

TEID Collision with ULI Change

- Feature Summary and Revision History, on page 1
- Feature Description, on page 2
- How It Works, on page 2
- Configuring TEID Collision with ULI Change, on page 5
- Monitoring and Troubleshooting, on page 6

Feature Summary and Revision History

Summary Data

Applicable Product(s) or Functional Area	• P-GW • GGSN
Applicable Platform(s)	• ASR 5500 • VPC-DI • VPC-SI
Default Setting	Disabled - Configuration Required
Related Changes in This Release	Not Applicable
Related Documentation	Not Applicable

Revision History

Revision Details	Release
With this release, P-GW and GGSN configuration to reject a Tunnel Endpoint Identifier (TEID) collision request with ULI change feature is supported.	21.6.13
First introduced.	Pre 21.2

Feature Description

During Tunnel Endpoint Identifier (TEID) collision scenario, P-GW or GGSN allocates a TEID to a home subscriber. In case of a stale session, in an S-GW or SGSN, the same TEID that is allocated by P-GW or GGSN, is allocated to a roaming subscriber. Then, S-GW sends BRCmd, DBCmd, and MBR messages to P-GW. SGSN sends the Update PDP Context message to P-GW. Due to the same TEID allocation to both the home subscriber and the roaming subscriber, and P-GW having no information on duplicate TEID allocation, P-GW accepts the request. The duplicate use of same TEID leads to the billing for the home subscriber for the data that is used by the roaming subscriber.

To eliminate this scenario, TEID Collision with User Location Information (ULI) change feature is introduced. With this feature, you can configure P-GW and GGSN to reject a request when TEID collision occurs.

TEID Collisions with ULI change feature allows comparison with only Mobile Country Code (MCC) instead of comparison of mcc+mnc. This functionality supports the MOCN scenario on P-GW, SAEGW, and GGSN.

How It Works

The following section provides an overview of the TEID Collision with ULI change feature.

Architecture

For 4G calls, you can configure the TEID Collision with ULI Change feature through CLI in pgw-service in P-GW. For 3G calls, you can configure this feature through CLI in ggsn-service in GGSN. This feature works in the following way for P-GW and GGSN:

- For a home user equipment (UE) in P-GW, a request is rejected if the mobile country code and mobile network code (mcc_mnc) information in ULI differs from the ULI information available in the session for the UE on P-GW. The request is for one of the following messages:
  - Bearer Resource Command
  - Modify Bearer Request
  - Delete Bearer Command
- For a home UE in GGSN, a request is rejected if the mobile country code and mobile network code information in ULI differs from the ULI information available in the session for the UE on GGSN. The request is for the following message:
  - Update PDP context

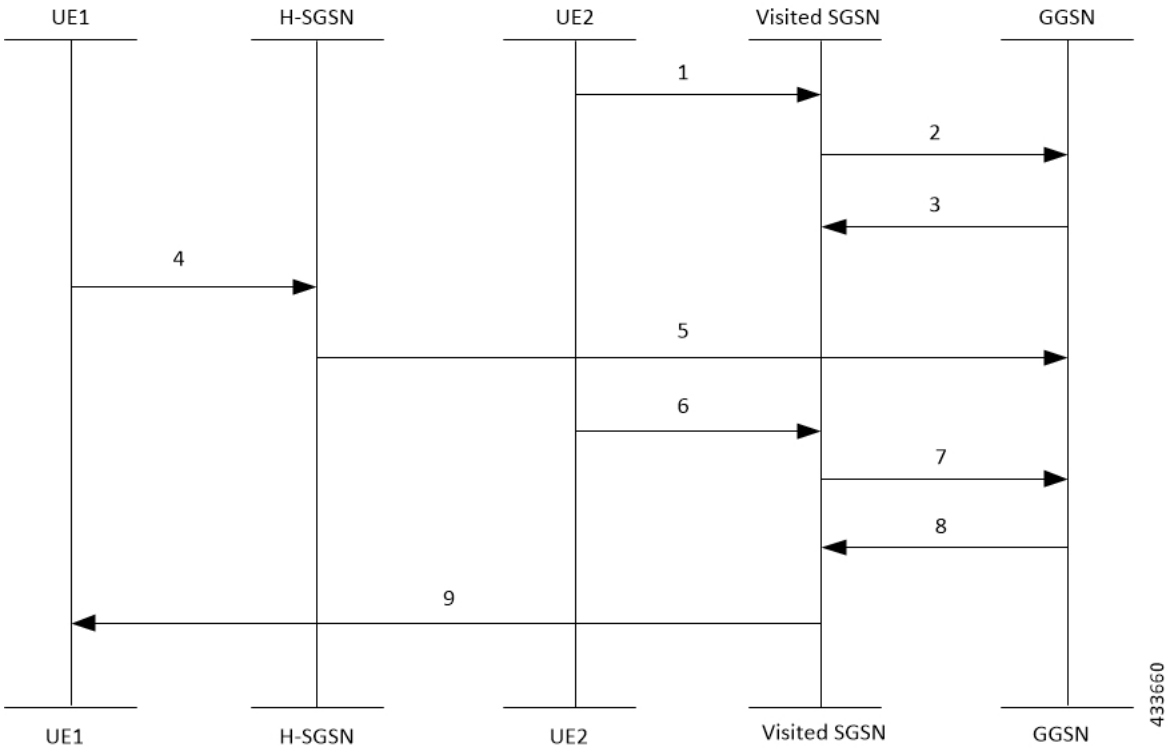
Call Flows

Following call flows show the handling of TEID collision with the ULI change for both P-GW and GGSN.

TEID Collision with ULI Change on GGSN Configuration

Following call flow shows the handling of TEID Collision with ULI Change on GGSN:

Figure 1: GTPC-Based TEID Collision Detection as per ULI Change



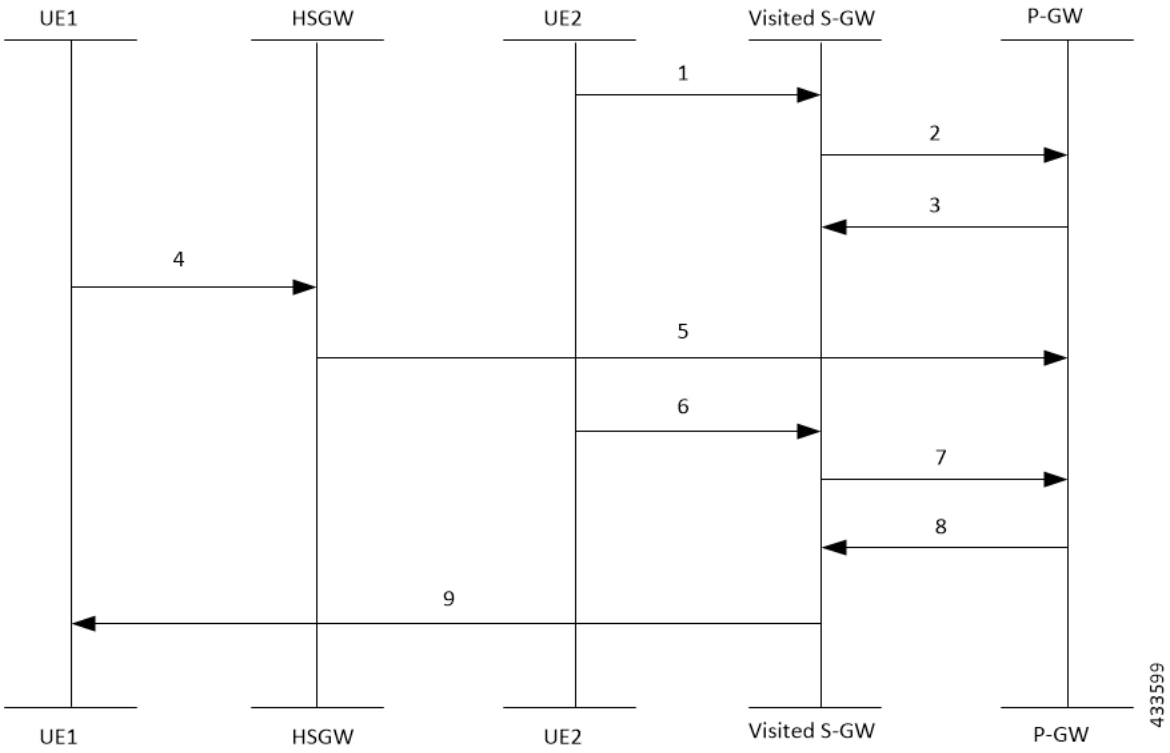
The call flow steps are listed below:

1. When a call is received from roaming subscriber, UE2 attempts to connect to GGSN through visited SGSN.
2. Roaming UE is allocated a TEID-x by the GGSN.
3. After the UE2 disconnects from the network, the session closes on GGSN. However, this session still continues on the visited SGSN.
4. The home UE attach happens on GGSN through home SGSN.
5. GGSN allocates the same TEID-x that was earlier assigned on GGSN.
6. Roaming UE returns to the GGSN. As the session on visited SGSN still exists, same TEID-x is used from visited SGSN.
7. If the TEID Collision with ULI Change feature is enabled at GGSN and the UE1 is in the home PLMN (as in Step 4), all the control requests (GTPv1-C) are processed at GGSN to check for a TEID-based collision as per the ULI change.
8. If the ULI exists in the request, for all the messages received from the visited SGSN for the roaming UE, GGSN checks for the mcc_mnc of the ULI against the PLMN list of the GGSN-Service. In case of no match, the request is rejected by GGSN.
9. In case of a match, the request is sent for further processing.

TEID Collision with ULI Change for P-GW Configuration

Following call flow shows the handling of TEID Collision with ULI Change on P-GW:

Figure 2: EGTPC-Based TEID Collision Detection as per ULI Change



The call flow steps are listed below:

1. When a call is received from roaming subscriber, UE2 attempts to connect to P-GW through visited S-GW.
2. Roaming UE is allocated a TEID-x by the P-GW.
3. After the UE2 disconnects from the network, the session closes on P-GW. However, this session still continues on the visited S-GW.
4. The home UE attach happens on P-GW through home S-GW.
5. P-GW allocates the same TEID-x that was earlier assigned on P-GW.
6. Roaming UE returns to the P-GW. As the session on visited S-GW still exists, same TEID-x is used from visited S-GW.
7. If the TEID Collision with ULI Change feature is enabled at P-GW and the UE1 is in the home PLMN (as in Step 4), all the control requests (GTPv2-C) are processed at P-GW to check for a TEID-based collision as per the ULI change.
8. If the ULI exists in the request, for all the messages received from the visited S-GW for the roaming UE, P-GW checks for the mcc_mnc of the ULI against the PLMN list of the P-GW-Service. In case of no match, the request is rejected by P-GW.
9. In case of a match, the request is sent for further processing.

Configuring TEID Collision with ULI Change

This section provides information on the configuration of CLI command to reject a request in a TEID collision scenario on P-GW and GGSN.

Configuring TEID Collision with ULI Change on GGSN

Use the following configuration commands to configure P-GW to reject a request when TEID collision occurs.

```
configure
  context context_name
    ggsn-service service_name
      [ default | no ] gtpc update-pdp-resp reject uli-mismatch mcc-only

        end
```

NOTES:

- **default**: Resets the command to it its default setting—Disabled.
- **no**: Disables the GTPC parameters.
- **update-pdp-resp reject**: Updates the PDP Response reject options.
- **uli-mismatch**: Rejects the update PDP request message if the ULI is not part of the home PLMN session.
- **mcc-only**: Sends update PDP response with NON_EXISTENT (CC 192) cause code if MCC that is received in update PDP request does not match to the HOME PLMN.

Configuring TEID Collision with ULI Change on P-GW

Use the following configuration commands to configure P-GW to reject a request when TEID collision occurs.

```
configure
  context context_name
    pgw-service service_name
      [ default | no ] egtp bearer-req reject uli-mismatch mcc-only
        end
```

Notes:

- **default**: Resets the command to it its default setting—Disabled.
- **no**: Disables the GTPC parameters.
- **bearer-req**: Performs configuration related to handling a Bearer Request.
- **reject**: Shows the Bearer Request reject options.
- **uli-mismatch**: Sends Bearer response with CONTEXT_NOT_FOUND (CC 64) cause code if the ULI that is received in Bearer request does not match with the ULI of the existing session.
- **mcc-only**: Sends Bearer Response with CONTEXT_NOT_FOUND (CC 64) cause code if the ULI with MCC that is received in Bearer request does not match with the MCC of the existing session.

Monitoring and Troubleshooting

Show Command(s) and/or Outputs

This section provides information about show commands and the fields that are introduced in support of TEID Collision with ULI Change.

show egtpc statistics

The output of this show command has been modified to display the following fields for TEID Collision with ULI Change:

- Modify Bearer Request
  - Total TX
  - Initial TX
  - Retrans TX
  - Total RX
  - Initial RX
  - Retrans RX
  - Discarded
  - No Rsp RX
- Modify Bearer Response
  - Total TX
  - Initial TX
  - Accepted
  - Denied
  - Retrans TX
  - Total RX
  - Initial RX
  - Accepted
  - Denied
  - Discarded
- Bearer Resource Command
  - Total TX
  - Initial TX

- Retrans TX
- Total RX
- Initial RX
- Retrans RX
- Discarded
- No Rsp RX

- Bearer Resource Failure Indication
  - Total TX
  - Initial TX
  - Retrans TX
  - Total RX
  - Initial RX
  - Discarded

- Delete Bearer Command
  - Total TX
  - Initial TX
  - Retrans TX
  - Total RX
  - Initial RX
  - Discarded

- Modify Bearer Request Without MME S11u TEID:
  - Local teid Mismatch:
    - Remote teid Mismatch
    - GnGp Call MBReq rejected FTEID absent
    - Tun Remote TEID Updated
    - Teid Collision with uli mismatch for BRcmd
    - Teid Collision with uli mismatch for DBCmd

show gtpc statistics

The output of this show command has been modified to display the following fields for TEID Collision with ULI Change:

- Update PDP Context RX
- Update PDP Context TX

show pgw-service name

The output of this show command has been modified to display the following fields for TEID Collision ULI Change with only MCC mismatch:

```
EGTP Bearer Request with Context Not Found cause if MCC mismatch : Enabled
EGTP Bearer Request with Context Not Found cause if MCC mismatch : Disabled
```

show ggsn-service name ggsn-service | more

The output of this show command has been modified to display the following fields for TEID Collision ULI Change with only MCC mismatch:

```
GTPC Update PDP Response with Non Existent cause if IMSI mismatch : Enabled
  GTPC Update PDP Response with Non Existent cause if ULI mismatch : Enabled
  GTPC Update PDP Response with Non Existent cause if MCC mismatch : Enabled
```