



# IMS PCO Configurations when Gx is Down

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## Feature Summary and Revision History

### Summary Data

Applicable Product(s) or Functional Area	<ul style="list-style-type: none"> <li>• S-GW</li> <li>• P-GW</li> </ul>
Applicable Platform(s)	<ul style="list-style-type: none"> <li>• ASR 5500</li> <li>• VPC-DI</li> <li>• VPC-SI</li> </ul>
Feature Default	Disabled - Configuration Required
Related Changes in This Release	Not applicable
Related Documentation	Not applicable

### Revision History

Revision Details	Release
First introduced. <b>Important</b> This feature is not validated for all customer deployment scenarios. For more information, contact your Cisco Account representative.	21.23

## Feature Description

When Gx is down, the IMS Packet Data Network (PDN) session uses the local policy. However, the existing Proxy-Call Session Control Function (P-CSCF) PCO list configuration under the "ims-auth" profile does not apply to the PDN session within the local policy. The alternative configuration is to configure the P-CSCF IPs under the APN configuration. This APN configuration has a limit of three IP addresses that does not meet the production configuration needs.

The IMS PDN session uses the P-CSCF list configuration under IMSA after falling back to local policy to achieve VoLTE Resiliency. With this feature, the P-CSCF PCO list applies to PDN session in local policy.

## How It Works

The UE performs P-CSCF discovery before sending any Session Initiation Protocol (SIP) requests. P-GW provides the UE with the P-CSCF addresses when UE requests the parameters from the network within the Protocol Configuration Options element to include the P-CSCF address. If UE has more than one P-CSCF address, the selection then uses the configuration policy to select the P-CSCF.

Priority of P-CSCF addresses selection in P-GW is as follows:

- Addresses from DNS (S6b provides FQDN or FQDN received from Access Point Name (APN) configuration).
- Addresses from the IMSA-configured table.
- Configuration addresses that are part of APN configuration.

When local policy fallback occurs and Gx is down, P-CSCF list from IMSA profile is used. The following are the scenarios when local policy is used:

- P-CSCF list when Gx is down
- CCR-I Response Failure

## Call Flows

The following call flows and procedures explain P-CSCF address selection and Response Failure scenarios.

### P-CSCF Address Selection Call Flow

When Create Session Request (CSR) is received with PCO request, the P-GW checks for peers. If all peers are in the down state or no peers are available, then the Gx interface is considered as down. The PDN session fallbacks to the local policy and uses the P-CSCF list from IMSA.

When Virtual APN (VAPN) configuration is available and Gx is down, the P-CSCF uses addresses from IMSA of the selected VAPN. If VAPN configuration is not available, then the P-CSCF address list is received from IMSA of an APN.

Figure 1: P-CSCF Address Selection-Gx Down

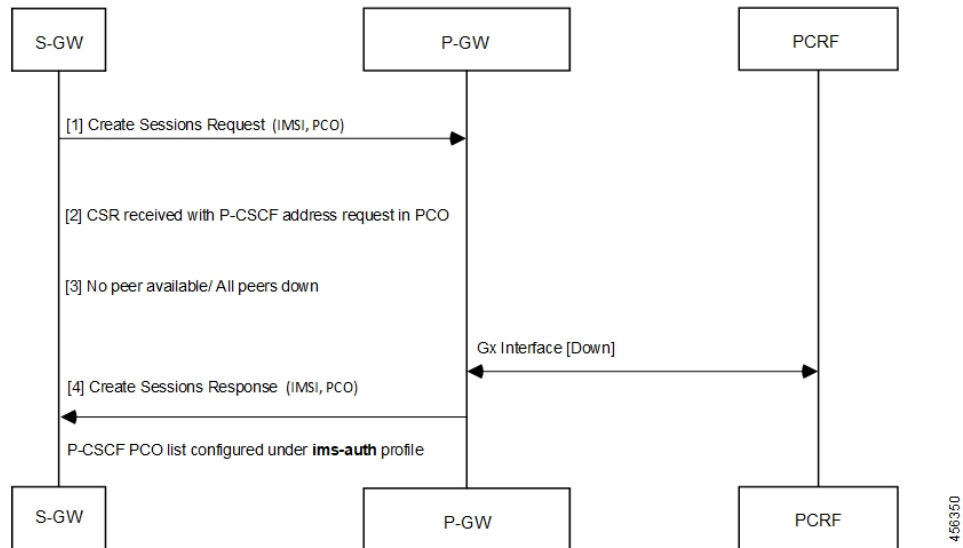


Table 1: Procedure

Step	Description
1	S-GW sends Create Session Request (IMSI, PCO) to P-GW.
2	P-GW receives Create Session Request with the P-CSCF address request in PCO from S-GW and checks for peers available for the Gx interface.
3	If no peers are available or all peers are down, then Gx interface is considered as down between PCRF and P-GW. The PDN session fallbacks to the local policy and uses the P-CSCF list from IMSA.
4	P-GW then sends a Create Session Response with P-CSCF PCO list configurations under the "ims-auth" profile to S-GW.

**Response Failures Call Flow**

When CSR is received with P-CSCF address request under PCO, the P-GW checks for peers.

If the peer is in the Up state and reachable, Gx is considered in Up state and CCR-I is sent for the primary host. If P-GW receives error response, then the secondary host is used. If the secondary host fails as well, then the PDN session falls back to the local policy and uses the P-CSCF list from IMSA.

Figure 2: Response Failure (CCR-Initial Request)

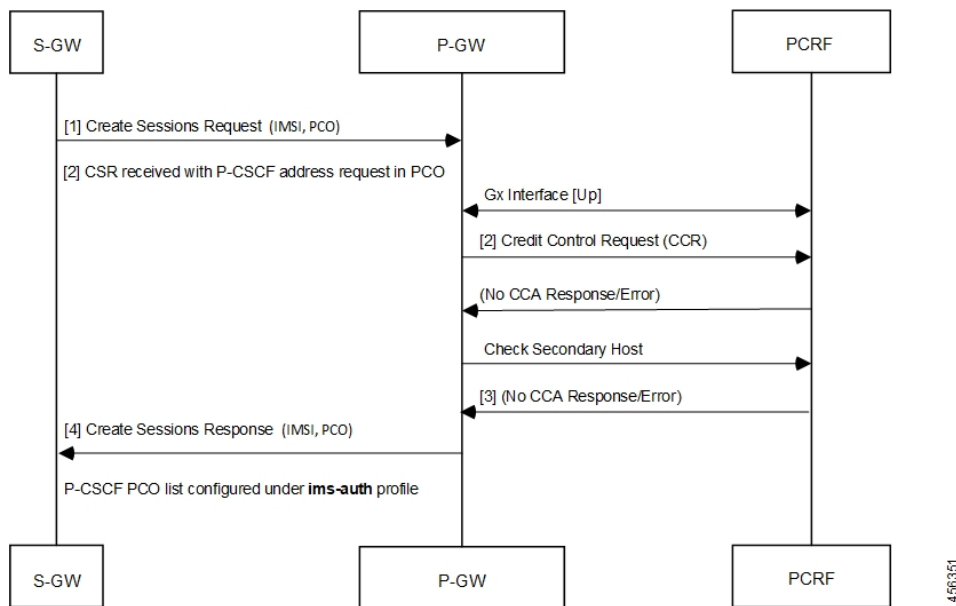


Table 2: CCR-I Response Failure

Step	Description
1	S-GW sends Create Session Request (IMSI, PCO) to P-GW.
2	P-GW receives Create Session Request with the P-CSCF address request in PCO from S-GW and checks for peers available for Gx interface.  If the peer is in the Up state and reachable, Gx is in Up state.  P-GW sends a Credit Control Request (CCR) to PCRF for the primary host.
3	PCRF does not send credit Control Answer (CCA) Response or sends an error code to P-GW.  If case P-GW receives error response, then use the secondary host.  If the secondary host fails, then the PDN session falls back to the local policy and uses the P-CSCF list from IMSA.
4	P-GW then sends a Create Session Response with the P-CSCF PCO list configurations under the "ims-auth" profile to S-GW.

## Configuring the IMS PCO Configuration when Gx is Down

This section describes how to configure the IMS PCO configuration when Gx is down.

## Enabling P-CSCF Address from IMSA in Local Policy Service

Use the following configuration to enable P-CSCF to use the address from IMSA, under Local Policy Service, when Gx is down.

```
configure
  local-policy-service service_name
    [ no ] use-pcscf-config-from-imsa
  end
```

### NOTES:

- **no** : Disables the feature.
- **use-pcscf-config-from-imsa**: Specifies to use the P-CSCF configuration from IMSA in Local Policy.
- To define the method of P-CSCF discovery to be used, use the existing **p-cscf discovery** CLI command under IMS Authorization Service Configuration mode.
- To add/append rows with primary and/or secondary IPv4/IPv6 addresses to a P-CSCF discovery table with precedence for P-CSCF discovery, use the existing **p-cscf table** CLI command under IMS Authorization Service Configuration mode.

### Verifying P-CSCF Configuration in Local Policy

Use the **show configuration** CLI command to verify if the P-CSCF Configuration in Local Policy is enabled or disabled. The output of this command does not display the mode if the **use-pcscf-config-from-imsa** is disabled.

The **show configuration verbose | grep "use-pcscf" use-pcscf-config-from-imsa** CLI command displays the mode for **use-pcscf-config-from-imsa** when it is enabled.

