



CHAPTER 8

Configuring SDM Templates

Finding Feature Information

Your software release may not support all the features documented in this chapter. For the latest feature information and caveats, see the release notes for your platform and software release.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

Prerequisites for Configuring SDM Templates

You must enter the **reload** privileged EXEC command to have your configured SDM template take effect.

Restrictions for Configuring SDM Templates

- For IPv6 routing support, you must be running the LAN Base image on the switch.
- When you select and configure SDM templates, you must reload the switch for the configuration to take effect.
- If you try to configure IPv6 features without first selecting a dual IPv4 and IPv6 template, a warning message is generated.
- Using the dual-stack templates results in less TCAM capacity allowed for each resource, so do not use if you plan to forward only IPv4 traffic.

Information About Configuring SDM Templates

SDM Templates

You can use SDM templates to configure system resources in the switch to optimize support for specific features, depending on how the switch is used in the network.

You can select a template to provide maximum system usage for some functions or use the default template to balance resources.

To allocate ternary content addressable memory (TCAM) resources for different usages, the switch SDM templates prioritize system resources to optimize support for certain features. When running the LAN Base image, you can select SDM templates to optimize these features:

- Default—The default template gives balance to all Layer 2 functions.
- Dual IPv6 and IPv6—Allows the switch to be used in dual-stack environments (supporting both IPv4 and IPv6).
- LAN Base Routing—The routing template maximizes system resources for IPv4 unicast routing, typically required for a router or aggregator in the center of a network.

See the “[Dual IPv4 and IPv6 SDM Default Template](#)” section on page 8-3.

**Note**

A switch running the LAN Lite image supports only the default SDM template.

Table 8-1 Approximate Number of Feature Resources Allowed by IPv4 Templates

Resource	Default
Unicast MAC addresses	12 K
Internet Group Management Protocol (IGMP) groups and multicast routes	1 K
IPv4 unicast routes	0
Policy-based routing access control entries (ACEs)	0
IPv4 or MAC QoS ACEs	0.75 K
IPv4 or MAC security ACEs	1 K

Table 8-2 Approximate Number of Feature Resources Allowed by Each Template

Resource	Default	QoS	Routing
Unicast MAC addresses	8 K	8 K	2 K
IGMP groups and multicast routes	256	256	1 K
Unicast routes	0		4 K
• Directly connected hosts	0		2 K
• Indirect routes	0		2 K
Policy-based routing ACEs	0		512
QoS classification ACEs	375	625	625
Security ACEs	375	125	375 K
Layer 2 VLANs	1 K	1 K	1 K

The first eight rows in the tables (unicast MAC addresses through security ACEs) represent approximate hardware boundaries set when a template is selected. If a section of a hardware resource is full, all processing overflow is sent to the CPU, seriously impacting switch performance. The last row is a guideline used to calculate hardware resource consumption related to the number of Layer 2 VLANs on the switch.

Dual IPv4 and IPv6 SDM Default Template

You can select an SDM template to support IP Version 6 (IPv6) switching. For more information about IPv6 and how to configure IPv6 routing, see [Chapter 38, “Configuring Static IP Unicast Routing.”](#)

This software release does not support Policy-Based Routing (PBR) when forwarding IPv6 traffic. The software supports IPv4 PBR only when the **dual-ipv4-and-ipv6 routing** template is configured.

The dual IPv4 and IPv6 template allows the switch to be used in dual-stack environments (supporting both IPv4 and IPv6). Using the dual-stack templates results in less TCAM capacity allowed for each resource. You should not use this template if you plan to forward only IPv4 traffic.

These SDM templates support IPv4 and IPv6 environments:

- Dual IPv4 and IPv6 default template—Supports Layer 2, QoS, and ACLs for IPv4; and Layer 2, IPv6 host, and ACLs for IPv6.
- Dual IPv4 and IPv6 routing template—Supports Layer 2, multicast, routing (including policy-based routing), QoS, and ACLs for IPv4; and Layer 2, routing, and ACLs for IPv6.



Note

An IPv4 route requires only one TCAM entry. Because of the hardware compression scheme used for IPv6, an IPv6 route can take more than one TCAM entry, reducing the number of entries forwarded in hardware. For example, for IPv6 directly connected IP addresses, the desktop template might allow less than two thousand entries.

Table 8-3 Approximate Feature Resources Allowed by Dual IPv6-IPv6 Templates¹

Resource	IPv4-and-IPv6 Default	IPv4-and-IPv6 Routing
Unicast MAC addresses	8 K	1K
IPv4 IGMP groups and multicast routes	0.25 K	0.5 K
Total IPv4 unicast routes:	0	2 K
• Directly connected IPv4 hosts	0	1 K
• Indirect IPv4 routes	0	1 K
IPv6 multicast groups	0.375 K	0.625 K
Total IPv6 unicast routes:	0	1.375 K
• Directly connected IPv6 addresses	0	1 K
• Indirect IPv6 unicast routes	0	0.375 K
IPv4 policy-based routing ACEs	0	0.125 K
IPv4 or MAC QoS ACEs (total)	0.375 K	0.375 K
IPv4 or MAC security ACEs (total)	0.375 K	0.125 K
IPv6 policy-based routing ACEs ²	0	0.125 K

Table 8-3 Approximate Feature Resources Allowed by Dual IPv4-IPv6 Templates¹ (continued)

Resource	IPv4-and-IPv6 Default	IPv4-and-IPv6 Routing
IPv6 QoS ACEs	0	0.125 K
IPv6 security ACEs	0.125 K	0.125 K

1. Template estimates are based on a switch with 8 routed interfaces and approximately 1000 VLANs.
2. IPv6 policy-based routing is not supported.

How to Configure the Switch SDM Templates

Setting the SDM Template

	Command	Purpose
Step 1	<code>configure terminal</code>	Enters global configuration mode.
Step 2	<code>sdm prefer { default dual-ipv4-and-ipv6 { default } lanbase-routing }</code>	Specifies the SDM template to be used on the switch: <ul style="list-style-type: none"> • default—Gives balance to all functions. • dual-ipv4-and-ipv6—Selects a template that supports both IPv4 and IPv6 routing. <ul style="list-style-type: none"> – default—Balances IPv4 and IPv6 Layer 2 functionality. • lanbase-routing—Maximizes IPv4 routing on the switch. <p>Use the no sdm prefer command to set the switch to the default template. The default template balances the use of system resources.</p>
Step 3	<code>end</code>	Returns to privileged EXEC mode.
Step 4	<code>reload</code>	Reloads the operating system.

Monitoring and Maintaining SDM Templates

This is an example of output from the `show sdm prefer default` command:

```
Switch# show sdm prefer default
"default" template:
The selected template optimizes the resources in
the switch to support this level of features for
0 routed interfaces and 1024 VLANs.

number of unicast mac addresses:          8K
number of IPv4 IGMP groups:              0.25K
number of IPv4/MAC qos aces:             0.375k
number of IPv4/MAC security aces:        0.375k
```

This is an example of output from the **show sdm prefer dual-ipv4-and-ipv6 default** command:

```
Switch# show sdm prefer dual-ipv4-and-ipv6 default
"dual-ipv4-and-ipv6 default" template:
The selected template optimizes the resources in
the switch to support this level of features for
0 routed interfaces and 1024 VLANs.

number of unicast mac addresses:          7.5K
number of IPv4 IGMP groups + multicast routes: 0.25K
number of IPv4 unicast routes:           0
number of IPv6 multicast groups:         0.375k
number of directly-connected IPv6 addresses: 0
number of indirect IPv6 unicast routes:   0
number of IPv4 policy based routing aces: 0
number of IPv4/MAC qos aces:             0.375k
number of IPv4/MAC security aces:        0.375k
number of IPv6 policy based routing aces: 0
number of IPv6 qos aces:                 0
number of IPv6 security aces:            0.125k
```

This is an example of output from the **show sdm prefer lanbase-routing** command:

```
Switch# show sdm prefer lanbase-routing
"lanbase-routing" template:
The selected template optimizes the resources in
the switch to support this level of features for
8 routed interfaces and 1005 VLANs.

number of unicast mac addresses:          4K
number of IPv4 IGMP groups + multicast routes: 0.25K
number of IPv4 unicast routes:           4.25K
  number of directly-connected IPv4 hosts: 4K
  number of indirect IPv4 routes:         0.25K
number of IPv4 policy based routing aces: 0
number of IPv4/MAC qos aces:             0.375k
number of IPv4/MAC security aces:        0.375k
```

Configuration Examples for Configuring SDM Templates

Configuring the IPv4-and-IPv6 Default Template: Example

This example shows how to configure the IPv4-and-IPv6 default template on a desktop switch:

```
Switch(config)# sdm prefer dual-ipv4-and-ipv6 default
Switch(config)# exit
Switch# reload
Proceed with reload? [confirm]
```

Additional References

The following sections provide references related to switch administration:

Related Documents

Related Topic	Document Title
Cisco IE 2000 commands	<i>Cisco IE 2000 Switch Command Reference</i> , Release 15.0(2)EC
Cisco IOS basic commands	<i>Cisco IOS Configuration Fundamentals Command Reference</i>

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIBs	MIBs Link
—	To locate and download MIBs using Cisco IOS XR software, use the Cisco MIB Locator found at the following URL and choose a platform under the Cisco Access Products menu: http://cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
The Cisco Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport