

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)	• ASR 5500 • VPC-DI • VPC-SI
Feature Default	Disabled - Configuration Required
Related Changes in This Release	Not Applicable
Related Documentation	• *ePDG Administration Guide* • *AAA Interface Administration and Reference* • *Statistics and Counters Reference*

Revision History

Revision Details	Release
The ePDG supports VoWiFi fresh attach request for IR subscribers. This enhancement also includes a related counter and bulk statistic.	21.25

Revision Details	Release
The PGW selection mechanisms in ePDG is enhanced to provide suppressing handover request for VoWiFi International Roaming (IR) subscribers.	21.23

Feature Description

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 P-GW for the IR in the ePDG-service and forwards it. Once the HO is successfully completed, the termination of UE context in LTE is not supported on ePDG and the requests received in this dedicated ePDG is expected to be always IR HO.

If the IR fresh attach request is on dedicated ePDG, there is no change in functionality and it is processed as in normal attach case.

How it Works

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.

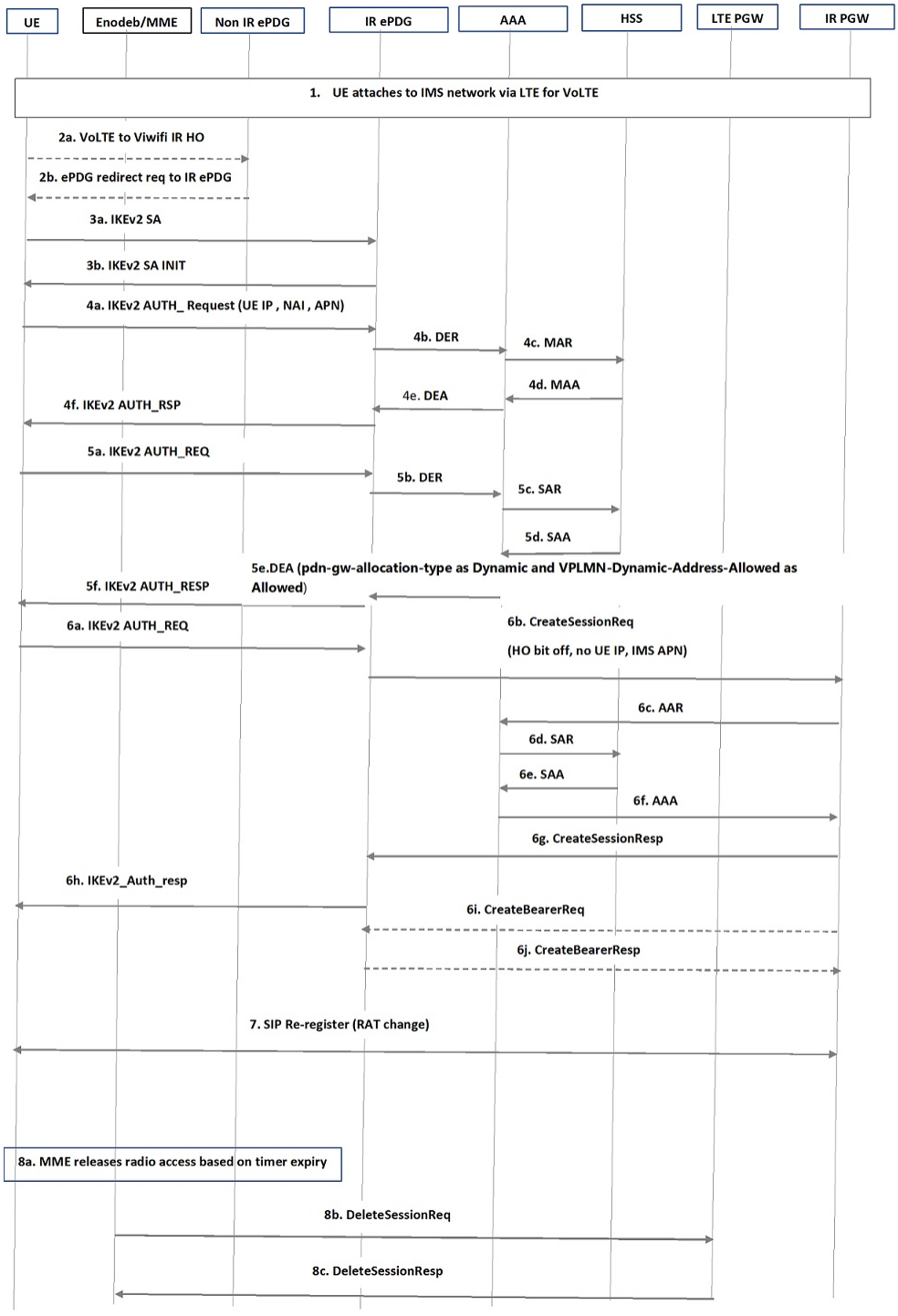
Enabling the CLI in normal ePDG impacts the normal ePDG HO call flows. The following warning message is displayed on enabling the feature:

Warning This feature is customer-specific. Enabling this feature might impact the calls.

VoLTE to VoWi-Fi IR HO Call Flows

The following call flow diagram describes the VoLTE to VoWi-Fi IR HO to IR ePDG.

Figure 1: VoLTE to VoWi-Fi IR HO to IR ePDG



Step	Description
1	The International Roamer (IR) UE attaches to LTE for availing IMS network (IMS APN).
2	• If the UE does handover (HO) to a Wi-Fi network, ensure that the UEAP 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, the ePDG sends redirect request indication to the UE with the correct information. UE sends HO requests to the IR ePDG only if UE redirection is supported. This feature does not support redirection and it must be handled outside the ePDG.
3	UE sends IKv2_SA_INIT to IR ePDG and receives a response from ePDG to establish the tunnel.
4	• The UE sends the user identity (in the IDi payload) and the APN information (in the IDr payload, IMS APN in 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 has the following format: "0<IMSI>AP_MAC_ADDR:nai.epc.mnc<MNC>.mcc<MCC>.3gppnetwork.org" **Note** The UE omits the AUTH parameter to indicate to the ePDG that it wants to use EAP over IKEv2. The user identity complies with the NAI format specified in TS 23.003 containing the IMSI, as defined for EAP-AKA in RFC 4187. The UE IP address is suppressed while sending CSReq message to P-GW. • The UI and APN are forwarded to the AAA server. The AAA server verifies the subscriber profile fetched from HSS and the 3GPP AAA server initiates the authentication challenge.
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 sets "VPLMN-Dynamic-Address-Allowed" as allowed and "PDN-GW-Allocation-Type" as dynamic.
6	Based on the P-GW identified in Step 5, the ePDG sends the CreateSessionReq with IMS APN, Handoff bit set to “off” to P-GW so that P-GW will consider this as a fresh attach. Since the new P-GW is different from the LTE P-GW, the UE context will not be present and it will allocate a new IP, which is forwarded to UE through ePDG. The new P-GW updates the UE and APN information to AAA and then to HSS. Optionally based on the number of dedicated bearers, the Create Bearer procedure will happen.
7	Since the RAT has changed from LTE to Wi-Fi, the SIP re-register will happen.
8	P-GW will not trigger the DeleteSessionReq for LTE bearers, as UE gets attached to a different P-GW after Wi-Fi handover. On the timer expiry (probably periodic TAU timer) expiry, the MME releases the LTE bearers.

Monitoring and Troubleshooting

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

Show Commands and Outputs

This section provides information regarding show commands and their outputs for this feature.

show epdg-service statistics suppress-ir-handover

The output of this command includes the following fields:

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.
Active: 1	Total number of current active ePDG sessions for which international roaming handoff attempts succeeded on international roaming HO suppression supported ePDG.

show epdg-service name *name*

The output of this command includes the following fields to check whether IR suppress handover is enabled or disabled.

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

Bulk Statistics

The ePDG schema supports the following bulk statistics for suppressing handover request for VoWiFi IR subscribers:

Bulk Statistics	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-active	Indicates the current number of active ePDG sessions for which international roaming handoff attempts succeeded.