

# Configuring the SDM on the Catalyst 2948G–L3 and 4908G–L3

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## **Introduction**

This document provides an overview of the Switching Database Manager (SDM) on the Catalyst 2948G–L3 and 4908G–L3 Layer 3 switches, and provides some SDM configuration examples and troubleshooting tips based on common deployments. The SDM is implemented in all versions of Cisco IOS ® Software for the Catalyst 2948G–L3 and 4908G–L3 switches.

## **Before You Begin**

### **Conventions**

For more information on document conventions, see the Cisco Technical Tips Conventions.

## Prerequisites

The default Ternary Content Addressable Memory (TCAM) partition sizes may or may not be appropriate for a given network deployment. Therefore, it is important to gauge your network requirements before reallocating the TCAM regions and understand your network protocol mix and traffic before deploying and configuring the Catalyst 2948G–L3 or 4908G–L3 Layer 3 switches.

## Components Used

The information in this document is based on the software and hardware versions below.

- Catalyst 2948G–L3 running Cisco IOS Software Release 12.0(18)W5(22b)
- Catalyst 4908G–L3 running Cisco IOS Software Release 12.0(18)W5(22b)

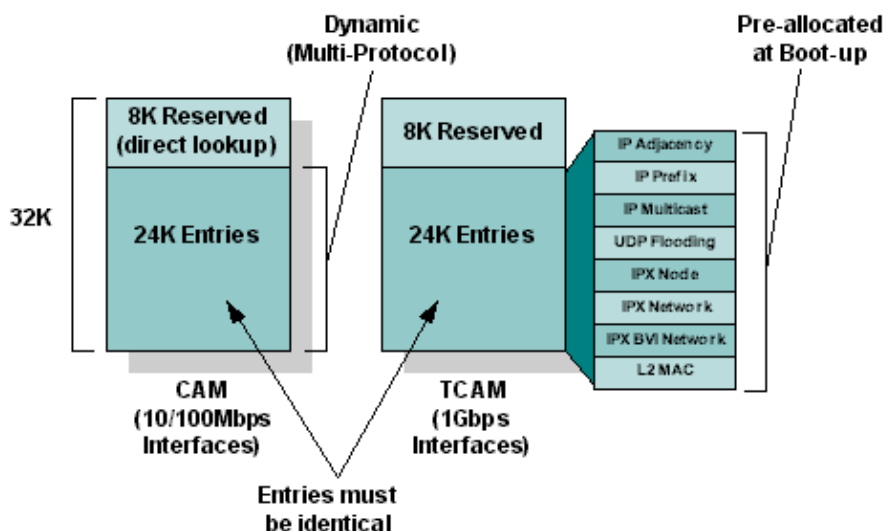
The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

## Background Theory

The SDM manages the Layer 2 and Layer 3 switching information on the Catalyst 2948G–L3 and 4908G–L3 switches. The Layer 2 and Layer 3 information is maintained in the TCAM. The Gigabit Ethernet interfaces use both the forwarding engine and the TCAM for forwarding lookups.

The Catalyst 2948G–L3 has both a Content–Addressable Memory (CAM) table and a TCAM table for storing the IP prefix, IP adjacencies, IPX networks, IPX nodes, and other Layer 3 information. The TCAM stores this information that is used by Gigabit Ethernet interfaces. The TCAM table stores a maximum of 24K total entries. The 24K entries in the shared CAM must be consistent with the entries in the TCAM used by the Gigabit Ethernet interfaces. The Catalyst 4908G–L3 only has gigabit Ethernet ports, therefore its TCAM table does not need to synchronize its entries with a CAM table.

The diagram below shows the relationship between the dynamic CAM on the Fast Ethernet interfaces and the TCAM on the Gigabit Ethernet interfaces.



The TCAM space on the Gigabit Ethernet interfaces consists of 32K entries, where each entry is 32 bits wide. By default, the SDM partitions approximately 24K of the 32K TCAM space at bootup. There are two reasons

for not partitioning the entire TCAM space:

1. On the Catalyst 2948G–L3, the entries in the shared CAM and the TCAM must be consistent. Therefore, on the Catalyst 2948G–L3, it is not recommended that you allocate the remaining 8K entries for protocol–specific regions, to reduce the likelihood of inconsistencies between the shared CAM on Fast Ethernet interfaces and the TCAMs on the Gigabit interfaces. Such inconsistencies are still possible if the number of entries for a given region in the TCAM exceeds the allocated space while there is still space for the entries in the shared CAM.
2. Future features on the Catalyst 2948G–L3 and 4908G–L3 (such as future support for data–plane Access Control Lists (ACLs) on Gigabit ports) will require some portion of the total TCAM space in order to function. Therefore, it is not recommended that you allocate the remaining 8K entries on either the Catalyst 2948G–L3 or the 4908G–L3 unless you require the additional entries and you do not anticipate using data–plane ACLs in the future. Doing so reduces the TCAM space available for ACL usage and may require that you reallocate your TCAM space to implement these features.

Unlike the shared CAM used on fast Ethernet interfaces, the SDM partitions switching information in the TCAM into protocol–specific regions. There are two types of TCAM regions, exact–match and longest–match.

- Exact–match regions store entries such as IP adjacency entries, IPX network entries, IPX node entries, and Layer 2 (MAC) entries
- Longest–match regions store entries such as IP prefix entries, IP multicast entries, and UDP flooding entries

Entries in the longest–match TCAM regions are grouped into buckets from the most–specific (longest) to the least–specific (shortest) mask length, where all entries within a bucket share the same mask value and key size. The bucket sizes in each protocol–specific region vary. The SDM increases the size of the buckets dynamically during system operation, moving existing TCAM entries as necessary. This dynamic bucket size, within the set protocol areas, allows neighboring buckets to borrow addresses from one another to accommodate for changes in network traffic.

To increase efficiency, the SDM autolearn function saves the bucket–size (mask–length) distribution for these regions so that the bucket–size distribution is preserved across a system reload. This increases system efficiency by reducing the need to move TCAM entries due to dynamic bucket sizing. The autolearn function is enabled by default, but can be disabled if desired. The autolearn function is implemented based on the assumption that the prefix distribution in a network is consistent and will be the same after the system is reloaded.

There are eight protocol–specific TCAM regions controlled by the SDM. Six of these regions are user–configurable, refer to the table below.

| Default SDM TCAM Partitioning |             |          |                    |                    |                        |                           |                    |
|-------------------------------|-------------|----------|--------------------|--------------------|------------------------|---------------------------|--------------------|
| Protocol Region               | Lookup Type | Key Size | Min Partition Size | Max Partition Size | Default Partition Size | Default # of TCAM Entries | User Configurable? |
| IPX Direct                    | Exact–match | 32 bits  | 224                | 224                | 224                    | 224                       | No                 |
| IPX Node                      | Exact–match | 64 bits  | 32                 | 16384              | 2048                   | 4096                      | Yes                |
| IP Adjacency                  | Exact–match | 32 bits  | 32                 | 31776              | 2048                   | 2048                      | Yes                |

|              |               |         |     |       |      |      |     |
|--------------|---------------|---------|-----|-------|------|------|-----|
| IP Prefix    | Longest-match | 32 bits | 32  | 31776 | 8192 | 8192 | Yes |
| IPX Network  | Exact-match   | 32 bits | 32  | 31776 | 6144 | 6144 | Yes |
| IP Multicast | Longest-match | 64 bits | 32  | 16384 | 3072 | 6144 | Yes |
| UDP Flooding | Longest-match | 64 bits | 256 | 256   | 256  | 512  | No  |
| MAC Addr     | Exact-match   | 64 bits | 128 | 16000 | 1024 | 2048 | Yes |

## Configuring the SDM

This section describes how to configure the SDM to change the size of the protocol-specific TCAM regions in the Layer 3 switch.

### Step-by-Step Instructions

In this example the following configuration changes are made to show how to modify the SDM protocol partitions. The IPX network and the IPX adjacency TCAM partitions are reduced to their minimum size of 32 entries. The IP adjacency and IP prefix TCAM partitions are increased to 4K and 12K respectively, and the SDM autolearn function is disabled.

**Note:** You must reload the system in order for the changes to take effect

To modify the default TCAM region sizes, use the following procedure:

1. Based on your network protocol mix and the number of prefixes and stations in the network, determine the required size of the various protocol-specific TCAM regions. Issue the **show sdm size** command to verify the current settings.

```
4908G-L3#show sdm size
Switching Database Region Sizes :
  TCAM Total Size      : 32768   32-bit entries
  TCAM Allocated Size  : 31488   32-bit entries
  Reserved Space       : 32      32-bit entries
  IPX Direct           : 224     32-bit entries
  IPX Node             : 2048    64-bit entries
  IP Adjacency         : 2048    32-bit entries
  IP Prefix            : 8192    32-bit entries
  IPX Network          : 6144    32-bit entries
  IP Multicast         : 3072    64-bit entries
  UDP Flooding         : 256     64-bit entries
  MAC Addr             : 1024    64-bit entries
  Access List          : 512     128-bit entries
```

```
4908G-L3#
```

2. Modify the size of each region by issuing the **sdm size** global configuration command. Notice that when using the **sdm size** command you can specify the exact number of entries in the region, or you can use the **k-entries** keyword to specify the size of the region in Kilobytes.

```
4908G-L3#configure terminal
4908G-L3(config)#sdm size ipx-network 32
4908G-L3(config)#sdm size ipx-node 32
4908G-L3(config)#sdm size ip-adjacency 4096
4908G-L3(config)#sdm size ip-prefix k-entries 12
```

```
4908G-L3(config)#no sdm autolearn
4908G-L3(config)#^Z
4908G-L3#
```



**Caution:** Take care in disabling the autolearn function, it should not be disabled unless

absolutely necessary. If the autolearn function is disabled, the administrator has to manually program the TCAM space. If this is not done properly, then the switch will experience high CPU utilization.

3. Verify that the desired sizing is reflected in the configuration before reloading the system (issue the **show running-config** command).

```
4908G-L3#show running-config
Building configuration...
Current configuration:
!
version 12.0
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 4908G-L3
!
!
sdm size ipx-node 32
sdm size ip-adjacency 4096
sdm size ip-prefix 12288
sdm size ipx-network 32no sdm autolearn
ip subnet-zero
```

*!--- Output suppressed.*

```
!
end
```

4. To implement the new partitioning, save the configuration changes by issuing the **copy running-config startup-config** command and reload the Catalyst 2948G-L3 or 4908G-L3 Layer 3 switch.

```
4908G-L3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...[OK]
4908G-L3#reload
Proceed with reload? [confirm]
00:04:24: %SYS-5-RELOAD: Reload requested
ROMMON: Cold Reset frame @0x00000000
ROMMON: Reading reset reason register
ROMMON: Valid NVRAM config
System Bootstrap, Version 12.0(7)W5(15a) RELEASE SOFTWARE
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```

*!--- Output suppressed.*

```
4908G-L3>
```

## Verifying SDM Configuration

To verify that the SDM size configuration changes after the reload, issue another **show sdm size** command.

```
4908G-L3#show sdm size
Switching Database Region Sizes :
  TCAM Total Size      : 32768   32-bit entries
  TCAM Allocated Size : 27488   32-bit entries
```

```

Reserved Space      : 32      32-bit entries
IPX Direct          : 224     32-bit entries
IPX Node          : 32     64-bit entries
IP Adjacency    : 4096   32-bit entries
IP Prefix       : 12288  32-bit entries
IPX Network    : 32     32-bit entries
IP Multicast        : 3072    64-bit entries
UDP Flooding        : 256     64-bit entries
MAC Addr            : 1024    64-bit entries
Access List         : 512     128-bit entries
4908G-L3#

```

## IP-Only Routed Network SDM Configuration

In this example, the Catalyst 2948G-L3 or 4908G-L3 Layer 3 switch is deployed in an IP-only network. Therefore, the SDM default TCAM partitions are reconfigured to allocate more TCAM space to the IP-related regions.

### Step-by-Step Instructions

In the following configuration example, the IPX network, IPX node, and 12-switching (MAC Addr) regions are reduced to the minimum size possible, permitting additional entries to be used for the IP adjacency, IP prefix, and IP multicast regions.

**Note:** You must reload the system in order for the changes to take effect.

To modify the default TCAM region sizes, use the following procedure:

```

4908G-L3#show sdm size
Switching Database Region Sizes :
  TCAM Total Size      : 32768  32-bit entries
  TCAM Allocated Size : 31488  32-bit entries
  Reserved Space      : 32      32-bit entries
  IPX Direct          : 224     32-bit entries
  IPX Node            : 2048    64-bit entries
  IP Adjacency        : 2048    32-bit entries
  IP Prefix           : 8192    32-bit entries
  IPX Network         : 6144    32-bit entries
  IP Multicast        : 3072    64-bit entries
  UDP Flooding        : 256     64-bit entries
  MAC Addr            : 1024    64-bit entries
  Access List         : 512     128-bit entries
4908G-L3#configure terminal
4908G-L3(config)#sdm size ipx-network 32
4908G-L3(config)#sdm size ipx-node 32
4908G-L3(config)#sdm size l2-switching 128
4908G-L3(config)#sdm size ip-prefix k-entries 16
4908G-L3(config)#sdm size ip-adjacency k-entries 4
4908G-L3(config)#sdm size ip-mcast k-entries 4
4908G-L3(config)#^Z
4908G-L3#
00:04:21: %SYS-5-CONFIG_I: Configured from console by console
4908G-L3#show running-config
Building configuration...

Current configuration:
!
version 12.0
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption

```

```

!
hostname 4908G-L3
!
!
sdm size ipx-node 32
sdm size ip-adjacency 4096
sdm size ip-prefix 16384
sdm size ipx-network 32
sdm size ip-mcast 4096
sdm size l2-switching 128
ip subnet-zero
!

!--- Output suppressed.

!
end 4908G-L3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...[OK]
4908G-L3#reload
Proceed with reload? [confirm]
00:12:27: %SYS-5-RELOAD: Reload requested

ROMMON: Cold Reset frame @0x00000000
ROMMON: Reading reset reason register
ROMMON: Valid NVRAM config

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!--- Output suppressed.

4908G-L3#

```

## Verifying SDM Configuration

```

4908G-L3#show sdm size
Switching Database Region Sizes :
    TCAM Total Size      : 32768    32-bit entries
    TCAM Allocated Size  : 31840    32-bit entries
    Reserved Space      : 32        32-bit entries
    IPX Direct           : 224      32-bit entries
    IPX Node             : 32      64-bit entries
    IP Adjacency        : 4096   32-bit entries
    IP Prefix           : 16384  32-bit entries
    IPX Network        : 32      32-bit entries
    IP Multicast       : 4096   64-bit entries
    UDP Flooding         : 256      64-bit entries
    MAC Addr           : 128    64-bit entries
    Access List          : 512      128-bit entries
4908G-L3#

```

## IPX-Only Routed Network SDM Configuration

In this example, the Catalyst 2948G-L3 or 4908G-L3 Layer 3 switch is deployed in an Novell IPX-only network. Therefore, the SDM default TCAM partitions are reconfigured to allocate more TCAM space to the IPX-related regions.

### Step-by-Step Instructions

In the following configuration example, the IP multicast and 12-switching (MAC Addr) regions are reduced to the minimum size possible, while the IP prefix and IP adjacency regions are reduced to 2K and 1K,

respectively, permitting additional entries to be used for the IPX network and IPX node regions. The IP prefix and IP adjacency regions are not reduced to the minimum to permit IP-based management and other basic IP functionality on the Layer 3 switch to continue to operate.

**Note:** You must reload the system in order for the changes to take effect

To modify the default TCAM region sizes, use the following procedure.

```
4908G-L3#show sdm size
Switching Database Region Sizes :
  TCAM Total Size      : 32768   32-bit entries
  TCAM Allocated Size : 31488   32-bit entries
  Reserved Space      : 32      32-bit entries
  IPX Direct          : 224     32-bit entries
  IPX Node            : 2048    64-bit entries
  IP Adjacency        : 2048    32-bit entries
  IP Prefix           : 8192    32-bit entries
  IPX Network         : 6144    32-bit entries
  IP Multicast        : 3072    64-bit entries
  UDP Flooding        : 256     64-bit entries
  MAC Addr            : 1024    64-bit entries
  Access List         : 512     128-bit entries

4908G-L3#configure terminal
4908G-L3(config)#sdm size ip-mcast 32
4908G-L3(config)#sdm size l2-switching 128
4908G-L3(config)#sdm size ip-prefix k-entries 2
4908G-L3(config)#sdm size ip-adjacency 1024
4908G-L3(config)#sdm size ipx-network k-entries 16
4908G-L3(config)#sdm size ipx-node k-entries 4
4908G-L3(config)#^Z
4908G-L3#
4908G-L3#show running-config
Building configuration...

Current configuration:
!
version 12.0
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 4908G-L3
!
!
sdm size ipx-node 4096
sdm size ip-adjacency 1024
sdm size ip-prefix 2048
sdm size ipx-network 16384
sdm size ip-mcast 32
sdm size l2-switching 128
ip subnet-zero
!

!--- Output suppressed.

!
end
4908G-L3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...[OK]
4908G-L3#reload
Proceed with reload? [confirm]

00:19:28: %SYS-5-RELOAD: Reload requested
```

```
ROMMON: Cold Reset frame @0x00000000
ROMMON: Reading reset reason register
ROMMON: Valid NVRAM config
```

```
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```

## Verifying SDM Configuration

```
4908G-L3#show sdm size
Switching Database Region Sizes :
  TCAM Total Size      : 32768   32-bit entries
  TCAM Allocated Size  : 30784   32-bit entries
  Reserved Space       : 32      32-bit entries
  IPX Direct           : 224     32-bit entries
  IPX Node             : 4096   64-bit entries
  IP Adjacency        : 1024   32-bit entries
  IP Prefix           : 2048   32-bit entries
  IPX Network        : 16384  32-bit entries
  IP Multicast       : 32     64-bit entries
  UDP Flooding         : 256     64-bit entries
  MAC Addr           : 128    64-bit entries
  Access List          : 512     128-bit entries
4908G-L3#
```

## IP and IPX Routed Network SDM Configuration

In this example, the Catalyst 2948G-L3 or 4908G-L3 Layer 3 switch is deployed in a mixed IP and Novell IPX network. For the most part, the default SDM allocations are adequate in such an environment. However, the entries reserved for the 12-switching region can be reallocated to IP or IPX regions if desired.

### Step-by-Step Instructions

In the following configuration example, the 12-switching region is reduced to the minimum size possible, while the IP prefix region is increased by 1K entries.

**Note:** You must reload the system in order for the changes to take effect

To modify the default TCAM region sizes, use the following procedure:

```
4908G-L3#show sdm size
Switching Database Region Sizes :
  TCAM Total Size      : 32768   32-bit entries
  TCAM Allocated Size  : 31488   32-bit entries
  Reserved Space       : 32      32-bit entries
  IPX Direct           : 224     32-bit entries
  IPX Node             : 2048    64-bit entries
  IP Adjacency         : 2048    32-bit entries
  IP Prefix            : 8192    32-bit entries
  IPX Network          : 6144    32-bit entries
  IP Multicast         : 3072    64-bit entries
  UDP Flooding         : 256     64-bit entries
  MAC Addr             : 1024    64-bit entries
  Access List          : 512     128-bit entries
4908G-L3#configure terminal
4908G-L3(config)#sdm size 12-switching 128
4908G-L3(config)#sdm size ip-prefix k-entries 9
4908G-L3(config)#^Z
4908G-L3#
4908G-L3#show running-config
```

Building configuration...

Current configuration:

```
!  
version 12.0  
no service pad  
service timestamps debug uptime  
service timestamps log uptime  
no service password-encryption  
!  
hostname 4908G-L3  
!  
!  
sdm size ip-prefix 9216  
sdm size l2-switching 128  
ip subnet-zero  
!
```

*!--- Output suppressed.*

```
!  
end  
4908G-L3#copy running-config startup-config  
Destination filename [startup-config]?  
Building configuration...[OK]  
4908G-L3#reload  
Proceed with reload? [confirm]
```

00:14:46: %SYS-5-RELOAD: Reload requested

```
ROMMON: Cold Reset frame @0x00000000  
ROMMON: Reading reset reason register  
ROMMON: Valid NVRAM config
```

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*!--- Output suppressed.*

4908G-L3#

## Verifying SDM Configuration

```
4908G-L3#show sdm size  
Switching Database Region Sizes :  
    TCAM Total Size      : 32768    32-bit entries  
    TCAM Allocated Size  : 30720    32-bit entries  
    Reserved Space       : 32       32-bit entries  
    IPX Direct           : 224      32-bit entries  
    IPX Node             : 2048     64-bit entries  
    IP Adjacency         : 2048     32-bit entries  
    IP Prefix           : 9216    32-bit entries  
    IPX Network          : 6144     32-bit entries  
    IP Multicast         : 3072     64-bit entries  
    UDP Flooding         : 256      64-bit entries  
    MAC Addr           : 128     64-bit entries  
    Access List          : 512      128-bit entries  
4908G-L3#
```

## IP Routed Network with IRB SDM Configuration

In this example, the Catalyst 2948G-L3 or 4908G-L3 Layer 3 switch is deployed in an IP-only network where Integrated Routing and Bridging (IRB) is required. Therefore, the SDM default TCAM partitions are

reconfigured to allocate more TCAM space to the 12-switching region (under the assumption that the default IP partitions are adequate in this example).

## Step-by-Step Instructions

In the following configuration example, the IPX network and IPX node regions are reduced to the minimum size possible and 6K entries are allocated to the 12-switching region.

**Note:** You must reload the system in order for the changes to take effect

To modify the default TCAM region sizes, use the following procedure:

```
4908G-L3#show sdm size
Switching Database Region Sizes :
    TCAM Total Size      : 32768   32-bit entries
    TCAM Allocated Size  : 31488   32-bit entries
    Reserved Space       : 32      32-bit entries
    IPX Direct           : 224     32-bit entries
    IPX Node             : 2048    64-bit entries
    IP Adjacency         : 2048    32-bit entries
    IP Prefix            : 8192    32-bit entries
    IPX Network          : 6144    32-bit entries
    IP Multicast         : 3072    64-bit entries
    UDP Flooding         : 256     64-bit entries
    MAC Addr             : 1024    64-bit entries
    Access List          : 512     128-bit entries
4908G-L3#configure terminal
4908G-L3(config)#sdm size ipx-network 32
4908G-L3(config)#sdm size ipx-node 32
4908G-L3(config)#sdm size 12-switching k-entries 6
4908G-L3(config)#^Z
4908G-L3#show running-config
Building configuration...

Current configuration:
!
version 12.0
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 4908G-L3
!
!
sdm size ipx-node 32
sdm size ipx-network 32
sdm size 12-switching 6144
ip subnet-zero
!

!--- Output suppressed.

!
end

4908G-L3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
4908G-L3#reload
Proceed with reload? [confirm]
```

```
00:12:27: %SYS-5-RELOAD: Reload requested
```

```
ROMMON: Cold Reset frame @0x00000000  
ROMMON: Reading reset reason register  
ROMMON: Valid NVRAM config
```

```
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```

```
!--- Output suppressed.
```

```
4908G-L3#
```

## Verifying SDM Configuration

```
4908G-L3#show sdm size  
Switching Database Region Sizes :  
  TCAM Total Size      : 32768   32-bit entries  
  TCAM Allocated Size  : 31584   32-bit entries  
  Reserved Space      : 32      32-bit entries  
  IPX Direct          : 224     32-bit entries  
  IPX Node            : 32     64-bit entries  
  IP Adjacency        : 2048   32-bit entries  
  IP Prefix           : 8192   32-bit entries  
  IPX Network        : 32     32-bit entries  
  IP Multicast        : 3072   64-bit entries  
  UDP Flooding        : 256    64-bit entries  
  MAC Addr           : 6144   64-bit entries  
  Access List         : 512    128-bit entries  
4908G-L3#
```

## Bridged Network SDM Configuration

In this example, the Catalyst 2948G-L3 or 4908G-L3 Layer 3 switch is deployed in a bridged network where there is no requirement for IP or IPX routing.

### Step-by-Step Instructions

In the following configuration example, the IPX network, IPX node, and IP multicast regions are reduced to the minimum size possible. In addition, the IP prefix and IP adjacency regions are reduced to 2K and 1K entries, respectively. The 12-switching region is allocated 13K entries.

**Note:** You must reload the system in order for the changes to take effect

To modify the default TCAM region sizes, use the following procedure:

```
4908G-L3#show sdm size  
Switching Database Region Sizes :  
  TCAM Total Size      : 32768   32-bit entries  
  TCAM Allocated Size  : 31488   32-bit entries  
  Reserved Space      : 32      32-bit entries  
  IPX Direct          : 224     32-bit entries  
  IPX Node            : 2048   64-bit entries  
  IP Adjacency        : 2048   32-bit entries  
  IP Prefix           : 8192   32-bit entries  
  IPX Network         : 6144   32-bit entries  
  IP Multicast        : 3072   64-bit entries  
  UDP Flooding        : 256    64-bit entries  
  MAC Addr            : 1024   64-bit entries  
  Access List         : 512    128-bit entries  
4908G-L3#configure terminal
```

```

4908G-L3(config)#sdm size ipx-network 32
4908G-L3(config)#sdm size ipx-node 32
4908G-L3(config)#sdm size ip-mcast 32
4908G-L3(config)#sdm size ip-adjacency 1024
4908G-L3(config)#sdm size ip-prefix k-entries 2
4908G-L3(config)#sdm size l2-switching k-entries 13
4908G-L3(config)^Z
4908G-L3#show running-config
Building configuration...

00:09:38: %SYS-5-CONFIG_I: Configured from console by console
Current configuration:
!
version 12.0
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 4908G-L3
!
!
sdm size ipx-node 32
sdm size ip-adjacency 1024
sdm size ip-prefix 2048
sdm size ipx-network 32
sdm size ip-mcast 32
sdm size l2-switching 13312
ip subnet-zero
!

!--- Output suppressed.

!
end

4908G-L3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
4908G-L3#reload
Proceed with reload? [confirm]

00:10:12: %SYS-5-RELOAD: Reload requested

ROMMON: Cold Reset frame @0x00000000
ROMMON: Reading reset reason register
ROMMON: Valid NVRAM config

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!--- Output suppressed.

4908G-L3#

```

## Verifying SDM Configuration

```

4908G-L3#show sdm size
Switching Database Region Sizes :
  TCAM Total Size      : 32768   32-bit entries
  TCAM Allocated Size  : 32672   32-bit entries
  Reserved Space       : 32      32-bit entries
  IPX Direct           : 224     32-bit entries
  IPX Node           : 32     64-bit entries

```

```

IP Adjacency      : 1024    32-bit entries
IP Prefix         : 2048    32-bit entries
IPX Network       : 32      32-bit entries
IP Multicast      : 32      64-bit entries
UDP Flooding      : 256     64-bit entries
MAC Addr          : 13312   64-bit entries
Access List       : 512     128-bit entries
4908G-L3#

```

## Troubleshooting the SDM

This section discusses two common problems when working with the SDM on the Catalyst 2948G-L3 and 4908G-L3 Layer 3 switches:

- The Layer 3 switch generates a Total protocol partitions exceed TCAM size!! error when configuring the SDM.
- The Layer 3 switch generates a %LSS-1-SDM: Region reached limit. Cannot accept more entries syslog message at startup or during normal operation of the Layer 3 switch.

### "Total protocol partitions exceed TCAM size!!" Error

**Problem** The Layer 3 switch generates a Total protocol partitions exceed TCAM size!! error message while you are configuring the SDM partition sizes. There are two reasons the system might generate this error:

- The command entered cannot be processed because the command you entered would cause the total size of the TCAM protocol partitions to exceed 32K.
- The command entered cannot be processed because the command you entered would cause the size of that specific TCAM protocol partition to exceed the maximum allowed size for that partition.

**Workaround** Specify a protocol partition size that does not exceed the total TCAM size, or the maximum size of the specified protocol partition.

**Example** In this example, the system generates an error when you attempt to specify more than 16000 entries for the 12-switching region. The workaround is to ensure the specified size is less than or equal to the maximum region size, and the sum of all of the protocol regions does not exceed 32K entries.

```

4908G-L3#configure terminal
4908G-L3(config)#sdm size 12-switching 17000
Total protocol partitions exceed TCAM size!!
4908G-L3(config)#sdm size 12-switching 16001
Total protocol partitions exceed TCAM size!!
4908G-L3(config)#sdm size 12-switching 16000
4908G-L3(config)#^Z
4908G-L3#

```

### "%LSS-1-SDM: Region reached limit. Cannot accept more entries" Syslog Message

**Problem** The Layer 3 switch generates a %LSS-1-SDM: Region reached limit. Cannot accept more entries syslog message at startup or during normal system operation.

The system generates the %LSS-1-SDM: Region reached limit. Cannot accept more entries syslog message for a specific protocol region when the system fails to install one or more entries in the TCAM because the specified region is full.

**Workaround** You must increase the size of the specified protocol region by issuing the **sdm size** command and reloading the system.

**Note:** The recommended size for the TCAM region varies depending on the network.

**Example** This example shows that the system was unable to install one or more entries in the TCAM for the IP adjacency and IP prefix regions. These syslog messages indicate that the TCAM regions should be reconfigured to allow more entries for IP prefix and adjacency entries.

```
Oct 10 15:54:57.179: %LSS-1-SDM: IP Prefix      Region reached limit. Cannot accept more en
Oct 10 16:12:45.275: %LSS-1-SDM: IP Adjacency  Region reached limit. Cannot accept more en
```

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## Related Information

- [Configuring Switching Database Manager](#)
- [LAN Product Support](#)
- [LAN Switching Technology Support](#)
- [Technical Support & Documentation – Cisco Systems](#)

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