



Seamless Session Handover

The following topics are discussed:

- [Feature Description, on page 1](#)
- [How Seamless Session Handover Works, on page 1](#)
- [Monitoring and Troubleshooting Seamless Session Handover, on page 6](#)

Feature Description

Overview

This feature enables SaMOG to switch the access type (PMIPv6/EoGRE) seamlessly and preserve the session when subscribers move between access points with different session trigger types.

The SaMOG Gateway can:

- Seamlessly switch the access type from PMIPv6 (PMIPv6-based session creation) to EoGRE, based on the DHCP Discover, DHCP Request, or Direct Data Traffic on the EoGRE tunnel.
- Seamlessly switch the access type from EoGRE (DHCP trigger-based session creation) to PMIPv6, based on the PBU message from the AP.

How Seamless Session Handover Works

Flows

PMIPv6 to EoGRE (DHCP-triggered) Handover

The figure below shows the detailed handover procedure from PMIPv6 to EoGRE (DHCP-triggered).

Figure 1: PMIPv6 to EoGRE (DHCP-triggered) Handover Call Flow

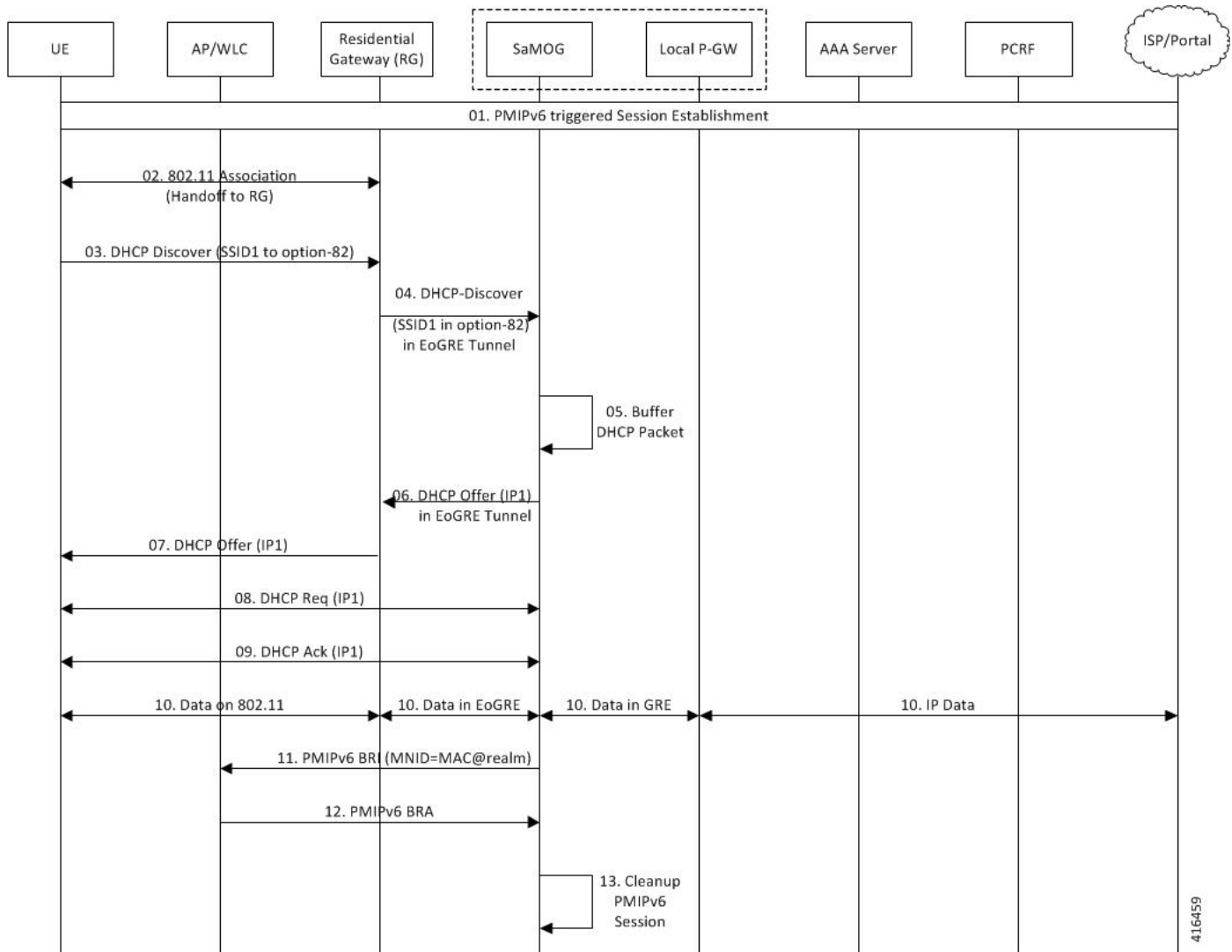


Table 1: PMIPv6 to EoGRE (DHCP-triggered) Handover

| Step | Description |
|------|---|
| 01 | PMIPv6-triggered session is established. For more information on the PMIPv6-based session establishment, refer the <i>PMIPv6-based Session Creation</i> section of this guide. As the TWAN profile for DHCP-triggered session is associated with the MRME service, EoGRE (UE MAC) based flows are installed during the PMIPv6-triggered session setup. |
| 02 | UE moves (hand-off) to a new Residential Gateway (RG) that supports EoGRE. |
| 03 | UE send a DHCP-DISCOVER message towards the Residential Gateway (RG). |
| 04 | The RG forwards the DHCP-DISCOVER message to SaMOG on the EoGRE tunnel. |

| Step | Description |
|------|---|
| 05 | SaMOG detects that the UE has moved to a new RG (hand-off) and switches the data path from the PMIPv6 GRE tunnel to EoGRE tunnel for the UE session. SaMOG also updates the session type to EoGRE/DHCP-triggered. |
| 06 | SaMOG assigns the same IP address allocated during the PMIPv6 session to UE. DHCP-OFFER message is sent to the RG on the EoGRE tunnel. |
| 07 | RG forwards the DHCP-OFFER message to the UE. |
| 08 | A DHCP-Request message is sent from the UE to SaMOG (through the RG). |
| 09 | SaMOG sends a DHCP Ack message to the UE (through the RG). |
| 10 | Data is transferred between the UE and ISP (through SaMOG and the RG). |
| 11 | SaMOG initiates a clean-up of the previous PMIPv6 access side session with the old AP/WLC. SaMOG sends a Binding Revocation Indication (BRI) message to the old AP/WLC. |
| 12 | The old AP/WLC sends a BRI Ack message to SaMOG. |
| 13 | SaMOG cleans up the PMIPv6 session. |

PMIPv6 to EoGRE (data-triggered) Handover

The figure below shows the detailed handover procedure from PMIPv6 to EoGRE (data-triggered).

Figure 2: PMIPv6 to EoGRE (data-triggered) Handover Call Flow

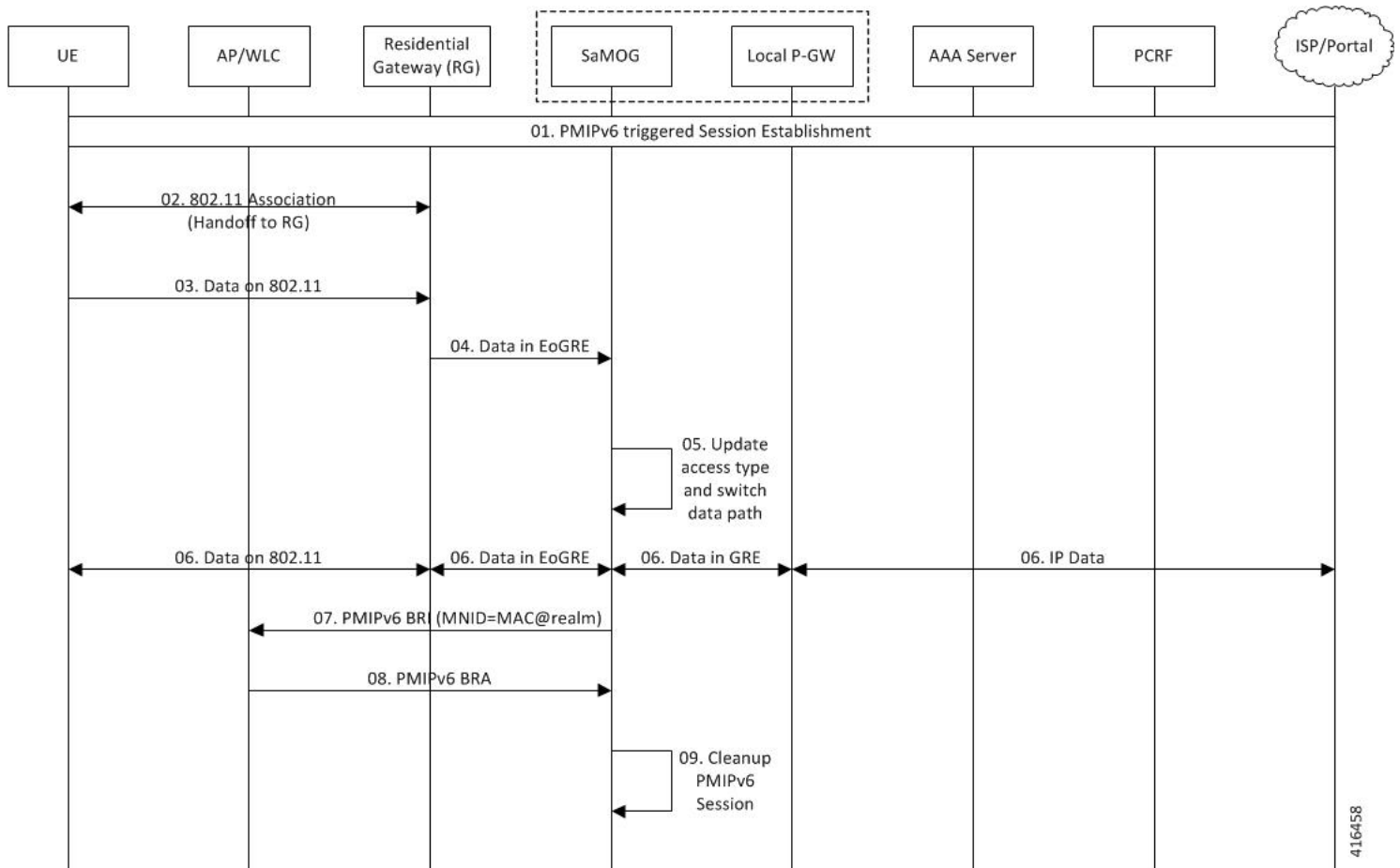


Table 2: PMIPv6 to EoGRE (data-triggered) Handover

| Step | Description |
|------|---|
| 01 | PMIPv6-triggered session is established. For more information on the PMIPv6-based session establishment, refer the <i>PMIPv6-based Session Creation</i> section of this guide. As the TWAN profile for DHCP-triggered session is associated with the MRME service, EoGRE (UE MAC) based flows are installed during the PMIPv6-triggered session setup. |
| 02 | UE moves (hand-off) to a new Residential Gateway (RG) that supports EoGRE. |
| 03 | UE continues to send data traffic through the new RG. |
| 04 | RG forwards the data traffic to SaMOG through the EoGRE tunnel. |
| 05 | SaMOG detects that the UE has moved to a new RG (hand-off) and switches the data path from the PMIPv6 GRE tunnel to EoGRE tunnel for the UE session. SaMOG also updates the session type to EoGRE/DHCP-triggered. |
| 06 | Data is transferred between the UE and ISP (through SaMOG and the RG). |

| Step | Description |
|------|---|
| 07 | SaMOG initiates a clean-up of the previous PMIPv6 access side session with the old AP/WLC. SaMOG sends a Binding Revocation Indication (BRI) message to the old AP/WLC. |
| 08 | The old AP/WLC sends a BRI Ack message to SaMOG. |
| 09 | SaMOG cleans up the PMIPv6 session. |

EoGRE to PMIPv6 (PBU-triggered) Handover

The figure below shows the detailed handover procedure from EoGRE to PMIPv6 (PBU-triggered).

Figure 3: EoGRE to PMIPv6 (PBU-triggered) Handover Call Flow

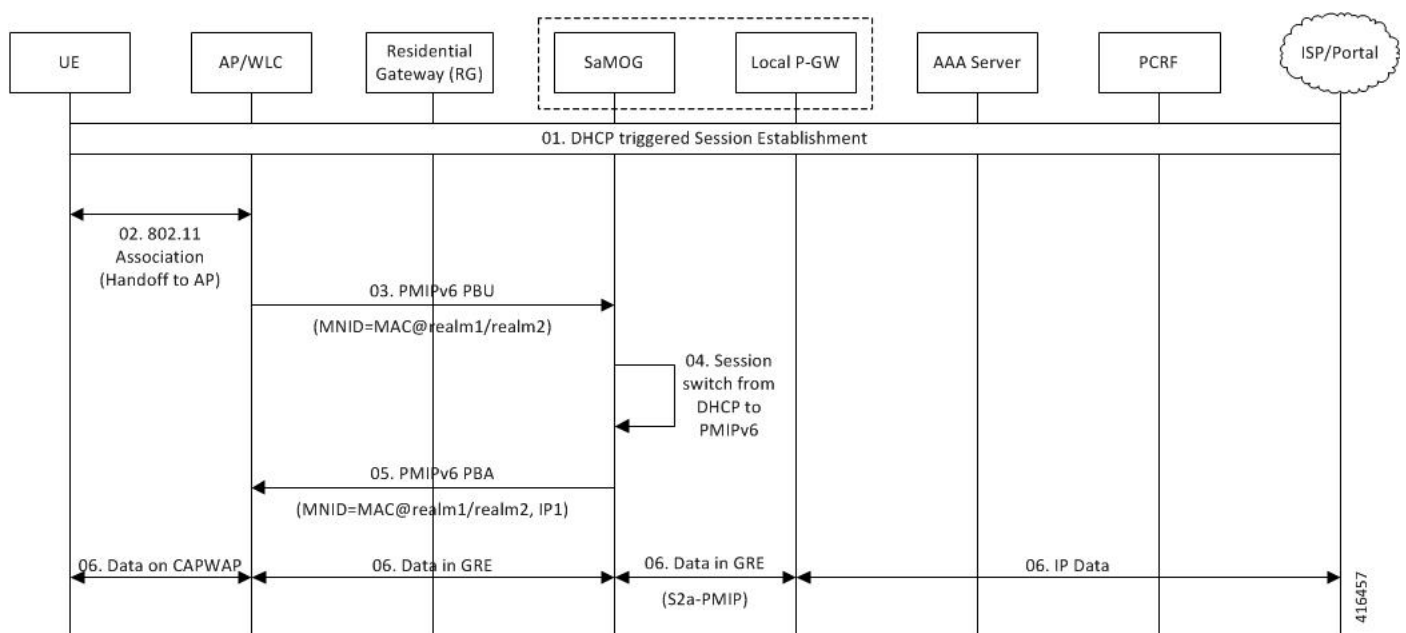


Table 3: EoGRE to PMIPv6 (PBU-triggered) Handover

| Step | Description |
|------|---|
| 01 | DHCP-triggered session is established. For more information on DHCP trigger-based session, refer the <i>DHCP-Trigger Based Session Creation</i> chapter of the <i>SaMOG Administration Guide</i> . |
| 02 | UE moves (hand-off) to a new AP/WLC that supports the PMIPv6 access type. |
| 03 | The AP/WLC initiates a PBU message towards SaMOG on behalf of the UE (NAI is <MAC> or <MAC>@relam). |
| 04 | SaMOG receives the PBU message and detects that UE has moved to new AP (hand-off). SaMOG switches the data path from the EoGRE tunnel to a PMIPv6 GRE tunnel for the UE session, and also updates the session type to PMIPv6 triggered. |

| Step | Description |
|------|---|
| 05 | SaMOG initiates a PBA message towards the AP/WLC. |
| 06 | Data is transferred between the UE and ISP (through SaMOG). |

Limitations

Architectural Limitations

- This feature supports RADIUS-based authentication between SaMOG and the 3GPP AAA Server. Diameter-based authentication is currently not supported.
- This feature supports PMIPv6-based S2a interface towards the local gateway. GTPv1 and GTPv2 are currently not supported.
- Only IPv4 address allocation is supported for the UE. IPv6 and IPv4v6 PDN types are currently not supported.
- All interfaces towards all external nodes will be IPv4 address only. IPv6 transport on any interface with external nodes is currently not supported.
- The AP will not convey the user location and SSID information to SaMOG.

Monitoring and Troubleshooting Seamless Session Handover

Show Command(s) and/or Outputs

show samog-service statistics

The following fields are available to the output of the **show samog-service statistics** command in support of this feature:

```

Handoff Statistics:
PMIP to PMIP Handoff Stats:
  Received:                0           Accepted:                0
  Denied:                  0
DHCP to DHCP Handoff Stats:
  Received:                0           Accepted:                0
  Denied:                  0
PMIP to EoGRE Handoff Requests:
  Received:                0           Accepted:                0
  Denied:                  0
EoGRE to PMIP Handoff Requests:
  Received:                0           Accepted:                0
  Denied:                  0

```

Table 4: show samog-service statistics Command Output Descriptions

| Field | Description |
|--|--|
| Handoff Statistics: | |
| PMIP to PMIP Handoff Stats: | |
| Received | Total number of PMIPv6 PBUs received for handoff for an existing PMIP session. |
| Accepted | Total number of PMIPv6 PBUs for Handoff accepted for an existing PMIP session. |
| Denied | Total number of PMIPv6 PBUs for handoff denied for an existing PMIP session. |
| DHCP to DHCP Handoff Stats: | |
| Received | Total number of DHCP Discover messages received during handoff for an existing DHCP session. |
| Accepted | Total number of DHCP Discover messages accepted during handoff for an existing DHCP session. |
| Denied | Total number of DHCP Discover messages denied during handoff for an existing DHCP session. |
| PMIP to EoGRE Handoff Requests: | |
| Received | Total number of EoGRE handoff messages received for a PMIP session. |
| Accepted | Total number of EoGRE handoff messages accepted for a PMIP session. |
| Denied | Total number of EoGRE handoff messages denied for a PMIP session. |
| EoGRE to PMIP Handoff Requests: | |
| Received | Total number of PMIP handoff messages received for an EoGRE session. |
| Accepted | Total number of PMIP handoff messages accepted for an EoGRE session. |
| Denied | Total number of PMIP handoff messages denied for an EoGRE session. |

Seamless Session Handover Bulk Statistics

The following bulk statistics in the SaMOG schema provide information on seamless handovers between access types for a session:

| Variable | Description | Data Type |
|---|--|-----------|
| cgw-binding-update-handoff-req-total-received | <p>Description: Total number of PMIPv6 PBUs received for handoff for an existing PMIP session.</p> <p>Triggers: Increments whenever PMIPv6 PBU is received by SaMOG for handoff.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |
| cgw-binding-update-handoff-req-total-accepted | <p>Description: Total number of PMIPv6 PBUs for Handoff accepted for an existing PMIP session.</p> <p>Triggers: Increments whenever PMIPv6 PBU is accepted by SaMOG for handoff.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |
| cgw-binding-update-handoff-req-total-denied | <p>Description: Total number of PMIPv6 PBUs for handoff denied for an existing PMIP session.</p> <p>Triggers: Increments whenever PMIPv6 PBU received by SaMOG for handoff denied during processing.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |
| cgw-sessstat-dhcp-disc-handoff-received | <p>Description: Total number of DHCP Discover messages received during handoff for an existing DHCP session.</p> <p>Triggers: Increments whenever a DHCP Discover message is received by SaMOG during handoff.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |
| cgw-sessstat-dhcp-disc-handoff-accepted | <p>Description: Total number of DHCP Discover messages accepted during handoff for an existing DHCP session.</p> <p>Triggers: Increments whenever a DHCP Discover message is accepted by SaMOG during handoff.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |
| cgw-sessstat-dhcp-disc-handoff-denied | <p>Description: Total number of DHCP Discover messages denied during handoff for an existing DHCP session.</p> <p>Triggers: Increments whenever a DHCP Discover message is denied by SaMOG during handoff.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |

| Variable | Description | Data Type |
|---|--|-----------|
| cgw-sessstat-pmip-to-eogre-handoff-received | <p>Description: Total number of EoGRE handoff messages received for a PMIP session.</p> <p>Triggers: Increments whenever an EoGRE message is received by SaMOG for an existing PMIP session.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |
| cgw-sessstat-pmip-to-eogre-handoff-accepted | <p>Description: Total number of EoGRE handoff messages accepted for a PMIP session.</p> <p>Triggers: Increments whenever an EoGRE message is accepted by SaMOG for handoff from a PMIP session.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |
| cgw-sessstat-pmip-to-eogre-handoff-denied | <p>Description: Total number of EoGRE handoff messages denied for a PMIP session.</p> <p>Triggers: Increments whenever an EoGRE message is denied by SaMOG for handoff from a PMIP session.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |
| cgw-sessstat-eogre-to-pmip-handoff-received | <p>Description: Total number of PMIP handoff messages received for an EoGRE session.</p> <p>Triggers: Increments whenever a PMIP message is received by SaMOG for an existing EoGRE session.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |
| cgw-sessstat-eogre-to-pmip-handoff-accepted | <p>Description: Total number of PMIP handoff messages accepted for an EoGRE session.</p> <p>Triggers: Increments whenever a PMIP message is accepted by SaMOG for handoff from an EoGRE session.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |
| cgw-sessstat-eogre-to-pmip-handoff-denied | <p>Description: Total number of PMIP handoff messages denied for an EoGRE session.</p> <p>Triggers: Increments whenever a PMIP message is denied by SaMOG for handoff from an EoGRE session.</p> <p>Availability: Per SaMOG Service</p> <p>Type: Counter</p> | Int32 |

