CHAPTER 15

Configuring the Switching Database Manager

This chapter describes the switching database manager (SDM) features built into the ML-Series card and contains the following major sections:

Understanding the SDM

ML-Series cards use the forwarding engine and ternary content-addressable memory (TCAM) to implement high-speed forwarding. The high-speed forwarding information is maintained in TCAM. The SDM is the software subsystem that manages the switching information maintained in TCAM.

SDM organizes the switching information in TCAM into application-specific regions and configures the size of these application regions. SDM enables exact-match and longest-match address searches, which result in high-speed forwarding. SDM manages TCAM space by partitioning application-specific switching information into multiple regions.

TCAM identifies a location index associated with each packet forwarded and conveys it to the forwarding engine. The forwarding engine uses this location index to derive information associated with each forwarded packet.

Understanding SDM Regions

SDM partitions multiple application-specific regions and interacts with the individual application control layers to store switching information. The regions share the total available space. SDM consists of the following types of regions:

- Exact-match region—The exact-match region consists of entries for multiple application regions such as IP adjacencies.
- Longest-match region—Each longest-match region consists of multiple buckets or groups of Layer 3 address entries organized in decreasing order by mask length. All entries within a bucket share the same mask value and key size. The buckets can change their size dynamically by borrowing address entries from neighboring buckets. Although the size of the whole application region is fixed, you can reconfigure it.

- Weighted-exact-match region—The weighted-exact-match region consists of exact-match-entries with an assigned weight or priority. For example, with QoS, multiple exact match entries might exist, but some have priority over others. The weight is used to select one entry when multiple entries match.

Table 15-1 lists default partitioning for each application region.

Table 15-1 Default Partitioning by Application Region

Application Region	Lookup Type	Key Size	Default Size
IP Adjacency	Exact-match	64 bits	300 (shared)
IP Prefix	Longest-match	64 bits	300 (shared)
QoS Classifiers	Weighted exact-match	64 bits	300 (shared)
IP VRF Prefix	Longest prefix match	64 bits	300 (shared)
IP Multicast	Longest prefix match	64 bits	300 (shared)
MAC Addr	Longest prefix match	64 bits	8192
Access List	Weighted exact match	64 bits	300 (shared)

Configuring SDM

This section describes SDM region size and access control list (ACL) size configuration. The commands described in this section are unique to the switching software. Configuration changes take place immediately on the ML-100T-8 card.

Configuring SDM Regions

To configure SDM maximum size for each application region, perform the following procedure, beginning in global configuration mode:

	Command	Purpose
Step 1	`ML_Series(config)# sdm size` *region-name number-of-entries*	Configures the maximum number of entries for an SDM region.
Step 2	`ML_Series(config)# end`	Exits to privileged EXEC mode.

An example of this is shown in Example 15-1.

Example 15-1 Limiting the IP-Prefix Region to 2K Entries

```
ML_Series # configure terminal
ML_Series(config)# sdm size ip-prefix 2000
ML_Series(config)# end
```

Configuring Access Control List Size in TCAM

The default maximum size of the ACL is 300 64-bit entries. You can enter the **sdm access-list** command to change the maximum ACL database size, as shown in Table 15-2.

Table 15-2 Partitioning the TCAM Size for ACLs

Task	Command
sdm access-list *number-entries*	Sets the name of the application region for which you want to configure the size. You can enter the size as an absolute number of entries.

An example of this is shown in Example 15-2.

Example 15-2 Configuring Entries for the ACL Region in TCAM

```
ML_Series# configure terminal
ML_Series(config)# sdm access-list 100
ML_Series(config)# end
```

Monitoring and Verifying SDM

To display the number of available TCAM entries, enter the **show sdm size** command from global configuration mode:

```
ML_Series # show sdm size
Active Switching Database Region Maximum Sizes :
    IP Adjacency        : 300     64-bit entries
    IP Prefix           : 300     64-bit entries
    QoS Classifiers     : 300     64-bit entries
    IP VRF Prefix       : 300     64-bit entries
    IP Multicast        : 300     64-bit entries
    MAC Addr            : 8192    64-bit entries
    Access List         : 300     64-bit entries
```