

# Local Source–Route Bridging Examples

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## Introduction

Local Source–Route Bridging (SRB) is an IBM feature that bridges packets from one interface on a router to another interface on the same router. There are two basic scenarios for its use:

- Bridging only two rings together
- Either bridging more than two rings or combining SRB with other IBM features, such as Remote Source–Route Bridging (RSRB), Synchronous Data Logical Link Control (SDLLC), Data Link Switching (DLSw), and Qualified Logical Link Control (QLLC)

The configurations depicted in this document are partial configurations. They provide only that part of the configuration required for SRB support; they do not provide IP or other protocol support. In addition, based on your topology and traffic type, you might need to issue the **source–bridge spanning** interface command or to use the IBM Automatic Spanning Tree support available with Cisco IOS® Software Release 10.2 or later. For example, if you are running Network Basic Input/Output System (NetBIOS) traffic which uses spanning tree explorers then you need to issue the **source–bridge spanning** command.

## Prerequisites

### Requirements

There are no specific requirements for this document.

### Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

### Conventions

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

# Simple Source–Route Bridging Two Local Rings

Simple SRB is the best solution with this topology:



In order to use simple SRB, each of these rings must have a ring number. If there are any other Source–Route (SR) bridges on these rings, then ring numbers have already been assigned, and those numbers that are defined to the routers must agree with the other bridges on the rings. If there are no other SR bridges on the rings, then any unique ring number can be used.

## Example 1 Simple SRB: No other SR Bridges in the Environment

```
interface tokenring 0
  source-bridge 1 1 2
  source-bridge spanning

interface tokenring 1
  source-bridge 2 1 1
  source-bridge spanning
```

If there are no other SR bridges in the network, then you can choose your own ring numbers.

In this example, ring number 1 has been assigned to the ring that is attached to interface Token Ring 0, and ring number 2 has been assigned to the ring that is attached to interface Token Ring 1. Of the three numbers in the example, the number that appears in the middle is the bridge number. You must define it to be the same number on both interfaces. Interface Token Ring 0 now attached to ring 1 is directed to send SR bridged traffic over bridge 1 to ring 2. Similarly, interface Token Ring 1 attached to ring 2 is directed to send SR bridged traffic over bridge 1 to ring 1.

If the source ring on one interface does not match the destination ring on the other, or if the bridge numbers are not set to the same value, then no SR bridged traffic flows between these two interfaces.

## Example 2 Simple SRB: Other SR Bridges in the Environment

If there are other SR bridges in the network, then you need to plan before you configure the router interface.

Assume that there is another Cisco router that is bridging on the same ring as interface Token Ring 0, and there is an IBM bridge on the same ring as interface Token Ring 1. The second Cisco router is assigned to ring 100, and the IBM bridge is assigned to ring 200. The router needs to be configured in this manner:

```
interface tokenring 0
  source-bridge 100 1 512
  source-bridge spanning

interface tokenring 1
  source-bridge 512 1 100
  source-bridge spanning
```

Even though the IBM bridge is on ring 200, configure the router as if it resides on ring 512. While Cisco

routers define the rings with a decimal value, IBM bridges use hexadecimal values to represent the rings. In order to match the definition on the IBM, use 0x (hexadecimal), and the conversion is done automatically.

```
router(config)# interface tokenring 1  
  
router(config-if)# source-bridge 0x200 1 0x64
```

If you are using SRB devices other than Cisco routers and IBM bridges, then you need to determine whether the ring numbers are represented with decimal or hexadecimal values, to properly configure the Cisco router interfaces.

Before you install any SRB device between two existing bridged environments, always ensure that ring numbers are not duplicated within your SRB network. In this example, ring numbers need to be changed before the installation of the new router or bridge. It is possible that bridge number 1 was used for both the SRB network behind the existing Cisco router and the network behind the IBM bridge.

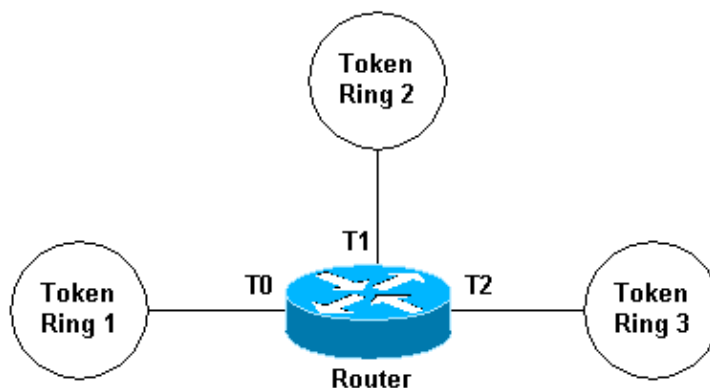
## Source-Route Bridging with a Ring-Group

When there are other SR bridges in the network (as in Example 2), you have a second configuration option that involves the creation of a ring group (also known as a virtual ring). This is a configuration example:

```
source-bridge ring-group 4095  
  
interface tokenring 0  
  source-bridge 1 1 4095  
  source-bridge spanning  
  
interface tokenring 1  
  source-bridge 2 1 4095  
  source-bridge spanning
```

The net effect of this configuration appears to be the same as that of Example 1: interface Token Ring 0 is assigned to ring 1, interface Token Ring 1 is assigned to ring 2, and traffic is bridged between these two interfaces. However, there is a slight difference: end stations are directed to send traffic from ring 1 to ring 4095 (the virtual ring) and, from there, to ring 2. The traffic takes an extra hop onto the virtual ring before it reaches its destination.

Even though there is a limit to the number of hops that SR bridged traffic can take (seven hops), sometimes it is helpful to force the extra hop. Consider this scenario:



Assume that you want to bridge traffic from any ring to any other ring. You may try to extend the prior configuration, which would result in a configuration similar to this:

```

interface tokenring 0 * INCORRECT configuration *
  source-bridge 1 1 2 * INCORRECT configuration *
  source-bridge 1 1 3 * INCORRECT configuration *

interface tokenring 1 * INCORRECT configuration *
  source-bridge 2 1 1 * INCORRECT configuration *
  source-bridge 2 1 3 * INCORRECT configuration *

interface tokenring 2 * INCORRECT configuration *
  source-bridge 3 1 1 * INCORRECT configuration *
  source-bridge 3 1 2 * INCORRECT configuration *

```

Each interface, however, supports only one **source-bridge** command. If you attempt to configure a second one, it overwrites the first.

The virtual ring provides a mechanism to get around this limitation:

```

source-bridge ring-group 4095

interface tokenring 0
  source-bridge 1 1 4095
  source-bridge spanning

interface tokenring 1
  source-bridge 2 1 4095
  source-bridge spanning

interface tokenring 2
  source-bridge 3 1 4095
  source-bridge spanning

```

Each ring is able to bridge traffic to the other two interfaces. Even if you are only bridging two interfaces together, use the virtual ring if you expect to add additional interfaces to the SRB network on the router, or if you plan to add RSRB to the router.

In the case of source-route bridging with a ring-group, the bridge numbers do not need to match, unlike the case of simple source-route bridging.

If you bridge traffic to any other ring, as shown above, it works equally well, if the router is configured as follows:

```

source-bridge ring-group 4095

interface tokenring 0
  source-bridge 1 1 4095
  source-bridge spanning

interface tokenring 1
  source-bridge 2 4 4095
  source-bridge spanning

interface tokenring 2
  source-bridge 3 9 4095
  source-bridge spanning

```

Any number of Token Ring interfaces on a router can be SR bridged together in this manner. The configuration is simply extended:

```

interface tokenring 3
  source-bridge 4 1 4095
  source-bridge spanning

```

```
interface tokenring 4
 source-bridge 5 1 4095
 source-bridge spanning
```

*!--- And so forth.*

In the this environment, two separate Token Ring interfaces are assigned to the same ring, for redundancy:



With these parallel bridges (two separate bridges that connect Token Ring 1 and Token Ring 2), each bridge must have a unique bridge number. In order to support this environment, this is the router configuration:

```
source-bridge ring-group 4095

interface tokenring 0
 source-bridge 1 1 4095
 source-bridge spanning

interface tokenring 1
 source-bridge 1 2 4095
 source-bridge spanning

interface tokenring 2
 source-bridge 2 1 4095
 source-bridge spanning
```

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