated Bearer Update (Single/Multiple Bearers) Support Call Flow Description

Step	Description
1	The PGW sends the S5 Update Bearer Request with multiple bearer contexts to the GTPC-EP pod.
2	The GTPC-EP pod forwards the S5 Update Bearer request to the SGW-SVC pod.
3	SGW-SVC receives the S5 Update Bearer request and performs the following: • Creates a new transaction • Performs GTP validations • Triggers the S11 Update Bearer Request to the GTPC-EP pod
4	The GTPC-EP pod forwards the S11 Update Bearer Request to the MME.
5	The MME sends the S11 Update Bearer Response to the GTPC-EP pod.
6	The GTPC-EP pod forwards the S11 Update Bearer Response to the SGW-SVC pod.

Step	Description

7	SGW-SVC receives the S11 Update Bearer Response and performs GTP validations.
	• If: Any of the following is true, the SGW-SVC triggers Sx Modification Request to the PFCP-EP pod:
	  • Bearer QoS (QCI/ARP) change
	  • Transport Level Marking change
	  • Fetch charging information for generating charging record ULI/TZ change
	• Else: The SGW-SVC sends the S11 Update Bearer Response to the PGW with the MME-provided S11 Update Bearer Response information.

8	The PFCP-EP pod forwards the Sx Session Modification Request to the UP.
9	The UP sends the Sx Session Modification Response to the PFCP-EP pod.
10	The PFCP-EP pod forwards the Sx Session Modification Response to the SGW-SVC. The SGW-SVC receives the Sx Modification Response and performs the following: • Ends the transaction/procedure • Updates the CDL • Sends the S5 Update Bearer Response with cause as Accepted
11	The SGW-SVC sends the S5 Update Bearer Response to the PFCP-EP pod. The PFCP-EP pod forwards the S5 Update Bearer Response to the GTP-EP pod.
12	The GTP-EP pod forwards the S5 Update Bearer Response to the UP. The UP forwards the S5 Update Bearer Response to the PGW.

Delete Dedicated Bearers

Feature Description

cnSGW-C supports single/multiple dedicated bearer deletion as part of single delete bearer procedure.

How it Works

This section describes how this feature works.

Call Flows

This section describes the key call flows for this feature.

Dedicated Bearer Deletion Procedure Call Flow

This section describes the Dedicated Bearer Delete Procedure call flow.

Figure 4: Dedicated Bearer Deletion Procedure (Single/Multiple Bearer) Call Flow

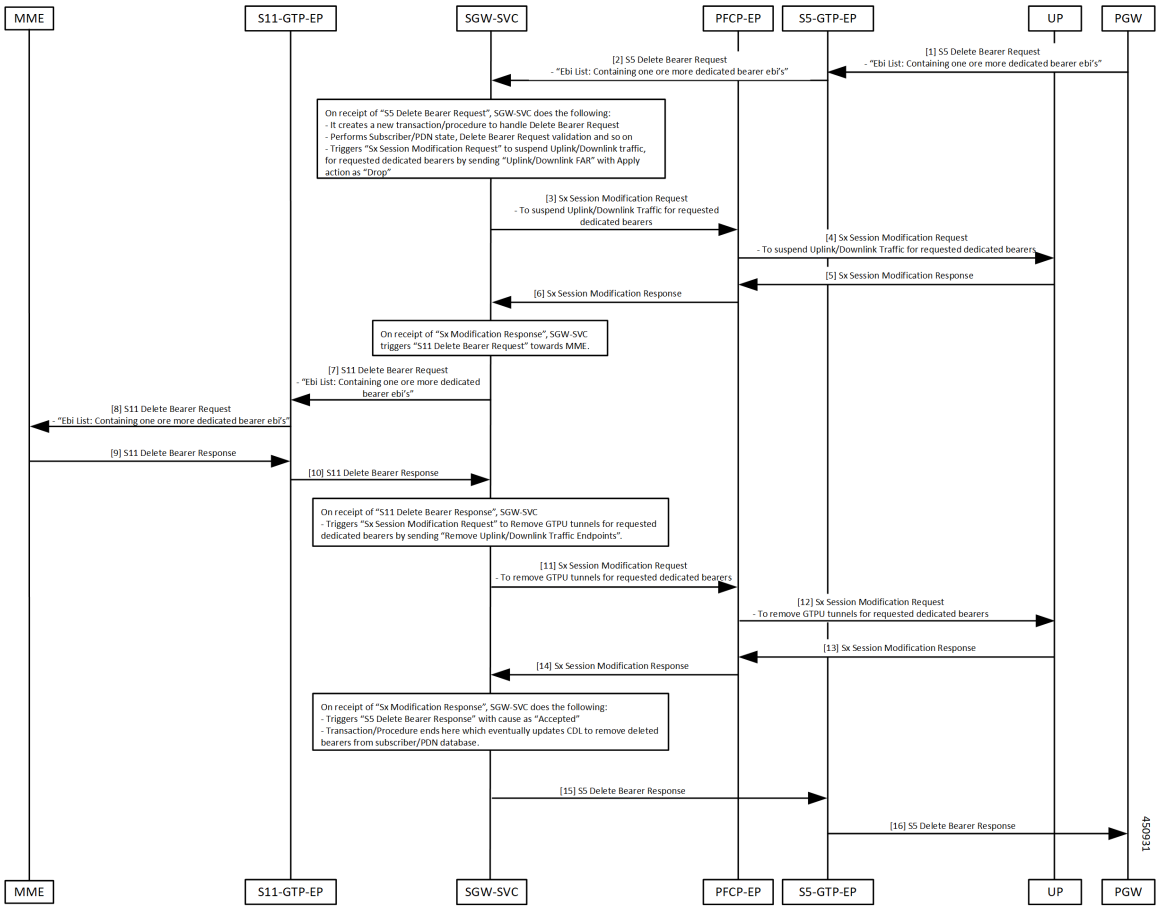

Table 6: Dedicated Bearer Deletion Procedure (Single/Multiple Bearer) Call Flow Description

Step	Description
1	The PGW sends the S5 Delete Bearer Request with EBI list containing one or more dedicated bearer EBIs, to the GTPC-EP pod.
2	The GTPC-EP pod forwards the S5 Delete Bearer Request to the SGW-SVC pod.
3	The SGW-SVC pod receives the S5 Delete Bearer request and performs the following: • Creates a new transaction • Performs GTP validations • Triggers the Sx Modification Request to the PFCP-EP pod to suspend uplink/downlink traffic for the requested bearers
4	The PFCP-EP pod forwards the Sx Modification Request to the UP.

Step	Description
5	The UP sends the Sx Modification Response to the PFCP-EP pod.
6	The PFCP-EP pod forwards the Sx Modification Response to the SGW-SVC pod.
7	The SGW-SVC pod receives the Sx Modification Response and triggers the S11 Delete Bearer Request to the GTPC-EP pod.
8	The GTPC-EP pod forwards the S11 Delete Bearer Request to the MME.
9	The MME sends the S11 Delete Bearer Response to the GTPC-EP pod.
10	The GTPC-EP pod forwards the S11 Delete Bearer Response to the SGW-SVC pod.
11	The SGW-SVC receives the S11 Delete Bearer Response and triggers the Sx Modification Request to the PFCP-EP pod, to remove traffic endpoints for removal of the GTPU tunnels for the requested dedicated bearers.
12	The PFCP-EP pod forwards the Sx Modification Request to the UP to remove GTP tunnels for the requested dedicated bearers.
13	The UP sends the Sx Modification Response to the PFCP-EP pod.
14	The PFCP-EP forwards the Sx Modification Response to the SGW-SVC pod.
15	The SGW-SVC receives the Sx Modification Response and performs the following: • Ends the transaction/procedure • Updates the CDL • Sends the S5 Delete Bearer Response with cause as Accepted, to the GTP-EP pod
16	The GTP-EP pod forwards the S5 Delete Bearer Response to the PGW.