



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

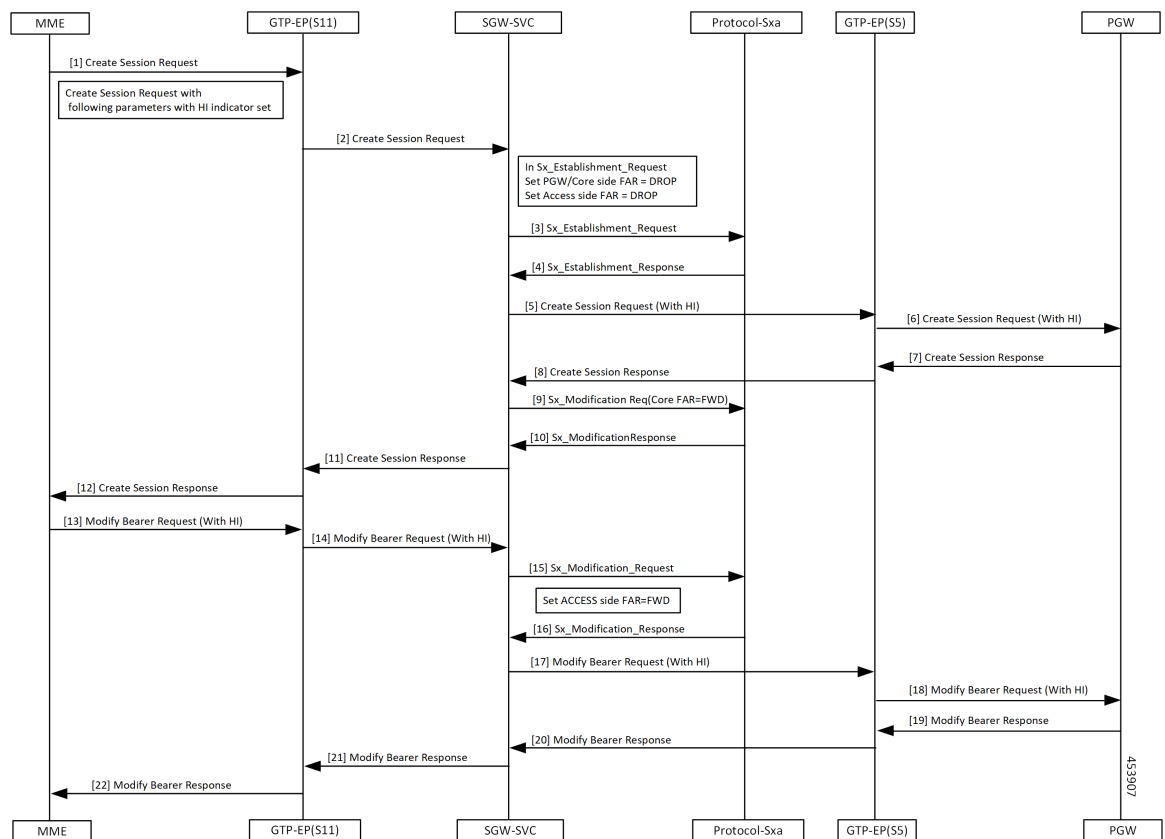


Table 3: Wi-Fi to LTE Success Call Flow Description

| Step | Description |
|------|---|
| 1 | The MME sends the Create Session Request to the GTP-EP(S11) with: <ul style="list-style-type: none"> • 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 | <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

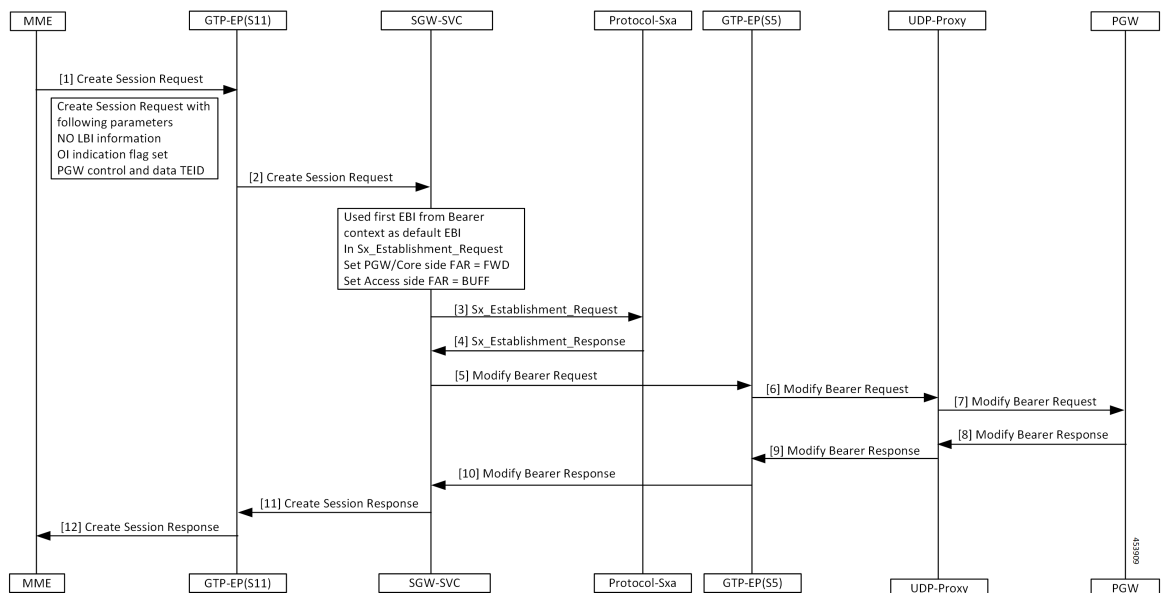


Table 4: GnGp to LTE Handover with OI Indicator Set Call Flow Description

| 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"> • 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

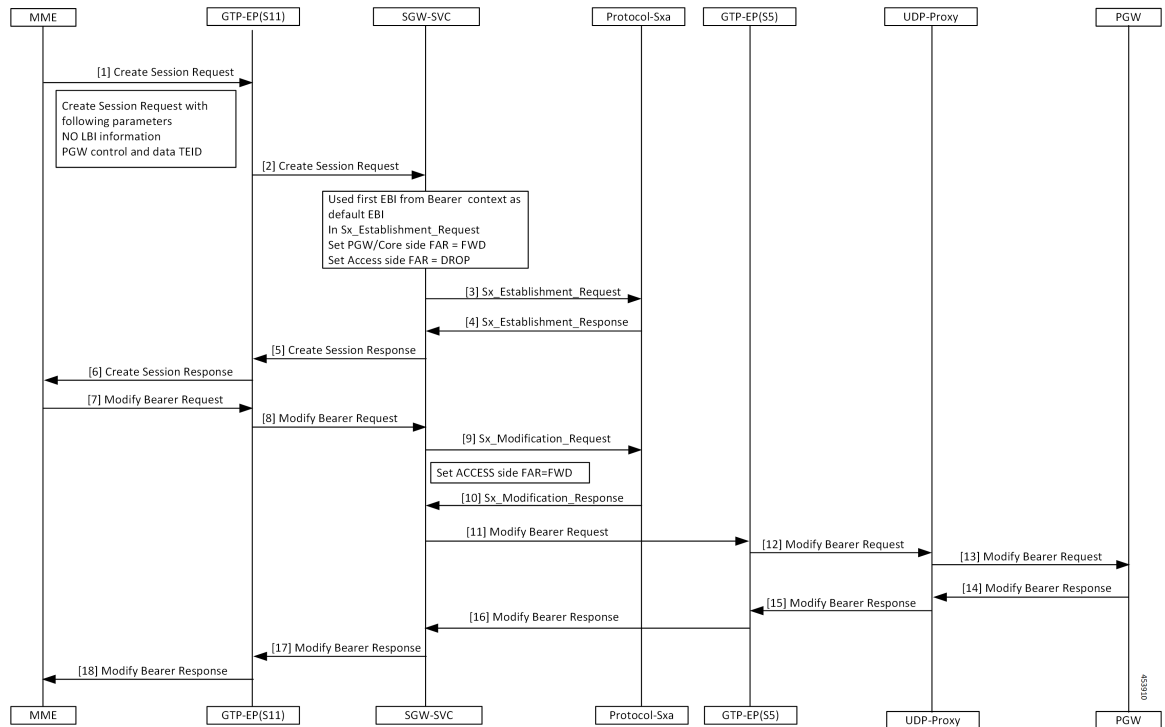


Table 5: GnGp to LTE HO with OI Indicator Unset Call Flow Description

| Step | Description |
|------|--|
| 1 | The MME sends the Create Session Request to the GTP-EP(S11) with the following information: <ul style="list-style-type: none"> • 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"*

