SaMOG Local P-GW Selection

This feature enables the SaMOG Gateway to configure and use local P-GW addresses either as a fall-back selection method or as the preferred selection method.

The following sections provide more detailed information:

Feature Description

The SaMOG Gateway allocates P-GW to provide PDN connectivity to the User Equipment (UEs). The P-GW address is either selected based on the address provided by the AAA server (static selection) or by using DNS resolution (dynamic selection). With this feature, the SaMOG Gateway can support P-GW addresses that are configured locally under the APN Profile Configuration Mode. SaMOG can use these locally configured P-GW addresses in one of the following ways:

- As a fall-back selection method
- As preferred selection method

Local P-GW as a Fall-back Selection Method

1. When AAA Server identifies the P-GW selection method as Dynamic and if the local P-GW address is configured under the APN Profile, the SaMOG Gateway will perform local P-GW selection in the following scenarios:
    - The P-GW addresses received by DNS resolution are unreachable.
    - The DNS server is unreachable, or the DNS query is rejected.
    - DNS resolution is not configured, and/or the AAA server does not send the P-GW address.
2. When AAA Server identifies the P-GW selection method as static (P-GW IP Address or P-GW FQDN):

If the local P-GW address(es) are configured under the APN Profile and also P-GW selection fallback for P-GW ID is configured under mrme-service, the SaMOG Gateway will perform local P-GW selection in the following scenarios:

- The P-GW address mentioned by AAA server or received by DNS resolution (P-GW FQDN) is unreachable
- The DNS server is unreachable, or the DNS query is rejected (for P-GW FQDN).
- DNS resolution is not configured (for P-GW FQDN).

Local P-GW as the Preferred Selection Method

The SaMOG Gateway can be configured to use the local P-GW addresses for P-GW node selection as the preferred selection method.

This method is applicable only when the AAA server mentions the selection method as dynamic and the "local-configuration-preferred" configuration is enabled under mrme-service.

Note This configuration is not effective when the AAA server mentions the selection method as static.

How Local P-GW Address Support Works

The SaMOG Gateway performs local P-GW address selection based on the weight that is configured for each P-GW address (similar to DNS resolution of P-GW addresses). Only the first P-GW address is selected based on its weight. The rest of the addresses are selected on a round-robin basis starting from the next available P-GW address, rounding to the P-GW address before the first selected P-GW address. A maximum of 16 IPv4 and/or IPv6 local P-GW addresses can be configured.

Limitations

- In this release, the SaMOG Gateway does not support dual bind (IPv4 and IPv6) address for EGTP service (or GTPU service).
- The PGW-Fallback is supported only for GTPv2 Network Protocol.

Table 1: Truth Table Describing P-GW Fall Back Selection

SL No	Local Preferred Configuration	PGW-ID Fallback Configuration	AAA - Address Location Type	Behavior
1	Yes/No	No	PGW - IP Address	1. If PGW is not reachable then session setup is terminated, No Fallback

2	Yes/No	No	PGW FQDN	1. SaMOG performs DNS resolution on provided PGW FQDN, If resolved PGW is not reachable session setup is terminated, No Fallback
3	Yes	Yes	PGW - IP Address	1. If PGW is not reachable then 2. SaMOG tries to establish session with locally configured PGW Addresses If they are not reachable then 3. SaMOG performs DNS resolution based on APN FQDN and tries to establish session with resolved PGW addresses.
4	No	Yes	PGW- IP Address	1. If PGW is not reachable then 2. SaMOG performs DNS resolution based on APN FQDN and tries to establish session with resolved PGW addresses. If they are unreachable then. 3. If local configured PGW's are available, SaMOG tries to establish session with configured IP's
5	Yes	Yes	PGW FQDN	1. SaMOG performs DNS resolution on provided PGW FQDN, If resolved PGW is not reachable then 2. SaMOG tries to establish session with locally configured PGW Addresses If they are not reachable then 3. SaMOG performs DNS resolution based on APN FQDN and tries to establish session with resolved PGW addresses.

6	No	Yes	PGW FQDN	1. SaMOG performs DNS resolution on provided PGW FQDN, If resolved PGW is not reachable then 2. SaMOG performs DNS resolution based on APN FQDN and tries to establish session with resolved PGW addresses. If they are unreachable then. 3. If local configured PGW's are available, SaMOG tries to establish session with configured IP's
7	No	No/Yes	PGW - Dynamic Allocation (APN FQDN)	1. SaMOG performs DNS resolution on APN FQDN, If resolved PGWs are not reachable then 2. SaMOG tries to establish session with locally configured PGW Addresses.
8	Yes	No/Yes	PGW - Dynamic Allocation (APN FQDN)	1. SaMOG tries to establish session with locally configured PGW Addresses. If they are not reachable then 2. SaMOG performs DNS resolution based on APN FQDN and tries to establish session with resolved PGW addresses.
		Note Note: Fallback is applicable to only GTPv2 Network Protocol.		

Configuring Local P-GW Selection

Configuring Local P-GW Resolution

Use the **pgw-address** command under the APN Profile Configuration Mode to define local P-GW addresses for load balancing.

```
configure
   apn-profile profile-name
     pgw-address ipv4_address |  ipv6_address weight weight [ primary | secondary
 ]
      no pgw-address ipv4_address | ipv6_address
      end
```

Notes:

- Use the **no pgw-address** *ipv4_address* | *ipv6_address* command to disable the P-GW address(es) configured for an APN profile.

  ipv4_address must be an IPv4 address expressed in dotted-decimal notation.

  ipv6_address must be an IPv6 address expressed in colon (or double-colon) notation.

- **weight** *weight*

  Configures the weight for the IPv4 or IPv6 address.

  weight is an integer from 1 to 100.

- **primary | secondary**

  primary: Configures the primary P-GW for S2b interface.

  secondary: Configures the primary P-GW for S2b interface.

- A maximum of 16 P-GW IPv4 and/or IPv6 addresses can be configured for an APN profile.
- When multiple P-GW addresses are configured, only the first P-GW will be selected based on the weight. The rest of the P-GW addresses are selected using the round-robin mechanism

Configuring Preferred Selection as Local P-GW

Use the **pgw-selection** command under the MRME Service Configuration Mode to set the P-GW address selection from a local configuration as the preferred selection mechanism.

```
configure
   context context_name
      mrme-service service_name
         pgw-selection local-configuration-preferred
         end
```

Notes:

- Use the **no pgw-selection local-configuration-preferred** command to disable this command.
- By default, this command is disabled. The SaMOG Gateway uses DNS-based P-GW selection (dynamic selection) as the preferred selection method.

Configuring Local P-GW Fallback for Static Selection Method

Use the **pgw-selection** command under the MRME Service Configuration Mode to set the P-GW address selection from a local configuration as static selection method.

```
configure
   context context_name
      mrme-service service_name
         pgw-selection fallback pgw-id
         end
```

Notes:

- Use the **no pgw-selection fallback pgw-id** command to disable this command.
- By default, this command is disabled.

Verifying Configuration for Local P-GW Support

show apn-profile full all

Use the **show apn-profile** command to verify the configured P-GW IP address(es).

```
P-GW:
 IP-Address                      : 6666::200:1
 S5-S8-Protocol                  : N/A
 Weight                          : 1
IP-Address                       : 6666::a00:1
 S5-S8-Protocol                  : N/A
 Weight                          : 17
```

show mrme-service name *mrme_service_name*

Use the **show mrme-service name** command to verify the status of the local P-GW selection configuration.

```
Preferred PGW selection mechanism : Local
PGW-ID selection fallback : Enabled
```

Monitoring Local P-GW Selection

This section provides information on the show commands available to monitor the local P-GW selection.

Local P-GW Selection 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.

```
Local PGW Fallback Stats:
 Attempted:              0
  Success:               0        No Alternate GW:          0
```

Table 2: show samog-service statistics Command Output Descriptions

Field	Description
Local PGW Fallback Stats	

Attempted	Total number of local P-GW fall-back attempted.
Success	Total number of successful local P-GW fall-back achieved.
No Alternate GW	Total number of alternative Gateways available for fall-back.