



Configuring SDM Templates

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

- 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 IPservices license, you can select SDM templates to optimize these features:

- **Default**—The default template gives balance to all Layer 2 functions.
- **Dual IPv4 and IPv6**—Allows the switch to be used in dual-stack environments (supporting both IPv4 and IPv6).
- **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 [Dual IPv4 and IPv6 SDM Default Template, page 138](#).

There are four templates for ip services and one template for lanbase licensing.

Resource	Default	IPv4 Routing	Dual-Default	Dual-Routing
Unicast MAC addresses	16 K	16 K	16 K	16 K
IPv4 IGMP or IPv6 groups	1K IPv4	1K IPv4	1K IPv4 1K IPv6	1K IPv4 1K IPv6
Direct routes	16K IPv4	16K IPv4	4K IPv4 4K IPv6	4K IPv4 4K IPv6
Indirect routes	2K IPv4	8K IPv4	1.25K IPv4 1.25K IPv6	2K IPv4 3K IPv6
IPv4 or IPv6 policy-based routing ACEs	0.125K (IPv4 PBR)	0.5K (IPv4 PBR)	0.25K (IPv4 PBR) 0.25K (IPv6 PBR)	0.125K (IPv4 PBR) 0.125K (IPv6 PBR)
IPv4 or IPv6 QoSACEs	1.875K (IPv4 QoS)	0.5K (IPv4 QoS)	0.5K (IPv4 QoS) 0.375K (IPv6 QoS)	0.5K (IPv4 QoS) 0.125K (IPv6 QoS)
IPv4 or IPv6 port or MAC security ACEs	1.875K (IPv4 ACL)	1K (IPv4 ACL)	0.75K (IPv4 ACL) 0.375K (IPv6 ACL)	0.625K (IPv4 ACL) 0.125K (IPv6 ACL)

Resource	Default
Unicast MAC addresses	16 K
IPv4 IGMP or IPv6 groups	1K IPv4/1K IPv6
Direct routes	4K IPv4/4K IPv6
Indirect routes	1.25K IPv4/1.25K IPv6
IPv4 or IPv6 policy-based routing ACEs	0.25K (IPv4 PBR)/0.25K (IPv6 PBR)
IPv4 or IPv6 QoSACEs	1K (IPv4 QoS)/0.25K (IPv6 QoS)
IPv4 or IPv6 port or MAC security ACEs	1K (IPv4 ACL)/0.25K (IPv6 ACL)

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.

Dual IPv4 and IPv6 SDM Default Template

You can select an SDM template to support IP Version 6 (IPv6) switching. 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.

How to Configure the Switch SDM Templates

Setting the SDM Template

	Command	Purpose
1.	configure terminal	Enters global configuration mode.
2.	sdm prefer {default dual-ipv4-and-ipv6 {default} routing}	<p>Specifies the SDM template to be used on the switch:</p> <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. ■ 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>
3.	end	Returns to privileged EXEC mode.
4.	reload	Reloads the operating system.

Configuration Examples for Configuring SDM Templates

Configuring IP Services Templates: Examples

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

```
Switch# show sdm prefer default
"IPv4 default" template:
The selected template optimizes the resources in
the switch to support this level of features for
8 routed interfaces and 1024 VLANs.

number of unicast mac addresses:          16K
number of IPv4 IGMP groups + multicast routes: 1K
number of IPv4 unicast routes:           18K
  number of directly-connected IPv4 hosts: 16K
  number of indirect IPv4 routes:         2K
number of IPv6 multicast groups:          0
number of IPv6 unicast routes:            0
  number of directly-connected IPv6 addresses: 0
  number of indirect IPv6 unicast routes: 0
number of IPv4 policy based routing aces: 0.125k
number of IPv4/MAC qos aces:              1.875k
number of IPv4/MAC security aces:         1.875k
number of IPv6 policy based routing aces: 0
number of IPv6 qos aces:                   0
number of IPv6 security aces:              0
```

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

Configuration Examples for Configuring SDM Templates

```
Switch# show sdm prefer dual-ipv4-and-ipv6 default
"dual IPv4/IPv6 default" template:
The selected template optimizes the resources in
the switch to support this level of features for
8 routed interfaces and 1024 VLANs.

number of unicast mac addresses:          16K
number of IPv4 IGMP groups + multicast routes: 1K
number of IPv4 unicast routes:           5.25K
  number of directly-connected IPv4 hosts: 4K
  number of indirect IPv4 routes:         1.25K
number of IPv6 multicast groups:          1K
number of IPv6 unicast routes:           5.25K
  number of directly-connected IPv6 addresses: 4K
  number of indirect IPv6 unicast routes: 1.25K
number of IPv4 policy based routing aces: 0.25K
number of IPv4/MAC qos aces:              0.5K
number of IPv4/MAC security aces:         0.75K
number of IPv6 policy based routing aces: 0.25K
number of IPv6 qos aces:                  0.375k
number of IPv6 security aces:             0.375k
```

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

```
Switch# show sdm prefer dual-ipv4-and-ipv6 routing
"dual IPv4/IPv6 routing" template:
The selected template optimizes the resources in
the switch to support this level of features for
8 routed interfaces and 1024 VLANs.

number of unicast mac addresses:          16K
number of IPv4 IGMP groups + multicast routes: 1K
number of IPv4 unicast routes:           6K
  number of directly-connected IPv4 hosts: 4K
  number of indirect IPv4 routes:         2K
number of IPv6 multicast groups:          1K
number of IPv6 unicast routes:           7K
  number of directly-connected IPv6 addresses: 4K
  number of indirect IPv6 unicast routes: 3K
number of IPv4 policy based routing aces: 0.125k
number of IPv4/MAC qos aces:              0.5K
number of IPv4/MAC security aces:         0.625k
number of IPv6 policy based routing aces: 0.125k
number of IPv6 qos aces:                  0.125k
number of IPv6 security aces:             0.125k
```

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

```
Switch# show sdm prefer routing
"IPv4 routing" template:
The selected template optimizes the resources in
the switch to support this level of features for
8 routed interfaces and 1024 VLANs.

number of unicast mac addresses:          16K
number of IPv4 IGMP groups + multicast routes: 1K
number of IPv4 unicast routes:           24K
  number of directly-connected IPv4 hosts: 16K
  number of indirect IPv4 routes:         8K
number of IPv6 multicast groups:          0
number of IPv6 unicast routes:            0
  number of directly-connected IPv6 addresses: 0
  number of indirect IPv6 unicast routes: 0
number of IPv4 policy based routing aces: 0.375k
```

```
number of IPv4/MAC qos aces:          0.5K
number of IPv4/MAC security aces:     1K
number of IPv6 policy based routing aces: 0
number of IPv6 qos aces:              0
number of IPv6 security aces:         0
```

Configuring Lanbase Templates: Example

This is an example of output from the **show sdm prefer** command on a Lanbase image:

```
Switch# show sdm prefer
```

```
The current template is "IPv4 default" template.
The selected template optimizes the resources in
the switch to support this level of features for
8 routed interfaces and 1024 VLANs.
```

```
number of unicast mac addresses:      16K
number of IPv4 IGMP groups + multicast routes: 1K
number of IPv4 unicast routes:       5.25K
  number of directly-connected IPv4 hosts: 4K
  number of indirect IPv4 routes:     1.25K
number of IPv6 multicast groups:      1K
number of IPv6 unicast routes:       5.25K
  number of directly-connected IPv6 addresses: 4K
  number of indirect IPv6 unicast routes: 1.25K
number of IPv4 policy based routing aces: 0.25K
number of IPv4/MAC qos aces:         1K
number of IPv4/MAC security aces:    1K
number of IPv6 policy based routing aces: 0.25K
number of IPv6 qos aces:             0.25K
number of IPv6 security aces:        0.25K
```

