Scale Profiles and Feature Profiles

Scale profiles in routers optimize performance by allowing customization for different network demands, such as high Layer 2 scale or a large number of Layer 3 routes. Feature profiles determine available software features, with the default profile supporting all features except PBB and the Layer 2 profile including PBB support but lacking IPv6, RPF, or Netflow.

Scale Profiles

Scale profiles help you tune your router that is running Cisco IOS XR software. Profiles help you run the router more efficiently based on your requirements.

Market segment types or network architectures can place different scale demands on the router. Therefore, it's important to configure the **scale profile** so that your router works as efficiently as possible.

Review the following considerations when setting a scale profile:

- Use of the router as a Layer 2 transport device, thus requiring the support of high Layer 2 scale numbers.

- Use of the router primarily as a Layer 3 device that provides Layer 3 virtual private network (VPN) services, thus requiring the support of a high number of Layer 3 routes.

Scale Profile Types

There are three scale profiles available on your router:

Default Scale Profile

The default scale profile supports deployments that require large Layer 2 MAC tables (up to 512,000 entries) and a relatively small number of Layer 3 routes (less than 512,000).

Layer 3 Scale Profile

The Layer 3 Scale Profile supports deployments that require smaller Layer 2 MAC tables (less than 128,000 entries) and relatively higher Layer 3 routes (up to 1 million).

Layer 3 XL Scale Profile

The Layer 3 XL Scale Profile supports deployments that require minimal Layer 2 functionality and a large number of Layer 3 routes (up to 1.3 million).

Note that the support for up to 1.3 million routes is split into IPv4 scaled support and IPv4/IPv6 scaled support. You can configure up to 1.3 million IPv4 routes, or up to 1 million IPv4 routes with 128,000 IPv6 routes.

Restrictions with Layer 3 XL Scale Profile

• Video monitoring isn't supported with the Layer 3 XL scale profile.

Configure Scale Profile

Recommendations and Guidelines

• We recommend that you configure scale profiles in the administration configuration mode and remove any L3 scale profiles committed via the global configuration mode.

• Scale profile settings in the administration configuration override scale profile settings in the global configuration.

• If the scale profile is set only in the global configuration, the setting takes effect.

• Once you configure the scale profile, you must use the **reload location all** command to reload the device, or the line cards to enable the profile.

• You can increase the memory available for BGP if you configure Layer 3 XL profile on the router.

• Configuring the layer 3 XL profile reduces the memory available for other processes.

• To activate the new profile, you must manually reboot the system.

Set Scale Profile

The tasks in this module describes how to set the scale profile on your router.

Step 1   To set the scale profile on the router, use the **hw-module profile scale** command in the Administration Configuration mode.

Example:

This example shows how to configure Layer 3 profile on the router.

```
Router# admin
Router(admin)# configure
Router(admin-config)# hw-module profile scalel xl
Router(admin-config)# commit
```

You can configure the Layer 3 XL profile on the router for BGP using the **scale l3xl** keyword to increase the memory.

Step 2   Reload the line cards to enable the profile

```
Router# reload location all
```

Step 3   Verify that the configured scale profile is enabled, use the **show hw-module profile scale** command which displays the active scale profile. If the active scale profile is different than what was configured, the line cards (or router) hasn't been reloaded as required.

```
Router# show hw-module profile scale
```

You can verify the memory for BGP and the other processes using the following commands before and after the configuration:

- **show processes memory detail**

- **show bgp process performance-statistics**: This command is available only from Cisco IOS XR Release 6.1.x onwards.

Feature Profiles

To allow sufficient computation capabilities within the router, the available features within the Cisco IOS XR software image are bundled. A feature profile determines which bundle of features is available for you to use.

Feature Profile Types

Default Profile

Supports all Cisco IOS XR software features except for IEEE 802.1ah provider backbone bridge (PBB).

Layer 2 Profile

Layer 2 Profile supports all Cisco IOS XR software features including IEEE 802.1ah PBB.

Restrictions with Layer 2 Profile

- Doesn't support IPv6, reverse-path forwarding (RPF) or Netflow.

- This feature profile is supported only on 1st Generation ASR 9000 Series Line Cards- Ethernet Line Cards, and 4th Generation ASR 9000 Series Line Cards - High Density Ethernet Line Cards. Therefore, this limitation is applicable only on those line cards; not on 2nd generation line cards and 3rd generation line cards.

Configure Feature Profile

Prerequisites and Recommendations

- Before deploying your router you should determine that the feature profile is consistent with the features that you need to use. If it is not, use this task to configure a different profile.

• If the feature profile that you have configured on your router does not support a feature that you have configured, warning messages are displayed on the console, and the feature does not work.

• A configured feature profile takes effect only after you reload all the line cards on the router.

Set Feature Profile

The tasks in this module describes how to set the feature profile on your router.

Step 1 To set the feature profile on your router, use the **hw-module profile feature** command in the Administration Configuration mode.

Example:

```
Router# admin
Router(admin)# configure
Router(admin-config)# hw-module profile feature l2
Router(admin-config)# commit
```

Step 2 You must reload the router, or line cards, to enable the profile.

```
Router# reload location all
```

Step 3 Verify that the configured feature profile is enabled, use the **show hw-module profile feature** command which displays the active feature profile. If the active feature profile is different than what was configured, the line cards (or router) haven't been reloaded as required.

Relationship Between Scale and Feature Profiles

While there are no restrictions on your choice of scale and feature profiles in relation to one another, we suggest using them together, as outlined here.

Table 1: Relationship Between Scale and Feature Profiles

	Default Feature Profile	Layer 2 Profile
Default Scale Profile	Up to 512 K Layer 3 Cisco Express Forwarding (CEF) scale	Provider backbone bridge
Layer 2 Scale Profile	Up to 1.0 M Layer 3 CEF scale Less than 128 K MAC entries	Not Recommended
Layer 3 XL Scale Profile	Up to 1.3 M Layer 3 CEF scale	Not Recommended

Other pairs are not recommended. Note that the Layer 3 XL scale profile does not support video monitoring.

Verify Scale Profile or Feature Profile Configurations

To verify the configured scale profile or feature profile, you may perform the following steps:

Step 1   If you see warning messages on the console indicating that the active feature profile does not match the configured profile, you must reload the affected line card so that the configured profile matches the active profile.

Example:

```
Router# Nov 5 02:50:42.732 : prm_server[236]: Configured 'hw-module profile feature l2' does not
match active 'hw-module profile feature default'.
You must reload this line card in order to activate the configured profile on this card or you must
 change the configured profile.
```

Step 2   If you see warning messages on the console indicating that some features do not match the feature profile, you should either change the feature profile configuration, or remove the non-supported features.

Example:

```
Router# Nov 5 02:50:42.732 : prm_server[236]: Active 'hw-module profile feature l2' does not support
 IPv6, RPF, or Netflow features. Please remove allunsupported feature configurations.
```

Verify Scale Profile or Feature Profile Configurations