Inter System RAT Handover

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

cnSGW-C is the Control Plane Network Functions (NF) of the Converged Core Network (4G-5GC).

cnSGW-C NF is built on top of SMI architecture. cnSGW-C acts as the UE anchor and supports mobility procedures along with session setup and termination procedures as specified in 3GPP TS 23.401, 23.214.

cnSGW-C User Plane (UP) is used to create UP sessions and bearers to carry data traffic.

This feature supports the following procedures in cnSGW-C:

- Wi-Fi to LTE
- GnGp to LTE Hand Over

How it Works

This section describes how this feature works.

Call Flows

This section describes the key call flows of this feature.

Wi-Fi to LTE Success Call Flow

This section describes the Wi-Fi to LTE success call flow.

Figure 1: Wi-Fi to LTE Success Call Flow

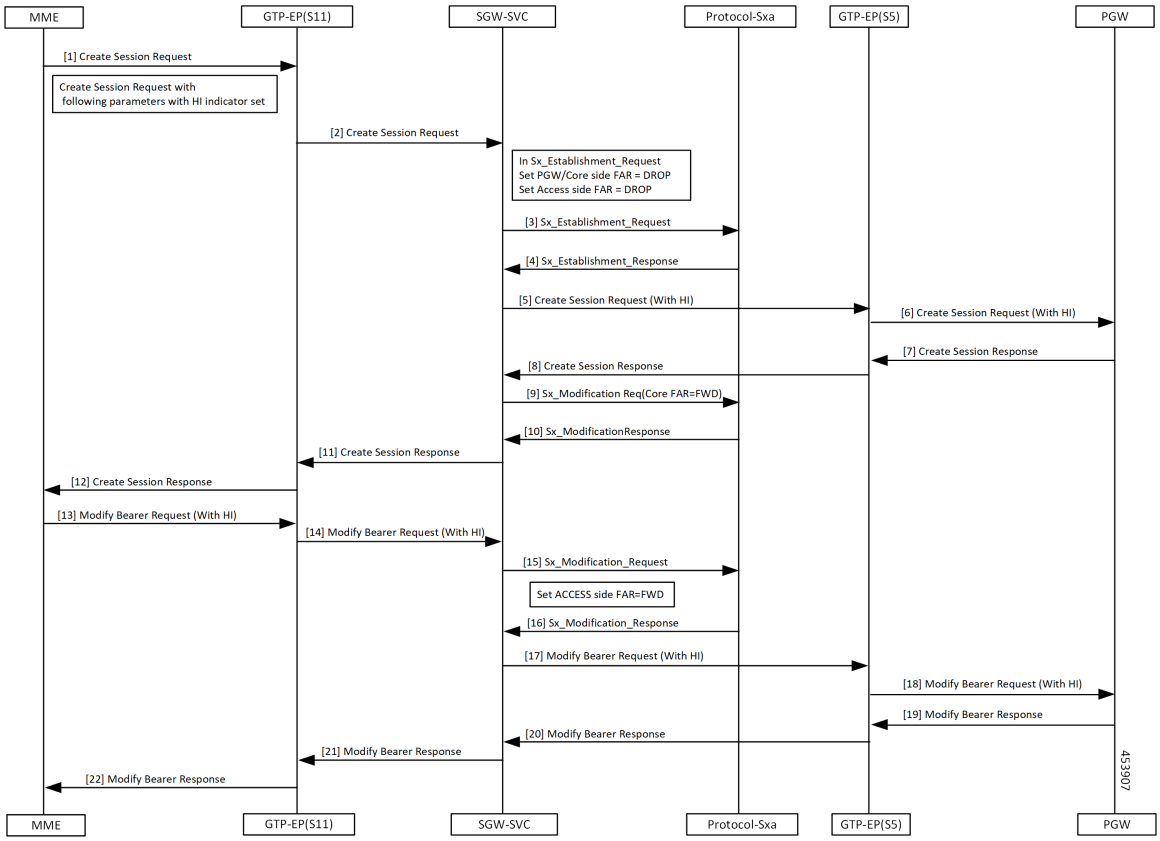

Table 3: Wi-Fi to LTE Success Call Flow Description

Step	Description
1	The MME sends the Create Session Request to the GTP-EP(S11) with: • RAT as EUTRAN • The handoff indicator set to TRUE.
2	The GTP-EP(S11) forwards the Create Session Request to the SGW-SVC.
3	The SGW-SVC sends the Sx Establishment Request to the Protocol-Sxa.
4	The Protocol-Sxa sends the Sx Establishment Response to the SGW-SVC.
5	The SGW-SVC sends the Create Session Request (with HI) to the GTP-EP(S5).
6	The GTP-EP(S5) forwards the Create Session Request (with HI) to the PGW.
7	The PGW sends the Create Session Response to the GTP-EP(S5). The PGW provides IPv6 Prefix.
8	The GTP-EP(S5) forwards the Create Session Response to the SGW-SVC.
9	The SGW-SVC sends the Sx Modification Request to the Protocol-Sxa.
10	The Protocol-Sxa sends the Sx Modification Response to the SGW-SVC.
11	The SGW-SVC sends the Create Session Response to the GTP-EP(S11).
12	The GTP-EP(S11) sends the Create Session Response to the MME.
13	The MME sends the Modify Bearer Request (with HI) to the GTP-EP(S11).
14	The GTP-EP forwards the Modify Bearer Request (with HI) to the SGW-SVC.
15	The SGW-SVC sends the Sx Modification Request to the Protocol-Sxa.
16	The Protocol-Sxa sends the Sx Modification Response to the SGW-SVC.
17	The SGW-SVC forwards the Modify Bearer Request (with HI) to the GTP-EP(S5).
18	The GTP-EP(S5) forwards the Modify Bearer Request (with HI) to the PGW.
19	The PGW sends the Modify Bearer Response to the GTP-EP(S5).
20	The GTP-EP(S5) forwards the Modify Bearer Response to the SGW-SVC.
21	The SGW-SVC forwards the Modify Bearer Response to the GTP-EP(S11).

Step	Description
22	The GTP-EP(S11) forwards the Modify Bearer Response to the MME. The S1 SGW FTEID is the same as the S1-U SGW FTEID sent in Create Session Response from the SGW-SVC to the MME. The SGW-SVC can now send the downlink packets to the eNodeB, and the switching of the data path from Wi-Fi to LTE occurs after the Modify Bearer Response.

GnGp to LTE Handover with OI Indicator Set Call Flow

This section describes the GnGp to LTE Handover with Operation Indication (OI) Indicator Set call flow.

Figure 2: GnGp to LTE Handover with OI Indicator Set Call Flow

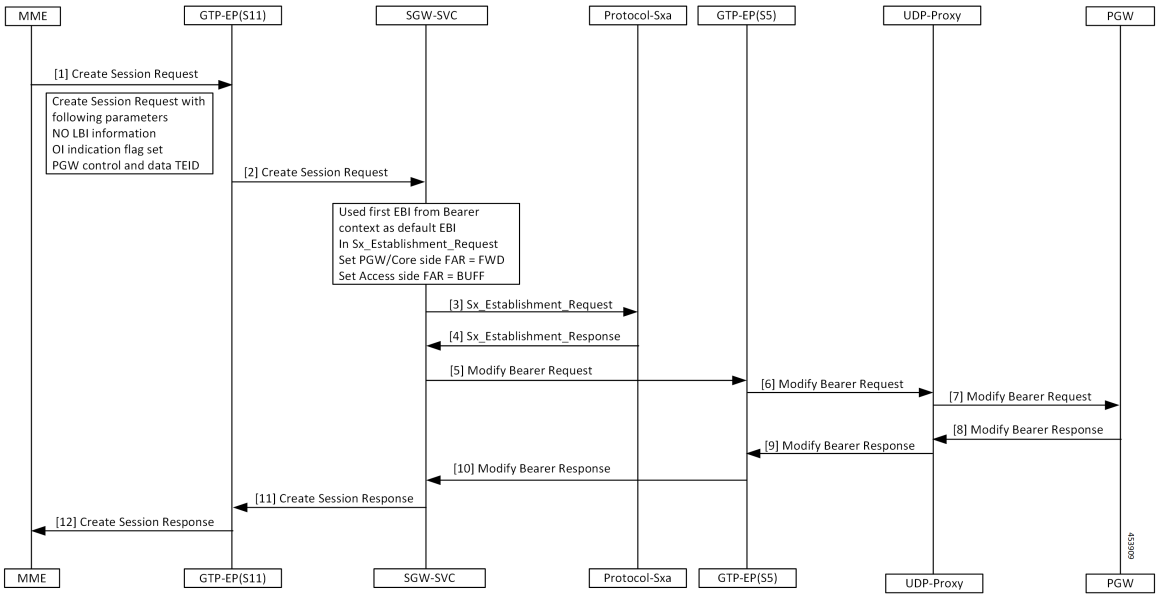

Table 4: GnGp to LTE Handover with OI Indicator Set Call Flow Description

Step	Description
1	The MME sends the Create Session Request to the GTP-EP(S11) with the following information: • EBI List (No LBI Information) • PGW control and data TEID • OI Indicator flag set
2	The GTP-EP(S11) forwards the Create Session Request to the SGW-SVC.
3	The SGW-SVC sends the Sx Session Establishment Request to the Protocol-Sxa.
4	The Protocol-Sxa sends the Sx Establishment Response to the SGW-SVC.
5	The SGW-SVC sends the Modify Bearer Request to GTP-EP(S5).

Step	Description
6	The GTP-EP(S5) forwards the Modify Bearer Request to the UDP-proxy.
7	The UDP-proxy forwards the Modify Bearer Request to the PGW.
8	The PGW sends the Modify Bearer Response with the default EBI information to the UDP-Proxy.
9	The UDP-proxy forwards the Modify Bearer Response to the GTP-EP(S5).
10	The GTP-EP(S5) forwards the Modify Bearer Response to the SGW-SVC.
11	The SGW-SVC sends the Create Session Response with the default EBI information to the GTP-EP(S11).
12	The GTP-EP(S11) forwards the Create Session Response to the MME.

GnGp to LTE Handover with OI Indicator Unset Call Flow

This section describes the GnGp to LTE Handover with Operation Indication (OI) Indicator Unset call flow.

Figure 3: GnGp to LTE Handover with OI Indicator Unset Call Flow

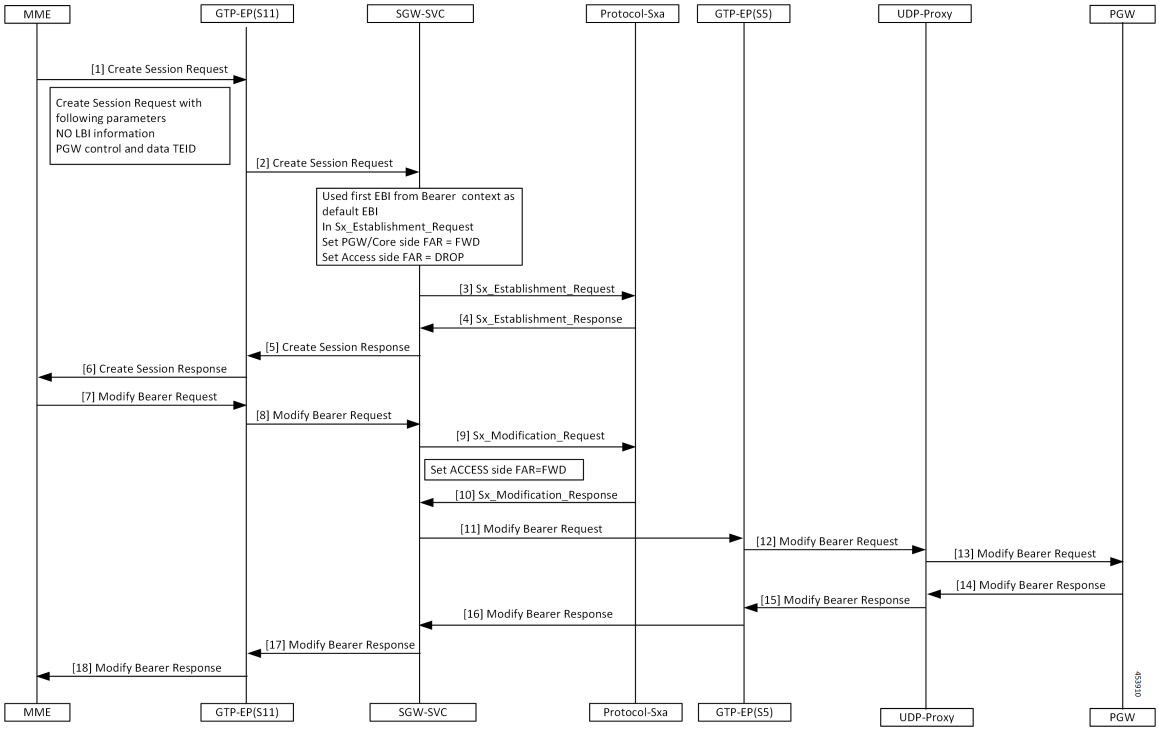

Table 5: GnGp to LTE HO with OI Indicator Unset Call Flow Description

Step	Description
1	The MME sends the Create Session Request to the GTP-EP(S11) with the following information: • EBI List (No LBI Information) • PGW control and data TEID • OI Indicator flag unset
2	The GTP-EP(S11) forwards the Create Session Request to the SGW-SVC.
3	The SGW-SVC sends the Sx Session Establishment Request to the Protocol-Sxa.
4	The Protocol-Sxa sends the Sx Establishment Response to the SGW-SVC.
5	The SGW-SVC sends the Create Session Response to the GTP-EP(S11).
6	The GTP-EP(S11) forwards the Create Session Response to the MME.
7	The MME sends the Modify Bearer Request to the GTP-EP(S11).
8	The GTP-EP(S11) forwards the Modify Bearer Request to the SGW-SVC.
9	The SGW-SVC sends the Sx Modification Request to the Protocol-Sxa.
10	The Protocol-Sxa sends the Sx Modification Response to the SGW-SVC.
11	The SGW-SVC sends the Modify Bearer Request to the GTP-EP(S5).
12	The GTP-EP(S5) forwards the Modify Bearer Request to the UDP-Proxy.
13	The UDP-proxy forwards the Modify Bearer Request to the PGW.
14	The PGW sends the Modify Bearer Response with the default EBI information to the UDP-Proxy.
15	The UDP-Proxy forwards the Modify Bearer Response to the GTP-EP(S5).
16	The GTP-EP(S5) forwards the Modify Bearer Response to the SGW-SVC.
17	The SGW-SVC forwards the Modify Bearer Response to the GTP-EP(S11).
18	The GTP-EP(S11) forwards the Modify Bearer Response to the MME. The S1 SGW FTEID is the same as the S1-U SGW FTEID sent in Create Session Response from the SGW-SVC to the MME. The SGW-SVC can now send the downlink packets to the eNodeB, and the switching of the data path from Wi-Fi to LTE occurs after the Modify Bearer Response.

Note cnSGW-C clears the call when the received default EBI in the Modify Bearer Response differs with the first EBI in the following scenarios:

- GnGp to LTE HO with OI Indicator Set
- GnGp to LTE HO with OI Indicator Unset

Standards Compliance

This feature complies with the following standards specifications:

- *3GPP TS 23.401 "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access"*
- *3GPP TS 23.214 "Architecture enhancements for control and user plane separation of EPC nodes"*