ZebOS-XP®
Network Platform

Version 1.4
Extended Performance

Transparent Interconnection of Lots of Links
Configuration Guide

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Contents

Preface

This guide describes how to configure Transparent Interconnection of Lots of Links (TRILL) in ZebOS-XP.

Audience

This guide is intended for network administrators and other engineering professionals who configure TRILL.

Conventions

Table P-1 shows the conventions used in this guide.

Table P-1: Conventions

Convention	Description
Italics	Emphasized terms; titles of books
Note:	Special instructions, suggestions, or warnings
`monospaced type`	Code elements such as commands, functions, parameters, files, and directories

Contents

This guide contains these chapters:

- Chapter 15, *Unicast Ping*
- Chapter 16, *Unicast Traceroute*
- Chapter 17, *Multicast OAM*
- Chapter 18, *End Station Address Distribution Information*
- Chapter 19, *Miscellaneous Configuration*

Related Documents

Use this guide with the *Transparent Interconnection of Lots of Links Command Reference* for details about the commands used in the configurations.

Note: All ZebOS-XP technical manuals are available to licensed customers at http://www.ipinfusion.com/support/document_list.

Chapter Organization

The chapters in this guide are organized into these major sections:

- An overview that explains a configuration in words
- Topology with a diagram that shows the devices and connections used in the configuration
- Configuration steps in a table for each device where the left-hand side shows the commands you enter and the right-hand side explains the actions that the commands perform
- Validation which shows commands and their output that verify the configuration

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CHAPTER 1 Adjacency

Topology

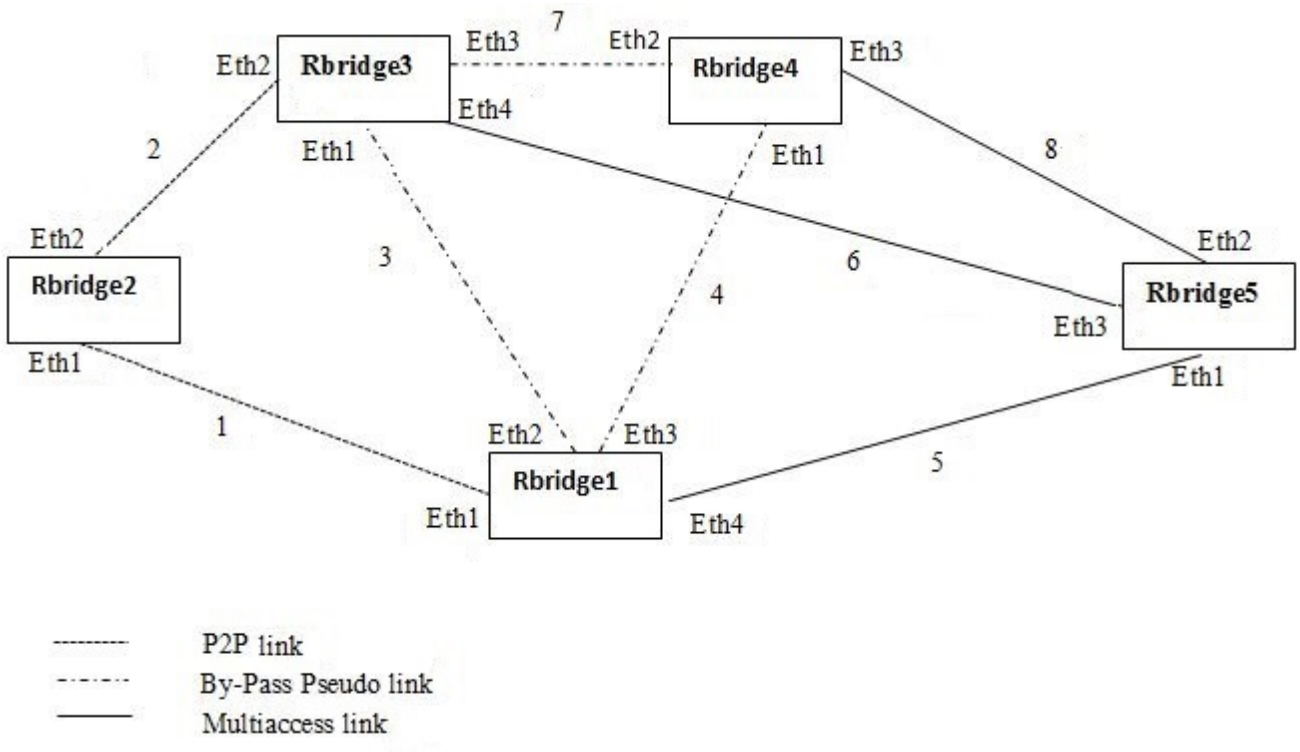

Figure 1-1: Adjacency

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure the system identifier for the RBridge
`(config-rb)#nickname 8005 nickname-priority 128 root-priority 8005`	Configure nickname 8005 with nickname priority 128 and root priority 8005 for rbridge 1
`(config-rb)#number-of-dtrees-to-compute 5`	Configure number of dtree nicknames to compute to 5
`(config-rb)#exit`	Exit rbridge mode

(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type point-to-point	Associate the interface eth1 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill pseudonode enable	Enable bypass pseudonode
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode

(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth4	Specify the interface (eth4)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth4 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth4 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth4 with trill instance 1.
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth4 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth4 with announcing vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure the system identifier
(config-rb)#nickname 8004 nickname-priority 128 root-priority 8004	Configure nickname 8004 with nickname priority 128 and root priority 8004 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type point-to-point	Associate the interface eth1 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.

(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type point-to-point	Associate the interface eth2 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure the system identifier
(config-rb)#nickname 8003 nickname-priority 128 root-priority 8003	Configure nickname 8003 with nickname priority 128 and root priority 8003 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth1 with vlan 2,3,4,5

(config-if)#trill announcing-vlan [1-5]	Associate the interface eth1 with announcing vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type point-to-point	Associate the interface eth2 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#trill-isis port-priority 100	trill-isis port-priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth4	Specify the interface (eth4)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth4 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth4 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth4 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth4 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth4 with announcing vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge4

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid DD:DD:DD:DD:DD:DD`	Configure the system identifier
`(config-rb)#nickname 8002 nickname-priority 128 root-priority 8002`	Configure nickname 8002 with nickname priority 128 and root priority 8002 for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#vlan database`	Enter the VLAN configuration mode.
`(config-vlan)#vlan 2 bridge 1 state enable`	Enable VLAN 2 on the bridge to forward frames
`(config-vlan)#vlan 3 bridge 1 state enable`	Enable VLAN 3 on the bridge to forward frames
`(config-vlan)#vlan 4 bridge 1 state enable`	Enable VLAN 4 on the bridge to forward frames.
`(config-vlan)#vlan 5 bridge 1 state enable`	Enable VLAN 5 on the bridge to forward frames
`(config- vlan)#exit`	Exit vlan mode
`(config)#interface eth1`	Enter interface mode
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#trill pseudonode enable`	To enable bypass pseudonode
`(config-if)#switchport trunk allowed vlan add 2,3,4,5`	Associate the interface eth1 with vlan 2,3,4,5
`(config-if)#trill announcing-vlan [1-5]`	Associate the interface eth1 with announcing vlan 1,2,3,4,5
`(config-if)#exit`	Exit interface mode.
`(config)#interface eth2`	Specify the interface (eth2)to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth2 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth2 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface with the TRILL instance

(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge5

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid EE:EE:EE:EE:EE:EE	Configure the system identifier
(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port

(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

Validation

RBridge1

```
#show trill  neighbor
TRILL Neighbor Table Instance = 1

NbrMacAddr          NbrMtu   NbrSysId            NbrNickname    PortId
Interface
-------------------------------------------------------------------------------
----
5254.00D5.DEAE      n/a      BBBB.BBBB.BBBB      n/a            n/a      eth1
```

```
5254.001A.E361      0        CCCC.CCCC.CCCC      b839           0        eth2

5254.0095.E24A      0        EEEE.EEEE.EEEE      8002           0        eth4

5254.00BD.BB74      0        DDDD.DDDD.DDDD      8003           1        eth3

HoldingTime  NbrPriority  DesiredVlan  State     DeadTime
-------------------------------------------------------
20           n/a          n/a          P2P-AdjUp 1
29           100          1            REPORT    1
28           64           1            REPORT    184 ms
25           64           1            REPORT    3
```

RBridge2

```
#show trill  neighbor
TRILL Neighbor Table Instance = 1

NbrMacAddr          NbrMtu   NbrSysId            NbrNickname    PortId
Interface
-------------------------------------------------------------------------------
5254.002A.5962      n/a      AAAA.AAAA.AAAA      n/a            n/a      eth1

5254.006E.54D7      n/a      CCCC.CCCC.CCCC      n/a            n/a      eth2

HoldingTime  NbrPriority  DesiredVlan  State     DeadTime
-------------------------------------------------------
27           n/a          n/a          P2P-AdjUp 6
22           n/a          n/a          P2P-AdjUp 3
n/a = not applicable
```

RBridge3

```
#show trill  neighbor
TRILL Neighbor Table Instance = 1

NbrMacAddr          NbrMtu   NbrSysId            NbrNickname    PortId
Interface
-------------------------------------------------------------------------------
5254.00F9.2B3D      n/a      BBBB.BBBB.BBBB      n/a            n/a      eth2

5254.00BD.BB74      0        DDDD.DDDD.DDDD      8003           0        eth3

5254.0092.FB0C      0        AAAA.AAAA.AAAA      9b81           1        eth1

5254.00C9.4BDF      0        EEEE.EEEE.EEEE      8002           2        eth4

HoldingTime  NbrPriority  DesiredVlan  State     DeadTime
-------------------------------------------------------
25           n/a          n/a          P2P-AdjUp 4
29           64           1            REPORT    1
8            100          1            REPORT/DR 7
8            100          1            REPORT/DR 9
```

RBridge4

```
#show trill  neighbor
TRILL Neighbor Table Instance = 1

NbrMacAddr          NbrMtu   NbrSysId            NbrNickname    PortId
Interface
-------------------------------------------------------------------------
----
5254.00BD.CAF9      0        EEEE.EEEE.EEEE      8002           1        eth3

5254.0039.0D41      0        AAAA.AAAA.AAAA      9b81           2        eth1

5254.001D.4C7A      0        CCCC.CCCC.CCCC      b839           2        eth2

HoldingTime  NbrPriority  DesiredVlan  State     DeadTime
-----------------------------------------------------
24           64           1            REPORT    1
7            100          1            REPORT/DR 6
7            100          1            REPORT/DR 2
```

RBridge5

```
#show trill  neighbor
TRILL Neighbor Table Instance = 1

NbrMacAddr          NbrMtu   NbrSysId            NbrNickname    PortId
Interface
-------------------------------------------------------------------------
5254.00DB.19A8      0        DDDD.DDDD.DDDD      8003           2        eth2

5254.0000.63AB      0        AAAA.AAAA.AAAA      9b81           3        eth1

5254.006B.345B      0        CCCC.CCCC.CCCC      b839           3        eth3

HoldingTime  NbrPriority  DesiredVlan  State     DeadTime
-----------------------------------------------------
7            100          1            REPORT/DR 6
6            100          1            REPORT/DR 2
24           64           1            REPORT    240 ms
```

CHAPTER 2 Appointed Forwarder

For each VLAN on a link, the DRB chooses an RBridge on the link to be the appointed VLAN-x forwarder. AF distribution algorithm is optimized for better performance. There are two configurations:

- AF Load Share Enable: DRB appoints other RBridges that have ports on the link as Appointed Forwarder for one or more VLANs
- AF Load Share Disable (default): DRB becomes AF for all enabled VLANs on its port. Do not appoint other RBridges that have ports on the link as Appointed Forwarder for one or more VLANs

Topology

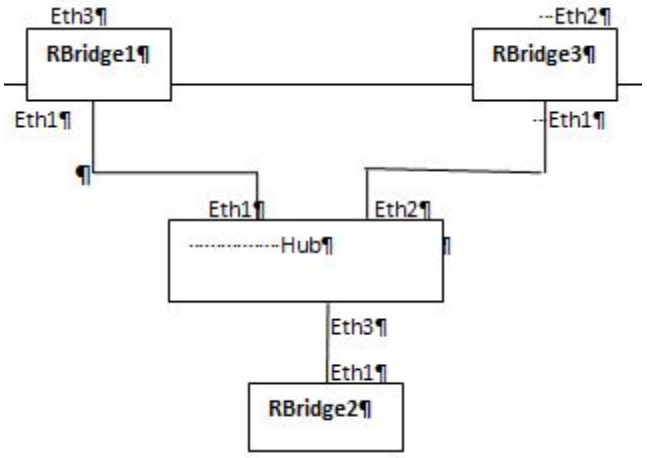

Figure 2-1: Optimizing AF Calculation

Enable Appointed Forwarder

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#vlan database`	Enter the VLAN configuration mode.
`(config-vlan)#vlan 2 bridge 1 state enable`	Enable VLAN 2 on the bridge to forward frames
`(config-vlan)#vlan 3 bridge 1 state enable`	Enable VLAN 3 on the bridge to forward frames
`(config-vlan)#vlan 4 bridge 1 state enable`	Enable VLAN 4 on the bridge to forward frames

(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#no trill trunk-port	Disable trill trunk port on interface
(config-if)#trill access-port enable	Enable trill access port on interface
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6	Associate the interface eth2 with vlan 2, 3, 4, 5, 6
(config-if)#trill end-station-service-vlan [1-6]	Associate the interface eth2 with end station service vlan 1, 2, 3, 4, 5, 6
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure system identifier for rbridge 1
(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#af-load-share enable	Enable AF Load share
(config-rb)#exit	Exit rbridge mode

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames

(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on the bridge to forward frames.
(config-vlan)#exit	Exit vlan mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#no trill trunk-port	Disable trill trunk port on interface
(config-if)#trill access-port enable	Enable trill access port on interface
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6	Associate the interface eth2 with vlan 2,3,4,5,6
(config-if)#trill end-station-service-vlan [1-6]	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure system identifier for rbridge 1
(config-rb)#nickname 8002 nickname-priority 128 root-priority 8002	Configure nickname 8002 with nickname priority 128 and root priority 8002 for rbridge 1
(config-rb)#af-load-share enable	Enable AF Load share
(config-rb)#exit	Exit rbridge mode

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames.

`(config-vlan)#vlan 6 bridge 1 state enable`	Enable VLAN 5 on the bridge to forward frames
`(config- vlan)#exit`	Exit vlan mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#no trill trunk-port`	Disable trill trunk port on interface
`(config-if)#trill access-port enable`	Enable trill access port on interface
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#switchport trunk allowed vlan add 2,3,4,5,6`	Associate the interface eth2 with vlan 2,3,4,5,6
`(config-if)#trill end-station-service-vlan [1-6]`	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6
`(config-if)#exit`	Exit interface mode.
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid CC:CC:CC:CC:CC:CC`	Configure system identifier for rbridge 1
`(config-rb)#nickname 8003 nickname-priority 128 root-priority 8003`	Configure nickname 8003 with nickname priority 128 and root priority 8003 for rbridge 1
`(config-rb)#af-load-share enable`	Enable AF Load share
`(config-rb)#exit`	Exit rbridge mode

Validation

Rbridge2

```
#show trill interface eth1
eth1 is up, line protocol is up
  Bridge Protocol: TRILL (1)
  Network Type: Broadcast
  Circuit Type: level-1
  Local circuit ID: 0x01
  Extended Local circuit ID: 0x00000003
  Local SNPA: 52:54:00:54:1c:dc
  Port Priority: 100
  Circuit ID: BBBB.BBBB.BBBB.01
  Number of active level-1 adjacencies: 1
  LSP MTU: 1470
  Next TRILL LAN Level-1 Hello in 1 seconds
```

```
  Port State  = DRB
  Port Type  = ACCESS
  Inhibition time = 30 sec
  Desired Designated Vlan = 1
  Designated Vlan =  1
  BPDU Handling Enabled = FALSE
  Root Change Inhibition Timer Interval = 30
  Root change inhibition timer running = FALSE
  Root Bridge ID (BPDU) = 00:00:00:00:00:00
  Number of TCN BPDU tranmitted = 0
  Number of TCN ACK BPDU Recieved = 0
  Vlan Mapping Detected = FALSE
  Bandwidth: 12500000.00 Bytes/sec
  Metric : 200000
                    AF list
-----------------------------------------------------------------
  Self                          Vlan
  BBBB.BBBB.BBBB                [1-2]
  Neighbor                      Vlan
  AAAA.AAAA.AAAA                [3-4]
  CCCC.CCCC.CCCC                [4-5]
```

Disable Appointed Forwarder

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#vlan database`	Enter the VLAN configuration mode.
`(config-vlan)#vlan 2 bridge 1 state enable`	Enable VLAN 2 on the bridge to forward frames
`(config-vlan)#vlan 3 bridge 1 state enable`	Enable VLAN 3 on the bridge to forward frames
`(config-vlan)#vlan 4 bridge 1 state enable`	Enable VLAN 4 on the bridge to forward frames.
`(config-vlan)#vlan 5 bridge 1 state enable`	Enable VLAN 5 on the bridge to forward frames
`(config-vlan)#vlan 6 bridge 1 state enable`	Enable VLAN 6 on the bridge to forward frames
`(config- vlan)#exit`	Exit vlan mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#no trill trunk-port`	Disable trill trunk port on interface

`(config-if)#trill access-port enable`	Enable trill access port on interface
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#switchport trunk allowed vlan add 2,3,4,5,6`	Associate the interface eth2 with vlan 2,3,4,5,6
`(config-if)#trill end-station-service-vlan [1-6]`	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6
`(config-if)#exit`	Exit interface mode.
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system identifier for rbridge 1
`(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001`	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
`(config-rb)#af-load-share disable`	Enable AF Load share
`(config-rb)#exit`	Exit rbridge mode

RBridge2

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#vlan database`	Enter the VLAN configuration mode.
`(config-vlan)#vlan 2 bridge 1 state enable`	Enable VLAN 2 on the bridge to forward frames
`(config-vlan)#vlan 3 bridge 1 state enable`	Enable VLAN 3 on the bridge to forward frames
`(config-vlan)#vlan 4 bridge 1 state enable`	Enable VLAN 4 on the bridge to forward frames
`(config-vlan)#vlan 5 bridge 1 state enable`	Enable VLAN 5 on the bridge to forward frames
`(config-vlan)#vlan 6 bridge 1 state enable`	Enable VLAN 6 on the bridge to forward frames
`(config- vlan)#exit`	Exit vlan mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#no trill trunk-port`	Disable trill trunk port on interface
`(config-if)#trill access-port enable`	Enable trill access port on interface

(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6	Associate the interface eth2 with vlan 2,3,4,5,6
(config-if)#trill end-station-service-vlan [1-6]	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure system identifier for rbridge 1.
(config-rb)#nickname 8002 nickname-priority 128 root-priority 8002	Configure nickname 8002 with nickname priority 128 and root priority 8002 for rbridge 1
(config-rb)#af-load-share disable	Enable AF Load share
(config-rb)#exit	Exit rbridge mode

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#no trill trunk-port	Disable trill trunk port on interface
(config-if)#trill access-port enable	Enable trill access port on interface

`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#switchport trunk allowed vlan add 2,3,4,5,6`	Associate the interface eth2 with vlan 2,3,4,5,6
`(config-if)#trill end-station-service-vlan [1-6]`	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6
`(config-if)#exit`	Exit interface mode.
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid CC:CC:CC:CC:CC:CC`	Configure system identifier for rbridge 1
`(config-rb)#nickname 8003 nickname-priority 128 root-priority 8003`	Configure nickname 8003 with nickname priority 128 and root priority 8003 for rbridge 1
`(config-rb)#af-load-share disable`	Enable AF Load share
`(config-rb)#exit`	Exit rbridge mode

Validation

Rbridge2

```
#show trill interface eth1
eth1 is up, line protocol is up
  Bridge Protocol: TRILL (1)
  Network Type: Broadcast
  Circuit Type: level-1
  Local circuit ID: 0x01
  Extended Local circuit ID: 0x00000003
  Local SNPA: 52:54:00:54:1c:dc
  Port Priority: 100
  Circuit ID: BBBB.BBBB.BBBB.01
  Number of active level-1 adjacencies: 1
  LSP MTU: 1470
  Next TRILL LAN Level-1 Hello in 1 seconds
  Port State  = DRB
  Port Type  = ACCESS
  Inhibition time = 30 sec
  Desired Designated Vlan = 1
  Designated Vlan =  1
  BPDU Handling Enabled = FALSE
  Root Change Inhibition Timer Interval = 30
  Root change inhibition timer running = FALSE
  Root Bridge ID (BPDU) = 00:00:00:00:00:00
  Number of TCN BPDU tranmitted = 0
  Number of TCN ACK BPDU Recieved = 0
  Vlan Mapping Detected = FALSE
  Bandwidth: 12500000.00 Bytes/sec
  Metric : 200000
```

```
                      AF list
-------------------------------------------------------------------
  Self                            Vlan
  BBBB.BBBB.BBBB                  [1-6]
  Neighbor                        Vlan
  AAAA.AAAA.AAAA
  CCCC.CCCC.CCCC
```

CHAPTER 3 Nickname Database

Nicknames are 16-bit dynamically assigned quantities that act as abbreviations for RBridges' IS-IS IDs to achieve a more compact encoding and can be used to specify potentially different trees with the same root. This assignment allows specifying up to 2**16 RBridges. The value 0x0000 is reserved to indicate that a nickname is not specified and the values 0xFFC0 through 0xFFFE are reserved for future specification, and the value 0xFFFF is permanently reserved.

Nickname-collision-free campus is accelerated by selecting new nicknames only from those that appear to be available and by having the highest priority nickname involved in a nickname conflict retain its value.

Topology

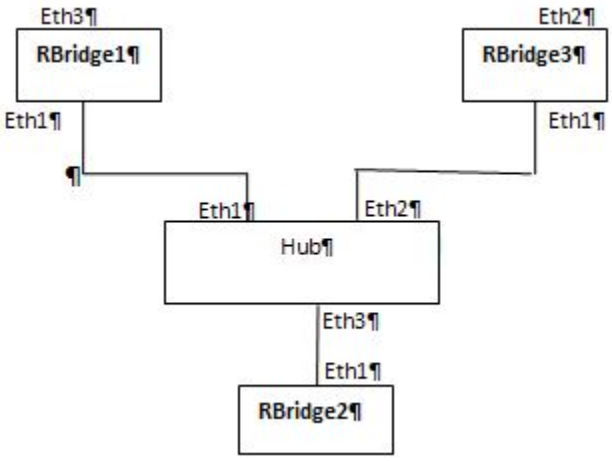

Figure 3-1: Nickname Database

Nickname Database Configuration

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk

(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#exit	Exit rbridge mode

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8002 nickname-priority 128 root-priority 8002	Configure nickname 8002 with nickname priority 128 and root priority 8002 for rbridge 1
(config-rb)#exit	Exit rbridge mode

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.

(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8003 nickname-priority 128 root-priority 8003	Configure nickname 8003 with nickname priority 128 and root priority 8003 for rbridge 1
(config-rb)#exit	Exit rbridge mode

Validation

Checking Nickname Collision on RBridge1

```
#show trill nicknamedatabase
TRILL Nickname Database
RBridge Instance 1:
Nickname   SystemID        Priority  Root_Priority   Status
Self Nickname List:
8001       AAAA.AAAA.AAAA      128           8001    Active
c8b7*      AAAA.AAAA.AAAA       64          32768    NotActive

Nickname Database:
8001       AAAA.AAAA.AAAA      128           8001    Active
8002       BBBB.BBBB.BBBB        128           8002    Active
8003      CCCC.CCCC.CCCC       128          8003    Active
c8b7*      AAAA.AAAA.AAAA       64          32768    NotActive
```

Checking Nickname Collision on RBridge2

```
#show trill nicknamedatabase
TRILL Nickname Database
RBridge Instance 1:
Nickname   SystemID        Priority  Root_Priority   Status
Self Nickname List:
8002       BBBB.BBBB.BBBB      128           8002    Active
9475*      BBBB.BBBB.BBBB       64          32768    NotActive

Nickname Database:
8001       AAAA.AAAA.AAAA      128           8001    Active
8002       BBBB.BBBB.BBBB        128           8002    Active
8003      CCCC.CCCC.CCCC       128          8003    Active
9475*      BBBB.BBBB.BBBB       64          32768    NotActive
```

Checking Nickname Collision on RBridge3

```
#show trill nicknamedatabase
TRILL Nickname Database
RBridge Instance 1:
Nickname   SystemID        Priority  Root_Priority   Status
Self Nickname List:
```

```
8003       CCCC.CCCC.CCCC      130           8003    Active
3ef1*      CCCC.CCCC.CCCC       64          32768    NotActive

Nickname Database:
8001       AAAA.AAAA.AAAA      128           8001    Active
8002       BBBB.BBBB.BBBB         128           8002    Active
8003      CCCC.CCCC.CCCC       128           8003    Active
3ef1      CCCC.CCCC.CCCC       64          32768    NotActive
```

Nickname Collision Configuration

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#exit`	Exit interface mode.
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
`(config-rb)#nickname 8001 nickname-priority 130 root-priority 8001`	Configure nickname 8001 with nickname priority 130 and root priority 8001 for rbridge 1
`(config-rb)#exit`	Exit rbridge mode

RBridge2

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.

(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#exit	Exit rbridge mode

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8002 nickname-priority 128 root-priority 8002	Configure nickname 8002 with nickname priority 128 and root priority 8002 for rbridge 1
(config-rb)#exit	Exit rbridge mode

Validation

RBridge1

```
#show trill nicknamedatabase
TRILL Nickname Database
RBridge Instance 1:
Nickname   SystemID        Priority  Root_Priority   Status
Self Nickname List:
8001       AAAA.AAAA.AAAA      130           8001    Active
```

```
c8b7*      AAAA.AAAA.AAAA       64          32768    NotActive

Nickname Database:
8001       AAAA.AAAA.AAAA      130           8001    Active
9475*       BBBB.BBBB.BBBB         128           8002    Active
8002      CCCC.CCCC.CCCC       128          32768    Active
c8b7*      AAAA.AAAA.AAAA       64          32768    NotActive
```

RBridge2

```
#show trill nicknamedatabase
TRILL Nickname Database
RBridge Instance 1:
Nickname   SystemID        Priority  Root_Priority   Status
Self Nickname List:
8001       BBBB.BBBB.BBBB      128           8002    Collision
9475*      BBBB.BBBB.BBBB       64          32768    Active

Nickname Database:
8001       AAAA.AAAA.AAAA      130           8001    Active
9475*       BBBB.BBBB.BBBB         128           8002    Active
8002      CCCC.CCCC.CCCC       128          32768    Active
```

RBridge3

```
#show trill nicknamedatabase
TRILL Nickname Database
RBridge Instance 1:
Nickname   SystemID        Priority  Root_Priority   Status
Self Nickname List:
8002       CCCC.CCCC.CCCC      130           8002    Active
3ef1*      CCCC.CCCC.CCCC       64          32768    NotActive

Nickname Database:
8001       AAAA.AAAA.AAAA      130           8001    Active
9475*       BBBB.BBBB.BBBB         128           8002    Active
8002      CCCC.CCCC.CCCC       128          32768    Active
3ef1      CCCC.CCCC.CCCC       64          32768    NotActive
```

Topology

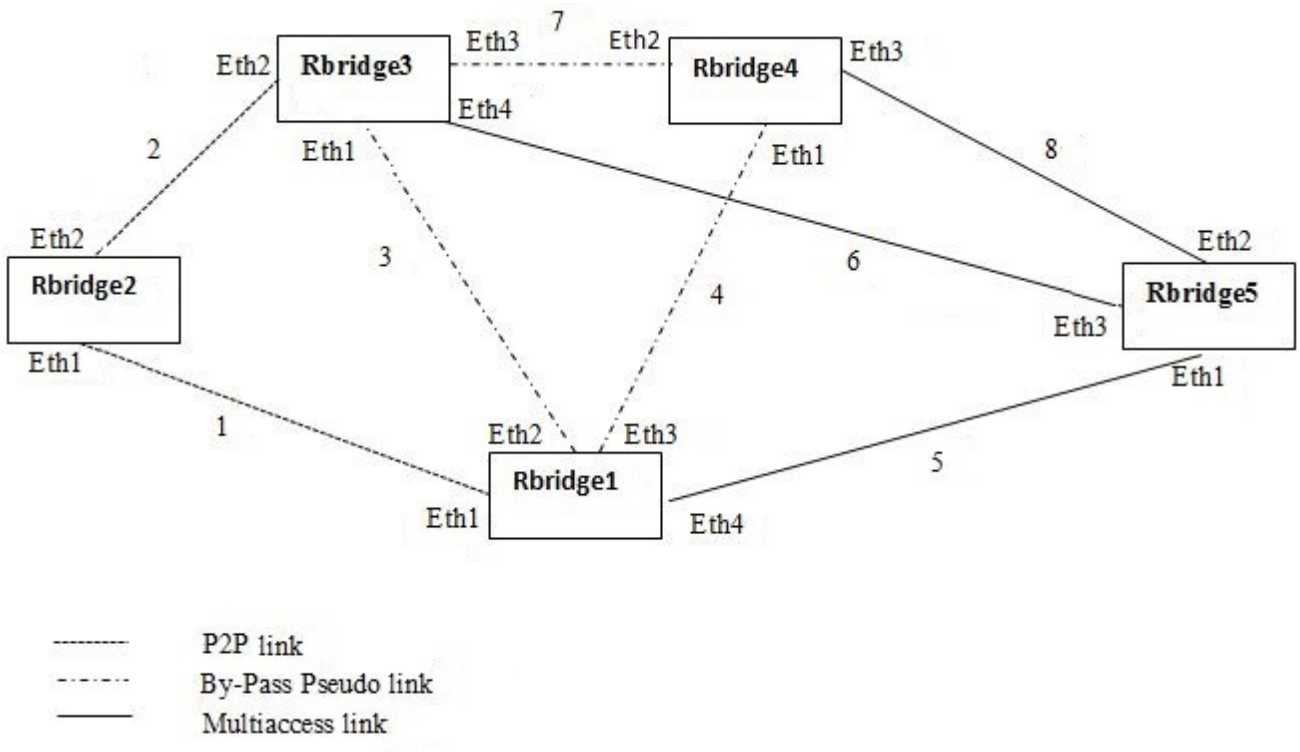

Figure 4-1: LSP Check

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure the system identifier
`(config-rb)#nickname 8005 nickname-priority 128 root-priority 8005`	Configure nickname 8005 with nickname priority 128 and root priority 8005 for rbridge 1
`(config-rb)#number-of-dtrees-to-compute 5`	Configure number of dtree nicknames to compute to 5

(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type point-to-point	Associate the interface eth1 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill pseudonode enable	Enable bypass pseudonode
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk

(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth4	Specify the interface (eth4)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth4 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth4 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth4 with trill instance 1.
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth4 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth4 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth4 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure the system identifier
(config-rb)#nickname 8004 nickname-priority 128 root-priority 8004	Configure nickname 8004 with nickname priority 128 and root priority 8004 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port

(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type point-to-point	Associate the interface eth1 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type point-to-point	Associate the interface eth2 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure the system identifier
(config-rb)#nickname 8003 nickname-priority 128 root-priority 8003	Configure nickname 8003 with nickname priority 128 and root priority 8003 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode

(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth1 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth1 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth1 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type point-to-point	Associate the interface eth2 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#trill-isis port-priority 100	trill-isis port-priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth4	Specify the interface (eth4)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth4 as a Layer 2 port

(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth4 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth4 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth4 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth4 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth4 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge4

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid DD:DD:DD:DD:DD:DD	Configure the system identifier
(config-rb)#nickname 8002 nickname-priority 128 root-priority 8002	Configure nickname 8002 with nickname priority 128 and root priority 8002 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.

(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth1 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth1 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth1 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge5

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table

(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid EE:EE:EE:EE:EE:EE	Configure the system identifier
(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge

(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

Validation

List LSPs

```
#show trill  detail
TRILL Link State Database
RBridge Instance 1:
LSP_ID                 LSP_Seq_Num    LSP_Checksum        LSP_Holdtime
AAAA.AAAA.AAAA.00-00*  0x00000013      0xE9CE               851
AAAA.AAAA.AAAA.04-00*  0x0000000F      0x35F0               833
BBBB.BBBB.BBBB.00-00   0x000000EB      0xAA81               748
CCCC.CCCC.CCCC.00-00   0x00000081      0x1FEE               702
DDDD.DDDD.DDDD.00-00   0x00000261      0x8F04               806
DDDD.DDDD.DDDD.03-00   0x00000169      0xB7AD               867
EEEE.EEEE.EEEE.00-00   0x0000015A      0xE5C5               816
EEEE.EEEE.EEEE.03-00   0x000000CE      0x56AA               530
```

Show Content of LSPs

```
#show trill  detail lsp
TRILL Link State Database
RBridge Instance 1:
LSP_ID                 LSP_Seq_Num    LSP_Checksum        LSP_Holdtime
AAAA.AAAA.AAAA.00-00*  0x00000013      0xE9CE               814
Extended IS Reachability TLV:
  Metric:   10            IS-Extended DDDD.DDDD.DDDD.00
  Metric:   10            IS-Extended AAAA.AAAA.AAAA.04
  Metric:   10            IS-Extended CCCC.CCCC.CCCC.00
  Metric:   10            IS-Extended BBBB.BBBB.BBBB.00

Router Capabaility TLV:
Trill Version  =  1

Nickname sub-TLV:
Nickname   Priority   Root_Priority
8005       128         8005

Tree sub-TLV:
```

```
Number_of_trees_to_compute  =  5
Max_trees_able_to_compute  =  8
Number_of_trees_to_use  =  5


AAAA.AAAA.AAAA.04-00*  0x0000000F      0x35F0              796
Extended IS Reachability TLV:
  Metric:   0             IS-Extended AAAA.AAAA.AAAA.00
  Metric:   0             IS-Extended EEEE.EEEE.EEEE.00



BBBB.BBBB.BBBB.00-00   0x000000EB      0xAA81              711
Extended IS Reachability TLV:
  Metric:   10            IS-Extended AAAA.AAAA.AAAA.00
  Metric:   10            IS-Extended CCCC.CCCC.CCCC.00

Router Capabaility TLV:
Trill Version  =  1

Nickname sub-TLV:
Nickname   Priority   Root_Priority
8004       128         8004

Tree sub-TLV:
Number_of_trees_to_compute  =  1
Max_trees_able_to_compute  =  8
Number_of_trees_to_use  =  1


CCCC.CCCC.CCCC.00-00   0x00000081      0x1FEE              665
Extended IS Reachability TLV:
  Metric:   10            IS-Extended AAAA.AAAA.AAAA.00
  Metric:   10            IS-Extended BBBB.BBBB.BBBB.00
  Metric:   10            IS-Extended DDDD.DDDD.DDDD.00
  Metric:   10            IS-Extended EEEE.EEEE.EEEE.03

Router Capabaility TLV:
Trill Version  =  1

Nickname sub-TLV:
Nickname   Priority   Root_Priority
8003       128         8003

Tree sub-TLV:
Number_of_trees_to_compute  =  1
Max_trees_able_to_compute  =  8
Number_of_trees_to_use  =  1


DDDD.DDDD.DDDD.00-00   0x00000261      0x8F04              769
Extended IS Reachability TLV:
  Metric:   10            IS-Extended DDDD.DDDD.DDDD.03
  Metric:   10            IS-Extended AAAA.AAAA.AAAA.00
  Metric:   10            IS-Extended CCCC.CCCC.CCCC.00

Router Capabaility TLV:
```

```
Trill Version  =  1

Nickname sub-TLV:
Nickname   Priority   Root_Priority
8002       128         8002

Tree sub-TLV:
Number_of_trees_to_compute  =  1
Max_trees_able_to_compute  =  8
Number_of_trees_to_use  =  1


DDDD.DDDD.DDDD.03-00   0x00000169      0xB7AD              830
Extended IS Reachability TLV:
  Metric:   0             IS-Extended DDDD.DDDD.DDDD.00
  Metric:   0             IS-Extended EEEE.EEEE.EEEE.00



EEEE.EEEE.EEEE.00-00   0x0000015A      0xE5C5              778
Extended IS Reachability TLV:
  Metric:   16777214      IS-Extended DDDD.DDDD.DDDD.03
  Metric:   10            IS-Extended AAAA.AAAA.AAAA.04
  Metric:   10            IS-Extended EEEE.EEEE.EEEE.03

Router Capabaility TLV:
Trill Version  =  1

Nickname sub-TLV:
Nickname   Priority   Root_Priority
8001       128         8001

Tree sub-TLV:
Number_of_trees_to_compute  =  1
Max_trees_able_to_compute  =  8
Number_of_trees_to_use  =  1


EEEE.EEEE.EEEE.03-00   0x000000CE      0x56AA              492
Extended IS Reachability TLV:
  Metric:   0             IS-Extended EEEE.EEEE.EEEE.00
  Metric:   0             IS-Extended CCCC.CCCC.CCCC.00
```

Topology

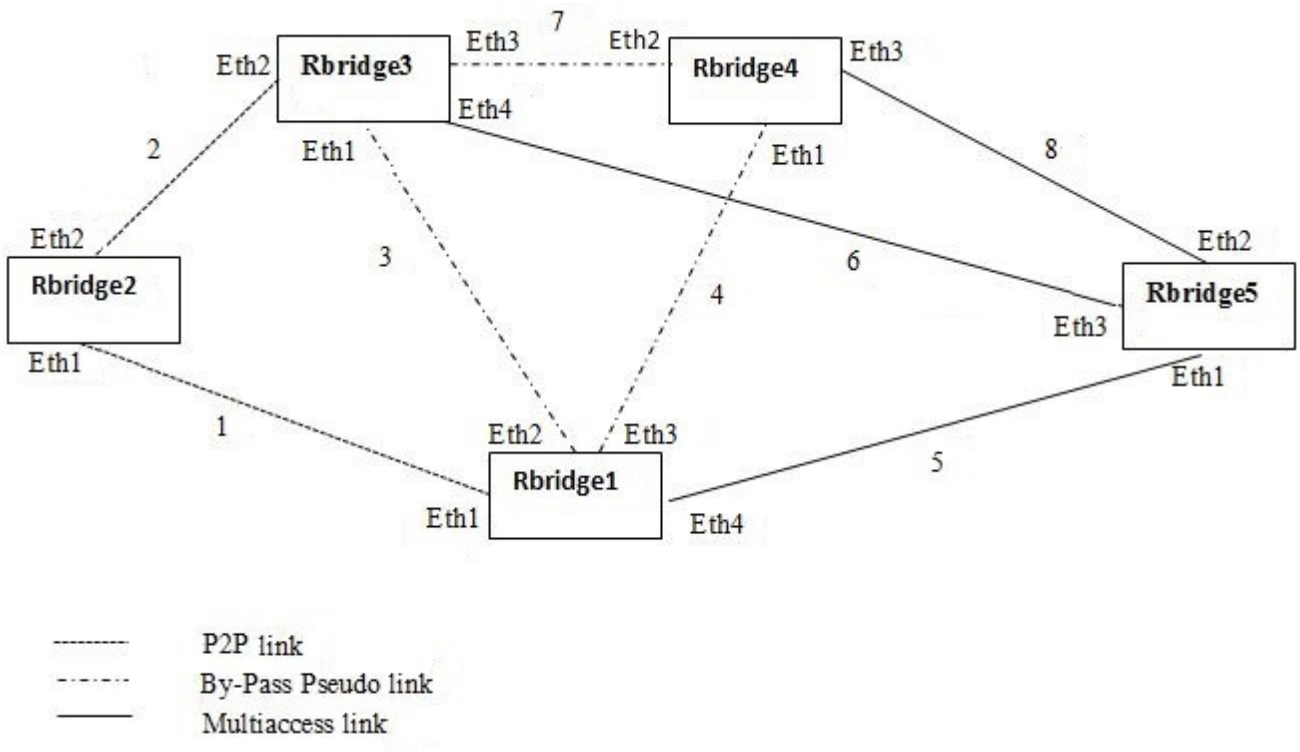

Figure 5-1: Topology Check

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure the system identifier
`(config-rb)#nickname 8005 nickname-priority 128 root-priority 8005`	Configure nickname 8005 with nickname priority 128 and root priority 8005 for rbridge 1
`(config-rb)#number-of-dtrees-to-compute 5`	Configure number of dtree nicknames to compute to 5

(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type point-to-point	Associate the interface eth1 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill pseudonode enable	Enable bypass pseudonode
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk

(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth4	Specify the interface (eth4)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth4 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth4 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth4 with trill instance 1.
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth4 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth4 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth4 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure the system identifier
(config-rb)#nickname 8004 nickname-priority 128 root-priority 8004	Configure nickname 8004 with nickname priority 128 and root priority 8004 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port

(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type point-to-point	Associate the interface eth1 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type point-to-point	Associate the interface eth2 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure the system identifier
(config-rb)#nickname 8003 nickname-priority 128 root-priority 8003	Configure nickname 8003 with nickname priority 128 and root priority 8003 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode

(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth1 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth1 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth1 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type point-to-point	Associate the interface eth2 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#trill-isis port-priority 100	trill-isis port-priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth4	Specify the interface (eth4)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth4 as a Layer 2 port

(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth4 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth4 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth4 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth4 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth4 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge4

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid DD:DD:DD:DD:DD:DD	Configure the system identifier
(config-rb)#nickname 8002 nickname-priority 128 root-priority 8002	Configure nickname 8002 with nickname priority 128 and root priority 8002 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.

(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth1 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth1 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth1 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge5

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table

(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid EE:EE:EE:EE:EE:EE	Configure the system identifier
(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge

(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

Validation

RBridge1

```
#show trill topology

RBridge Instance 1:
TRILL paths to Campus Wide Rbridges
System Id            Metric     Next-Hop             Interface   SNPA
AAAA.AAAA.AAAA       --
BBBB.BBBB.BBBB       10         BBBB.BBBB.BBBB       eth1        5254.00d5.deae
CCCC.CCCC.CCCC       10         CCCC.CCCC.CCCC       eth2        5254.001a.e361
DDDD.DDDD.DDDD    10         DDDD.DDDD.DDDD       eth3        5254.00bd.bb74
EEEE.EEEE.EEEE          10         EEEE.EEEE.EEEE       eth4        5254.0095.e24a
```

RBridge2

```
#show trill  topology
RBridge Instance 1:
TRILL paths to Campus Wide Rbridges
System Id            Metric     Next-Hop             Interface   SNPA
AAAA.AAAA.AAAA       10         AAAA.AAAA.AAAA       eth1        5254.002a.5962
BBBB.BBBB.BBBB       --
CCCC.CCCC.CCCC         10         CCCC.CCCC.CCCC       eth2        5254.006e.54d7
DDDD.DDDD.DDDD       20         AAAA.AAAA.AAAA       eth1        5254.002a.5962
                                                    CCCC.CCCC.CCCC       eth2
5254.006e.54d7
EEEE.EEEE.EEEE       20         CCCC.CCCC.CCCC       eth2        5254.006e.54d7
                                                    AAAA.AAAA.AAAA       eth1
5254.002a.5962
```

RBridge3

```
#show trill  topology
RBridge Instance 1:
```

```
TRILL paths to Campus Wide Rbridges
System Id            Metric     Next-Hop             Interface   SNPA
AAAA.AAAA.AAAA       10         AAAA.AAAA.AAAA       eth1        5254.0092.fb0c
BBBB.BBBB.BBBB          10         BBBB.BBBB.BBBB         eth2        5254.00f9.2b3d
CCCC.CCCC.CCCC           --
DDDD.DDDD.DDDD       10         DDDD.DDDD.DDDD       eth3        5254.00bd.bb74
EEEE.EEEE.EEEE            10         EEEE.EEEE.EEEE          eth4        5254.00c9.4bdf
```

RBridge4

```
#show trill  topology
RBridge Instance 1:
TRILL paths to Campus Wide Rbridges
System Id            Metric     Next-Hop             Interface   SNPA
AAAA.AAAA.AAAA       10         AAAA.AAAA.AAAA       eth1        5254.0039.0d41
BBBB.BBBB.BBBB          20         AAAA.AAAA.AAAA       eth1        5254.0039.0d41
                                                     CCCC.CCCC.CCCC       eth2
5254.001d.4c7a
CCCC.CCCC.CCCC        10            CCCC.CCCC.CCCC       eth2        5254.001d.4c7a
DDDD.DDDD.DDDD       --
EEEE.EEEE.EEEE            10         EEEE.EEEE.EEEE       eth3        5254.00bd.caf9
```

RBridge5

```
#show trill  topology
RBridge Instance 1:
TRILL paths to Campus Wide Rbridges
System Id            Metric     Next-Hop             Interface   SNPA
AAAA.AAAA.AAAA       10         AAAA.AAAA.AAAA       eth1        5254.0000.63ab
BBBB.BBBB.BBBB       20         CCCC.CCCC.CCCC       eth3        5254.006b.345b
                                AAAA.AAAA.AAAA       eth1        5254.0000.63ab
CCCC.CCCC.CCCC       10         CCCC.CCCC.CCCC       eth3        5254.006b.345b
DDDD.DDDD.DDDD       20         CCCC.CCCC.CCCC       eth3        5254.006b.345b
                                AAAA.AAAA.AAAA       eth1        5254.0000.63ab
EEEE.EEEE.EEEE       --
```

Topology

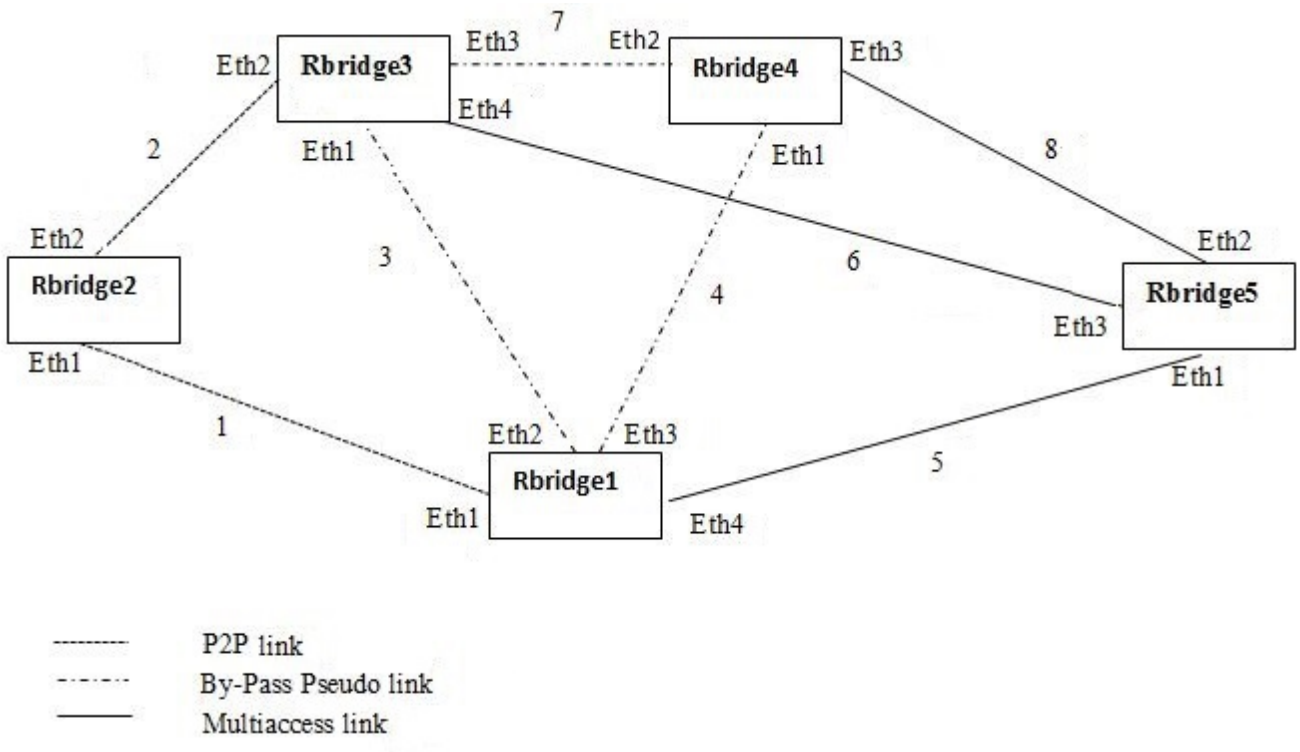

Figure 6-1: Dtree Check

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure the system identifier
`(config-rb)#nickname 8005 nickname-priority 128 root-priority 8005`	Configure nickname 8005 with nickname priority 128 and root priority 8005 for rbridge 1
`(config-rb)#number-of-dtrees-to-compute 5`	Configure number of dtree nicknames to compute to 5

(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type point-to-point	Associate the interface eth1 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill pseudonode enable	Enable bypass pseudonode
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk

(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth4	Specify the interface (eth4)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth4 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth4 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth4 with trill instance 1.
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth4 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth4 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth4 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure the system identifier
(config-rb)#nickname 8004 nickname-priority 128 root-priority 8004	Configure nickname 8004 with nickname priority 128 and root priority 8004 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port

(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type point-to-point	Associate the interface eth1 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type point-to-point	Associate the interface eth2 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure the system identifier
(config-rb)#nickname 8003 nickname-priority 128 root-priority 8003	Configure nickname 8003 with nickname priority 128 and root priority 8003 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config-vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode

(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth1 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth1 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth1 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type point-to-point	Associate the interface eth2 to trill link-type as point-to-point
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#trill-isis port-priority 100	trill-isis port-priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth4	Specify the interface (eth4)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth4 as a Layer 2 port

(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth4 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth4 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth4 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth4 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth4 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge4

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid DD:DD:DD:DD:DD:DD	Configure the system identifier
(config-rb)#nickname 8002 nickname-priority 128 root-priority 8002	Configure nickname 8002 with nickname priority 128 and root priority 8002 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enabl	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.

(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth1 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth1 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth1 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill pseudonode enable	To enable bypass pseudonode
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

RBridge5

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table

(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid EE:EE:EE:EE:EE:EE	Configure the system identifier
(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth2 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Enter interface mode
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge

(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill-isis port-priority 100	Configure interface with port priority 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth3 with vlan 2,3,4,5
(config-if)#trill announcing-vlan [1-5]	Associate the interface eth3 with announcing vlan 1,2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth3 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

Validation

RBridge1

```
#show trill  fdb
RBridge Instance 1:
TRILL Unicast Forwarding Database
Eg_Nick  Eg_SysId        Metric  HopCnt  NH_Nick  NH_SysId        Interface SNPA
8001     EEEE.EEEE.EEEE  0010    001     8001     EEEE.EEEE.EEEE  eth4
5254.0095.e24a
8002     DDDD.DDDD.DDDD  0010    001     8002     DDDD.DDDD.DDDD  eth3
5254.00bd.bb74
8003     CCCC.CCCC.CCCC  0010    001     8003     CCCC.CCCC.CCCC  eth2
5254.001a.e361
8004     BBBB.BBBB.BBBB  0010    001     8004     BBBB.BBBB.BBBB  eth1
5254.00d5.deae

RBridge Instance 1:
TRILL Multicast Forwarding Database
Highest tree root priority Rbridge is 0x8005. LSP ID is AAAA.AAAA.AAAA.00-00
Dtree-number D-Tree_Name D-tree-system-id   Hop-count
 04                            8001        EEEE.EEEE.EEEE     004
Adj_Nickname   Adj_System_id        Interface  SNPA
8001           EEEE.EEEE.EEEE       eth4       5254.0095.e24a
8004           BBBB.BBBB.BBBB       eth1       5254.00d5.deae
8002           DDDD.DDDD.DDDD       eth3       5254.00bd.bb74

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
03                           8002        DDDD.DDDD.DDDD     004
Adj_Nickname   Adj_System_id        Interface  SNPA
8002           DDDD.DDDD.DDDD       eth3       5254.00bd.bb74
8004           BBBB.BBBB.BBBB       eth1       5254.00d5.deae

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
02                             8003        CCCC.CCCC.CCCC     002
Adj_Nickname   Adj_System_id        Interface  SNPA
```

```
8003           CCCC.CCCC.CCCC       eth2       5254.001a.e361

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
01                           8004        BBBB.BBBB.BBBB     004
Adj_Nickname   Adj_System_id        Interface  SNPA
8004           BBBB.BBBB.BBBB       eth1       5254.00d5.deae
8002           DDDD.DDDD.DDDD       eth3       5254.00bd.bb74

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
00                        8005        AAAA.AAAA.AAAA     001
Adj_Nickname   Adj_System_id        Interface  SNPA
8001           EEEE.EEEE.EEEE       eth4       5254.0095.e24a
8002           DDDD.DDDD.DDDD       eth3       5254.00bd.bb74
8003           CCCC.CCCC.CCCC       eth2       5254.001a.e361
8004           BBBB.BBBB.BBBB       eth1       5254.00d5.deae
```

RBridge2

```
#show trill  fdb
RBridge Instance 1:
TRILL Unicast Forwarding Database
Eg_Nick  Eg_SysId        Metric  HopCnt  NH_Nick  NH_SysId        Interface SNPA
8001     EEEE.EEEE.EEEE  0020    002     8003     CCCC.CCCC.CCCC  eth2
5254.006e.54d7
                                         8005     AAAA.AAAA.AAAA  eth1      5254.002a.5962
8002     DDDD.DDDD.DDDD  0020    002     8005     AAAA.AAAA.AAAA  eth1
5254.002a.5962
                                         8003     CCCC.CCCC.CCCC  eth2      5254.006e.54d7
8003     CCCC.CCCC.CCCC  0010    001     8003     CCCC.CCCC.CCCC  eth2
5254.006e.54d7
8005     AAAA.AAAA.AAAA  0010    001     8005     AAAA.AAAA.AAAA  eth1
5254.002a.5962


RBridge Instance 1:
TRILL Multicast Forwarding Database
Highest tree root priority Rbridge is 0x8005. LSP ID is AAAA.AAAA.AAAA.00-00
Dtree-number D-Tree_Name D-tree-system-id   Hop-count
04                               8001        EEEE.EEEE.EEEE     004
Adj_Nickname   Adj_System_id        Interface  SNPA
8005           AAAA.AAAA.AAAA       eth1       5254.002a.5962

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
03                                8002        DDDD.DDDD.DDDD     004
Adj_Nickname   Adj_System_id        Interface  SNPA
8005           AAAA.AAAA.AAAA       eth1       5254.002a.5962

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
02                                8003        CCCC.CCCC.CCCC     002
Adj_Nickname   Adj_System_id        Interface  SNPA
8003           CCCC.CCCC.CCCC       eth2       5254.006e.54d7
```

```
Dtree-number D-Tree_Name D-tree-system-id   Hop-count
01                     8004        BBBB.BBBB.BBBB     002
Adj_Nickname   Adj_System_id        Interface  SNPA
8005           AAAA.AAAA.AAAA       eth1       5254.002a.5962
8003           CCCC.CCCC.CCCC       eth2       5254.006e.54d7

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
00                              8005        AAAA.AAAA.AAAA     002
Adj_Nickname   Adj_System_id        Interface  SNPA
8005           AAAA.AAAA.AAAA       eth1       5254.002a.59
```

RBridge3

```
#show trill  fdb
RBridge Instance 1:
TRILL Unicast Forwarding Database
Eg_Nick  Eg_SysId        Metric  HopCnt  NH_Nick  NH_SysId        Interface SNPA
8001     EEEE.EEEE.EEEE  0010    001     8001     EEEE.EEEE.EEEE  eth4
5254.00c9.4bdf
8002     DDDD.DDDD.DDDD  0010    001     8002     DDDD.DDDD.DDDD  eth3
5254.00bd.bb74
8004     BBBB.BBBB.BBBB  0010    001     8004     BBBB.BBBB.BBBB  eth2
5254.00f9.2b3d
8005     AAAA.AAAA.AAAA  0010    001     8005     AAAA.AAAA.AAAA  eth1
5254.0092.fb0c


RBridge Instance 1:
TRILL Multicast Forwarding Database
Highest tree root priority Rbridge is 0x8005. LSP ID is AAAA.AAAA.AAAA.00-00
Dtree-number D-Tree_Name D-tree-system-id   Hop-count
04                              8001        EEEE.EEEE.EEEE     004
Adj_Nickname   Adj_System_id        Interface  SNPA
8001           EEEE.EEEE.EEEE       eth4       5254.00c9.4bdf

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
03                              8002        DDDD.DDDD.DDDD     004
Adj_Nickname   Adj_System_id        Interface  SNPA
8002           DDDD.DDDD.DDDD       eth3       5254.00bd.bb74

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
02                              8003        CCCC.CCCC.CCCC     001
Adj_Nickname   Adj_System_id        Interface  SNPA
8001           EEEE.EEEE.EEEE       eth4       5254.00c9.4bdf
8005           AAAA.AAAA.AAAA       eth1       5254.0092.fb0c
8004           BBBB.BBBB.BBBB       eth2       5254.00f9.2b3d
8002           DDDD.DDDD.DDDD       eth3       5254.00bd.bb74

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
01                              8004        BBBB.BBBB.BBBB     004
```

```
Adj_Nickname   Adj_System_id        Interface  SNPA
8004           BBBB.BBBB.BBBB       eth2       5254.00f9.2b3d
8001           EEEE.EEEE.EEEE       eth4       5254.00c9.4bdf

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
00                              8005        AAAA.AAAA.AAAA     002
Adj_Nickname   Adj_System_id        Interface  SNPA
8005           AAAA.AAAA.AAAA       eth1       5254.0092.fb0c
```

RBridge4

```
#show trill fdb
RBridge Instance 1:
TRILL Unicast Forwarding Database
Eg_Nick  Eg_SysId        Metric  HopCnt  NH_Nick  NH_SysId        Interface SNPA
8001     EEEE.EEEE.EEEE  0010    001     8001     EEEE.EEEE.EEEE  eth3
5254.00bd.caf9
8003     CCCC.CCCC.CCCC  0010    001     8003     CCCC.CCCC.CCCC  eth2
5254.001d.4c7a
8004     BBBB.BBBB.BBBB  0020    002     8005     AAAA.AAAA.AAAA  eth1
5254.0039.0d41
                                        8003     CCCC.CCCC.CCCC  eth2      5254.001d.4c7a
8005     AAAA.AAAA.AAAA  0010    001     8005     AAAA.AAAA.AAAA  eth1
5254.0039.0d41


RBridge Instance 1:
TRILL Multicast Forwarding Database
Highest tree root priority Rbridge is 0x8005. LSP ID is AAAA.AAAA.AAAA.00-00
Dtree-number D-Tree_Name D-tree-system-id   Hop-count
04                              8001        EEEE.EEEE.EEEE     004
Adj_Nickname   Adj_System_id        Interface  SNPA
8005           AAAA.AAAA.AAAA       eth1       5254.0039.0d41

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
03                              8002        DDDD.DDDD.DDDD     002
Adj_Nickname   Adj_System_id        Interface  SNPA
8001           EEEE.EEEE.EEEE       eth3       5254.00bd.caf9
8005           AAAA.AAAA.AAAA       eth1       5254.0039.0d41
8003           CCCC.CCCC.CCCC       eth2       5254.001d.4c7a

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
02                              8003        CCCC.CCCC.CCCC     002
Adj_Nickname   Adj_System_id        Interface  SNPA
8003           CCCC.CCCC.CCCC       eth2       5254.001d.4c7a

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
01                              8004        BBBB.BBBB.BBBB     004
Adj_Nickname   Adj_System_id        Interface  SNPA
8005           AAAA.AAAA.AAAA       eth1       5254.0039.0d41
```

```
Dtree-number D-Tree_Name D-tree-system-id   Hop-count
00                               8005        AAAA.AAAA.AAAA     002
Adj_Nickname   Adj_System_id        Interface  SNPA
8005           AAAA.AAAA.AAAA       eth1       5254.0039.0d41
```

RBridge5

```
#show trill  fdb
RBridge Instance 1:
TRILL Unicast Forwarding Database
Eg_Nick  Eg_SysId        Metric  HopCnt  NH_Nick  NH_SysId        Interface SNPA
8002     DDDD.DDDD.DDDD  0020    002     8003     CCCC.CCCC.CCCC  eth3
5254.006b.345b
                                        8005     AAAA.AAAA.AAAA  eth1      5254.0000.63ab
8003     CCCC.CCCC.CCCC  0010    001     8003     CCCC.CCCC.CCCC  eth3
5254.006b.345b
8004     BBBB.BBBB.BBBB  0020    002     8003     CCCC.CCCC.CCCC  eth3
5254.006b.345b
                                        8005     AAAA.AAAA.AAAA  eth1      5254.0000.63ab
8005     AAAA.AAAA.AAAA  0010    001     8005     AAAA.AAAA.AAAA  eth1
5254.0000.63ab


RBridge Instance 1:
TRILL Multicast Forwarding Database
Highest tree root priority Rbridge is 0x8005. LSP ID is AAAA.AAAA.AAAA.00-00
Dtree-number D-Tree_Name D-tree-system-id   Hop-count
04                               8001        EEEE.EEEE.EEEE     002
Adj_Nickname   Adj_System_id        Interface  SNPA
8003           CCCC.CCCC.CCCC       eth3       5254.006b.345b
8005           AAAA.AAAA.AAAA       eth1       5254.0000.63ab

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
03                               8002        DDDD.DDDD.DDDD     004
Adj_Nickname   Adj_System_id        Interface  SNPA
8003           DDDD.DDDD.DDDD       eth2       5254.00db.19a8

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
02                               8003        CCCC.CCCC.CCCC     002
Adj_Nickname   Adj_System_id        Interface  SNPA
8003           CCCC.CCCC.CCCC       eth3       5254.006b.345b

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
01                               8004        BBBB.BBBB.BBBB     004
Adj_Nickname   Adj_System_id        Interface  SNPA
8003           CCCC.CCCC.CCCC       eth3       5254.006b.345b

Dtree-number D-Tree_Name D-tree-system-id   Hop-count
00                               8005        AAAA.AAAA.AAAA     002
Adj_Nickname   Adj_System_id        Interface  SNPA
8005           AAAA.AAAA.AAAA       eth1       5254.0000.63ab
```

CHAPTER 7 BPDU handling

TRILL supports backwardly compatible with existing IEEE 802.1 devices like hubs and bridges. This chapter shows the configuration required for TRILL Rbridges to handle BPDUs of intermediate bridges.

Topology

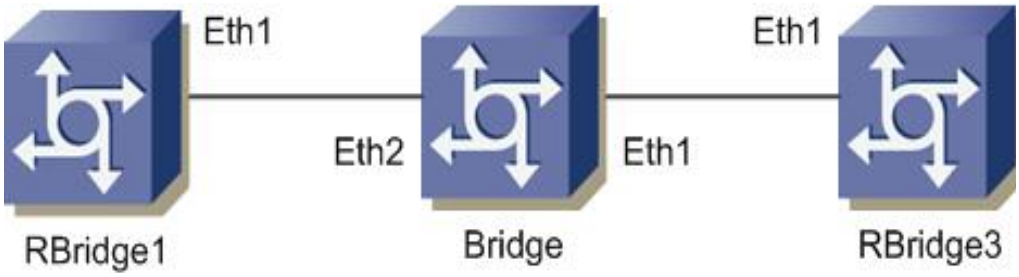

Figure 7-1: TRILL BPDU handling

The configuration assumes that you running the `trilld`, `nsm`, and `imi` daemons on Rbridges and `mstpd`, `nsm`, and `imi` daemons on bridges. Normal STP/RSTP/MSTP configuration are done on intermediate bridges.

Note: For ZebOS-XP bridging commands, see the *Layer 2 Command Reference*.

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#mtu-probe enable`	Enable MTU probe option on Rbridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system identifier for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#trill link-type broadcast`	Associate the interface eth1 to trill link-type as broadcast

`(config-if)#trill bpdu-handling enable`	Enable BPDU handling on interface
`(config-if)#exit`	Exit interface mode.

RBridge3

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid BB:BB:BB:BB:BB:BB`	Configure system identifier for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#interface eth1`	Enter interface mode
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#trill link-type broadcast`	Associate the interface eth1 to trill link-type as broadcast
`(config-if)#trill-isis port-priority 100`	Configure port priority of interface to 100
`(config-if)#trill bpdu-handling enable`	Enable BPDU handling on interface
`(config-if)#exit`	Exit interface mode.

Bridge

`#configure terminal`	Enter configure mode.
`(config)#bridge 1 protocol ieee`	Add a bridge `(1)` to the spanning tree table
`(config)#interface eth1`	Enter interface mode.
`(config-if)#switchport`	Configure `eth1` as a Layer 2 port.
`(config-if)#bridge-group 1`	Associate the interface with bridge group `1`.
`(config-if)#exit`	Exit interface mode.
`(config)#interface eth2`	Enter interface mode.
`(config-if)#switchport`	Configure `eth2` as a Layer 2 port.

(config-if)#bridge-group 1	Associate the interface with bridge group 1.
(config-if)#exit	Exit interface mode.

Validation

RBridge1

```
#show trill interface eth1
eth1 is up, line protocol is up
  Bridge Protocol: TRILL (1)
  Network Type: Broadcast
  Circuit Type: level-1
  Local circuit ID: 0x01
  Extended Local circuit ID: 0x00000003
  Local SNPA: 52:54:00:ac:f0:c2
  Port Priority: 64
  Circuit ID: AAAA.AAAA.AAAA.01
  Number of active level-1 adjacencies: 0
  LSP MTU: 1470
  Next TRILL LAN Level-1 Hello in 887 milliseconds
  Port State  = DRB
  Port Type  = TRUNK
  Inhibition time = 30 sec
  Desired Designated Vlan = 1
  Designated Vlan =  1
  BPDU Handling Enabled = TRUE
  Root Change Inhibition Timer Interval = 30
  Root change inhibition timer running = TRUE
  Root Bridge ID (BPDU) = 5254.00bd.bb74
  Number of TCN BPDU transmitted = 0
  Number of TCN ACK BPDU Recieved = 0
  Vlan Mapping Detected = FALSE
  Bandwidth: 12500000.00 Bytes/sec
  Metric : 200000
                     AF list
---------------------------------------------------------------
  Self                          Vlan
  AAAA.AAAA.AAAA

  Neighbor                      Vlan
```

RBridge3

```
#show trill interface eth1
eth1 is up, line protocol is up
  Bridge Protocol: TRILL (1)
  Network Type: Broadcast
  Circuit Type: level-1
  Local circuit ID: 0x01
  Extended Local circuit ID: 0x00000003
  Local SNPA: 52:54:00:ac:f0:c4
```

```
  Port Priority: 64
  Circuit ID: BBBB.BBBB.BBBB.01
  Number of active level-1 adjacencies: 0
  LSP MTU: 1470
  Next TRILL LAN Level-1 Hello in 887 milliseconds
  Port State  = DRB
  Port Type  = TRUNK
  Inhibition time = 30 sec
  Desired Designated Vlan = 1
  Designated Vlan =  1
  BPDU Handling Enabled = TRUE
  Root Change Inhibition Timer Interval = 30
  Root change inhibition timer running = TRUE
  Root Bridge ID (BPDU) = 5254.00bd.bb74
  Number of TCN BPDU transmitted = 0
  Number of TCN ACK BPDU Recieved = 0
  Vlan Mapping Detected = FALSE
  Bandwidth: 12500000.00 Bytes/sec
  Metric : 200000
                    AF list
-----------------------------------------------------------------
  Self                          Vlan
 BBBB.BBBB.BBBB

  Neighbor                      Vlan
```

CHAPTER 8 Reverse Path Forwarding

Reverse Path Forwarding (RPF) is a technique used by RBridges to avoid temporary multicast loops during topology changes. RPF involves checking that a multidestination frame, based on the tree and the ingress RBridge, arrives from the expected link. RBridges must drop multidestination frames that fail the RPF check.

Topology

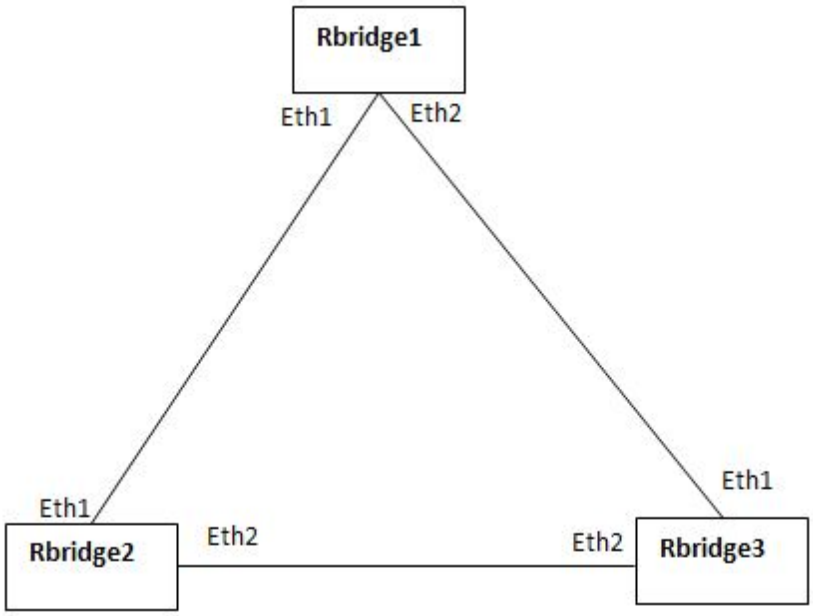

Figure 8-1: Reverse Path Forwarding

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure systemid for rbridge 1
`(config-rb)#max-nickname 5`	Configure the number of nicknames for rbridge 1.
`(config-rb)#nickname 8001 nickname-priority 128 root-priority 801`	Configure nickname 8001 with nickname priority 128 and root priority 801 for rbridge 1

`(config-rb)#nickname 8002 nickname-priority 128 root-priority 802`	Configure nickname 8002 with nickname priority 128 and root priority 802 for rbridge 1
`(config-rb)#nickname 8003 nickname-priority 128 root-priority 803`	Configure nickname 8003 with nickname priority 128 and root priority 803 for rbridge 1
`(config-rb)#number-of-dtrees-to-compute 4`	Configure the number of dtrees to be computed for the campus.
`(config-rb)#exit`	Exit rbridge mode
`(config)#interface eth1`	Enter interface mode
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#exit`	Exit from interface mode
`(config)#interface eth2`	Specify the interface (eth2)to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth2 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface with the TRILL instance
`(config-if)#exit`	Exit from interface mode

RBridge2

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid BB:BB:BB:BB:BB:BB`	Configure systemid for RBridge2
`(config-rb)#nickname 7002 nickname-priority 128 root-priority 702`	Configure nickname 7002 with nickname priority 128 and root priority 702 for RBridge2
`(config-rb)#number-of-dtrees-to-use 2`	Configure the number of dtrees to be used by rbridge2 when it ingresses a multidestination frame.
`(config-rb)#exit`	Exit rbridge mode
`(config)#interface eth1`	Enter interface mode
`(config-if)#switchport`	Configure eth1 as a Layer 2 port

(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit from interface mode
(config)#interface eth2	Specify the interface (eth2)to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#exit	Exit from interface mode

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure systemid for RBridge3
(config-rb)#nickname 6003 nickname-priority 128 root-priority 603	Configure nickname 6003 with nickname priority 128 and root priority 603 for RBridge3
(config-rb)#number-of-dtrees-to-use 3	Configure number of dtrees to 3
(config-rb)#dtree-in-use 8002	Specify dtree 8002 to be used when RB3 ingresses a multidestination frame.
(config-rb)#dtree-in-use 7002	Specify dtree 7002 to be used when RB3 ingresses a multidestinaion frame.
(config-rb)#exit	Exit rbridge mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit from interface mode
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port

(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#exit	Exit from interface mode

Validation

Rbridge1

```
#show trill fdb multicast
RBridge Instance 1:
TRILL Multicast Forwarding Database

Highest tree root priority Rbridge is 0x8003. LSP ID is AAAA.AAAA.AAAA.00-00

D-Tree_Name D-tree-system-id   Hop-count
8001        AAAA.AAAA.AAAA     001
    Adj_Nickname   Adj_System_id        Interface  SNPA
    7002           BBBB.BBBB.BBBB       eth1       5254.0040.6abd


D-Tree_Name D-tree-system-id   Hop-count
7002        BBBB.BBBB.BBBB     002
    Adj_Nickname   Adj_System_id        Interface  SNPA
    7002           BBBB.BBBB.BBBB       eth1       5254.0040.6abd


D-Tree_Name D-tree-system-id   Hop-count
8002        AAAA.AAAA.AAAA     001
    Adj_Nickname   Adj_System_id        Interface  SNPA
    7002           BBBB.BBBB.BBBB       eth1       5254.0040.6abd


D-Tree_Name D-tree-system-id   Hop-count
8003        AAAA.AAAA.AAAA     001        Originating dtree
    Adj_Nickname   Adj_System_id        Interface  SNPA
       BBBB.BBBB.BBBB       eth1       5254.0040.6abd
```

Rbridge2

```
#show trill fdb multicast
RBridge Instance 1:
TRILL Multicast Forwarding Database

Highest tree root priority Rbridge is 0x8003. LSP ID is AAAA.AAAA.AAAA.00-00

D-Tree_Name D-tree-system-id   Hop-count
8001        AAAA.AAAA.AAAA     002
    Adj_Nickname   Adj_System_id        Interface  SNPA
    8003           AAAA.AAAA.AAAA       eth1       5254.0083.33b5
```

```
D-Tree_Name D-tree-system-id   Hop-count
7002        BBBB.BBBB.BBBB     001
    Adj_Nickname   Adj_System_id        Interface  SNPA
    6003           CCCC.CCCC.CCCC       eth2       5254.00d4.3095
    8003           AAAA.AAAA.AAAA       eth1       5254.0083.33b5


D-Tree_Name D-tree-system-id   Hop-count
8002        AAAA.AAAA.AAAA     002
    Adj_Nickname   Adj_System_id        Interface  SNPA
    8003           AAAA.AAAA.AAAA       eth1       5254.0083.33b5


D-Tree_Name D-tree-system-id   Hop-count
8003        AAAA.AAAA.AAAA     002        Originating dtree
    Adj_Nickname   Adj_System_id        Interface  SNPA
       AAAA.AAAA.AAAA       eth1       5254.0083.33b5
```

Rbridge3

```
#show trill fdb multicast

RBridge Instance 1:
TRILL Multicast Forwarding Database

Highest tree root priority Rbridge is 0x8003. LSP ID is AAAA.AAAA.AAAA.00-00

D-Tree_Name D-tree-system-id   Hop-count
8001        AAAA.AAAA.AAAA     002
    Adj_Nickname   Adj_System_id        Interface  SNPA
    8003           AAAA.AAAA.AAAA       eth1       5254.008c.b3b1


D-Tree_Name D-tree-system-id   Hop-count
7002        BBBB.BBBB.BBBB     002
    Adj_Nickname   Adj_System_id        Interface  SNPA
    7002           BBBB.BBBB.BBBB       eth2       5254.00bc.a436


D-Tree_Name D-tree-system-id   Hop-count
8002        AAAA.AAAA.AAAA     002
    Adj_Nickname   Adj_System_id        Interface  SNPA
    8003           AAAA.AAAA.AAAA       eth1       5254.008c.b3b1


D-Tree_Name D-tree-system-id   Hop-count
8003        AAAA.AAAA.AAAA     002        Originating dtree
    Adj_Nickname   Adj_System_id        Interface  SNPA
    8003           AAAA.AAAA.AAAA       eth1       5254.008c.b3b1
```

Rbridge1

```
#show trill rpfinfo
```

```
RBridge Instance 1:
TRILL RPF Table
Dtree_Name  Ingress_Nickname  If_Index  If_Name
7002        6003              0003      eth1

8002        6003              0004      eth2
8002        7002              0003      eth1

8003        6003              0004      eth2
8003        7002              0003      eth1
```

Rbridge2

```
#show trill rpfinfo

RBridge Instance 1:
TRILL RPF Table
Dtree_Name  Ingress_Nickname  If_Index  If_Name
7002        6003              0004      eth2

8002        6003              0003      eth1

8003        8003              0003      eth1
8003        8001              0003      eth1
8003        8002              0003      eth1
8003        6003              0003      eth1
```

Rbridge3

```
#show trill rpfinfo

RBridge Instance 1:
TRILL RPF Table
Dtree_Name  Ingress_Nickname  If_Index  If_Name
8002        7002              0003      eth1

8003        8003              0003      eth1
8003        8001              0003      eth1
8003        8002              0003      eth1
8003        7002              0003      eth1
```

CHAPTER 9 Multicast Pruning

RBridges use distribution trees to forward multi-destination frames. Each distribution tree should be pruned based on IGMP, MLD, and MRD messages, where these are to be delivered only to links with IP multicast routers or to links that have registered listeners, plus links that have IP multicast routers, except for IP multicast addresses that must be broadcast.

Topology

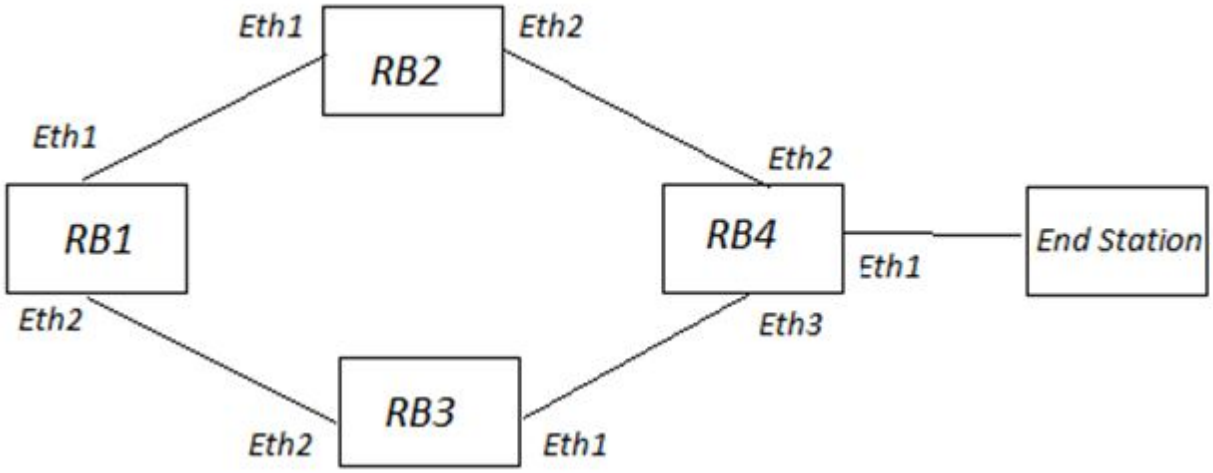

Figure 9-1: Multicast Pruning

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system identifier for rbridge 1
`(config-rb)#max-nickname 3`	Configure maximum nickname
`(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001`	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
`(config-rb)#nickname 8002 nickname-priority 128 root-priority 8002`	Configure nickname 8002 with nickname priority 128 and root priority 8002 for rbridge 1
`(config-rb)#mcast-pruning`	Enable Multicast Pruning on Rbridge1

(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#exit	Exit the VLAN configuration mode and enter Configure mode.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#switchport trunk allowed vlan add all	Associate the interface eth1 with all the vlan
(config-if)#trill-isis port-priority 100	Change interface eth1 port priority to 100
(config-if)#exit	Exit from interface mode
(config)#interface eth2	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add all	Associate the interface eth1 with all the vlan
(config-if)#exit	Exit from interface mode

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure system id for RBridge2
(config-rb)#mcast-pruning	Enable Multicast Pruning on Rbridge2
(config-rb)#nickname 7001 nickname-priority 128 root-priority 7001	Configure nickname 7001 with nickname priority 128 and root priority 7001 for RBridge2
(config-rb)#exit	Exit rbridge mode

(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#exit	Exit the VLAN configuration mode and enter Configure mode.
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add all	Associate the interface eth1 with all vlans
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#switchport trunk allowed vlan add all	Associate the interface eth2 with all vlans
(config-if)#trill-isis port-priority 105	Change interface eth1 port priority to 105
(config-if)#exit	Exit interface mode.

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure system id for RBridge3
(config-rb)#nickname 7002 nickname-priority 128 root-priority 7002	Configure nickname 7002 with nickname priority 128 and root priority 7002 for RBridge3
(config-rb)#mcast-pruning	Enable Multicast Pruning on this Rbridge
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.

(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#exit	Exit the VLAN configuration mode and enter Configure mode.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add all	Associate the interface eth1 with all vlans
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#switchport trunk allowed vlan add all	Associate the interface eth2 with all vlans
(config-if)#exit	Exit interface mode.

RBridge4

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid DD:DD:DD:DD:DD:DD	Configure system id for RBridge3
(config-rb)#nickname 7003 nickname-priority 128 root-priority 7003	Configure nickname 7003 with nickname priority 128 and root priority 7003 for RBridge4
(config-rb)#mcast-pruning	Enable Multicast Pruning on this Rbridge
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#exit	Exit the VLAN configuration mode and enter Configure mode.

(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add all	Associate the interface eth1 with all vlans
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#switchport trunk allowed vlan add all	Associate the interface eth2 with all vlans
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Specify the interface (eth3) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#switchport trunk allowed vlan add all	Associate the interface eth3 with all vlans
(config-if)#exit	Exit interface mode.
(config)#int vlan1.2	Configure vlan interface
(config-if)#igmp snooping	Enable IGMP snooping
(config-if)#exit	Exit interface mode.

Configure an end station so that it sends an IGMP/MLD join message on VLAN 2 to join a particular multicast group.

Validation

RBridge4

```
#show trill pruning multicast
TRILL Link State Database
RBridge Instance 1:
LSP_ID                 LSP_Seq_Num    LSP_Checksum        LSP_Holdtime    OL_Flag
AAAA.AAAA.AAAA.00-00   0x00000007      0x2181              1051              0
```

```
  Extended IS Reachability TLV:
      Metric:   200000        IS-Extended BBBB.BBBB.BBBB.00
      Metric:   200000        IS-Extended CCCC.CCCC.CCCC.00
  Router Capability TLV:
    Trill Version  =  1
    Tree sub-TLV:
        Number_of_trees_to_compute  =  3
        Max_trees_able_to_compute  =  8
        Number_of_trees_to_use  =  1
    Nickname sub-TLV:
        Nickname   Priority   Root_Priority
        8001       128         8001
        8002       128         8002

BBBB.BBBB.BBBB.00-00   0x0000002F      0xA9D6              1050            0
  Extended IS Reachability TLV:
      Metric:   200000        IS-Extended DDDD.DDDD.DDDD.00
      Metric:   200000        IS-Extended AAAA.AAAA.AAAA.00
  Router Capability TLV:
    Trill Version  =  1
    Tree sub-TLV:
        Number_of_trees_to_compute  =  1
        Max_trees_able_to_compute  =  8
        Number_of_trees_to_use  =  1
    Nickname sub-TLV:
        Nickname   Priority   Root_Priority
        7001       128         7001

CCCC.CCCC.CCCC.00-00   0x00000004      0x3D06              1021            0
  Extended IS Reachability TLV:
      Metric:   200000        IS-Extended DDDD.DDDD.DDDD.00
      Metric:   200000        IS-Extended AAAA.AAAA.AAAA.00
  Router Capability TLV:
    Trill Version  =  1
    Tree sub-TLV:
        Number_of_trees_to_compute  =  1
        Max_trees_able_to_compute  =  8
        Number_of_trees_to_use  =  1
    Nickname sub-TLV:
        Nickname   Priority   Root_Priority
        7002       128         7002

DDDD.DDDD.DDDD.00-00*  0x00000008      0x6CED              1194            0
  Extended IS Reachability TLV:
      Metric:   200000        IS-Extended BBBB.BBBB.BBBB.00
      Metric:   200000        IS-Extended CCCC.CCCC.CCCC.00
      Metric:   200000        IS-Extended 1000.0000.0001.00
  Router Capability TLV:
    Trill Version  =  1
```

```
    Tree sub-TLV:
        Number_of_trees_to_compute  =  1
        Max_trees_able_to_compute  =  8
        Number_of_trees_to_use  =  1
    Nickname sub-TLV:
        Nickname   Priority   Root_Priority
        7003       128         7003

    Group Address TLV:
    Group MAC Address sub-TLV:
        Multicast_MAC       VLAN
        01:00:5e:01:01:02     2
```

RBridge1

```
#show trill pruning multicast
RBridge Instance : 1
    Multicast Pruning Information for All D-Trees
        D-Tree    VLANID    Multicast-MAC        Port_List
        7003        2       01:00:5e:01:01:02    eth2

        D-Tree    VLANID    Multicast-MAC        Port_List
        8001        2       01:00:5e:01:01:02    eth1

        D-Tree    VLANID    Multicast-MAC        Port_List
        8002        2       01:00:5e:01:01:02    eth2
```

RBridge2

```
#show trill pruning multicast
RBridge Instance : 1
    Multicast Pruning Information for All D-Trees
        D-Tree    VLANID    Multicast-MAC        Port_List
        7003        2       01:00:5e:01:01:02    eth2

        D-Tree    VLANID    Multicast-MAC        Port_List
        8001        2       01:00:5e:01:01:02    eth2

        D-Tree    VLANID    Multicast-MAC        Port_List
        8002        2       01:00:5e:01:01:02    eth1
```

RBridge3

```
#show trill pruning multicast
RBridge Instance : 1
    Multicast Pruning Information for All D-Trees
        D-Tree    VLANID    Multicast-MAC        Port_List
        7003        2       01:00:5e:01:01:02    eth1

        D-Tree    VLANID    Multicast-MAC        Port_List
        8001        2       01:00:5e:01:01:02    eth2
```

```
D-Tree    VLANID    Multicast-MAC        Port_List
8002        2       01:00:5e:01:01:02    eth1
```

Topology

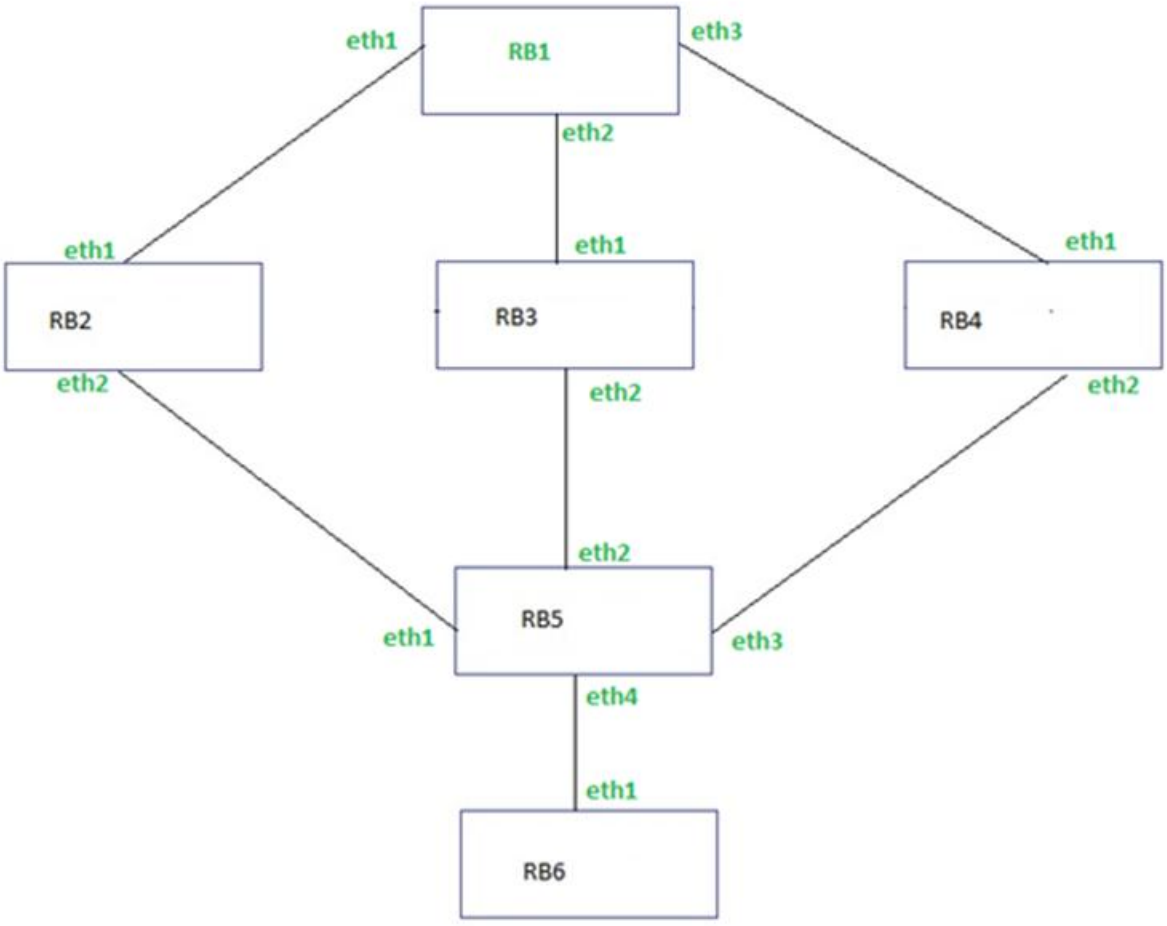

Figure 10-1: VLAN Pruning

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge

(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#number-of-dtrees-to-compute 3	Configure number of dtrees to compute
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 8003 nickname- priority 140 root-priority 8003	Configures nickname for rbridge
(config-rb)#nickname 8002 nickname- priority 139 root-priority 8002	Configures nickname for rbridge
(config-rb)#nickname 8001 nickname- priority 138 root-priority 8001	Configures nickname for rbridge
(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure systemid for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on bridge 1.
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on bridge 1.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on bridge 1.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on bridge 1.
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on bridge 1.
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on bridge 1.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9

(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill-isis port-priority 100	Configures port priority
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Specify the interface (eth3) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth3 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth3 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth3 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth3 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table

(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 7003 nickname- priority 137 root-priority 7003	Configures nickname for rbridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure systemid for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on bridge 1.
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on bridge 1.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on bridge 1.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on bridge 1.
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on bridge 1.
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on bridge 1.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port

(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 7002 nickname- priority 136 root-priority 7002	Configures nickname for rbridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure systemid for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on bridge 1.
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on bridge 1.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on bridge 1.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on bridge 1.

(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on bridge 1.
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on bridge 1.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

RBridge4

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.

(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 7001 nickname- priority 135 root-priority 7001	Configures nickname for rbridge
(config-rb)#systemid DD:DD:DD:DD:DD:DD	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on bridge 1.
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on bridge 1.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on bridge 1.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on bridge 1.
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on bridge 1.
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on bridge 1.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface

(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

RBridge5

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 6001 nickname- priority 134 root-priority 6001	Configures nickname for rbridge
(config-rb)#systemid EE:EE:EE:EE:EE:EE	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on bridge 1.
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on bridge 1.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on bridge 1.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on bridge 1.
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on bridge 1.

(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on bridge 1.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Specify the interface (eth3) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth3 to trill link-type as broadcast

(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth3 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth3 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth3 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth4	Specify the interface (eth4) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth4 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth4 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth4 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth4 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth4 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth4 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

RBridge6

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 7001 nickname- priority 135 root-priority 7001	Configures nickname for rbridge
(config-rb)#systemid FF:FF:FF:FF:FF:FF	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.

(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on the bridge to forward frames
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on the bridge to forward frames
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on the bridge to forward frames
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

Validation

Each distribution tree should be pruned per VLAN, eliminating branches that have no potential receivers downstream.

Multi-destination TRILL Data frames should only be forwarded on branches that are not pruned.

```
#show trill vlan-pruning
NSM - TRILL Vlan Pruning Info
DTree   Vlan    Port_List
8001    0001    eth1    eth2    eth3
8001    0002    eth1    eth2    eth3
8001    0003    eth1    eth2    eth3
8001    0004    eth1    eth2    eth3
8001    0005    eth1    eth2    eth3
8001    0006    eth1    eth3
8001    0007    eth1    eth2    eth3
8001    0008    eth1    eth2    eth3
8002    0001    eth1    eth2    eth3
8002    0002    eth1    eth2    eth3
8002    0003    eth1    eth2    eth3
8002    0004    eth1    eth2    eth3
8002    0005    eth1    eth2    eth3
8002    0006    eth1    eth3
8002    0007    eth1    eth2    eth3
8002    0008    eth1    eth2    eth3
8003    0001    eth1    eth2    eth3
8003    0002    eth1    eth2    eth3
8003    0003    eth1    eth2    eth3
8003    0004    eth1    eth2    eth3
8003    0005    eth1    eth2    eth3
8003    0006    eth1    eth3
8003    0007    eth1    eth2    eth3
8003    0008    eth1    eth2    eth3
```

CHAPTER 11 Access Port

TRILL supports multi-access LAN links that can have multiple end stations and RBridges attached. Appointed Forwarders handle the native traffic to and from end stations on that link, with the intent that native traffic in each VLAN be handled by at most one port of one RBridge. Enabling access option on port will allow port to send or receive normal L2 frames and to discard TRILL encapsulated frames.

The following example details the configurations for enabling end station VLAN 1-10 on RBridge1 and end station VLAN 1-9 on RBridge2 and the verification of the AF list for these RBridges.

Topology

Figure 11-1: Access Port

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system id for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#vlan database`	Enter the VLAN configuration mode.
`(config-vlan)#vlan 2 bridge 1 state enable`	Enable VLAN 2 on the bridge to forward frames
`(config-vlan)#vlan 3 bridge 1 state enable`	Enable VLAN 3 on the bridge to forward frames
`(config-vlan)#vlan 4 bridge 1 state enable`	Enable VLAN 4 on the bridge to forward frames
`(config-vlan)#vlan 5 bridge 1 state enable`	Enable VLAN 5 on the bridge to forward frames
`(config-vlan)#vlan 6 bridge 1 state enable`	Enable VLAN 6 on the bridge to forward frames

(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on the bridge to forward frames
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on the bridge to forward frames
(config-vlan)#vlan 9 bridge 1 state enable	Enable VLAN 9 on the bridge to forward frames
(config-vlan)#vlan 10 bridge 1 state enable	Enable VLAN 10 on the bridge to forward frames
(config-vlan)#exit	Exit the VLAN configuration mode and enter Configure mode.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#no trill trunk-port	Disable trill trunk port on interface
(config-if)#trill access-port enable	Enable trill access port on interface
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9,10
(config-if)#trill announcing-vlan [1-10]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9,10
(config-if)#trill end-station-service-vlan [1-10]	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9,10
(config-if)#trill-isis port-priority 100	Change interface eth1 port priority to 100
(config-if)#trill access-port enable	Enable trill access port on interface
(config-if)#exit	Exit interface mode.

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure system id for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.

(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on the bridge to forward frames
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on the bridge to forward frames
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on the bridge to forward frames
(config-vlan)#vlan 9 bridge 1 state enable	Enable VLAN 9 on the bridge to forward frames
(config-vlan)#exit	Exit the VLAN configuration mode.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#no trill trunk-port	Disable trill trunk port on interface
(config-if)#trill access-port enable	Enable trill access port on interface
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [1-9]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan [1-9]	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill access-port enable	Enable trill access port on interface
(config-if)#exit	Exit interface mode.

Validation

RBridge1

```
#show trill  interface eth1
eth1 is up, line protocol is up
  Bridge Protocol: TRILL (1)
  Network Type: Broadcast
  Circuit Type: level-1
```

```
  Local circuit ID: 0x01
  Extended Local circuit ID: 0x00000003
  Local SNPA: 52:54:00:a4:d6:42
  Port Priority: 100
  Circuit ID: AAAA.AAAA.AAAA.01
  Number of active level-1 adjacencies: 0
  LSP MTU: 1470
  Next TRILL LAN Level-1 Hello in 18 milliseconds
  Port State  = DRB
  Port Type  = ACCESS
  Inhibition time = 30 sec
  Desired Designated Vlan = 1
  Designated Vlan =  1
  BPDU Handling Enabled = FALSE
  Root Change Inhibition Timer Interval = 30
  Root change inhibition timer running = FALSE
  Root Bridge ID (BPDU) = 00:00:00:00:00:00
  Number of TCN BPDU tranmitted = 0
  Number of TCN ACK BPDU Recieved = 0
  Vlan Mapping Detected = FALSE
  Bandwidth: 12500000.00 Bytes/sec
  Metric : 200000
                    AF list
--------------------------------------------------------------------
  Self                          Vlan
  AAAA.AAAA.AAAA                [1-5]

  Neighbor                      Vlan

 BBBB.BBBB.BBBB                  [6-10]
```

RBridge2

```
#show trill  interface eth1
eth1 is up, line protocol is up
  Bridge Protocol: TRILL (1)
  Network Type: Broadcast
  Circuit Type: level-1
  Local circuit ID: 0x01
  Extended Local circuit ID: 0x00000003
  Local SNPA: 52:54:00:7b:22:d5
  Port Priority: 64
  Circuit ID: AAAA.AAAA.AAAA.01
  Number of active level-1 adjacencies: 0
  LSP MTU: 1470
  Next TRILL LAN Level-1 Hello in 2 seconds
  Port State  = NON DRB
  Port Type  = ACCESS
  Inhibition time = 30 sec
  Desired Designated Vlan = 1
  Designated Vlan =  1
  BPDU Handling Enabled = FALSE
  Root Change Inhibition Timer Interval = 30
  Root change inhibition timer running = FALSE
  Root Bridge ID (BPDU) = 00:00:00:00:00:00
  Number of TCN BPDU tranmitted = 0
```



```
  Number of TCN ACK BPDU Recieved = 0
  Vlan Mapping Detected = FALSE
  Bandwidth: 12500000.00 Bytes/sec
  Metric : 200000
                     AF list
-----------------------------------------------------------------------
  Self                            Vlan
BBBB.BBBB.BBBB                    [6-10]
```

CHAPTER 12 Trunk Port

This chapter shows the configuration to enable end station VLAN 1-10 on RBridge1 and end station VLAN 1-9 on RBridge2 and the verification that AF is not appointed for these RBridges.

Topology

Figure 12-1: Trunk Port

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure systemid for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#vlan database`	Enter the VLAN configuration mode.
`(config-vlan)#vlan 2 bridge 1 state enable`	Enable VLAN 2 on the bridge to forward frames
`(config-vlan)#vlan 3 bridge 1 state enable`	Enable VLAN 3 on the bridge to forward frames
`(config-vlan)#vlan 4 bridge 1 state enable`	Enable VLAN 4 on the bridge to forward frames
`(config-vlan)#vlan 5 bridge 1 state enable`	Enable VLAN 5 on the bridge to forward frames
`(config-vlan)#vlan 6 bridge 1 state enable`	Enable VLAN 6 on the bridge to forward frames
`(config-vlan)#vlan 7 bridge 1 state enable`	Enable VLAN 7 on the bridge to forward frames
`(config-vlan)#vlan 8 bridge 1 state enable`	Enable VLAN 8 on the bridge to forward frames

(config-vlan)#vlan 9 bridge 1 state enable	Enable VLAN 9 on the bridge to forward frames
(config-vlan)#vlan 10 bridge 1 state enable	Enable VLAN 10 on the bridge to forward frames
(config-vlan)#exit	Exit the VLAN configuration mode.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill-isis port-priority 100	Change interface eth1 port priority to 100
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9,10
(config-if)#trill announcing-vlan [1-10]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9,10
(config-if)#trill end-station-service-vlan [1-10]	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9,10
(config-if)#trill trunk-port enable	Enable trill trunk port on interface
(config-if)#exit	Exit interface mode.

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure systemid for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames

(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on the bridge to forward frames
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on the bridge to forward frames
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on the bridge to forward frames
(config-vlan)#vlan 9 bridge 1 state enable	Enable VLAN 9 on the bridge to forward frames
(config-vlan)#exit	Exit the VLAN configuration mode and enter Configure mode.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [1-9]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan [1-9]	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill trunk-port enable	Enable trill trunk port on interface
(config-if)#exit	Exit interface mode.

Validation

RBridge1

```
#show trill  interface eth1
eth1 is up, line protocol is up
  Bridge Protocol: TRILL (1)
  Network Type: Broadcast
  Circuit Type: level-1
  Local circuit ID: 0x01
  Extended Local circuit ID: 0x00000003
  Local SNPA: 52:54:00:a4:d6:42
  Port Priority: 100
  Circuit ID: AAAA.AAAA.AAAA.01
  Number of active level-1 adjacencies: 0
  LSP MTU: 1470
  Next TRILL LAN Level-1 Hello in 18 milliseconds
  Port State  = DRB
  Port Type  = TRUNK
  Inhibition time = 30 sec
  Desired Designated Vlan = 1
```

```
  Designated Vlan =  1
  BPDU Handling Enabled = FALSE
  Root Change Inhibition Timer Interval = 30
  Root change inhibition timer running = FALSE
  Root Bridge ID (BPDU) = 00:00:00:00:00:00
  Number of TCN BPDU tranmitted = 0
  Number of TCN ACK BPDU Recieved = 0
  Vlan Mapping Detected = FALSE
  Bandwidth: 12500000.00 Bytes/sec
  Metric : 200000
                    AF list
-----------------------------------------------------------------------
  Self                          Vlan
  AAAA.AAAA.AAAA

  Neighbor                      Vlan

 BBBB.BBBB.BBBB
```

RBridge2

```
#show trill  interface eth1
eth1 is up, line protocol is up
  Bridge Protocol: TRILL (1)
  Network Type: Broadcast
  Circuit Type: level-1
  Local circuit ID: 0x01
  Extended Local circuit ID: 0x00000003
  Local SNPA: 52:54:00:7b:22:d5
  Port Priority: 64
  Circuit ID: AAAA.AAAA.AAAA.01
  Number of active level-1 adjacencies: 0
  LSP MTU: 1470
  Next TRILL LAN Level-1 Hello in 2 seconds
  Port State  = NON DRB
  Port Type  = TRUNK
  Inhibition time = 30 sec
  Desired Designated Vlan = 1
  Designated Vlan =  1
  BPDU Handling Enabled = FALSE
  Root Change Inhibition Timer Interval = 30
  Root change inhibition timer running = FALSE
  Root Bridge ID (BPDU) = 00:00:00:00:00:00
  Number of TCN BPDU tranmitted = 0
  Number of TCN ACK BPDU Recieved = 0
  Vlan Mapping Detected = FALSE
  Bandwidth: 12500000.00 Bytes/sec
  Metric : 200000
                    AF list
-----------------------------------------------------------------------
  Self                          Vlan
  BBBB.BBBB.BBBB
```

CHAPTER 13 Campus-Wide MTU

For peers having different campus MTU sizes, the one having smaller campus MTU should go to Report state after receiving MTU ACK from peer. The one with higher campus MTU will not receive any MTU ACK and will be in 2-way state (because its peer does not support that value).

Meanwhile the one which moved to Report state will send LSP with its Campus wide MTU size (TLV originatingLSPBufferSize), the peer in 2-way should process this LSP and set its campus wide MTU to the smaller value and start MTU negotiation again and eventually move to Report state.

Topology

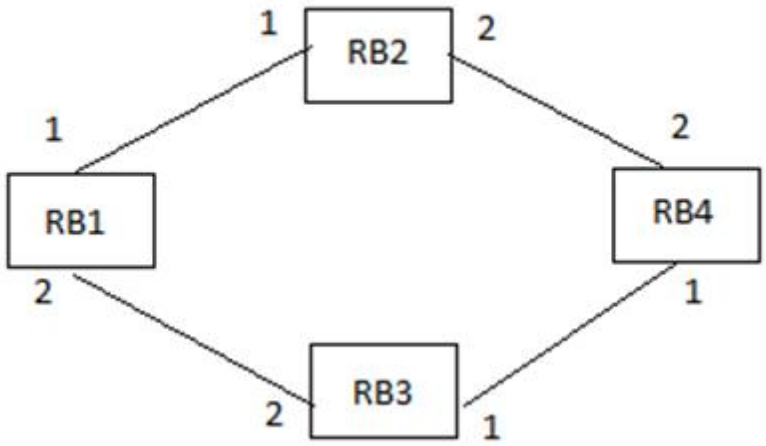

Figure 13-1: Campus Wide MTU

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.

(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#mtu probe enable	Enable MTU probe
(config-rb)#minimum-mtu 1475	Configure Campus Wide MTU value
(config-rb)#exit	Exit rbridge mode

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#exit	Exit interface mode.

(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8002 nickname-priority 128 root-priority 8002	Configure nickname 8002 with nickname priority 128 and root priority 8002 for rbridge 1
(config-rb)#mtu probe enable	Enable MTU probe
(config-rb)#minimum-mtu 1480	Configure Campus Wide MTU value
(config-rb)#exit	Exit rbridge mode

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8003 nickname-priority 128 root-priority 8003	Configure nickname 8003 with nickname priority 128 and root priority 8003 for rbridge 1
(config-rb)#mtu probe enable	Enable MTU probe
(config-rb)#minimum-mtu 1480	Configure Campus Wide MTU value
(config-rb)#exit	Exit rbridge mode

RBridge4

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#exit`	Exit interface mode.
`(config)#interface eth2`	Specify the interface (eth2) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth2 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface with the TRILL instance
`(config-if)#exit`	Exit interface mode.
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid DD:DD:DD:DD:DD:DD`	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
`(config-rb)#nickname 8004 nickname-priority 128 root-priority 8004`	Configure nickname 8004 with nickname priority 128 and root priority 8004 for rbridge 1
`(config-rb)#mtu probe enable`	Enable MTU probe
`(config-rb)#minimum-mtu 1490`	Configure Campus Wide MTU value
`(config-rb)#exit`	Exit rbridge mode

Validation

RBridge1

```
#show trill neighbor
TRILL Neighbor Table Instance = 1

NbrMacAddr          NbrMtu   NbrSysId            NbrNickname    PortId  Interface
--------------------------------------------------------------------------------
```

```
5254.0054.1CDC      1475        BBBB.BBBB.BBBB      8002           0        eth1

5254.00EE.74C5      1475        CCCC.CCCC.CCCC      8003           1        eth2

HoldingTime  NbrPriority  DesiredVlan  State       UpTime
-------------------------------------------------------
26           64           1            REPORT      00:00:04
7            64           1            REPORT/DR   00:00:02
```

RBridge2

```
#show trill neighbor
TRILL Neighbor Table Instance = 1

NbrMacAddr          NbrMtu   NbrSysId            NbrNickname    PortId  Interface
-------------------------------------------------------------------------------
5254.00A4.D642      1475        AAAA.AAAA.AAAA      8001           0        eth1

5254.00B2.D97E      1475        DDDD.DDDD.DDDD      8004           1        eth2

HoldingTime  NbrPriority  DesiredVlan  State       UpTime
-------------------------------------------------------
9            64           1            REPORT/DR   00:02:04
8            64           1            REPORT/DR   00:02:05
```

RBridge3

```
#show trill neighbor
TRILL Neighbor Table Instance = 1
NbrMacAddr          NbrMtu   NbrSysId            NbrNickname    PortId  Interface
-------------------------------------------------------------------------------
5254.00EF.866A      1475        DDDD.DDDD.DDDD      8004           0        eth1
5254.00E9.7908       1475        AAAA.AAAA.AAAA      8001           1        eth2

HoldingTime  NbrPriority  DesiredVlan  State       UpTime
-------------------------------------------------------
8            64           1            REPORT/DR   00:05:08
21           64           1            REPORT      00:05:08
```

RBridge4

```
#show trill neighbor
TRILL Neighbor Table Instance = 1
NbrMacAddr          NbrMtu   NbrSysId            NbrNickname    PortId  Interface
-------------------------------------------------------------------------------
5254.006B.0E92      1475        CCCC.CCCC.CCCC      8003           0        eth1
5254.007B.C3D8     1475        BBBB.BBBB.BBBB      8002           1        eth2

HoldingTime  NbrPriority  DesiredVlan  State       UpTime
-------------------------------------------------------
20           64           1            REPORT      00:05:50
```

```
27          64          1           REPORT      00:05:52
```

RBridge1

```
#show trill detail lsp
TRILL Link State Database
RBridge Instance 1:
LSP_ID                 LSP_Seq_Num  LSP_Checksum  LSP_Holdtime  OL_Flag   LSP_SIZE
AAAA.AAAA.AAAA.00-00   0x00000006     0x2BE8        454           0         84
  Extended IS Reachability TLV:
      Metric:   200000        IS-Extended BBBB.BBBB.BBBB.00
      Metric:   200000        IS-Extended CCCC.CCCC.CCCC.00
  Router Capabaility TLV:
    Trill Version  =  1
    Tree sub-TLV:
        Number_of_trees_to_compute  =  1
        Max_trees_able_to_compute  =  8
        Number_of_trees_to_use  =  1
    Nickname sub-TLV:
        Nickname   Priority   Root_Priority
        8001       128         8001
    LSP Buffer Size TLV:
        Campus MTU = 1475

BBBB.BBBB.BBBB.00-00   0x00000006    0x06A3         453           0         84
  Extended IS Reachability TLV:
      Metric:   200000        IS-Extended DDDD.DDDD.DDDD.00
      Metric:   200000        IS-Extended AAAA.AAAA.AAAA.00
  Router Capabaility TLV:
    Trill Version  =  1
    Tree sub-TLV:
        Number_of_trees_to_compute  =  1
        Max_trees_able_to_compute  =  8
        Number_of_trees_to_use  =  1
    Nickname sub-TLV:
        Nickname   Priority   Root_Priority
        8002       130         8002
    LSP Buffer Size TLV:
        Campus MTU = 1480

CCCC.CCCC.CCCC.00-00*  0x00000007    0x630B         1190          0         84
  Router Capabaility TLV:
    Trill Version  =  1
    Tree sub-TLV:
        Number_of_trees_to_compute  =  1
        Max_trees_able_to_compute  =  8
        Number_of_trees_to_use  =  1
    Nickname sub-TLV:
        Nickname   Priority   Root_Priority
        8003       128         8003
```

```
    LSP Buffer Size TLV:
        Campus MTU = 1480

DDDD.DDDD.DDDD.00-00  0x00000005     0x0BFC         1150        0        84

  Extended IS Reachability TLV:
      Metric:   200000        IS-Extended CCCC.CCCC.CCCC.00
      Metric:   200000        IS-Extended BBBB.BBBB.BBBB.00

  Router Capabaility TLV:
    Trill Version  =  1
    Tree sub-TLV:
        Number_of_trees_to_compute  =  1
        Max_trees_able_to_compute  =  8
        Number_of_trees_to_use  =  1
    Nickname sub-TLV:
        Nickname   Priority   Root_Priority
        8004       128         8004
    LSP Buffer Size TLV:
        Campus MTU = 1490
```

CHAPTER 14 VLAN Inhibition

When an RBridge RB1 receives a TRILL Hello asserting that the sender is the Appointed Forwarder that either (1) arrives on VLAN-x or (2) was sent on VLAN-x as indicated inside the Hello, then RB1 sets its VLAN-x inhibition timer for the link to the maximum of that timer's existing value and the Holding Time in the received Hello. An RBridge must maintain VLAN inhibition timers for a link to which it connects if it can offer end station service on that link even if it is not currently Appointed Forwarder for any VLAN on that link.

Topology

Figure 14-1: VLAN Inhibition

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#vlan database`	Enter the VLAN configuration mode.
`(config-vlan)#vlan 2 bridge 1 state enable`	Enable VLAN 2 on the bridge to forward frames
`(config-vlan)#vlan 3 bridge 1 state enable`	Enable VLAN 3 on the bridge to forward frames
`(config- vlan)#exit`	Exit vlan mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#exit`	Exit interface mode.
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge

`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
`(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001`	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
`(config-rb)#exit`	Exit rbridge mode

RBridge2

Write script code to generate hellos with RB1's AF VLAN 3 in RB2's hello and send it from RB2 to RB1.

Validation

RBridge1

Check AF before VLAN inhibition.

```
#show trill interface eth1
eth1 is up, line protocol is up
  Bridge Protocol: TRILL (1)
  Network Type: Broadcast
  Circuit Type: level-1
  Local circuit ID: 0x01
  Extended Local circuit ID: 0x00000003
  Local SNPA: 52:54:00:a4:d6:42
  Port Priority: 64
  Circuit ID: BBBB.BBBB.BBBB.01
  Number of active level-1 adjacencies: 1
  LSP MTU: 1470
  Next TRILL LAN Level-1 Hello in 6 seconds
  Port State  = Non-DRB
  Port Type  = UNIVERSAL
  Inhibition time = 30 sec
  Desired Designated Vlan = 1
  Designated Vlan =  1
  BPDU Handling Enabled = FALSE
  Root Change Inhibition Timer Interval = 30
  Root change inhibition timer running = FALSE
  Root Bridge ID (BPDU) = 00:00:00:00:00:00
  Number of TCN BPDU tranmitted = 0
  Number of TCN ACK BPDU Recieved = 0
  Vlan Mapping Detected = FALSE
  Bandwidth: 12500000.00 Bytes/sec
  Metric : 200000
                    AF list
-----------------------------------------------------------------
  Self                          Vlan
  AAAA.AAAA.AAAA               [1-3]
  Neighbor
  1000.0000.0001
```

Check AF after VLAN inhibition.

```
#show trill interface eth1
eth1 is up, line protocol is up
  Bridge Protocol: TRILL (1)
  Network Type: Broadcast
  Circuit Type: level-1
  Local circuit ID: 0x01
  Extended Local circuit ID: 0x00000003
  Local SNPA: 52:54:00:a4:d6:42
  Port Priority: 64
  Circuit ID: BBBB.BBBB.BBBB.01
  Number of active level-1 adjacencies: 1
  LSP MTU: 1470
  Next TRILL LAN Level-1 Hello in 6 seconds
  Port State  = Non-DRB
  Port Type  = UNIVERSAL
  Inhibition time = 30 sec
  Desired Designated Vlan = 1
  Designated Vlan =  1
  BPDU Handling Enabled = FALSE
  Root Change Inhibition Timer Interval = 30
  Root change inhibition timer running = FALSE
  Root Bridge ID (BPDU) = 00:00:00:00:00:00
  Number of TCN BPDU tranmitted = 0
  Number of TCN ACK BPDU Recieved = 0
  Vlan Mapping Detected = FALSE
  Bandwidth: 12500000.00 Bytes/sec
  Metric : 200000
                     AF list
---------------------------------------------------------------------
  Self                           Vlan
  AAAA.AAAA.AAAA                [1-2]
  Neighbor
  1000.0000.0001
#show nsm trill appointed-forwader
Appointed Forwarder VLAN and Designated VLAN
Ifname   IfIdx     SNPA                       DVLAN     AF_VLANs
  eth1      0003    52:54:00:a4:d6:42    0001          1,2
```

CHAPTER 15 Unicast Ping

Ping is a tool for verifying RBridge connectivity. The ping originating RBridge transmits one or more TRILL data frames with a TRILL OAM message. This message contains the code of an echo request. The ingress RBridge MUST be the frame originating RBridge. The egress RBridge is the destination Rbridge to which connectivity will be checked. RBridges implementing ping SHOULD issue a reply in response to this request. options defined in future drafts MAY be included, the purpose of allowing the addition of options is so that the frame mimics a data frame that follows the same path through the data plane that a “real” data frame would. An RBridge Ping, however, uses the OAM Channel and so depending on the ECMP hashing used by RBridges in the campus it may not in fact share the same path as a “real” data going through the network.

This chapter shows forming adjacency and checking connectivity in a multi-access LAN topology. The configurations assume that you running the `trilld`, `nsm`, and `imi` daemons.

Topology

Figure 15-1: Unicast Ping

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#oam-protocol enable`	Enable MTU probe option on Rbridge
`(config-rb)#channel-protocol enable`	Enable channel protocol on RBridge
`(config-rb)#nickname 8000 nickname-priority 130 root-priority 80`	Configure nickname 8000 with nickname priority 130 and root priority 80
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system identifier for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.

(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#exit	Exit interface mode.

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable MTU probe option on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on RBridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure systemid for rbridge 1
(config-rb)#nickname 8001 nickname- priority 140 root-priority 70	Configure nickname 8000 with nickname priority 130 and root priority 80
(config-rb)#exit	Exit rbridge mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#trill-isis port-priority 100	Configure port priority of interface to 100
(config-if)#exit	Exit interface mode.

Validation

```
#rbridge-ping 8001
```

```
Sending ping request to Rbridge:8001
Reply from rbridge:  8001
Reply from rbridge:  8001
Reply from rbridge:  8001
Reply from rbridge:  8001
Ping Statistic for Rbridge : 8001
Packet sent = 4,Packets Received = 4,Packet Lost = 0 (Percentage Lost = 0.00%)
```

CHAPTER 16 Unicast Traceroute

The ability to trace the path the data takes through the network is an invaluable Debugging tool. RBridge traceroute provides this functionality through use of the TRILL OAM message. In a hop-count traceroute, the originating RBridge starts by transmitting one TRILL data frame with a TRILL OAM message. This message contains a protocol code of an echo request the ingress RBridge MUST be the RBridge originating the frame the egress RBridge is the destination RBridge to which connectivity will be checked and the M bit MUST be zero. The first echo request frame transmitted MUST have a hop-count of zero. The RBridge will continue transmitting these echo requests, incrementing the hop-count by one each time until a hop-count error notification from the destination nickname as its ingress nickname is received.

The purpose of the traceroute is to confirm connectivity of the data plane, and therefore options defined in future drafts MAY be included. The purpose of allowing the addition of options is so that the frame mimics a data frame that follows the same path through the data plane that a “real” data frame would.

Topology

Figure 16-1: Unicast Traceroute

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#oam-protocol enable`	Enable MTU probe option on Rbridge
`(config-rb)#channel-protocol enable`	Enable channel protocol on RBridge
`(config-rb)#nickname 8000 nickname- priority 130 root-priority 80`	Configure nickname 8000 with nickname priority 130 and root priority 80
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system identifier for rbridge 1
`(config-rb)#exit`	Exit rbridge mode

(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#exit	Exit interface mode.

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable MTU probe option on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on RBridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure system identifier for rbridge 1
(config-rb)#nickname 8001 nickname- priority 140 root-priority 70	Configure nickname 8001 with nickname priority 140 and root priority 70
(config-rb)#exit	Exit rbridge mode
(config)#interface eth1	Enter interface mode
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#trill-isis port-priority 100	Configure port priority of interface to 100
(config-if)#exit	Exit interface mode.

Validation

```
#Rbridge-traceroute 8001
Rbridgeincoming portoutgoing portNext-Hop_Nickname
8001  0x0000   egress          ****

Traceroute is Complete !!
```

CHAPTER 17 Multicast OAM

Multicast - OAM being a light feature with 2 tools (Ping and Tracreroute as of now) will be part of trill process Later on with new features being added to the OAM, it can be run as a separate process.

To minimize unnecessary burden on transit RBridges and to provide a more realistic test of network continuity and the like, RBridge Channel messages are designed to look like TRILL Data frames and, in the case of multi-hop messages, can normally be handled by transit RBridges as if they were TRILL Data frames. In the absence of TRILL data plane we will have to pass on every frame related to OAM to trill control plane, and processing and forwarding has to be done via routing tables maintained in TRILL control plane.

Ping tool is designed to check the connectivity between two or more RBridges along a particular Distribution Tree.

This chapter shows forming adjacency, dtree computation, and checking connectivity in a multi-access LAN topology. The configuration assumes that you running the `trilld`, `nsm` and `imi` daemons.

Topology

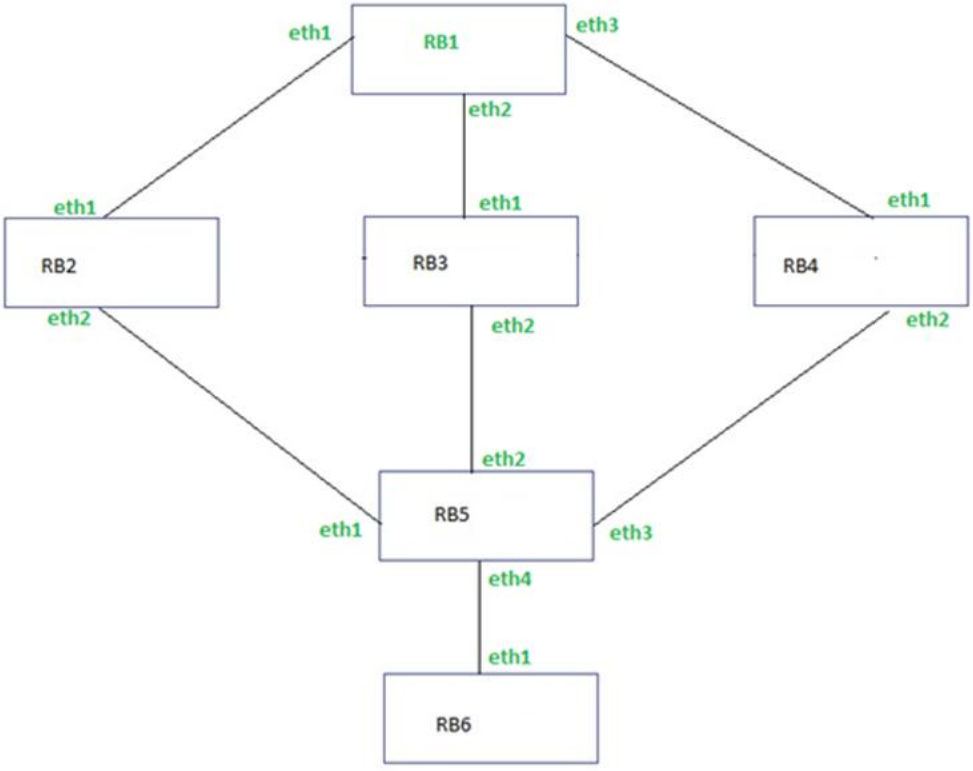

Figure 17-1: Multicast OAM

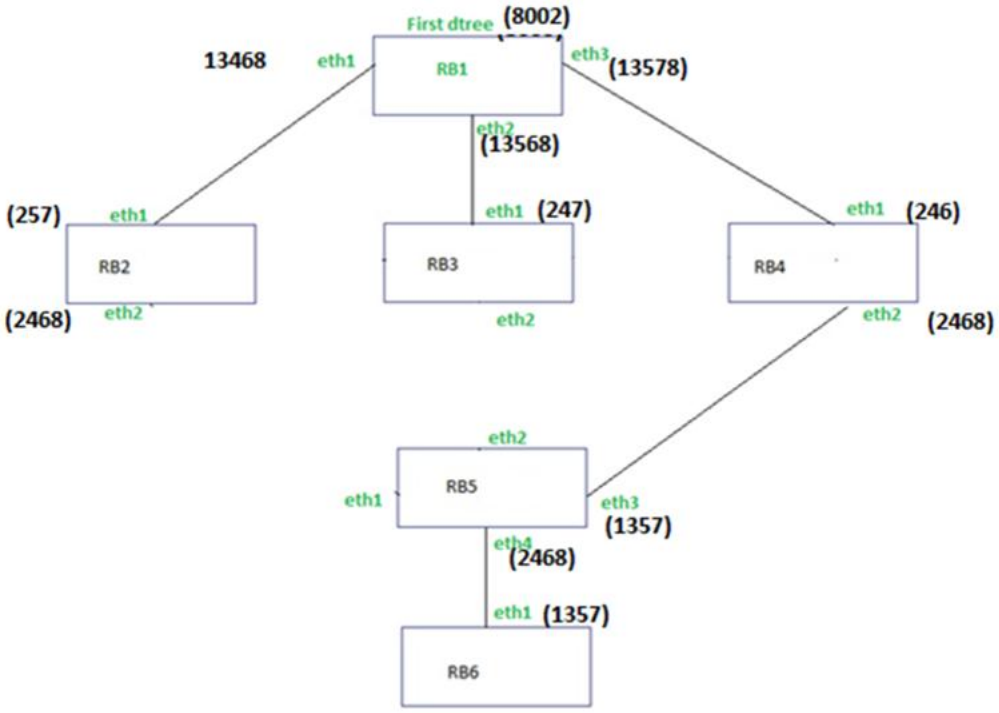

Figure 17-2: 8002 Dtree from Topology

Note: The values in brackets such as (1357), (2468) are VLAN values for which Rbridges are AFs for those VLANS.

This configuration uses these nicknames for Rbridges:

Rb1: 8003, 8002, 8001

Rb2: 7003

Rb3: 7002

Rb4: 7001

Rb5: 6001

Rb6: 5001

Rbridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge

(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#number-of-dtrees-to-compute 3	Configure number of dtrees to compute
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 8003 nickname- priority 140 root-priority 8003	Configures nickname for rbridge
(config-rb)#nickname 8002 nickname- priority 139 root-priority 8002	Configures nickname for rbridge
(config-rb)#nickname 8001 nickname- priority 138 root-priority 8001	Configures nickname for rbridge
(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on bridge 1.
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on bridge 1.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on bridge 1.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on bridge 1.
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on bridge 1.
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on bridge 1.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9

(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill-isis port-priority 100	Configures port priority
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Specify the interface (eth3) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth3 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth3 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth3 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth3 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

Rbridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table

(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 7003 nickname- priority 137 root-priority 7003	Configures nickname for rbridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on bridge 1.
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on bridge 1.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on bridge 1.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on bridge 1.
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on bridge 1.
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on bridge 1.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port

(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

Rbridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 7002 nickname- priority 136 root-priority 7002	Configures nickname for rbridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on bridge 1.
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on bridge 1.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on bridge 1.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on bridge 1.

(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on bridge 1.
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on bridge 1.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

Rbridge4

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.

(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 7001 nickname- priority 135 root-priority 7001	Configures nickname for rbridge
(config-rb)#systemid DD:DD:DD:DD:DD:DD	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward 2 frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward 2 frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward 2 frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward 2 frames
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on the bridge to forward 2 frames
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on the bridge to forward 2 frames
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on the bridge to forward 2 frames
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface

(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

Rbridge5

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 6001 nickname- priority 134 root-priority 6001	Configures nickname for rbridge
(config-rb)#systemid EE:EE:EE:EE:EE:EE	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward 2 frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward 2 frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward 2 frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward 2 frames
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on the bridge to forward 2 frames
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on the bridge to forward 2 frames

(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on the bridge to forward 2 frames
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Specify the interface (eth3) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface with the bridge
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth3 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth3 to trill link-type as broadcast

(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth3 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth3 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth3 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth4	Specify the interface (eth4) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth3 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth4 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth4 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth4 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth4 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth4 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth4 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

Rbridge6

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#oam-protocol enable	Enable oam protocol on Rbridge
(config-rb)#channel-protocol enable	Enable channel protocol on Rbridge
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 7001 nickname- priority 135 root-priority 7001	Configures nickname for rbridge
(config-rb)#systemid FF:FF:FF:FF:FF:FF	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.

(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward 2 frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward 2 frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward 2 frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward 2 frames
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on the bridge to forward 2 frames
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on the bridge to forward 2 frames
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on the bridge to forward 2 frames
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth2 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth2 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface with the TRILL instance
(config-if)#trill link-type broadcast	Associate the interface eth2 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,	Associate the interface eth2 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth2 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth2 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#exit	Exit interface mode.

Validation for Rbridge Multicast Ping

Validate the dtrees

Use any dtree to perform multicast ping or trace route operations.

```
#sh tril fdb
RBridge Instance 1:
TRILL Unicast Forwarding Database
Eg_Nick  Eg_SysId        Metric    HopCnt  NH_Nick  NH_SysId        Interface SNPA
5001     FFFF.FFFF.FFFF  00200000  001     5001     FFFF.FFFF.FFFF  eth4
52:54:00:05:b6:66
7001     DDDD.DDDD.DDDD  00200000  001     7001     DDDD.DDDD.DDDD  eth3
52:54:00:ec:27:40
7002     CCCC.CCCC.CCCC  00600000  003     7001     DDDD.DDDD.DDDD  eth3
52:54:00:ec:27:40
7003     BBBB.BBBB.BBBB  00200000  001     7003     BBBB.BBBB.BBBB  eth1
52:54:00:c3:fb:b6
8001     AAAA.AAAA.AAAA  00400000  002     7001     DDDD.DDDD.DDDD  eth3
52:54:00:ec:27:40
8002     AAAA.AAAA.AAAA  00400000  002     7001     DDDD.DDDD.DDDD  eth3
52:54:00:ec:27:40
8003     AAAA.AAAA.AAAA  00400000  002     7001     DDDD.DDDD.DDDD  eth3
52:54:00:ec:27:40
RBridge Instance 1:
TRILL Multicast Forwarding Database
Highest tree root priority Rbridge is 0x8003. LSP ID is AAAA.AAAA.AAAA.00-00
Dtree-number D-Tree_Name D-tree-system-id   Hop-count
 02           8001        AAAA.AAAA.AAAA     006
    Adj_Nickname   Adj_System_id        Interface  SNPA
    7001           DDDD.DDDD.DDDD       eth3       52:54:00:ec:27:40
    5001           FFFF.FFFF.FFFF       eth4       52:54:00:05:b6:66
Dtree-number D-Tree_Name D-tree-system-id   Hop-count
 01           8002        AAAA.AAAA.AAAA     006
    Adj_Nickname   Adj_System_id        Interface  SNPA
    7003           BBBB.BBBB.BBBB       eth1       52:54:00:c3:fb:b6
    5001           FFFF.FFFF.FFFF       eth4       52:54:00:05:b6:66
Dtree-number D-Tree_Name D-tree-system-id   Hop-count
 00           8003        AAAA.AAAA.AAAA     006        Dtree to use
    Adj_Nickname   Adj_System_id        Interface  SNPA
    7001           DDDD.DDDD.DDDD       eth3       52:54:00:ec:27:40
    5001           FFFF.FFFF.FFFF       eth4       52:54:00:05:b6:66
RBridge Instance 1:
TRILL Static Destination MAC Table
DMAC            VLANID   Eg_Nickname
```

Use 8002 dtree to check multicast ping and traceroute commands

1. Verify that ping is successful from RB1 to RB6 on vlan1

```
"#rbridge-mping dtree 8003 -v 1 -c 5 -i 3 -t 5 -d  5001
 Sending ping request to DTree : 8003
```

```
Reply from Rbridge: Nickname [5001] SystemID: [FFFF.FFFF.FFFF] on interface: [eth1] time
[04] msec
Reply from Rbridge: Nickname [5001] SystemID: [FFFF.FFFF.FFFF] on interface: [eth1] time
[01] msec
Reply from Rbridge: Nickname [5001] SystemID: [FFFF.FFFF.FFFF] on interface: [eth1] time
[02] msec
Reply from Rbridge: Nickname [5001] SystemID: [FFFF.FFFF.FFFF] on interface: [eth1] time
[01] msec
Reply from Rbridge: Nickname [5001] SystemID: [FFFF.FFFF.FFFF] on interface: [eth1] time
[ 1] msec
Ping Statistics for DTree : 8003
Packets Sent = 5,        Packets Received = 5,                    Packet Lost =
0(Percentage Lost = 0.00%)
#
```

2. Verify that ping is not successful from RB1 to RB5 when dtree is not in ingress

```
#rbridge-mping dtree 8002 -v 3 -c 10 -t 6001
%Dtree [8002] is not ingress dtree!!
Ping request failed
#
(config)#rbridge trill 1
(config-rb)#number-of-dtrees-to-use 3------------→ Command validates to use number of
dtrees
(config-rb)#dtree-in-use 8002------------------------→ Command validates to which dtree
to use for frame forwarding
(config-rb)#
```

3. Verify that ping is successful from RB5 to RB1 on vlan5 with dtree 8002 and verify 10 times replies are received

```
#rbridge-mping dtree 8002 -c 10 -v 5 -d 8001
 Sending ping request to DTree : 8002
Reply from Rbridge: Nickname [8001] SystemID: [AAAA.AAAA.AAAA] on interface: [eth3] time
[02] msec
Reply from Rbridge: Nickname [8001] SystemID: [AAAA.AAAA.AAAA] on interface: [eth3] time
[02] msec
Reply from Rbridge: Nickname [8001] SystemID: [AAAA.AAAA.AAAA] on interface: [eth3] time
[02] msec
Reply from Rbridge: Nickname [8001] SystemID: [AAAA.AAAA.AAAA] on interface: [eth3] time
[02] msec
Reply from Rbridge: Nickname [8001] SystemID: [AAAA.AAAA.AAAA] on interface: [eth3] time
[01] msec
Reply from Rbridge: Nickname [8001] SystemID: [AAAA.AAAA.AAAA] on interface: [eth3] time
[01] msec
Reply from Rbridge: Nickname [8001] SystemID: [AAAA.AAAA.AAAA] on interface: [eth3] time
[01] msec
Reply from Rbridge: Nickname [8001] SystemID: [AAAA.AAAA.AAAA] on interface: [eth3] time
[03] msec
Reply from Rbridge: Nickname [8001] SystemID: [AAAA.AAAA.AAAA] on interface: [eth3] time
[02] msec
Reply from Rbridge: Nickname [8001] SystemID: [AAAA.AAAA.AAAA] on interface: [eth3] time
[ 1] msec
Ping Statistics for DTree : 8002
Packets Sent = 10,        Packets Received = 10,                     Packet Lost =
0(Percentage Lost = 0.00%)
#
```

4. Verify that ping is not successful from RB5 to RB1 on vlan2 with dtree 8002 since RB1 is not an AF for vlan2. Request will gets timed out.

```
#rbridge-mping dtree 8002 -c 5 -v 2 -d 8001
 Sending ping request to DTree : 8002
No reply for Dtree : 8002
No reply for Dtree : 8002
No reply for Dtree : 8002
No reply for Dtree : 8002
No reply for Dtree : 8002
Ping Statistics for Dtree : 8002
Packets Sent = 5,        Packets Received = 0,                    Packet Lost =
5(Percentage Lost = 100.00%)
#
```

5. Verify that ping without specifying any target rbridge

   Reply from rbridges which has vlan 1 should be received.

```
#rbridge-mping dtree 8002
 Sending ping request to DTree : 8002
Reply from Rbridge: Nickname [7003] SystemID: [BBBB.BBBB.BBBB] on interface: [eth1] time
[01] msec
Reply from Rbridge: Nickname [6001] SystemID: [EEEE.EEEE.EEEE] on interface: [eth3] time
[03] msec
Reply from Rbridge: Nickname [5001] SystemID: [FFFF.FFFF.FFFF] on interface: [eth3] time
[03] msec
Reply from Rbridge: Nickname [7003] SystemID: [BBBB.BBBB.BBBB] on interface: [eth1] time
[00] msec
Reply from Rbridge: Nickname [6001] SystemID: [EEEE.EEEE.EEEE] on interface: [eth3] time
[02] msec
Reply from Rbridge: Nickname [5001] SystemID: [FFFF.FFFF.FFFF] on interface: [eth3] time
[02] msec
Reply from Rbridge: Nickname [7003] SystemID: [BBBB.BBBB.BBBB] on interface: [eth1] time
[00] msec
Reply from Rbridge: Nickname [6001] SystemID: [EEEE.EEEE.EEEE] on interface: [eth3] time
[02] msec
Reply from Rbridge: Nickname [5001] SystemID: [FFFF.FFFF.FFFF] on interface: [eth3] time
[02] msec
Reply from Rbridge: Nickname [7003] SystemID: [BBBB.BBBB.BBBB] on interface: [eth1] time
[00] msec
Reply from Rbridge: Nickname [6001] SystemID: [EEEE.EEEE.EEEE] on interface: [eth3] time
[03] msec
Reply from Rbridge: Nickname [5001] SystemID: [FFFF.FFFF.FFFF] on interface: [eth3] time
[03] msec
Ping Statistics for DTree : 8002
Packets Sent = 4,        Packets Received = 12,                   Packet Lost =
0(Percentage Lost = 0.00%)
#
```

RBridge TraceRoute for a Multi-Access Link

Trace route tool is designed to trace the multi-destination data path hop-by-hop to a target RBridge along a Distribution Tree.

The following example details the configurations required for forming adjacency, dtree computation and checking connectivity in a multi-access LAN Topology. The configurations assume that you running the trilld, nsm & imi daemons.

Use 8002 dtree to check multicast ping and traceroute commands (you can use any dtree).

1. Verify that Trace route is successful from RB1 to RB6 on vlan1.

```
#rbridge-mtraceroute dtree 8002 -v 1 -d 5001
RBridge    Incoming-Port    Outgoing-Port    Next-Hop_Nickname
   7001    0x0              0x0              6001
   6001    0x2              0x2              5001
   5001    0x0              Egress           ****
Traceroute Complete!!
#
```

2. Verify that Trace route without specifying target rbridge.

   Trace route will happen for the rbridges which has vlan 1, path will be shown for those rbridges.

```
#rbridge-mtraceroute dtree 8002
RBridge    Incoming-Port    Outgoing-Port    Next-Hop_Nickname
   7003    0x0              0x0              None
   7001    0x0              0x0              6001
   6001    0x2              0x2              5001
   5001    0x0              0x0              None
Traceroute Complete !!!
#
```

3. Verify trace route to RB2 from RB6 on VLAN without specifying target rbridge.

```
#rbridge-mtraceroute dtree 8002 -v 4  -d 7003
RBridge    Incoming-Port    Outgoing-Port    Next-Hop_Nickname
   7001    0x1              0x1              8003
   8003    0x2              0x2              7002
Traceroute Complete !!!-------------→ Egress rbridge RB2 not present since RB2 is not
AF for vlan 4.
#
```

CHAPTER 18 End Station Address Distribution Information

The ESADI (End Station Address Distribution Information) protocol is an optional VLAN scoped way RBridges can communicate locally learned end station addresses with each other. An RBridge that is announcing connectivity to VLAN-x (normally a VLAN-x appointed forwarder [RFC6439]) MAY use the ESADI protocol to announce the end station address of some or all of its attached VLAN-x end nodes to other RBridges that are running ESADI for VLAN-x.

Topology

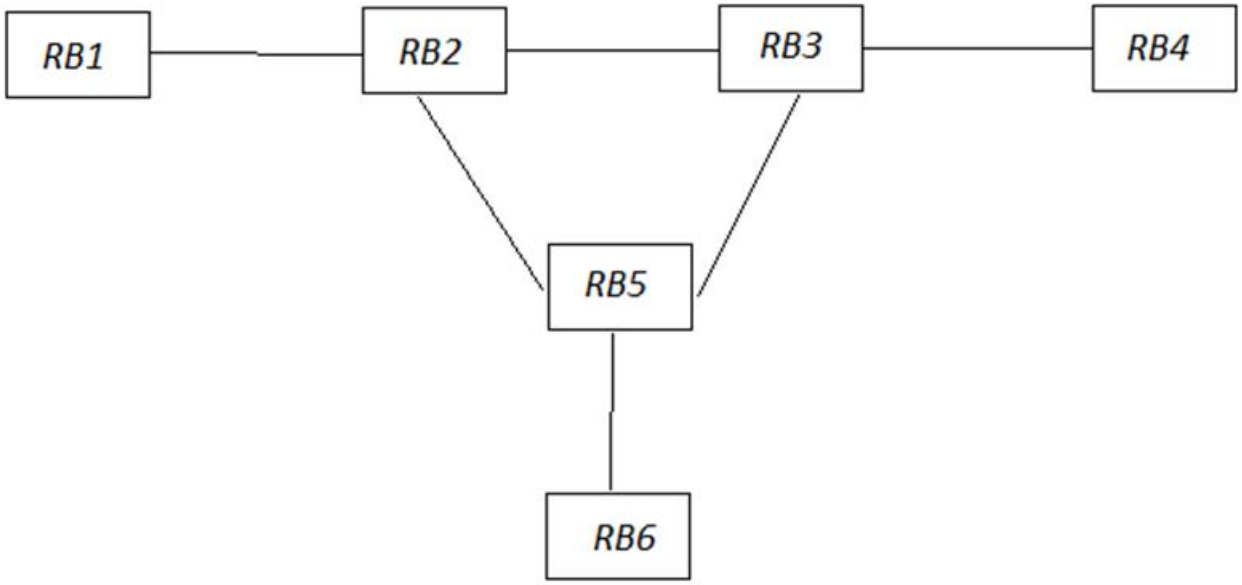

Figure 18-1: ESADI Topology

Basic Configuration

RBridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#vlan database`	Enter the VLAN configuration mode.
`(config-vlan)#vlan 2 bridge 1 state enable`	Enable VLAN 2 on the bridge to forward frames
`(config-vlan)#vlan 3 bridge 1 state enable`	Enable VLAN 3 on the bridge to forward frames

(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8001 nickname-priority 128 root-priority 8001	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#exit	Exit rbridge mode

RBridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.

(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Specify the interface (eth3) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid BB:BB:BB:BB:BB:BB	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8002 nickname-priority 128 root-priority 8002	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#exit	Exit rbridge mode

RBridge3

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth3	Specify the interface (eth3) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk

(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid CC:CC:CC:CC:CC:CC	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8003 nickname-priority 128 root-priority 8003	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#exit	Exit rbridge mode

RBridge4

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge

(config-rb)#systemid DD:DD:DD:DD:DD:DD	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8004 nickname-priority 128 root-priority 8004	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#exit	Exit rbridge mode

RBridge5

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#interface eth2	Specify the interface (eth2) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.

(config)#interface eth3	Specify the interface (eth3) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5
(config-if)#trill end-station-service-vlan [1-5]	Associate the interface eth2 with end station service vlan 1,2,3,4,5
(config-if)#exit	Exit interface mode.
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid EE:EE:EE:EE:EE:EE	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
(config-rb)#nickname 8005 nickname-priority 128 root-priority 8005	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
(config-rb)#exit	Exit rbridge mode

RBridge6

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on the bridge to forward frames
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on the bridge to forward frames
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on the bridge to forward frames
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on the bridge to forward frames
(config- vlan)#exit	Exit vlan mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#switchport trunk allowed vlan add 2,3,4,5	Associate the interface eth2 with vlan 2,3,4,5

`(config-if)#trill end-station-service-vlan [1-5]`	Associate the interface eth2 with end station service vlan 1,2,3,4,5
`(config-if)#exit`	Exit interface mode.
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid FF:FF:FF:FF:FF:FF`	Configure system id for rbridge 1. If not configured, systemid will auto-generated.
`(config-rb)#nickname 8006 nickname-priority 128 root-priority 8006`	Configure nickname 8001 with nickname priority 128 and root priority 8001 for rbridge 1
`(config-rb)#exit`	Exit rbridge mode

Adjacency

This section shows forming ESADI adjacency in a multi-access LAN topology. The configurations assumes that you running the `trilld`, `nsm`, and `imi` daemons.

Make sure that RBridge1, RBridge4 and RBridge6 have common AF VLAN – VLAN 1, VLAN 3, VLAN 5.

RBridge1

`#configure terminal`	Enter configure mode
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#esadi enable`	Enable ESADI protocol
`(config-rb)#esadi instance enable vlan 1`	Enable ESADI instance for vlan 1
`(config-rb)#esadi instance enable vlan 3`	Enable ESADI instance for vlan 3
`(config-rb)#esadi instance enable vlan 5`	Enable ESADI instance for vlan 5
`(config-rb)#exit`	Exit rbridge mode

RBridge4

`#configure terminal`	Enter configure mode
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#esadi enable`	Enable ESADI protocol
`(config-rb)#esadi instance enable vlan 1`	Enable ESADI instance for vlan 1
`(config-rb)#esadi instance enable vlan 3`	Enable ESADI instance for vlan 3
`(config-rb)#esadi instance enable vlan 5`	Enable ESADI instance for vlan 5
`(config-rb)#exit`	Exit rbridge mode

RBridge6

`#configure terminal`	Enter configure mode
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#esadi enable`	Enable ESADI protocol
`(config-rb)#esadi instance enable vlan 1`	Enable ESADI instance for vlan 1
`(config-rb)#esadi instance enable vlan 3`	Enable ESADI instance for vlan 3
`(config-rb)#esadi instance enable vlan 5`	Enable ESADI instance for vlan 5
`(config-rb)#exit`	Exit rbridge mode

Validation

Checking ESADI Adjacency on RBridge1

```
#show trill esadi instance
VLAN    ESADI-priority    CSNP-timer    state     confidence   DRB-system-id
-------------------------------------------------------------------------------
1       64                30            NON-DRB   16           FFFF.FFFF.FFFF
3       64                30            NON-DRB   16           FFFF.FFFF.FFFF
5       64                30            NON-DRB   16           FFFF.FFFF.FFFF
```

Checking ESADI Adjacency on RBridge4

```
#show trill esadi instance
VLAN    ESADI-priority    CSNP-timer    state     confidence   DRB-system-id
-------------------------------------------------------------------------------
1       64                30            NON-DRB   16           FFFF.FFFF.FFFF
3       64                30            NON-DRB   16           FFFF.FFFF.FFFF
5       64                30            NON-DRB   16           FFFF.FFFF.FFFF
```

Checking ESADI Adjacency on RBridge6

```
#show trill esadi instance
VLAN    ESADI-priority    CSNP-timer    state     confidence   DRB-system-id
-------------------------------------------------------------------------------
1       64                30            ESADI-DRB 16           FFFF.FFFF.FFFF
3       64                30            ESADI-DRB 16           FFFF.FFFF.FFFF
5       64                30            ESADI-DRB 16           FFFF.FFFF.FFFF
```

DRB Election

This section shows forming ESADI DRB election between remote RBridges in a multi-access LAN topology. The configuration assumes that you running the `trilld`, `nsm`, and `imi` daemons.

Make sure that RBridge1, RBridge4 and RBridge6 should have common AF VLAN – VLAN 1, VLAN 3, VLAN 5

RBridge1

`#configure terminal`	Enter configure mode
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#esadi enable`	Enable ESADI protocol
`(config-rb)#esadi instance enable vlan 1`	Enable ESADI instance for vlan 1
`(config-rb)#esadi instance enable vlan 3`	Enable ESADI instance for vlan 3
`(config-rb)#esadi priority 90 vlan 3`	Configuration used to set priority for ESADI instance per VLAN
`(config-rb)#esadi instance enable vlan 5`	Enable ESADI instance for vlan 5
`(config-rb)#exit`	Exit rbridge mode

RBridge4

`#configure terminal`	Enter configure mode
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#esadi enable`	Enable ESADI protocol
`(config-rb)#esadi instance enable vlan 1`	Enable ESADI instance for vlan 1
`(config-rb)#esadi instance enable vlan 3`	Enable ESADI instance for vlan 3
`(config-rb)#esadi instance enable vlan 5`	Enable ESADI instance for vlan 5
`(config-rb)#esadi priority 90 vlan 5`	Configuration used to set priority for ESADI instance per VLAN
`(config-rb)#exit`	Exit rbridge mode

RBridge6

`#configure terminal`	Enter configure mode
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#esadi enable`	Enable ESADI protocol
`(config-rb)#esadi instance enable vlan 1`	Enable ESADI instance for vlan 1
`(config-rb)#esadi instance enable vlan 3`	Enable ESADI instance for vlan 3
`(config-rb)#esadi instance enable vlan 5`	Enable ESADI instance for vlan 5
`(config-rb)#exit`	Exit rbridge mode

Validation

Checking ESADI DRB Election on RBridge1

```
#show trill esadi instance
VLAN    ESADI-priority    CSNP-timer    state     confidence   DRB-system-id
-------------------------------------------------------------------------------
1       64                30            NON-DRB   16           FFFF.FFFF.FFFF
3       90                30            ESADI-DRB 16           AAAA.AAAA.AAAA
5       64                30            NON-DRB   16           DDDD.DDDD.DDDD
```

Checking ESADI DRB Election on RBridge4

```
#show trill esadi instance
VLAN    ESADI-priority    CSNP-timer    state     confidence   DRB-system-id
-------------------------------------------------------------------------------
1       64                30            NON-DRB   16           FFFF.FFFF.FFFF
3       64                30            NON-DRB   16           AAAA.AAAA.AAAA
5       90                30            ESADI-DRB 16           DDDD.DDDD.DDDD
```

Checking ESADI DRB Election on RBridge6

```
#show trill esadi instance
VLAN    ESADI-priority    CSNP-timer    state     confidence   DRB-system-id
-------------------------------------------------------------------------------
1       64                30            ESADI-DRB 16           FFFF.FFFF.FFFF
3       64                30            NON-DRB   16           AAAA.AAAA.AAAA
5       64                30            NON-DRB   16           DDDD.DDDD.DDDD
```

LSP Check

Once an ESADI instance is operationally up for VLAN-x, it multicasts its self-originated ESADI-LSP number zero on the virtual link to announce its ESADI parameters. When the other ESADI instances receive the ESADI-LSP number zero and find a new neighbor, their self originated LSP fragments are scheduled to be sent and MAY be unicast to that neighbor if the neighbor is announcing in its LSP that it supports unicast ESADI

The content of an ESADI-LSP consists of zero or more MAC Reachability TLVs, optionally an Authentication TLV, and exactly one ESADI parameter APPsub-TLV in ESADI-LSP zero.

This section shows forming ESADI LSP in a multi-access LAN topology. The configuration assumes that you running the `trilld`, `nsm`, and imi daemons.

Make sure that RBridge1, RBridge4 and RBridge6 have common AF VLAN – VLAN 1, VLAN 3, VLAN 5.

RBridge1

`#configure terminal`	Enter configure mode
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#esadi enable`	Enable ESADI protocol
`(config-rb)#esadi instance enable vlan 1`	Enable ESADI instance for vlan 1

(config-rb)#esadi instance enable vlan 3	Enable ESADI instance for vlan 3
(config-rb)#esadi instance enable vlan 5	Enable ESADI instance for vlan 5
(config-rb)#exit	Exit rbridge mode
(config)#bridge 1 address 0023.0033.0044 forward eth1	Add static l2 end station mac address per vlan.
(config)#bridge 1 address 0002.0003.0004 forward eth1 vlan3	Add static l2 end station mac address per vlan.
(config)#bridge 1 address 0042.0033.0054 forward eth1 vlan 5	Add static l2 end station mac address per vlan.

RBridge4

#configure terminal	Enter configure mode
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#esadi enable	Enable ESADI protocol
(config-rb)#esadi instance enable vlan 1	Enable ESADI instance for vlan 1
(config-rb)#esadi instance enable vlan 3	Enable ESADI instance for vlan 3
(config-rb)#esadi instance enable vlan 5	Enable ESADI instance for vlan 5
(config-rb)#exit	Exit rbridge mode
(config)#bridge 1 address 0032.0033.0034 forward eth1	Add static l2 end station mac address per vlan.
(config)#bridge 1 address 0042.0043.0044 forward eth1 vlan3	Add static l2 end station mac address per vlan.
(config)#bridge 1 address 0052.0053.0054 forward eth1 vlan 5	Add static l2 end station mac address per vlan.

RBridge6

#configure terminal	Enter configure mode
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#esadi enable	Enable ESADI protocol
(config-rb)#esadi instance enable vlan 1	Enable ESADI instance for vlan 1
(config-rb)#esadi instance enable vlan 3	Enable ESADI instance for vlan 3
(config-rb)#esadi instance enable vlan 5	Enable ESADI instance for vlan 5
(config-rb)#exit	Exit rbridge mode

(config)#5bridge 1 address 0063.0063.0064 forward eth1	Add static l2 end station mac address per vlan.
(config)#bridge 1 address 0072.0073.0074 forward eth1 vlan3	Add static l2 end station mac address per vlan.
(config)#bridge 1 address 0082.0083.0084 forward eth1 vlan 5	Add static l2 end station mac address per vlan.

Validation

Show LSPs in the Database of RBridge1

```
#show trill esadi-lsp
TRILL ESADI LSP Details
RBridge Instance: 1

ESADI LSP Details for VLAN 1
LSP_ID                 LSP_Seq_Num     LSP_Checksum          LSP_Size
AAAA.AAAA.AAAA.00-00*  0x00000003      0x6139                   46
DDDD.DDDD.DDDD.00-00   0x00000001      0xCB9D                   33
FFFF.FFFF.FFFF.00-00   0x00000002      0x6338                   40

ESADI LSP Details for VLAN 3
LSP_ID                 LSP_Seq_Num     LSP_Checksum          LSP_Size
AAAA.AAAA.AAAA.00-00*  0x00000005      0x5D3B                   52
DDDD.DDDD.DDDD.00-00   0x00000002      0xC99E                   70
FFFF.FFFF.FFFF.00-00   0x00000001      0x6537                   38

ESADI LSP Details for VLAN 5
LSP_ID                 LSP_Seq_Num     LSP_Checksum
AAAA.AAAA.AAAA.00-00*  0x00000003      0x6139                   46
DDDD.DDDD.DDDD.00-00   0x00000003      0xC79F                   52
FFFF.FFFF.FFFF.00-00   0x00000002      0x6338                   60
```

Show Contents of LSPs in RBridge1

```
#show trill esadi-lsp vlan 1 detail
TRILL ESADI LSP Details
RBridge Instance: 1

ESADI LSP Details for VLAN 3
LSP_ID                 LSP_Seq_Num     LSP_Checksum        LSP_Size
AAAA.AAAA.AAAA.00-00*  0x00000006      0x60CA                 46
    GenApp Sub-TLV:
        Esadi priority   :  64
        Esadi csnp_timer :  30

    MAC Reachability Sub-TLV:
        Nickname          :  8001
        Esadi Confidence  :  16
        Esadi VLAN        :  3
```

```
        MACs              :  00:12:00:13:00:14

DDDD.DDDD.DDDD.00-00   0x00000003      0x184F                33
    GenApp Sub-TLV:
        Esadi priority   :  64
        Esadi csnp_timer :  30

    MAC Reachability Sub-TLV:
        Nickname         :  8004
        Esadi Confidence :  16
        Esadi VLAN       :  3
        MACs             :  00:42:00:43:00:44

FFFF.FFFF.FFFF.00-00   0x00000002      0xF315                52
    GenApp Sub-TLV:
        Esadi priority   :  64
        Esadi csnp_timer :  30

    MAC Reachability Sub-TLV:
        Nickname         :  8006
        Esadi Confidence :  16
        Esadi VLAN       :  3
        MACs             :  00:72:00:73:00:74
```

Check the same output for other RBridges – Rbridge4 and RBridge6 for all VLANs and specific VLANs.

ESADI L2 Table Check

The primary information in TRILL ESADI-LSP PDUs consists of MAC Reachability (MAC-RI) TLVs as specified in RFC 6165. These TLVs contain one or more unicast MAC addresses of end stations that are both on a port and in a VLAN for which the originating RBridge is appointed forwarder

This section shows the configurations required to update end station mac address in ESADI L2 table in a multi-access LAN topology. The configuration assume that you running the `trilld`, `nsm`, and `imi` daemons.

Refer the configuration LSP Check on page 159.

Validation

Checking ESADI Remote L2 Table on RBridge1

```
#show trill esadi-remote-l2-table
VLAN  Confidence  Egress_Name  MACs
-------------------------------------------------------------------------------
1      16         8004         00:32:00:33:00:34
1      16         8006         00:62:00:63:00:64
-------------------------------------------------------------------------------
3      16         8004         00:42:00:43:00:44
3      16         8006         00:72:00:73:00:74
-------------------------------------------------------------------------------
5      16         8004         00:52:00:53:00:54
```

```
5       16          8006          00:82:00:83:00:84
-------------------------------------------------------------------------------
```

Checking ESADI Remote L2 Table on RBridge4

```
#show trill esadi-remote-l2-table
VLAN  Confidence  Egress_Name  MACs
-------------------------------------------------------------------------------
1       16          8001          00:02:00:03:00:04
1       16          8006          00:62:00:63:00:64
-------------------------------------------------------------------------------
3       16          8001          00:12:00:13:00:14
3       16          8006          00:72:00:73:00:74
-------------------------------------------------------------------------------
5       16          8001          00:22:00:33:00:44
5       16          8006          00:82:00:83:00:84
-------------------------------------------------------------------------------
```

Checking ESADI Remote L2 Table on RBridge6

```
#show trill esadi-remote-l2-table
VLAN  Confidence  Egress_Name  MACs
-------------------------------------------------------------------------------
1       16          8001          00:02:00:03:00:04
1       16          8004          00:32:00:33:00:34
-------------------------------------------------------------------------------
3       16          8001          00:12:00:13:00:14
3       16          8004          00:42:00:43:00:44
-------------------------------------------------------------------------------
5       16          8001          00:22:00:33:00:44
5       16          8004          00:52:00:53:00:54
-------------------------------------------------------------------------------
```

Checking ESADI Native L2 Table on RBridge1

```
#show trill esadi-native-l2-table
VLAN  Confidence  MACs
-------------------------------------------------------------------------------
1       16          00:02:00:03:00:04
-------------------------------------------------------------------------------
3       16          00:12:00:13:00:14
-------------------------------------------------------------------------------
5       16          00:22:00:33:00:44
-------------------------------------------------------------------------------
```

Checking ESADI Native L2 Table on RBridge4

```
#show trill esadi-native-l2-table
VLAN  Confidence  MACs
-------------------------------------------------------------------------------
1       16          00:32:00:33:00:34
-------------------------------------------------------------------------------
3       16          00:42:00:43:00:44
-------------------------------------------------------------------------------
5       16          00:52:00:53:00:54
```

```
-------------------------------------------------------------------------------
```

Checking ESADI Native L2 Table on RBridge6

```
#show trill esadi-native-l2-table
VLAN  Confidence  MACs
-------------------------------------------------------------------------------
1      16         00:62:00:63:00:64
-------------------------------------------------------------------------------
3      16         00:72:00:73:00:74
-------------------------------------------------------------------------------
5      16         00:82:00:83:00:84
-------------------------------------------------------------------------------
```

ESADI Participation Flag Check

IANA is requested to allocate an “ESADI Participation” and the “capability of receiving unicast ESADI PDU” bit in the Interested VLANs and Spanning Tree Roots sub-TLV [RFC 6326] (bit 2 and 3 respectively in the Interested VLANs field recommended). If bit 2 is a one, it indicates that the originating RBridge is participating in ESADI for the indicated VLAN or VLANs

Refer to Adjacency on page 156.

Validation

Checking ESADI Participation FLAG

```
#show trill detail lsp
TRILL Link State Database
RBridge Instance 1:
LSP_ID                 LSP_Seq_Num  LSP_Checksum  LSP_Holdtime  OL_Flag  LSP_SIZE
AAAA.AAAA.AAAA.00-00*  0x00000007     0xBAF2        945            0        84

  Extended IS Reachability TLV:
      Metric:   200000        IS-Extended BBBB.BBBB.BBBB.00

  Router Capabaility TLV:
    Trill Version  =  1
    Tree sub-TLV:
        Number_of_trees_to_compute  =  1
        Max_trees_able_to_compute  =  8
        Number_of_trees_to_use  =  1

    Nickname sub-TLV:
        Nickname   Priority   Root_Priority
        8001       128         8001

    Interested VLAN Sub TLV
    VLAN_Range   M4     M6     ESADI     ESADI-UNICAST     AF_Lost_Cnt
      1 - 1      Unset  Unset  Set       Set               2
      3 - 3      Unset  Unset  Set       Set               2
```



```
5 - 5       Unset   Unset   Set       Set              2
```

NSM L2 Table Check

This section shows the configuration required to update end station mac address in NSM L2 table in a multi-access LAN topology. The configurations assume that you running the trilld, nsm, and imi daemons.

RBridge1

`#configure terminal`	Enter configure mode
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#esadi enable`	Enable ESADI protocol
`(config-rb)#esadi instance enable vlan 1`	Enable ESADI instance for vlan 1
`(config-rb)#esadi instance enable vlan 3`	Enable ESADI instance for vlan 3
`(config-rb)#esadi instance enable vlan 5`	Enable ESADI instance for vlan 5
`(config-rb)#exit`	Exit rbridge mode
`(config)#bridge 1 address 0013.0013.0014 forward eth1`	Add static l2 end station mac address per vlan.
`(config)#bridge 1 address 00013.0013.0014 forward eth1 vlan3`	Add static l2 end station mac address per vlan.
`(config)#bridge 1 address 0043.0034.0053 forward eth1 vlan 5`	Add static l2 end station mac address per vlan.

RBridge4

`#configure terminal`	Enter configure mode
`(config)#rbridge trill 1`	Specify the RBridge (1) to configure and enter RBridge mode
`(config-rb)#esadi enable`	Enable ESADI protocol
`(config-rb)#esadi instance enable vlan 1`	Enable ESADI instance for vlan 1
`(config-rb)#esadi instance enable vlan 3`	Enable ESADI instance for vlan 3
`(config-rb)#esadi instance enable vlan 5`	Enable ESADI instance for vlan 5
`(config-rb)#exit`	Exit rbridge mode
`(config)#bridge 1 address 0023.0023.0024 forward eth1`	Add static l2 end station mac address per vlan.

(config)#bridge 1 address 00033.0033.0034 forward eth1 vlan3	Add static l2 end station mac address per vlan.
(config)#bridge 1 address 0043.0044.0043 forward eth1 vlan 5	Add static l2 end station mac address per vlan.

RBridge6

#configure terminal	Enter configure mode
(config)#rbridge trill 1	Specify the RBridge (1) to configure and enter RBridge mode
(config-rb)#esadi enable	Enable ESADI protocol
(config-rb)#esadi instance enable vlan 1	Enable ESADI instance for vlan 1
(config-rb)#esadi instance enable vlan 3	Enable ESADI instance for vlan 3
(config-rb)#esadi instance enable vlan 5	Enable ESADI instance for vlan 5
(config-rb)#exit	Exit rbridge mode
(config)#bridge 1 address 0053.0053.0054 forward eth1	Add static l2 end station mac address per vlan.
(config)#bridge 1 address 00063.0063.0064 forward eth1 vlan3	Add static l2 end station mac address per vlan.
(config)#bridge 1 address 0073.0074.0073 forward eth1 vlan 5	Add static l2 end station mac address per vlan.

Validation

Checking ESADI NSM L2 Table

```
#show nsm trill l2-table
TRILL L2-Table Information
Egress_Nickname  Vlan  Confidence  SNPA
8001*            0001  016         00:02:00:03:00:04
8001*            0003  016         00:12:00:13:00:14
8001*            0005  016         00:22:00:33:00:44
8001*            0001  016         00:05:00:06:00:07
8001*            0003  016         00:07:00:08:00:09
8001*            0005  016         00:01:00:02:00:03
8004             0001  016         00:32:00:33:00:34
8004             0003  016         00:42:00:43:00:44
8004             0005  016         00:52:00:53:00:54
8004             0001  016         00:08:00:16:00:10
8004             0003  016         00:15:00:16:00:17
8004             0005  016         00:09:00:18:00:11
8006             0001  016         00:62:00:63:00:64
8006             0003  016         00:72:00:73:00:74
8006             0005  016         00:82:00:83:00:84
8006             0001  016         00:10:00:20:00:12
```

```
8006            0003  016         00:12:00:21:00:13
8006            0005  016         00:13:00:24:00:14
```

Port State Information

The `show nsm trill portinfo` command validates:

- Port state information
- Whether a port has trunk, access or is a universal port (no TRILL or access port is enabled)
- Whether the port type is inhibited or uninhibited

Topology

Figure 19-1: Port State Information

Rbridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system identifier for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#trill link-type broadcast`	Associate the interface eth1 to trill link-type as broadcast
`(config-if)#exit`	Exit interface mode.

Rbridge2

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system identifier for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#trill link-type broadcast`	Associate the interface eth1 to trill link-type as broadcast
`(config-if)#exit`	Exit interface mode.

Validation

```
#sh nsm trill portinfo
Port Mode Information
Ifname     Ifindex    port_state       port_type
  eth1     0000003    UNINHIBITED      UNIVERSAL PORT
```

Trunk port and Uninhibited State

Rbridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system identifier for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface

(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#trill trunk-port enable	Enable trill trunk port
(config-if)#exit	Exit interface mode.

Rbridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#trill trunk-port enable	Enable trill trunk port
(config-if)#exit	Exit interface mode.

Validation

```
#sh nsm trill portinfo
Port Mode Information
Ifname     Ifindex    port_state       port_type
  eth1     0000003    UNINHIBITED      TRUNK PORT
#
```

Access Port and Uninhibited State

Rbridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system identifier for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#trill link-type broadcast`	Associate the interface eth1 to trill link-type as broadcast
`(config-if)#trill access-port enable`	Enable trill trunk port
`(config-if)#exit`	Exit interface mode.

Rbridge2

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system identifier for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.

(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#trill access-port enable	Enable trill trunk port
(config-if)#exit	Exit interface mode.

Validation

```
#sh nsm trill portinfo
Port Mode Information
Ifname     Ifindex    port_state       port_type
  eth1     0000003    UNINHIBITED      ACCESS PORT
#
```

Port in Inhibited State

Rbridge1

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#trill access-port enable	Enable trill trunk port
(config-if)#shutdown	Makes eth1 interface down
(config-if)#no shutdown	Makes eth1 interface up
(config-if)#exit	Exit interface mode.

Validation

```
(config-if)#do show nsm tril port
Port Mode Information
Ifname     Ifindex    port_state       port_type
```

```
      eth1      0000003     INHIBITED       UNIVERSAL PORT
```

Designated VLAN Information

The designated VLAN ID is used for Inter-Rbridge communication. This VLAN is used for all TRILL encapsulated data and ESADI frames.

Topology

Figure 19-2: Designated VLAN Information

Rbridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#systemid AA:AA:AA:AA:AA:AA`	Configure system identifier for rbridge 1
`(config-rb)#exit`	Exit rbridge mode
`(config)#vlan database`	Enter the VLAN configuration mode.
`(config-vlan)#vlan 2 bridge 1 state enable`	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
`(config-vlan)#vlan 3 bridge 1 state enable`	Enable VLAN 3 on bridge 1.
`(config-vlan)#vlan 4 bridge 1 state enable`	Enable VLAN 4 on bridge 1.
`(config-vlan)#vlan 5 bridge 1 state enable`	Enable VLAN 5 on bridge 1.
`(config-vlan)#vlan 6 bridge 1 state enable`	Enable VLAN 6 on bridge 1.
`(config-vlan)#vlan 7 bridge 1 state enable`	Enable VLAN 7 on bridge 1.
`(config-vlan)#vlan 8 bridge 1 state enable`	Enable VLAN 8 on bridge 1.
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface

(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill designated vlan 2	Configures 2 as designated vlan
(config-if)#exit	Exit from interface mode

Rbridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on bridge 1.
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on bridge 1.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on bridge 1.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on bridge 1.
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on bridge 1.
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on bridge 1.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.

(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill designated vlan 2	Configures 2 as designated vlan
(config-if)#exit	Exit from interface mode

Validation

```
#sh nsm trill appointed-forwarder
Appointed Forwarder VLAN and Designated VLAN
Ifname  IfIdx  SNPA              DVLAN   AF_VLANs
eth1  0003   52:54:00:4e:7c:26  0002    1, 3, 5, 7
```

Appointed Forwarder Information

The DRB designates the VLAN to be used on the link for inter-RBridge communication by the non-P2P RBridge ports and appoints itself or other RBridges on the link as appointed forwarder for VLANs on the link. Appointed Forwarder is responsible for loop avoidance.

Topology

Figure 19-3: Appointed Forwarder Information

Rbridge1

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.

(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on bridge 1.
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on bridge 1.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on bridge 1.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on bridge 1.
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on bridge 1.
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on bridge 1.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill designated vlan 2	Configures 2 as designated vlan
(config-if)#exit	Exit from interface mode

Rbridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.

(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#vlan database	Enter the VLAN configuration mode.
(config-vlan)#vlan 2 bridge 1 state enable	Enable VLAN 2 on bridge 1. Enabling this allows forwarding of VLAN id 2 frames on bridge 1.
(config-vlan)#vlan 3 bridge 1 state enable	Enable VLAN 3 on bridge 1.
(config-vlan)#vlan 4 bridge 1 state enable	Enable VLAN 4 on bridge 1.
(config-vlan)#vlan 5 bridge 1 state enable	Enable VLAN 5 on bridge 1.
(config-vlan)#vlan 6 bridge 1 state enable	Enable VLAN 6 on bridge 1.
(config-vlan)#vlan 7 bridge 1 state enable	Enable VLAN 7 on bridge 1.
(config-vlan)#vlan 8 bridge 1 state enable	Enable VLAN 8 on bridge 1.
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#switchport trunk allowed vlan add 2,3,4,5,6,7,8,9,10	Associate the interface eth1 with vlan 2,3,4,5,6,7,8,9
(config-if)#trill announcing-vlan [2-8]	Associate the interface eth1 with announcing vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill end-station-service-vlan all	Associate the interface eth1 with end station service vlan 1,2,3,4,5,6,7,8,9
(config-if)#trill designated vlan 2	Configures 2 as designated vlan
(config-if)#exit	Exit from interface mode

Validation

```
#sh nsm trill appointed-forwarder
Appointed Forwarder VLAN and Designated VLAN
Ifname  IfIdx  SNPA              DVLAN   AF_VLANs
eth1  0003   52:54:00:d0:29:82  0002    1, 3, 4, 7
```

Unicast Route Information

Known-unicast frames have a unicast inner MAC destination address (Inner.MacDA) and are those for which the ingress RBridge knows the egress RBridge for the destination MAC address in the frame's VLAN. Such frames are forwarded Rbridge hop by Rbridge hop to their egress Rbridge.

Use the same topology and configuration as in Chapter 17, *Multicast OAM*.

Validation

```
#sh nsm trill ufdb
NSM-Trill Unicast Forwarding Database
Eg_NkName Metric    NH_NkName SNPA               Hop    IfIdx  IfName  Mode
7001      200000    7001      52:54:00:b2:f4:ae 0001   0005     eth3   D
7002      200000    7002      52:54:00:76:6a:71 0001   0004     eth2   D
7003      200000    7003      52:54:00:dc:ec:e1 0001   0003     eth1   D
```

Multicast Route Information

RBridges build distribution trees and use these trees for forwarding multi-destination frames.Each distribution tree reaches all RBridges in the campus, is shared across all VLANs, and may be used for the distribution of a native frame that is in any VLAN.However, the distribution of any particular frame on a distribution tree is pruned in different ways for different cases to avoid unnecessary propagation of the frame.

Use the same topology and configuration as in Chapter 17, *Multicast OAM*.

Validation

```
#sh nsm trill mfdb
NSM - TRILL Multicast Forwarding Database
[*] Refers to Ingress DTree
D-TreeName Hop_Cnt   NH_Name   IfIdx   IfName  SNPA               Mode
8001       0001      7003      0003    eth1    52:54:00:dc:ec:e1  D
                               7002      0004    eth2    52:54:00:76:6a:71  D
                               7001      0005    eth3    52:54:00:b2:f4:ae  D
8002       0001      7003      0003    eth1    52:54:00:dc:ec:e1  D
                               7002      0004    eth2    52:54:00:76:6a:71  D
                               7001      0005    eth3    52:54:00:b2:f4:ae  D
8003[*]    0001      7003      0003    eth1    52:54:00:dc:ec:e1  D
                                 7002      0004    eth2    52:54:00:76:6a:71  D
                                           7001      0005    eth3    52:54:00:b2:f4:ae
D
```

VLAN Pruning Information

Each distribution tree should be pruned per VLAN, eliminating branches that have no potential receivers downstream. Multi-destination TRILL data frames should only be forwarded on branches that are not pruned.

Use the same topology and configuration as in Chapter 17, *Multicast OAM*.

Validation

```
#show nsm trill vlan-pruning
NSM - TRILL Vlan Pruning Info
DTree   Vlan    Port_List
8001    0001    eth1    eth2    eth3
8001    0002    eth1    eth2    eth3
8001    0003    eth1    eth2    eth3
8001    0004    eth1    eth2    eth3
8001    0005    eth1    eth2    eth3
8001    0006    eth1    eth3
8001    0007    eth1    eth2    eth3
8001    0008    eth1    eth2    eth3
8002    0001    eth1    eth2    eth3
8002    0002    eth1    eth2    eth3
8002    0003    eth1    eth2    eth3
8002    0004    eth1    eth2    eth3
8002    0005    eth1    eth2    eth3
8002    0006    eth1    eth3
8002    0007    eth1    eth2    eth3
8002    0008    eth1    eth2    eth3
8003    0001    eth1    eth2    eth3
8003    0002    eth1    eth2    eth3
8003    0003    eth1    eth2    eth3
8003    0004    eth1    eth2    eth3
8003    0005    eth1    eth2    eth3
8003    0006    eth1    eth3
8003    0007    eth1    eth2    eth3
8003    0008    eth1    eth2    eth3
```

TRILL RPF Check

RPF Check technique is used by RBridges for avoiding temporary multicast loops during topology changes is the Reverse Path Forwarding Check. It involves checking that a multi-destination frame, based on the tree and the ingress RBridge, arrives from the expected link. RBridges MUST drop multi-destination frames that fail the RPF check.

Use the same topology and configuration as in Chapter 17, *Multicast OAM*.

Along with above configurations on RBridge1, configure the number of dtrees to use as shown below:

```
#con terminal
Enter configuration commands, one per line.  End with CNTL/Z.
(config)#rbridge trill 1
(config-rb)#number-of-dtrees-to-use 2
(config-rb)#exi
(config)#
```

Validation

```
#sh nsm trill rpf
Reverse Path Forwarding Info
```



```
DTree  Ingress_NkName  Ifindex   Ifname
8003   7001            0000003    eth1
8003   7002            0000003    eth1
8002   8001            0000003    eth1
8002   8002            0000003    eth1
8003   8001            0000003    eth1
8002   8003            0000003    eth1
8003   8002            0000003    eth1
003            0000003    eth1
```

Nickname Information

Nicknames are 16-bit dynamically assigned quantities that act as abbreviations for RBridges' IS-IS IDs to achieve a more compact encoding and can be used to specify potentially different trees with the same root.

The value 0x0000 is reserved to indicate that a nickname is not specified, the values 0xFFC0 through 0xFFFE are reserved for future specification, and the value 0xFFFF is permanently reserved.

RBridges piggyback a nickname acquisition protocol on the link state protocol to acquire one or more nicknames unique within the campus.

Topology

Figure 19-4: Nickname Information

Rbridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#max-nickname 10`	Configure maximum nickname allowed for configuration
`(config-rb)#nickname 8003 nickname- priority 140 root-priority 8003`	Configures nickname for rbridge
`(config-rb)#nickname 8002 nickname- priority 139 root-priority 8002`	Configures nickname for rbridge
`(config-rb)#nickname 8001 nickname- priority 138 root-priority 8001`	Configures nickname for rbridge

(config-rb)#systemid AA:AA:AA:AA:AA:AA	Configure system identifier for rbridge 1
(config-rb)#exit	Exit rbridge mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type broadcast	Associate the interface eth1 to trill link-type as broadcast
(config-if)#exit	Exit interface mode.

Validation

```
#sh nsm trill detail
TRILL Details
Self Nickname List
c236    8003    8002    8001
```

Accept Non-Adjacency Information

Rbridge1

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#accept-non-adj	Enable accept non adjacent mode
(config-if)#exit	Exit interface mode.

Validation

```
#sh nsm trill detail
TRILL Details
Self Nickname List
c236    8003    8002    8001
Accept Non-Adjacency is Set
Static Confidence =  255
Native Confidence =  32
Decap Confidence  =  32
#
```

Trunk and P2P Mode Adjacency Information

When a multi-destination TRILL-encapsulated frame is received by an RBridge, Tree Adjacency check is performed which may cause the frame to be discarded

Each RBridge RBn keeps a set of adjacencies ({port, neighbor} pairs) for each distribution tree it is calculating. One of these adjacencies is toward the tree root RBi, and the others are toward the leaves. Once the adjacencies are chosen, it is irrelevant which ones are towards the root RBi and which are away from RBi. RBridges MUST drop a multi-destination frame that arrives at a port from an RBridge that is not an adjacency for the tree on which the frame is being distributed.

Topology

Figure 19-5: Trunk and P2P Mode Adjacency Information

Rbridge1

`#configure terminal`	Enter configure mode
`(config)#bridge 1 protocol trill`	Add a bridge (1) to the spanning tree table
`(config)#rbridge trill 1`	Specify the rbridge (1) to be configured and enter the rbridge mode.
`(config-rb)#rbridge trill 1 bridge 1`	Associate the RBridge with the bridge
`(config-rb)#max-nickname 10`	Configure maximum nickname allowed for configuration
`(config-rb)#nickname 8003 nickname- priority 140 root-priority 8003`	Configures nickname for rbridge
`(config-rb)#exit`	Exit rbridge mode
`(config)#interface eth1`	Specify the interface (eth1) to be configured and enter the Interface mode.
`(config-if)#switchport`	Configure eth1 as a Layer 2 port
`(config-if)#no shutdown`	Start the interface
`(config-if)#bridge-group 1`	Associate the interface eth1 with bridge group 1.
`(config-if)#switchport mode trunk`	Configure the port as trunk
`(config-if)#trill instance 1`	Associate the interface eth1 with trill instance 1.
`(config-if)#trill link-type point-to-point`	Associate the interface eth1 to trill link-type as Point-to-point
`(config-if)#exit`	Exit interface mode.

Rbridge2

#configure terminal	Enter configure mode
(config)#bridge 1 protocol trill	Add a bridge (1) to the spanning tree table
(config)#rbridge trill 1	Specify the rbridge (1) to be configured and enter the rbridge mode.
(config-rb)#rbridge trill 1 bridge 1	Associate the RBridge with the bridge
(config-rb)#max-nickname 10	Configure maximum nickname allowed for configuration
(config-rb)#nickname 8003 nickname- priority 140 root-priority 8003	Configures nickname for rbridge
(config-rb)#exit	Exit rbridge mode
(config)#interface eth1	Specify the interface (eth1) to be configured and enter the Interface mode.
(config-if)#switchport	Configure eth1 as a Layer 2 port
(config-if)#no shutdown	Start the interface
(config-if)#bridge-group 1	Associate the interface eth1 with bridge group 1.
(config-if)#switchport mode trunk	Configure the port as trunk
(config-if)#trill instance 1	Associate the interface eth1 with trill instance 1.
(config-if)#trill link-type point-to-point	Associate the interface eth1 to trill link-type as Point-to-point
(config-if)#exit	Exit interface mode.

Validation

Adjacency Formed on P2P port

```
#sh nsm trill adjacency
Adjacency Table
Ifname  IfIdx  SNPA
eth1  0003   52:54:00:41:58:7a
#sh tril neighbor
TRILL Neighbor Table Instance = 1
NbrMacAddr          NbrMtu   NbrSysId            NbrNickname    PortId  Interface
------------------------------------------------------------------------------
5254.0041.587A      n/a      EEEE.EEEE.EEEE      n/a            n/a      eth1
HoldingTime  NbrPriority  DesiredVlan  State       UpTime
-------------------------------------------------------------
21           n/a          n/a          P2P-AdjUp   00:09:38
n/a = not applicable
```

Adjacency Formed on Trunk port

```
#sh nsm trill adjacency
Adjacency Table
Ifname  IfIdx  SNPA
 eth4  0006   52:54:00:4e:7c:26
```

```
#sh tril neighbor
TRILL Neighbor Table Instance = 1
NbrMacAddr          NbrMtu   NbrSysId            NbrNickname    PortId  Interface
------------------------------------------------------------------------------
5254.004E.7C26      0        FFFF.FFFF.FFFF      5001           0        eth4
HoldingTime  NbrPriority  DesiredVlan  State       UpTime
-------------------------------------------------------------
8            64           1            REPORT/DR   00:00:15
#
```

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