



# Inter System RAT Handover

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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.	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.

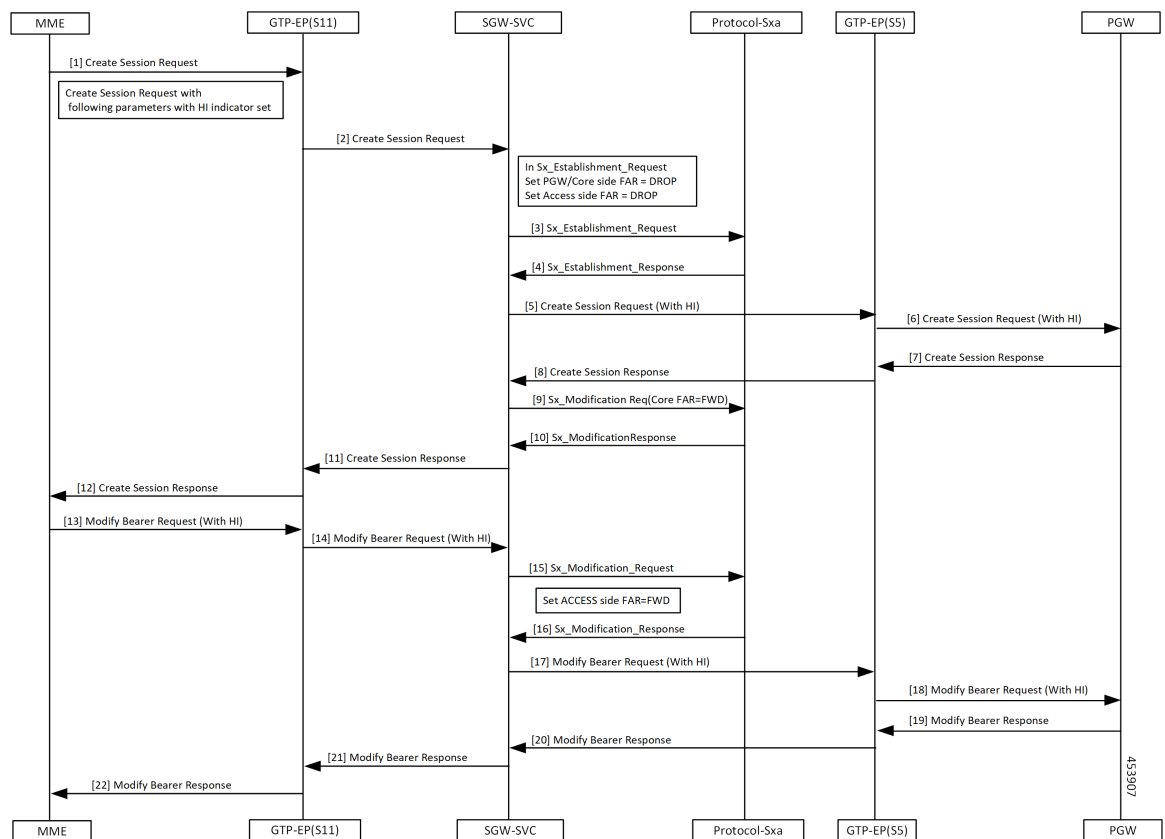
## Call Flows

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**

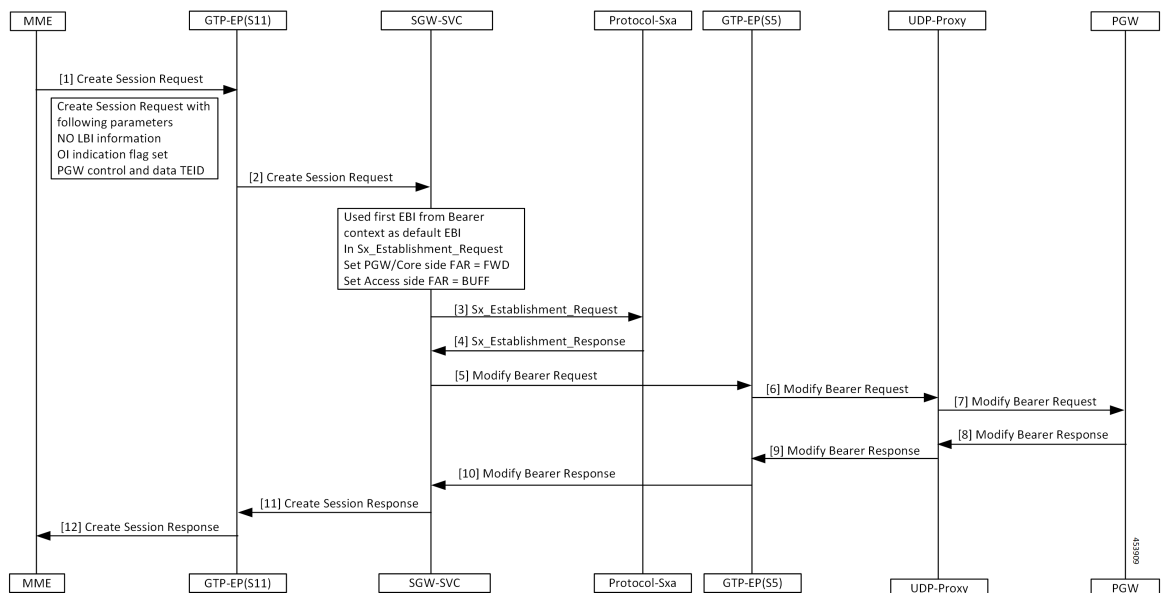
<b>Step</b>	<b>Description</b>
1	The MME sends the Create Session Request to the GTP-EP(S11) with: <ul style="list-style-type: none"> <li>• RAT as EUTRAN</li> <li>• The handoff indicator set to TRUE.</li> </ul>
2	The GTP-EP(S11) forwards the Create Session Request to the SGW-SVC.
3	The SGW-SVC sends 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	<p>The GTP-EP(S11) forwards the Modify Bearer Response to the MME.</p> <p>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.</p> <p>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.</p>

## 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	<p>The MME sends the Create Session Request to the GTP-EP(S11) with the following information:</p> <ul style="list-style-type: none"> <li>• EBI List (No LBI Information)</li> <li>• PGW control and data TEID</li> <li>• OI Indicator flag set</li> </ul>
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

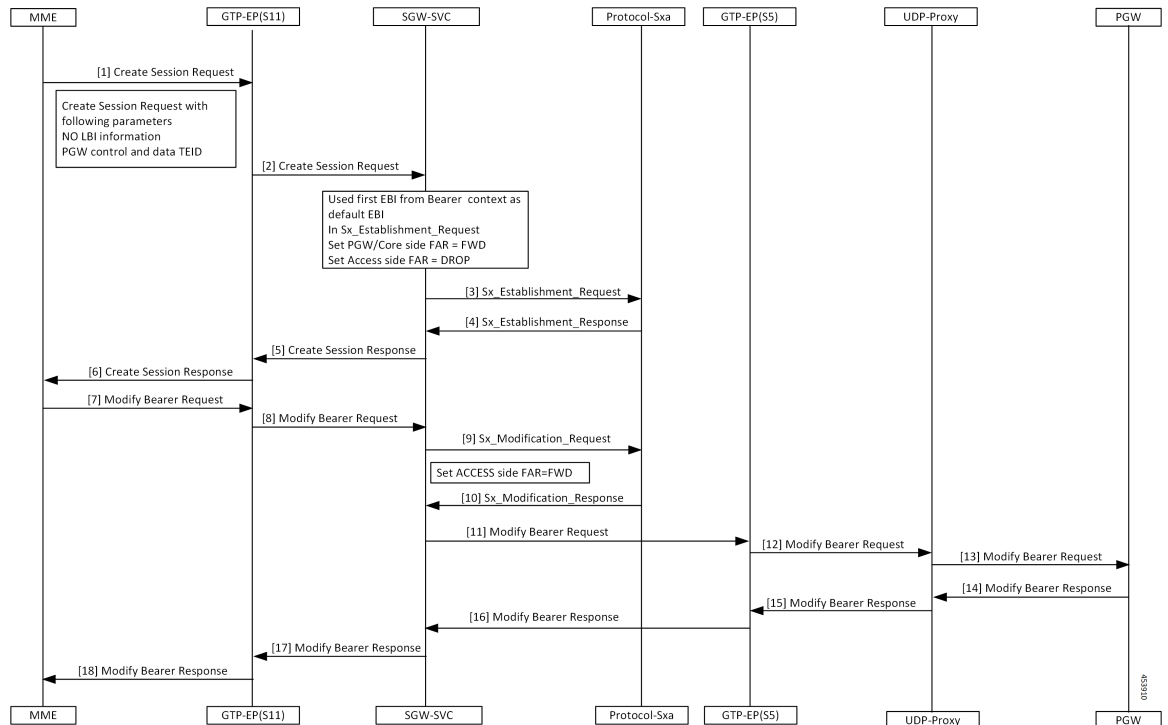


Table 5: GnGp to LTE HO with OI Indicator Unset Call Flow Description

Step	Description
1	The MME sends the Create Session Request to the GTP-EP(S11) with the following information: <ul style="list-style-type: none"> <li>• EBI List (No LBI Information)</li> <li>• PGW control and data TEID</li> <li>• OI Indicator flag unset</li> </ul>
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.



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**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
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## 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"*

