

Multiple PDN Attach or Detach Procedures

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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.	2020.03.0

Feature Description

cnSGW-C handles the following functionalities:

- UE-requested PDN connection
- UE-requested PDN disconnection

- PGW-initiated PDN disconnection
- Admin-initiated disconnection.

How it Works

This section describes how this feature works.

Call Flows

This section describes the key call flows for this feature.

UE-requested PDN Connection Call Flow

This section describes the UE-requested PDN connection call flow.

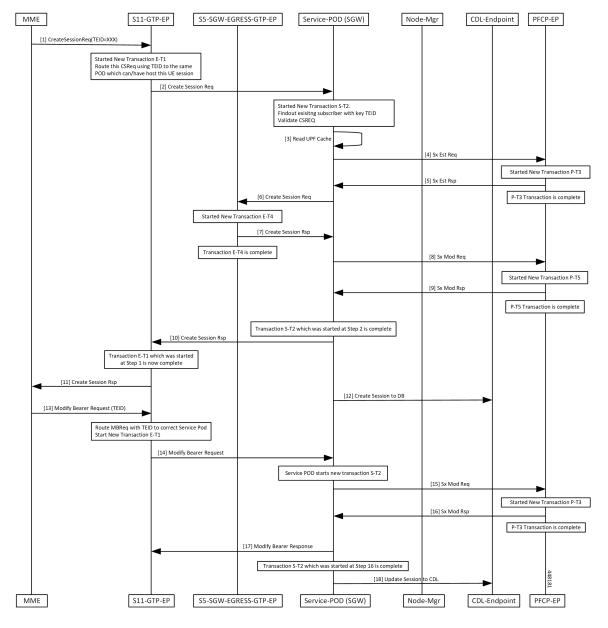


Figure 1: UE-requested PDN Connection Call Flow

Table 3: UE-requested PDN Connection Call Flow Description

Step	Description
1	The MME sends the Create Session Request for a new PDN connection to the S11-GTP-EP with a nonzero TEID.

Step	Description
2	The E-T1 transaction is started.
	The S11-GTP-EP decodes the received UDP message and converts the message into the gGRPC message. Based on the IMSI value, the message is forwarded to the respective SGW-service pod which handles the UE session.
	The SGW-service pod receives the Create Session Request from the S11-GTP-EP.
3	The S-T2 transaction is started.
	The SGW-service pod finds the subscriber context based on the local ingress TEID, and validates the Create Session Request content and updates the PDN and subscriber information.
	The SGW-service pod reads the UPF cache to provide the selected UPF.
4	The SGW-service pod sends the Sx Establishment Request to the PFCP-EP.
5	The P-T3 transaction is started.
	The PFCP-EP sends the Sx Establishment Response to the SGW-service pod.
6	The P-T3 transaction is completed.
	The SGW-service pod sends the Create Session Request to the S5-SGW-EGRESS-GTP-EP with S11-U and S5-U TEID details.
7	The E-T4 transaction is started.
	The Create Session Response is validated and the S5-U remote TEID is updated in the PDN.
	The S5-SGW-EGRESS-GTP-EP sends the Create Session response to the SGW-service pod.
8	The E-T4 transaction is completed.
	The SGW-service pod sends the Sx Modify Request to the PFCP-EP.
9	The P-T5 transaction is started.
	The PFCP-EP sends the Sx Modify Response to the SGW-service pod on expiry of the timer T5.
10	The P-T5 and S-T2 transaction is completed.
	The GTP-EP receives the Create Session Response from the SGW-service pod.
11	The E-T1 transaction is completed.
	The MME receives the Create Session Response from the S11-GTP-EP.
12	The SGW-service pod updates the created session in CDL endpoint (database) with new PDN information.
13	The MME sends the Modify Bearer Request with TEID to the S11-GTP-EP.
14	The E-T1 transaction is started.
	The S11-GTP-EP routes the Modify Bearer Request to the SGW-service pod.
	The S11-GTP-EP sends the Modify Bearer Request to the SGW-service pod.

Step	Description
15	The S-T2 transaction is started.
	The SGW-service pod sends the Sx Modify Request to the PFCP-EP pod on expiry of the timer S-T2.
16	The P-T3 transaction is started.
	The PFCP-EP sends the Sx Modify Response to the SGW-service pod on expiry of the timer T3.
17	R-T3 transaction is completed.
	The SGW-service pod sends the Modify Bearer Response to the MME.
18	S-T2 transaction is completed
	The SGW-service pod sends the update session to the CDL endpoint.

UE-requested or the MME-requested PDN Disconnection Call Flow

This section describes the UE or the MME-requested PDN disconnection call flow.

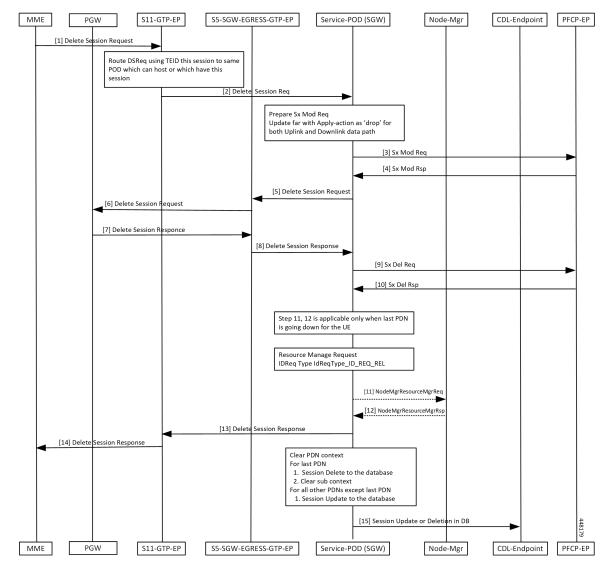


Figure 2: UE-requested or the MME-requested PDN Disconnection Call Flow

Table 4: UE-requested or the MME-requested PDN Disconnection Call Flow Description

Step	Description
1	The MME sends the Delete Session Request to the S11-GTP-EP for other PDN disconnection.
2	The GTP-EP decodes the received UDP message and converts the message into the gRPC message. Based on the TEID value, the gRPC message is forwarded to the SGW-service pod which can handle the UE session.
3	The SGW-service pod finds the subscriber context information as per the local ingress TEID. The SGW-service pod validates the Delete Session Request content. The SGW-service pod sends the Sx Modify Request to the PFCP-EP with apply action as DROP to drop the uplink or downlink packets at the SGW-U.

Step	Description
4	The PFCP-EP sends the Sx Modify Response to the SGW-service pod.
5	The SGW-service pod forwards the Delete Session Request to the S5-SGW-EGRESS-GTP-EP.
6	The S5-SGW-EGRESS-GTP-EP forwards the Delete Session Request to the PGW through the UDP proxy.
7	The PGW sends the Delete Session Response to the S5-SGW-EGRESS-GTP-EP.
8	The S5-SGW-EGRESS-GTP-EP forwards the Delete Session Response to the SGW-service pod.
9	The SGW-service pod validates the Delete Session Response, and sends the Sx Delete Request to the PFCP-EP.
10	The SGW-service pod receives the Sx Delete Session Response from the PFCP-EP.
11	For the last PDN, the SGW-service pod sends the NodeMgrResourceManager Request for the ID release to the NodeManager.
12	The Node Manager releasees the ID and sends the acknowledgment to the SGW-service pod.
13	The SGW-service pod sends the Delete Session Response to the S11-GTP-EP.
14	The S11-GTP-EP forwards the Delete Session Response to the MME.
15	The SGW-service pod • Updates the session in database for the delete PDN information for other than the last PDN • Sends the delete session message to the database for the last PDN

PGW-requested Disconnection Call Flow

This section describes the PGW-requested disconnection call flow.

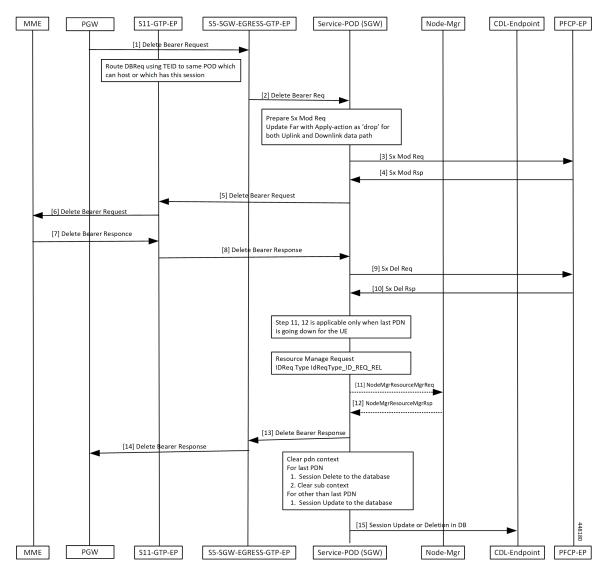


Figure 3: PGW-requested Disconnection Call Flow

Table 5: PGW-requested Disconnection Call Flow Description

Step	Description
1	The PGW sends the Delete Bearer Request to the S11-GTP-EP for other PDN disconnection.
2	The GTP-EP decodes the received UDP message and converts the message into the gRPC message. Based on the TEID value, the gRPC message is forwarded to the SGW-service pod which can handle the UE session.
3	The SGW-service pod finds the subscriber context information as per the local ingress TEID. The SGW-service pod validates the Delete Bearer Request content. The SGW-service pod sends the Sx Modify Request to the PFCP-EP with apply action as DROP to drop the uplink or downlink packets at the SGW-U.

Step	Description
4	The PFCP-EP sends the Sx Modify Response to the SGW-service pod.
5	The SGW-service pod forwards the Delete Bearer Request to the S5-SGW-EGRESS-GTP-EP.
6	The S5-SGW-EGRESS-GTP-EP forwards the Delete Bearer Request to the PGW through the UDP proxy.
7	The PGW sends the Delete Bearer Response to the S5-SGW-EGRESS-GTP-EP.
8	The S5-SGW-EGRESS-GTP-EP forwards the Delete Bearer Response to the SGW-service pod.
9	The SGW-service pod validates the Delete Bearer Response, and sends the Sx Delete Request to the PFCP-EP.
10	The SGW-service pod receives the Sx Delete Bearer Response from the PFCP-EP.
11	For the last PDN, the SGW-service pod sends the NodeMgrResourceManager Request for the ID release to the NodeManager.
12	The Node Manager releasees the ID and sends the acknowledgment to the SGW-service pod.
13	The SGW-service pod sends the Delete Bearer Response to the S11-GTP-EP.
14	The S11-GTP-EP forwards the Delete Bearer Response to the MME.
15	The SGW-service pod
	 Updates the Bearer in database for the delete PDN information for other than the last PDN Sends the delete Bearer message to the database for the last PDN

PGW-requested Disconnection Call Flow