Configure Routing Resources on the Switch through the CLI

Objective

On your switch, all of the routing information is stored in special high-speed memory called Ternary Content Addressable Memory (TCAM) which mainly functions in speeding up route search, packet classification and forwarding, and access control list (ACL)-based commands.

TCAM entries are divided into the following groups:

- IP Entries — Router TCAM entries reserved for IP static routes, IP interfaces, and IP hosts.
- Non-IP Entries — TCAM entries reserved for other applications, such as ACL rules, Cost of Service (CoS) policers, and Virtual Local Area Network (VLAN) rate limits.

The Routing Resources page on your switch allows you to adjust the TCAM allocation. Routing resources can be modified incorrectly in one of the following ways:

- The number of router TCAM entries you allocate is less than the number currently in use.
- The number of router TCAM entries that you allocate is greater than the maximum available for that category. The maximum values are displayed on the page.

If you change the router TCAM allocation incorrectly, an error message is displayed. If your router TCAM allocation is feasible, a message is displayed that an automatic reboot will be performed with the new settings.

The following table provides the number of TCAM entries used by the various features:

Logical Entity	IPv4	IPv6 (PCL TCAM)	IPv6 (Router TCAM)
IP Neighbor	1 entry	1 entry	4 entries
IP Address on an interface	2 entries	2 entries	8 entries
IP Remote Route	1 entry	1 entry	4 entries
On-Link-Prefix	N/A	1 entry	4 entries

Note: VLAN mapping uses four TCAM entries in all cases.

This article provides instructions on how to configure the routing resources settings on your switch through the Command Line Interface (CLI). In this scenario, the default values must be adjusted in order to accommodate the VLAN mapping routing resources.

Note: To configure routing resources on the switch using the GUI, click here.

Applicable Devices

- Sx350 Series

- SG350X Series
- SG550X Series

Software Version

- 2.3.0.130

Configure Router Resources

Step 1. Log in to the switch console. The default username and password is cisco/cisco. If you have configured a new username or password, enter the credentials instead.

Note: To learn how to access an SMB switch CLI through SSH or Telnet, click <u>here</u>.

```
[User Name:cisco
[Password:**********
```

Note: The commands may vary depending on the exact model of your switch. In this example, the SG350X-48MP switch is accessed through Telnet.

Step 2. To display the currently configured router entries on the switch, enter the following:

SG350X#**show system router resources**

```
[SG350X#show system router resources

                                   In-Use Reserved (Current)
                                   ------ -----------------
IPv4 Entries                          8         320
     Number of Routes                 1
     Number of Neighbors              2
     Number of Interfaces             1
IPv6 Entries                          0         320
     Number of Routes                 0
     Number of Neighbors              0
     Number of Interfaces             0
     Number of On-Link Prefixes       0
IPv4 Multicast                        0         128
IPv6 Multicast                        0          96
IPv4 Policy-Based-Routes              0          48
IPv6 Policy-Based-Routes              0          48
VLAN mapping entries                  0           0
SG350X#
```
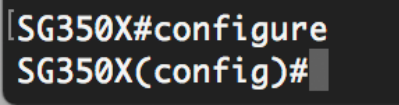
The following TCAM entries are used by the various features:

- Each IPv4 Route consumes one entry.
- Each IPv4 Neighbor consumes one entry.
- Each IPv4 Interface consumes two entries.
- Each IPv6 Route consumes four entries.

- Each IPv6 Neighbor consumes four entries.
- Each IPv6 Interface consumes eight entries.
- Each IPv6 On-Link Prefix consumes four entries.
- Each IPv4 Multicast Route consumes two entries.
- Each IPv6 Multicast Route consumes eight entries.
- Each IPv4 Policy consumes four entries.
- Each IPv6 Policy consumes four entries.
- Each VLAN mapping bound to an interface consumes 4 entries.

Step 3. From the Privileged EXEC mode of the switch, enter the Global Configuration mode by entering the following:

`SG350X#`**`configure`**

```
SG350X#configure
SG350X(config)#
```

Step 4. To configure the system router resources on the switch, enter the following:

`SG350X#`**`system router resources [ip-entries max-number] [ipv6-entries max-number] [ipm-entries max-number] [ipmv6-entries max-number] [policy-ip-entries max-number] [policy-ipv6-entries max-number] [vlan-mapping-entries max-number]`**

The parameters are:

- ip-entries max-number — (Optional) The maximum number of IPv4 entries. The default value is 320 for Sx350 and 3072 for SG550X.
- ipv6-entries max-number — (Optional) The maximum number of IPv6 entries. The default value is 320 for Sx350 and 3702 for SG550X.
- ipm-entries max-number — (Optional) The maximum number of IPv4 multicast entries. The default value is 128 for Sx350 and 512 for SG550X.
- ipmv6-entries max-number — (Optional) The maximum number of IPv6 multicast entries. The default value is 128 for Sx350 and 512 for SG550X.
- policy-ip-entries max-number — (Optional) The maximum number of IPv4 policy routing entries. The default value is 48 for Sx350.
- policy-ipv6-entries max-number — (Optional) The maximum number of IPv6 policy routing entries. The default value is 48 for Sx350.
- vlan-mapping-entries max-number — (Optional) The maximum number of VLAN Mapping entries. The default value is 0 for Sx350

```
SG350X(config)#$ies 32 policy-ipv6-entries 0 vlan-mapping-entries 128

                             In-Use Reserved (Current)    Reserved (New)
                             ------ ------------------    --------------
IPv4 Entries                    8         320                 128
    Number of Routes            1
    Number of Neighbors         2
    Number of Interfaces        1
IPv6 Entries                    0         320                  32
    Number of Routes            0
    Number of Neighbors         0
    Number of Interfaces        0
    Number of Prefixes          0
IPv4 Multicast                  0         128                 128
IPv6 Multicast                  0          96                  32
IPv4 Policy-Based-Routes        0          48                  48
IPv6 Policy-Based-Routes        0          48                   0
VLAN mapping entries            0           0                 128
Setting the new configuration of route entries requires saving the running-config
uration file to startup-configuration file and rebooting the system, do you want
to continue? (Y/N)[N]
```

Step 5. Press **Y** for Yes or **N** for No on your keyboard once you are prompted to overwrite file startup-configuration file with the running-configuration file. Once you press Y, the switch will be rebooted. In this example, Y is entered.

```
SG350X(config)#$ies 32 policy-ipv6-entries 0 vlan-mapping-entries 128

                             In-Use Reserved (Current)    Reserved (New)
                             ------ ------------------    --------------
IPv4 Entries                    8         320                 128
    Number of Routes            1
    Number of Neighbors         2
    Number of Interfaces        1
IPv6 Entries                    0         320                  32
    Number of Routes            0
    Number of Neighbors         0
    Number of Interfaces        0
    Number of Prefixes          0
IPv4 Multicast                  0         128                 128
IPv6 Multicast                  0          96                  32
IPv4 Policy-Based-Routes        0          48                  48
IPv6 Policy-Based-Routes        0          48                   0
VLAN mapping entries            0           0                 128
Setting the new configuration of route entries requires saving the running-config
uration file to startup-configuration file and rebooting the system, do you want
to continue? (Y/N)[N] Y
09-Nov-2017 02:54:15 %COPY-I-FILECPY: Files Copy - source URL running-config dest
ination URL flash://system/configuration/startup-config
SG350X(config)#09-Nov-2017 02:54:19 %COPY-N-TRAP: The copy operation was complete
d successfully
```

The switch will automatically reboot to apply the configuration settings to the startup configuration file.

You should now have successfully configured the routing resources settings on your switch through the CLI.

Verify the Configured Router Resources

Step 1. Log in to the switch console.

```
[User Name:cisco
[Password:**********
```

Step 2. To display the currently configured router entries on the switch, enter the following:

`SG350X#show system router resources`

```
[SG350X#show system router resources

                                In-Use Reserved (Current)
                                ------ ------------------
IPv4 Entries                        8        128
     Number of Routes               1
     Number of Neighbors            2
     Number of Interfaces           1
IPv6 Entries                        0         32
     Number of Routes               0
     Number of Neighbors            0
     Number of Interfaces           0
     Number of On-Link Prefixes     0
IPv4 Multicast                      0        128
IPv6 Multicast                      0         32
IPv4 Policy-Based-Routes            0         48
IPv6 Policy-Based-Routes            0          0
VLAN mapping entries                0        128
SG350X#
```

Note: In this example, the adjusted entries are displayed. This will allow you to configure VLAN mapping settings on your switch.

You should now have successfully verified the configured routing resources on your switch through the CLI.

Note: To learn how to configure the VLAN Mapping settings on your switch through the CLI, click here.