



Configuring Proxy Mobile IPv6

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Proxy Mobile IPv6

Proxy Mobile IPv6 (PMIPv6) is a network-based mobility management protocol that supports a mobile node by acting as the proxy for the mobile node in an IP mobility-related signaling scenario. The mobility entities in the network track the movements of the mobile node, initiate mobility signaling, and set up the required routing state.

The main functional entities are the Local Mobility Anchor (LMA) and Mobile Access Gateway (MAG). The LMA maintains the reachability state of the mobile node and is the topological anchor point for the IP address of the mobile node. The MAG performs mobility management on behalf of a mobile node. The MAG resides on the access link where the mobile node is anchored. The Cisco Wireless LAN Controller (WLC) implements the MAG functionality.

In the Cisco 5508 WLC, Cisco WiSM2, and Cisco 8510 WLCs, PMIPv6 MAG support for integration with LMA such as Cisco ASR 5000 Series in cellular data networks.

For PMIPv6 clients, Cisco WLC supports both central web authentication and local web authentication.

PMIPv6 is supported for clients with 802.1X authentication. After the 802.1X authentication is complete, a Cisco AP starts PMIPv6 signaling for the corresponding client.

Dynamic AAA Attributes

The dynamic AAA attributes that are supported are listed below:

Type	Attribute	Value	Description	Cisco WLC Behavior
89	Chargeable-User-Identity	String	Chargeable User Identity RFC-4372	If present, the attribute is copied into the MSCB and used in accounting reports; no other usage.

Type	Attribute	Value	Description	Cisco WLC Behavior
26/104 15/13	3GPP-Charging-Characteristics	String	Rules for producing charging information	If present, the attribute is copied to the MSCB and passed to the L2 attach triggers to the MAG. The attribute is used to send to the local mobility anchor (LMA) as an option in the proxy binding update (PBU).
26/9/1	Cisco-Service-Selection	String	Service Identifier (APN)	If present, the attribute overrides the locally configured APN.
26/9/1	Cisco-Mobile-Node-Identifier	String	Mobile Node Identifier	If present, the attribute is used for the network access identifier (NAI).
26/9/1	Cisco-MSISDN	String	Mobile Subscriber ISDN Number	If present, the attribute is used to pass to MAG code with a new parameter in the L2 attach trigger.
26/9/1	Cisco-MPC-Protocol-Interface	ENUM: "none" "PMIPv6" "GTPv1" "PMIPv4"	Mobile Node Service Type	Only IPv4 and simple IP clients are supported.
26/9/1	Cisco-URL-REDIRECT	String	HTTP URL of the Captive Portal	Existing attribute used for web authentication; no changes required.
26/9/1	Cisco-URL-REDIRECT-ACL	String	Specific Redirect Rule	Existing attribute used for web authentication; no changes required.
26/9/1	Cisco-Home-LMA-IPv4-Address	IP Address	Mobile node's Home LMA IPv4 address	If present, this attribute is used as the LMA for the client. Note The GRE tunnel creation is still static.

PMIPv6 AAA Attributes

The PMIPv6 AAA attributes that are supported are listed below:

Type	Attribute	Value	Description	Cisco WLC Behavior
89	Chargeable-User-Identity	String	Chargeable User Identity RFC-4372	If present, the attribute is copied into the MSCB and used in accounting reports; no other usage.
26/104 15/13	3GPP-Charging-Characteristics	String	Rules for producing charging information	If present, the attribute is copied to the MSCB and passed to the L2 attach triggers to the MAG. The attribute is used to send to the local mobility anchor (LMA) as an option in the proxy binding update (PBU).
26/9/1	mn-network	String	Service Identifier (APN)	If present, the attribute overrides the locally configured APN (Mandatory)

Type	Attribute	Value	Description	Cisco WLC Behavior
26/9/1	mn-nai	String	Mobile Node Identifier	If present, the attribute is used for the network access identifier (NAI).
26/9/1	cisco-msisdn	String	Mobile Subscriber ISDN Number	If present, the attribute is used to pass to MAG code with a new parameter in the L2 attach trigger.
26/9/1	cisco-mpc-protocol-interface	ENUM: "None" "PMIPv6"	Mobile Node Service Type	Only PMIPv6 clients are supported. (Mandatory)
26/9/1	home-lma-ipv4-address	IPv4 Address	Mobile node's Home LMA IPv4 address	If present, this attribute is used as the LMA for the client. The LMA should also be configured in WLC (Mandatory). Note The GRE tunnel creation is still static.
26/9/1	mn-service	ENUM: "IPv4"	Type of client	Only IPv4 is supported.

Restrictions on Proxy Mobile IPv6

- IPv6/dual stack clients are not supported. Only IPv4 is supported with PMIPv6.
- You must enable DHCP Proxy before you can connect to a PMIPv6-enabled WLAN.
- PMIPv6 is not supported on local switching WLANs with FlexConnect mode APs.
- PMIPv6 on FlexConnect ACL with local switching is not supported.

Configuring Proxy Mobile IPv6 (GUI)

Step 1 Choose **Controller > PMIPv6 > General**. The **PMIPv6 General** window is displayed.

Step 2 Enter the values for the following parameters:

- **Domain Name**—Name of the PMIPv6 domain. The domain name can be up to 127 case-sensitive, alphanumeric characters.
- **MAG Name**—Name of the MAG.
- **Maximum Bindings Allowed**—Maximum number of binding updates that the Cisco WLC can send to the MAG. The valid range is between 0 and 40000.
- **Binding Lifetime**—Lifetime, in seconds, of the binding entries in the Cisco WLC. The valid range is between 10 and 65535. The default value is 3600. The binding lifetime should be a multiple of 4.

- **Binding Refresh Time**—Refresh time, in seconds, of the binding entries in the Cisco WLC. The valid range is between 4 and 65535 seconds. The default value is 300 seconds. The binding refresh time should be a multiple of 4.
- **Binding Initial Retry Timeout**—Initial timeout, in milliseconds, between the Proxy Binding Updates (PBUs) when the Cisco WLC does not receive the Proxy Binding Acknowledgments (PBAs). The valid range is between 100 and 65535. The default value is 1000.
- **Binding Maximum Retry Timeout**—Maximum timeout between the PBUs when the Cisco WLC does not receive the PBAs. The valid range is between 100 and 65535. The default value is 32000.
- **Replay Protection Timestamp**—Maximum amount of time, in milliseconds, difference between the timestamp in the received PBA and the current time of the day. The valid range is between 1 and 255. The default value is 7.
- **Minimum BRI Retransmit Timeout**—Minimum amount of time, in milliseconds, that the Cisco WLC waits for before retransmitting the BRI message. The valid range is between 500 and 65535. The default value is 1000.
- **Maximum BRI Retransmit Timeout**—Maximum amount of time, in milliseconds, that the Cisco WLC waits for before retransmitting the Binding Revocation Indication (BRI) message. The valid range is between 500 and 65535. The default value is 2000.
- **BRI Retries**—Maximum number of times that the Cisco WLC retransmits the BRI message before receiving the Binding Revocation Acknowledgment (BRA) message. The valid range is between 1 to 10. The default value is 1.

Step 3 Click **Apply**.

Note To clear your configuration, click **Clear Domain**.

Step 4 To create the LMA, follow these steps:

- a) Choose **Controller > PMIPv6 > LMA** and click **New**.
- b) Enter the values for the following parameters:
 - **Member Name**—Name of the LMA connected to the Cisco WLC.
 - **Member IP Address**—IP address of the LMA connected to the Cisco WLC.
- c) Click **Apply**.

Step 5 To create a PMIPv6 profile, follow these steps:

- a) Choose **Controller > PMIPv6 > Profiles** and click **New**.
- b) In the **PMIPv6 Profile > New** window, enter the values for the following parameters:
 - **Profile Name**—Name of the profile.
 - **Network Access Identifier**—Name of the Network Access Identifier (NAI) associated with the profile.
 - **LMA Name**—Name of the LMA to which the profile is associated.
 - **Access Point Node**—Name of the access point node; APN identifies a particular routing domain for user traffic.
- c) Click **Apply**.

Step 6 To configure PMIPv6 parameters for a WLAN, follow these steps:

- a) Choose **WLANs > WLAN ID**. The **WLANs > Edit** window is displayed.
- b) Click the **Advanced** tab.
- c) Under **PMIP**, from the **PMIP Mobility Type** drop-down list, choose the mobility type from the following options:

- **None**—Configures the WLAN with simple IP
 - **PMIPv6**—Configures the WLAN with only PMIPv6
- d) From the **PMIP Profile** drop-down list, choose the PMIP profile for the WLAN.
- e) In the **PMIP Realm** field, enter the default realm for the WLAN.
- f) Click **Apply**.

Step 7 Click **Save Configuration**.

Configuring Proxy Mobile IPv6 (CLI)

Step 1 Configure a PMIPv6 domain name by entering this command:

```
config pmipv6 domain domain-name
```

Note This command also enables the MAG functionality on the Cisco Wireless Controller (WLC).

Step 2 Configure MAG by using these commands:

- Configure the maximum binding update entries that are allowed by entering this command:

```
config pmipv6 mag binding maximum units
```

- Configure the binding entry lifetime by entering this command:

```
config pmipv6 mag lifetime units
```

- Configure the binding refresh interval by entering this command:

```
config pmipv6 mag refresh-time units
```

- Configure the initial timeout between PBUs if PBA does not arrive by entering this command:

```
config pmipv6 mag init-retx-time units
```

- Configure the maximum initial timeout between PBUs if PBA does not arrive by entering this command:

```
config pmipv6 mag max-retx-time units
```

- Configure the replay protection mechanism by entering this command:

```
config pmipv6 mag replay-protection {timestamp window units | sequence-no | mobile-node-timestamp}
```

- Configure the minimum or maximum amount of time, in seconds, that the MAG should wait for before it retransmits the binding revocation indication (BRI) message by entering this command:

```
config pmipv6 mag bri delay {min | max} units
```

- Configure the maximum number of times the MAG should retransmit the BRI message before it receives the binding revocation acknowledgment (BRA) message by entering this command:

```
config pmipv6 mag bri retries units
```

- Configure the list of LMAs for the MAG by entering this command:

```
config pmipv6 mag lma lma-name ipv4-address ip-address
```

Step 3 Add a profile to a PMIPv6 domain by entering this command:

```
config pmipv6 add profile profile-name nai {user@realm | @realm | *} lma lma-name apn apn-name
```

Note nai stands for network access identifier, while apn stands for access point name.

Step 4 Delete a PMIPv6 entity by entering this command:

```
config pmipv6 delete {domain domain-name | lma lma-name | profile profile-name nai {user@realm | @realm | *}}
```

Step 5 Configure the PMIPv6 parameters for the WLAN by using these commands:

- Configure the default realm for the WLAN by entering this command:

```
config wlan pmipv6 default-realm {realm-name | none} wlan-id
```

- Configure the mobility type for a WLAN or for all WLANs by entering this command:

```
config wlan pmipv6 mobility-type {none | pmipv6} {wlan-id | all}
```

- Configure the profile name for a PMIPv6 WLAN by entering this command:

Step 6 Save your changes by entering this command:

```
save config
```

Step 7 See the PMIPv6 configuration details by using the following **show** commands:

- See the details of a profile of a PMIPv6 domain by entering this command:

```
show pmipv6 domain domain-name profile profile-name
```

- See a summary of all the PMIPv6 profiles by entering this command:

```
show pmipv6 profile summary
```

- See global information about the PMIPv6 for a MAG by entering this command:

```
show pmipv6 mag globals
```

- See information about MAG bindings for LMA or NAI by entering this command:

```
show pmipv6 mag bindings {lma lma-name | nai nai-name}
```

- See statistical information about MAG by entering this command:

```
show pmipv6 mag stats domain domain-name peer peer-name
```

- See information about PMIPv6 for all clients by entering this command:

```
show client summary
```

- See information about PMIPv6 for a client by entering this command:

```
show client details client-mac-address
```

- See information about PMIPv6 for a WLAN by entering this command:

```
show wlan wlan-id
```
