C H A P T E R **1**

Configuring SDM Templates

The Catalyst 2960 and 2960-S switch command reference has command syntax and usage information. Unless otherwise noted, the term *switch* refers to a standalone switch and a switch stack.

Note Configuring an SDM template is not required on Catalyst 2960-S switches unless you configure static routing on the switch. A Catalyst 2960-S switch running the LAN base image uses a default template that includes maximum resources for all supported features.

Understanding the SDM Templates

Note The SDM template used by Catalyst 2960-S running LAN Lite image is a default templates and is not configurable. Catalyst 2960-S switches running the LAN base image support only a default template and the lanbase-routing template.

You can use SDM templates to configure system resources in the Catalyst 2960 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. You can select SDM templates to optimize these features on the Catalyst 2960 switch:

- Default—The default template gives balance to all functions.
- Dual—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. Do not use them if you plan to forward only IPv4 traffic.

Note The dual IPv4 and IPv6 template is not supported on Catalyst 2960 switches running the LAN Lite image or on Catalyst 2960-S switches.

- LAN base routing—The lanbase-routing template supports IPv4 unicast routes for configuring static routing SVIs

> **Note**   The lanbase-routing template is supported only on switches running Cisco IOS Release 12.2(55)SE or later and the LAN base image.

- QoS—The QoS template maximizes system resources for quality of service (QoS) access control entries (ACEs).

Table 1-1   *Approximate Number of Feature Resources Allowed by Each Template*

Resource	Default Catalyst 2960	Default Catalyst 2960-S	QoS Catalyst 2960 Only	Dual Catalyst 2960 Only	LAN base routing
Unicast MAC addresses	8 K	8K	8 K	8 K	4K
IPv4 IGMP groups	256	256	256	256	256
IPv4 unicast routes	0	256	0	0	4.25K
• Directly connected hosts	0		0	0	4K
• Indirect routes	0		0	0	256
IPv6 multicast groups	0		0	0	0
Directly connected IPv6 addresses	0		0	0	0
Indirect IPv6 unicast routes	0		0	0	0
IPv4 policy-based routing aces	0		0	0	0
IPv4 MAC QoS ACEs	128	384	384	0	128
IPv4 MAC security ACEs	384	384	128	256	384
IPv6 policy-based routing aces	0		0	0	0
IPv6 QoS ACEs	0		0	0	0
IPv6 security ACEs	0	128	0	0	0

The rows in the tables 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.

SDM Templates and Switch Stacks

> **Note**   Stacking is supported only on Catalyst 2960-S switches running the LAN base image.

All stack members use the same SDM template that is stored on the stack master. When a new switch is added to a stack, as with the switch configuration and VLAN database files, the SDM configuration that is stored on the stack master overrides the template configured on an individual switch. For more information about stacking, see Chapter 1, "Managing Switch Stacks."

You can use the **show switch** privileged EXEC command to see if any stack members are in SDM mismatch mode. This example shows the output from the **show switch** privileged EXEC command when an SDM mismatch exists:

```
Switch# show switch
                                       Current
Switch#  Role      Mac Address    Priority   State
------------------------------------------------------------
*2       Master    000a.fdfd.0100    5        Ready

4        Member    0003.fd63.9c00    5        SDM Mismatch
```

This is an example of a syslog message notifying the stack master that a stack member is in SDM mismatch mode:

```
2d23h:%STACKMGR-6-SWITCH_ADDED_SDM:Switch 2 has been ADDED to the stack (SDM_MISMATCH)

2d23h:%SDM-6-MISMATCH_ADVISE:
2d23h:%SDM-6-MISMATCH_ADVISE:
2d23h:%SDM-6-MISMATCH_ADVISE:System (#2) is incompatible with the SDM
2d23h:%SDM-6-MISMATCH_ADVISE:template currently running on the stack and
2d23h:%SDM-6-MISMATCH_ADVISE:will not function unless the stack is
2d23h:%SDM-6-MISMATCH_ADVISE:downgraded. Issuing the following commands
2d23h:%SDM-6-MISMATCH_ADVISE:will downgrade the stack to use a smaller
2d23h:%SDM-6-MISMATCH_ADVISE:compatible desktop SDM template:
2d23h:%SDM-6-MISMATCH_ADVISE:
2d23h:%SDM-6-MISMATCH_ADVISE:    "sdm prefer lanbase-routing"
2d23h:%SDM-6-MISMATCH_ADVISE:    "reload"
```

Configuring the Switch SDM Template

Default SDM Template

The default template for the Catalyst 2960 and 2960-S switches is the default desktop template.

SDM Template Configuration Guidelines

> **Note** You configure SDM template on Catalyst 2960 switches. A Catalyst 2960-S switch running the LAN base image uses the desktop default template that includes maximum resources for all supported features. However, to enable static routing, you must configure the lanbase-routing template.

- When you select and configure SDM templates, you must reload the switch for the configuration to take effect.
- Do not use the routing template if you do not have routing enabled on your switch. The **sdm prefer lanbase routing** global configuration command prevents other features from using the memory allocated to unicast routing in the routing template.

- If you try to configure IPv6 features without first selecting a dual IPv4 and IPv6 template, a warning message appears.

> **Note** The dual template is not supported on switches running the LAN lite image and is not required on Catalyst 2960-S switches.

- Using the dual stack templates results in less TCAM capacity allowed for each resource, so do not use it if you plan to forward only IPv4 traffic.

Setting the SDM Template

Beginning in privileged EXEC mode, follow these steps to use the SDM template to maximize feature usage:

	Command	Purpose
Step 1	**configure terminal**	Enter global configuration mode.
Step 2	**sdm prefer** {**default** | **dual-ipv4-and-ipv6 default** | **lanbase-routing** | **qos**}	Specify the SDM template to be used on the switch: The keywords have these meanings: • **default**—Gives balance to all functions. • **dual-ipv4-and-ipv6 default**—Allows the switch to be used in dual stack environments (supporting both IPv4 and IPv6). • **lanbase-routing**—Supports configuring unicast routes for static routing on SVIs. • **qos**—Maximizes system resources for QoS ACEs. Use the **no sdm prefer** command to set the switch to the default template. The default template balances the use of system resources. **Note** The Catalyst 2960-S switch supports only the default and lanbase-routing templates.
Step 3	**end**	Return to privileged EXEC mode.
Step 4	**reload**	Reload the operating system.

After the system reboots, you can use the **show sdm prefer** privileged EXEC command to verify the new template configuration. If you enter the **show sdm prefer** command before you enter the **reload** privileged EXEC command, the **show sdm prefer** command shows the template in use and the template that becomes active after a reload.

.Displaying the SDM Templates

Use the **show sdm prefer** privileged EXEC command with no parameters to display the active template.

Use the **show sdm prefer** [**default** | **dual-ipv4-and-ipv6 default | lanbase-routing | qos**] privileged EXEC command to display the resource numbers supported by the specified template.

Note The Catalyst 2960-S switch supports only the default and lanbase-routing templates.

This is an example of output from the **show sdm prefer** command, displaying the template in use.

```
Switch# show sdm prefer
The current template is "lanbase-routing" template.
 The selected template optimizes the resources in
 the switch to support this level of features for
 8 routed interfaces and 255 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:                    0.125k
  number of IPv4/MAC security aces:               0.375k
```

.Displaying the SDM Templates