Access Switch Device Manager Template Configuration

This chapter provides information about the Access Switch Device Manager (SDM) Template.

Note For complete syntax and usage information for the commands used in this chapter, see the command reference for this release.

Prerequisites for the SDM Template

- Before using an SDM template, you must set the license boot level.

- For IPv6 QoS template, the license to use should be *metroipaccess*. You can view the license level using the **show version | in License Level** command.

    Note If you use *advancedmetroipaccess*, then your options may vary.

Restrictions for the SDM Template

- You cannot edit individual values in a template category as all templates are predefined.

- You cannot use a new SDM template without reloading the router.

- SDM templates are supported only by the Metro Aggregation Services license. Use the help option of the **sdm prefer** command to display the supported SDM templates.

- A mismatch in an SDM template between an active RSP and standby RSP results in a reload of the standby RSP. During reload, SDM template of the standby RSP synchronizes with the SDM template of the active RSP.

- To revert to the current SDM template after issuing the **sdm prefer** command to initiate reload of a new SDM template, you must wait for the reload to complete.

- Using the **configure replace** command which results in changes in the current SDM template is not supported.

- The supported group numbers are for scaling in uni-dimension. When scaling in multi-dimension, the numbers can vary as certain features may share resources.

- When FPGA upgrade is triggered during reload or SDM template change, the last reset reason in show version shows as power on.

- The following restrictions apply to the IPv6 QoS SDM template:

  - The number of QoS ACL class maps and policy maps supported depends on the maximum TCAM entries available.

  - The software solution with expansion method is not supported for maximum QoS SDM template.

  - Due to hardware limitation, a maximum number of eight Layer 4 port operators is supported per interface for IPv6 QoS ACL classification.

  - Ethernet CFM, Ethernet OAM, and Y.1731 protocols are not supported. Features dependent on these protocols are impacted.

  - Layer 2 monitoring features are not supported.

  - Only eight Layer 4 operations are supported in templates other than maximum IPv6 QoS ACL template.

SDM Template

The SDM templates are used to optimize system resources in the router to support specific features, depending on how the router is used in the network. The SDM templates allocate Ternary Content Addressable Memory (TCAM) resources to support different features. You can use the SDM templates to optimize resources for different features. You can select the default template to balance system resources or select specific templates to support the required features.

Table below shows the approximate number of each resource supported in each of the templates for a router running the Metro Aggregation Services license.

Table 1: Approximate Number of Feature Resources Allowed by Each SDM Template

Resource	IP template	Video template	IPv6 QoS template	Max QoS Video template
Ingress Qos TCAM	4000	2000	4000	2000
Egress Qos TCAM	5000	5000	5000	5000

Resource	IP template	Video template	IPv6 QoS template	Max QoS Video template
IPv6 ACL TCAM	1000	1000	1000	1000
ACL TCAM	2000	4000	4000	2000
MAC table	16000	16000	16000	16000
Virtual local area network (VLAN) mapping	4000	4000	4000	4000
IPv4 routes [1]	24000	12000	24000	12000
IPv6 routes [2]	4000	4000	4000	4000
VPNv4 routes	24000	12000	24000	12000
VPNv6 routes	4000	4000	4000	4000
IPv4 multicast routes (mroutes)	1000	2000	1000	2000
Layer 2 multicast groups	1000	2000	NA	2000
Bridge Domains (BD)	4094	4094	4094	4094
MAC-in-MAC	0	0	0	0
Ethernet over Multiprotocol Label Switching (EoMPLS) tunnels	512	512	512	512
MPLS Virtual Private Network (VPN)	128	128	128	128
Virtual Routing and Forwarding (VRF) lite	128	128	128	128
Virtual Private LAN Services (VPLS) instances	2000	2000	2000	2000
Access Control List (ACL) entries	2000	4000	4096	2000

Resource	IP template	Video template	IPv6 QoS template	Max QoS Video template
Queues per Application-Specific Integrated Circuit (ASIC)	2048	2048	2048	2048
IPv4 Quality of Service (QoS) classifications	4096	2048	4096	2048
Policers	1024	1024	1024	1024
Ethernet Operations, Administration, and Maintenance (OAM) sessions	1000	1000	0	1000
IP Service Level Agreements (IPSLA) sessions	1000	1000	1000	1000
Ethernet Flow Point (EFP)	4000	4000	4000	4000
Maximum VLANs per port	4094	4094	4094	4094
Maximum I-TAG per system	500	500	500	500
Maximum Virtual Private LAN Services (VPLS) neighbors	62	62	62	62
Maximum attachment circuit per BD	62	62	62	62
STP Instances	16	16	16	16
Maximum Etherchannel groups	26	26	26	26
Maximum Interfaces per Etherchannel groups	8	8	8	8

Resource	IP template	Video template	IPv6 QoS template	Max QoS Video template
Maximum Hot Standby Router Protocol (HSRP)/Virtual Router Redundancy Protocol (VRRP)	128	128	128	128
Maximum Ingress MPLS labels	38912	38912	38912	38912
Maximum Egress MPLS labels	28500	28500	28500	28500
Maximum Fast Reroute (FRR)/Traffic Engineering (TE) headend	512	512	512	512
Maximum FRR/TE midpoints	5000	5000	5000	5000
Maximum Enhanced Local Management Interface (E-LMI) sessions	1000	1000	1000	1000
Maximum Bidirectional Forwarding Detection (BFD) sessions	511	511	511	511
Maximum Switched Port Analyzer (SPAN)/Remote SPAN (RSPAN) sessions	32	32	32	32
Maximum Queue counters (packet & byte)	65536	65536	65536	65536
Maximum Policer counters (packet & byte)	49152	49152	49152	49152
Max number of BDI for Layer 3	256	256	256	256

Resource	IP template	Video template	IPv6 QoS template	Max QoS Video template
IPv6 ACL	1000	1000	2000	1000
IPv6 QoS classification	4096	2048	4096	2048
Maximum Number of Layer 4 Source/Destination matches per interface [6]	8	8	NA	8

[1] Using IPv4 and VPNv4 routes concurrently reduces the maximum scaled value as both the routes use the same TCAM space.

[2] User available routes are 3967.

[3] Due to label space limitation of 16000 VPNv4 routes, to achieve 24000 VPNv4 routes in IP template use per VRF mode.

[4] Using Layer 2 and Layer 3 multicast groups concurrently reduces the scale number to 1947.

[5] ACLs contend for TCAM resources with Multicast Virtual Private Network (MVPN).

[6] TCAM consumption for IPv6 Qos ACL Layer 4 port match operations increase with Maximum IPv6 Qos SDM template.

Selecting the SDM Template

Enables privileged EXEC mode.

- Enter your password if prompted.

  Router# **configure terminal**

  ```
  Router# configure terminal
  ```

- Enters global configuration mode.

  If *advancedmetroipaccess* license is used, then the following options are applicable.

  ```
  Router(config)# sdm prefer default
  ```

Specifies the SDM template to be used on the router:

- **default**—Balances all functions.

- **ip**—Increases IPv4/VPNv4 routes.

- **video**—Increases multicast routes and ACLs.

- **max-ipv6-acl**—Supports IPv6 QoS ACL routes. The NEQ Layer 4 operation is supported in maximum IPv6 QoS ACL template.

- **max-qos-video**—Increases QoS support to 4000 and decreases IPv4 ACL to 2000.

| **Note** | When changing the SDM template, the router waits for two minutes before reloading. Do not perform any operation till the router reloads. |

| **Note** | For the new SDM template to take effect, you must save and reload the new configuration, otherwise the current SDM template is retained. |

| **Note** | After the system reboots, you can use the **show sdm prefer current** command in the privileged EXEC mode to verify the new SDM template configuration. |

Verifying the SDM Template

You can use the following **show** commands to verify configuration of your SDM template:

show sdm prefer current— Displays information about the active SDM template.

The following example shows output from the **show sdm prefer current** command:

Router# **show sdm prefer current**

The current template is "video" template.

show sdm prefer—Displays the resource numbers supported by the specified SDM template.

show platform hardware pp active sdm current—Displays the scale numbers for your current SDM template.

Following is a sample output using the **show sdm prefer current** command to display the current template configured on the router:

```
Router# show sdm prefer current
The current template is "video" template.

Router# show sdm prefer current
The current template is "max-ipv6-qos" template.

Router# show sdm prefer current
The current template is "max-qos-video" template.

Router# show platform hardware pp active sdm current
Tcam blocks
CYLON_TCAM_VLAN_MAPPING_INGRESS      =          4
CYLON_TCAM_VLAN_MAPPING_EGRESS       =          4
CYLON_TCAM_IPV4_UCAST                =          12
CYLON_TCAM_IPV4_MCAST                =          8
CYLON_TCAM_IPV4_TUNNEL               =          4
CYLON_TCAM_IPV6_UCAST                =          8
CYLON_TCAM_IPV6_MCAST                =          4
CYLON_TCAM_ACL                       =          8
CYLON_TCAM_QOS                       =          4
CYLON_TCAM_MAC_IN_MAC                =          0
CYLON_TCAM_EOAM                      =          4
CYLON_TCAM_IPV6_ACL                  =          4
```

```
CYLON_TCAM_EGRESS_IPV6_ACL          =            4
CYLON_TCAM_EGRESS_ACL               =            0

Feature Scale value:
CYLON_NUM_MAC_TABLE_ENTRIES         =        16000
CYLON_NUM_IVLAN_MAPPING_ENTRIES     =         4001
CYLON_NUM_EVLAN_MAPPING_ENTRIES     =         4000
CYLON_NUM_MAX_VLANS_PER_PORT        =         4094
CYLON_NUM_MAX_SEC_ADDR_PER_EFP      =         1000
CYLON_NUM_MAX_SEC_ADDR_PER_BD       =        10000
CYLON_NUM_MAX_SEC_ADDR              =        16000
CYLON_NUM_MAX_SEC_CONFIG_ADDR       =        16000
CYLON_NUM_MAX_EFPS_PER_BD           =          128
CYLON_NUM_IPV4_ROUTES               =        12000
CYLON_NUM_IPV6_ROUTES               =         4000
CYLON_NUM_MAX_L3_INTERFACES         =         1000
CYLON_NUM_MAX_ITAG_PER_SYSTEM       =          500
CYLON_NUM_ROUTING_GROUPS            =         2000
CYLON_NUM_MULTICAST_GROUPS          =         2000
CYLON_NUM_IPV6_ROUTING_GROUPS       =            0
CYLON_NUM_IPV6_MULTICAST_GROUPS     =         1000
CYLON_NUM_BRIDGE_DOMAINS            =         4096
CYLON_NUM_MAC_IN_MAC                =            0
CYLON_NUM_PSEUDO_WIRES              =         2000
CYLON_NUM_ROUTED_PSEUDO_WIRES       =          128
CYLON_NUM_MPLS_VPN                  =          128
CYLON_NUM_VRFS                      =          128
CYLON_NUM_ACL_ENTRIES               =         4000
CYLON_NUM_IPV6_ACL_ENTRIES          =         1000
CYLON_NUM_EGRESS_ACL_ENTRIES        =         1000
CYLON_NUM_QUEUES_PER_ASIC           =         4095
CYLON_NUM_CLASSIFICATIONS           =         2048
CYLON_NUM_SH_ING_EGR_POLICERS_PER_ASIC  =      4096
CYLON_NUM_MAX_CLASS_MAPS            =         4096
CYLON_NUM_MAX_POLICY_MAPS           =         1024
CYLON_NUM_MAX_QUEUE_COUNTERS        =        65536
CYLON_NUM_MAX_POLICER_COUNTERS      =        49152
CYLON_NUM_OAM_SESSIONS              =         1000
CYLON_NUM_ELMI_SESSIONS             =         1000
CYLON_NUM_SLA_SESSIONS              =         1000
CYLON_NUM_EFPS                      =         4000
CYLON_NUM_MPLS_SERVICES             =          512
CYLON_NUM_MPLS_INGRESS_LABELS       =        38912
CYLON_NUM_MPLS_EGRESS_LABELS        =        28500
CYLON_NUM_FRR_TE_HEADEND            =          512
CYLON_NUM_FRR_TE_MIDPOINTS          =         5000
CYLON_NUM_STP_INSTANCES             =           16
CYLON_NUM_HSRP_VRRP_SESSIONS        =          256
CYLON_NUM_MAX_EC_GROUPS             =           64
CYLON_NUM_MAX_INTF_PER_EC_GROUP     =            8
CYLON_NUM_MAX_SPAN_RSPAN_SESSIONS   =           32
CYLON_NUM_IPV4_TUNNEL_ENTRIES       =         2000
```