



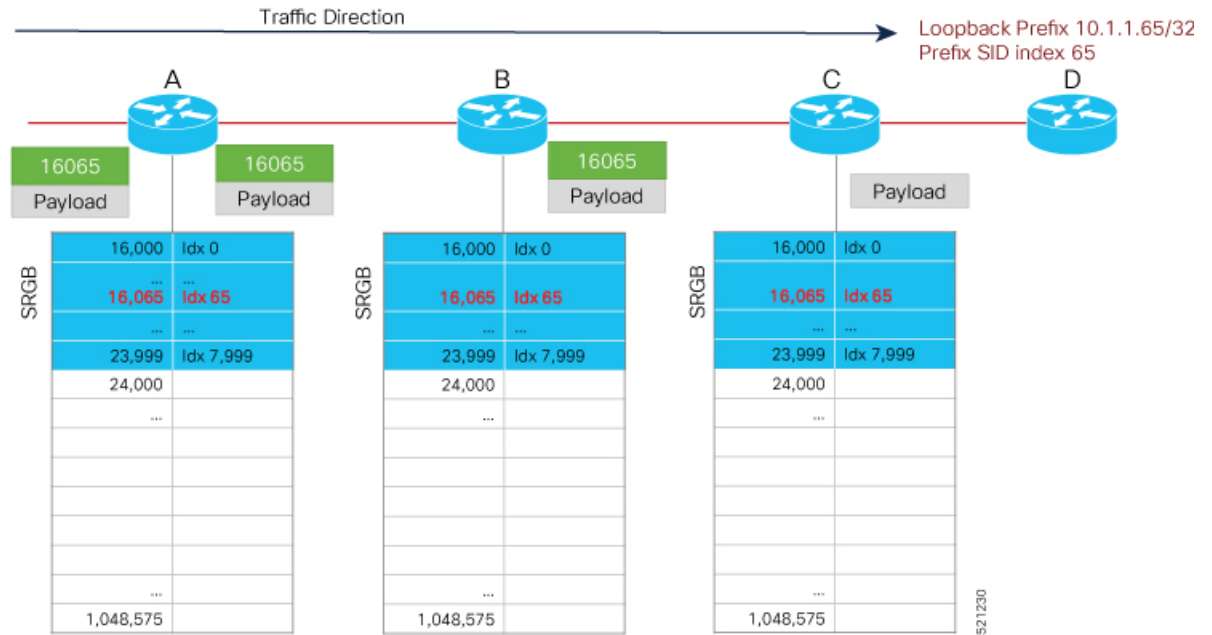
# Configure Segment Routing Global Block

Local label allocation is managed by the label switching database (LSD). The Segment Routing Global Block (SRGB) is the range of label values preserved for segment routing in the LSD.

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## About the Segment Routing Global Block

The Segment Routing Global Block (SRGB) is a range of labels reserved for Segment Routing global segments. A prefix-SID is advertised as a domain-wide unique index. The prefix-SID index points to a unique label within the SRGB range. The index is zero-based, meaning that the first index is 0. The MPLS label assigned to a prefix is derived from the Prefix-SID index plus the SRGB base. For example, considering an SRGB range of 16,000 to 23,999, a prefix 10.1.1.65/32 with prefix-SID index of **65** is assigned the label value of **16065**.



To keep the configuration simple and straightforward, we strongly recommended that you use a homogenous SRGB (meaning, the same SRGB range across all nodes). Using a heterogenous SRGB (meaning, a different SRGB range of the same size across nodes) is also supported but is not recommended.

### Behaviors and Limitations

- The default SRGB in IOS XR has a size of 8000 starting from label value 16000. The default range is 16000 to 23,999. With this size, and assuming one loopback prefix per router, an operator can assign prefix SIDs to a network with 8000 routers.
- There are instances when you might need to define a different SRGB range. For example:
  - Non-IOS XR nodes with a SRGB range that is different than the default IOS XR SRGB range.
  - The default SRGB range is not large enough to accommodate all required prefix SIDs.
- A non-default SRGB can be configured following these guidelines:
  - The SRGB starting value can be configured anywhere in the dynamic label range space (16,000 to 1,048,575).
  - In Cisco IOS XR release earlier than 6.6.3, the SRGB can have a maximum configurable size of 262,143.
  - In Cisco IOS XR release 6.6.3 and later, the SRGB can be configured to any size value that fits within the dynamic label range space.




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**Note** The NCS 5001 and NCS 5002 support a total of 16000 labels. The NCS 5011 supports a total of 13800 labels. Although you can configure the SRGB to any range, an Out of Resource (OOR) mechanism in hardware prevents the platform from programming more labels. When an OOR condition occurs, reduce the label scale and reload the router.

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- Allocating an SRGB label range does not mean that all the labels in this range are programmed in the forwarding table. The label range is just reserved for SR and not available for other purposes. Furthermore, a platform may limit the number of local labels that can be programmed.
- We recommend that the non-default SRGB be configured under the **segment-routing** global configuration mode. By default, all IGP instances and BGP use this SRGB.
- You can also configure a non-default SRGB under the IGP, but it is not recommended.

### SRGB Label Conflicts

When you define a non-default SRGB range, there might be a label conflict (for example, if labels are already allocated, statically or dynamically, in the new SRGB range). The following system log message indicates a label conflict:

```
%ROUTING-ISIS-4-SRGB_ALLOC_FAIL : SRGB allocation failed: 'SRGB reservation not
successful for [16000,80000], SRGB (16000 80000, SRGB_ALLOC_CONFIG_PENDING, 0x2)
(So far 16 attempts). Make sure label range is free'
```

To remove this conflict, you must reload the router to release the currently allocated labels and to allocate the new SRGB.

After the system reloads, LSD does not accept any dynamic label allocation before IS-IS/OSPF/BGP have registered with LSD. Upon IS-IS/OSPF/BGP registration, LSD allocates the requested SRGB (either the default range or the customized range).

After IS-IS/OSPF/BGP have registered and their SRGB is allocated, LSD starts serving dynamic label requests from other clients.



**Note** To avoid a potential router reload due to label conflicts, and assuming that the default SRGB size is large enough, we recommend that you use the default IOS XR SRGB range.



**Note** Allocating a non-default SRGB in the upper part of the MPLS label space increases the chance that the labels are available and a reload can be avoided.



**Caution** Modifying a SRGB configuration is disruptive for traffic and may require a reboot if the new SRGB is not available entirely.

## Setup a Non-Default Segment Routing Global Block Range

This task explains how to configure a non-default SRGB range.

### SUMMARY STEPS

1. **configure**
2. **segment-routing global-block** *starting\_value ending\_value*
3. Use the **commit** or **end** command.

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure</b> <b>Example:</b> RP/0/RP0/CPU0:router# <code>configure</code>	Enters mode.
Step 2	<b>segment-routing global-block</b> <i>starting_value ending_value</i> <b>Example:</b> RP/0/RP0/CPU0:router(config)# <code>segment-routing global-block 16000 80000</code>	Enter the lowest value that you want the SRGB range to include as the starting value. Enter the highest value that you want the SRGB range to include as the ending value.

	Command or Action	Purpose
<b>Step 3</b>	Use the <b>commit</b> or <b>end</b> command.	<p><b>commit</b> —Saves the configuration changes and remains within the configuration session.</p> <p><b>end</b> —Prompts user to take one of these actions:</p> <ul style="list-style-type: none"> <li>• <b>Yes</b> — Saves configuration changes and exits the configuration session.</li> <li>• <b>No</b> —Exits the configuration session without committing the configuration changes.</li> <li>• <b>Cancel</b> —Remains in the configuration session, without committing the configuration changes.</li> </ul>

Use the **show mpls label table [label label-value]** command to verify the SRGB configuration:

```
Router# show mpls label table label 16000 detail
Table Label   Owner                               State Rewrite
-----
0      16000   ISIS(A):1                               InUse  No
      (Lbl-blk SRGB, vers:0, (start_label=16000, size=64001))
```

### What to do next

Configure prefix SIDs and enable segment routing.