



Suppressing Handover Request for VoWiFi IR Subscribers

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Feature Summary and Revision History

Summary Data

Applicable Product(s) or Functional Area	ePDG
Applicable Platform(s)	<ul style="list-style-type: none">• ASR 5500• VPC-DI• VPC-SI
Feature Default	Disabled - Configuration Required
Related Changes in This Release	Not Applicable
Related Documentation	<ul style="list-style-type: none">• ePDG Administration Guide• AAA Interface Administration and Reference• Statistics and Counters Reference, StarOS Release Guide

Revision History

Revision Details	Release
In this release the PGW selection mechanisms in ePDG is enhanced to provide suppressing handover request for VoWiFi International Roaming (IR) subscribers.	21.23
This release supports Diameter error code counters and 5001, 5004 and 5041 experimental result codes for ePDG and SaMOG services.	21.21

Feature Description

The P-GW selection mechanisms in ePDG is enhanced to provide suppressing handover request for VoWiFi International Roaming (IR) subscribers only if the requests are received in IR supported dedicated ePDG.

The selection mechanism is enhanced so that whenever the IR subscribers do a VoLTE to VoWiFi HandOver (HO) call, the ePDG selects the dedicated locally configured PGW for the IR in the ePDG-service and forwards it. Once the HO is successfully completed, the termination of UE context in LTE is out of scope of ePDG and the requests received in this dedicated ePDG is expected to be always IR HO. Any fresh attach comes from UE and roaming without HO will be dropped, and any other HO requests other than IR HO comes will be processed as is.

How to Suppress Handover Request for VoWiFi IR Subscribers

Use the following command to enable IR feature under the ePDG service is:

handover international-roamer suppress

Use the following command to disable this feature under the ePDG service:

no handover international-roamer suppress



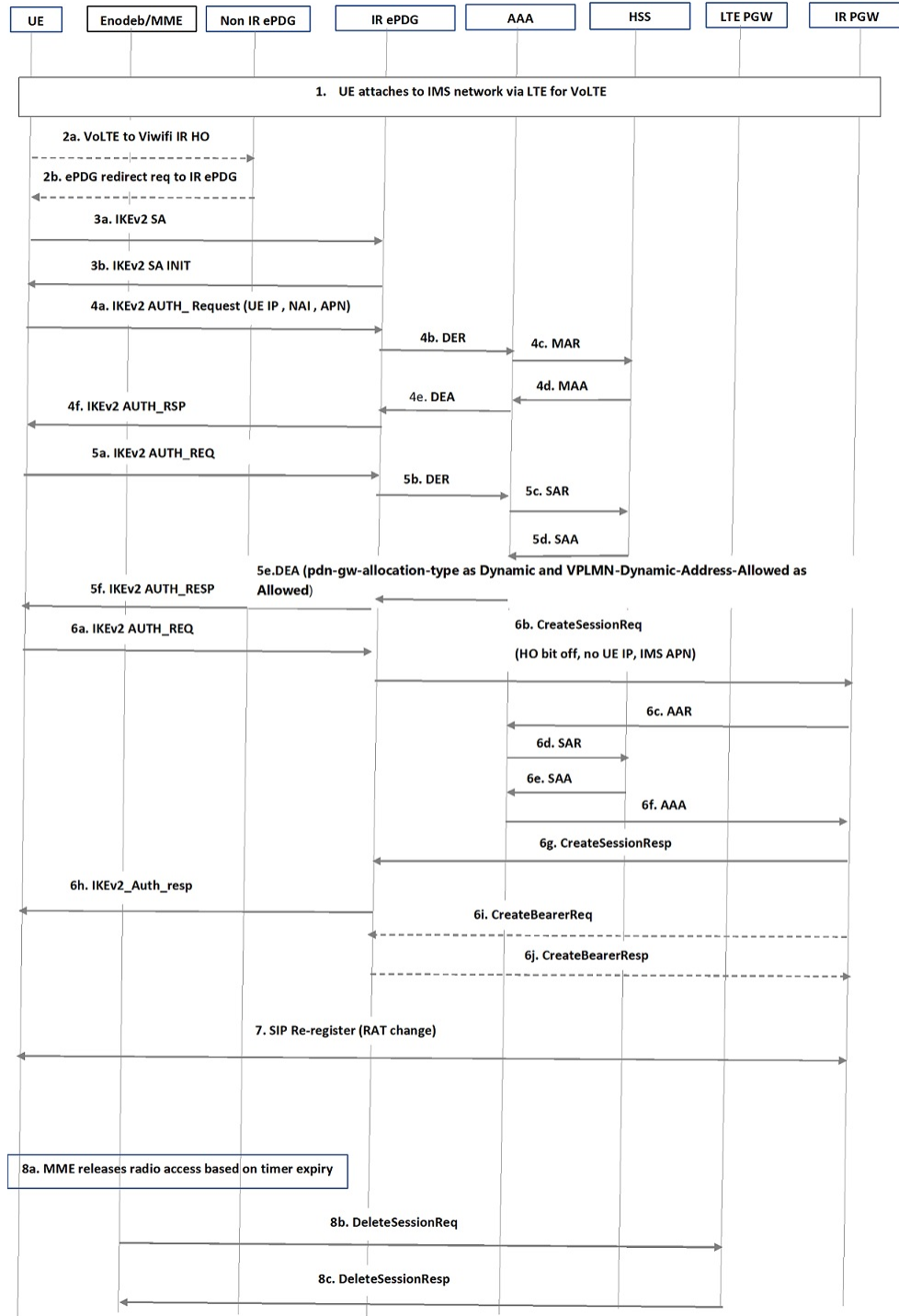
Note This CLI is disabled by default.

Enabling this CLI in normal ePDG will have impact on the normal ePDG HO call flows. The following warning message is displayed on enabling the feature:

It is customer specific feature, enabling this feature might have impact on the calls. If it is not intended, disable it

VoLTE to VoWiFi IR HO Call Flows

The following call flow diagram describes the VoLTE to VoWiFi IR HO Call Flows to IR ePDG:



Step	Description
1	The International Roamer (IR) UE attaches to LTE for availing IMS network (IMS APN).

Step	Description
2	<ul style="list-style-type: none"> If the UE does HandOver (HO) to a Wi-Fi network, ensure that the UE/AP sends the request to IR supported ePDG, and not to the non-IR supported ePDG. If the UE sends the request to a non-IR supported ePDG, ePDG sends redirect request indication to the UE with proper ePDG information, and UE sends HO requests to IR ePDG, only if UE redirection is supported in UE.
3	UE sends IPv2_SA_INIT to IR ePDG, and UE receives a response from ePDG to establish the tunnel.
4	<ul style="list-style-type: none"> The UE sends the user identity (in the IDi payload) and the APN information (in the IDr payload, IMS APN in this case) in this first message of the IKE_AUTH phase, and begins negotiation of child security associations. When the MAC ULI feature is enabled the root NAI used will be of the form "0<IMSI>AP_MAC_ADDR.nai.epc.mnc<MNC>.mcc<MCC>.3gppnetwork.org" <p>Note The UE omits the AUTH parameter to indicate to the ePDG that it wants to use EAP over IKEv2. The user identity shall be compliant with Network Access Identifier (NAI) format specified in TS 23.003 containing the IMSI, as defined for EAP-AKA in RFC 4187. In this feature UE IP address is suppressed while sending CSReq message to P-GW.</p> <ul style="list-style-type: none"> The UI and APN are forwarded to the AAA server, and an AAA server verifies the subscriber profile fetched from HSS and, 3GPP AAA Server initiates the authentication challenge. If the user identity is not requested again then ePDG responds to IKA_INIT.
5	UE sends the Authentication challenge-response and verifies with AAA, then responds to UE for authentication completion. During the DEA (Diameter EAP Answer) reply from AAA in this process, the AAA must set "VPLMN-Dynamic-Address-Allowed" as allowed and pdn-gw-allocation-type as dynamic.
6	<p>Based on the PGW identified in Step 5, the ePDG sends the CreateSessionReq (with IMS APN, Handoff bit set "off", and UE IP wouldn't be included) to PGW so that PGW will consider this as a fresh attach. Since it is a new PGW different from the LTE PGW, the UE context won't be there and it will allocate a new IP, which is forwarded to UE via ePDG.</p> <p>The new PGW update the UE information and APN to AAA and in-turn to HSS. Optionally based on a number of dedicated bearers, the createBearer procedure will happen.</p>
7	Since the RAT (Radio Access Technology) has changed from LTE to Wifi, the SIP re-register will happen.
8	P-GW will not trigger the DeleteSessionReq for LTE bearers, as UE gets attached to different P-GW after wifi Handover. So on the timer expiry (probably periodic Tau timer) expiry, the MME would release the LTE bearers as mentioned in procedure step 8 in the call flow.

Monitoring and Troubleshooting

This section provides information on how to monitor and troubleshoot using show commands and bulk statistics available to support this feature.

Show Commands and Outputs

The following table lists the new fields/counters added to the following show command that will help to monitor and troubleshoot this feature:

show epdg-service statistics suppress-ir-handover

Fields/Counters	Description
Attempts: 1	Total number of ePDG sessions for which international roaming handoff attempted on international roaming HO suppression supported ePDG.
Success: 1	Total number of ePDG sessions for which international roaming handoff attempts succeeded on international roaming HO suppression supported ePDG.
Failures: 0	Total number of ePDG sessions for which international roaming handoff attempts failed on international roaming HO suppression supported ePDG.
Rejected Attach: 0	Total number of initial attach rejected on international roaming HO suppression supported ePDG.

Use the following command to check whether IR suppress HO is enabled or disabled:

show epdg-service name *name*

Fields/Counters	Description
Suppress International Roamer Handover: Disabled	Specifies if the suppress international roamer HO is disabled.
Suppress International Roamer Handover: Enabled	Specifies if the suppress international roamer HO is enabled.

Bulk Statistics

The following bulk statistics variables are added in the ePDG schema for suppressing handover request for VoWiFi IR subscribers:

Bulk Statistics Variables	Description
suppress-intr-roaming-ho-attempts	Indicates the total number of ePDG sessions for which international roaming handoff attempted. This increments when international roaming handoff is attempted on international roaming HO suppression supported ePDG.
suppress-intr-roaming-ho-success	Indicates the total number of ePDG sessions for which international roaming handoff attempts succeeded. This increments when international roaming handoff attempt succeeds on international roaming HO suppression supported ePDG.
suppress-intr-roaming-ho-failures	Indicates the total number of ePDG sessions for which international roaming handoff attempts failed. This increments when international roaming handoff attempt fails on international roaming HO suppression supported ePDG.
suppress-intr-roaming-ho-rejected-attach	Indicates the total number of initial attach rejected. This increments when initial attach is rejected on international roaming HO suppression supported ePDG.