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Document ID: 12350

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Introduction

This document explains how to troubleshoot a scenario where two MAC addresses do not connect. This document uses a 1100 access list to solve the problem. The 1100 access list is a debug filter utility that extends access list configuration commands.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Access lists
- Source–route bridging (SRB)

Components Used

The information in this document is based on these software and hardware versions:

- Routers that run Cisco IOS® Software Release 10.3 and later

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

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Background Information

The debug filter utility does not block traffic. Build an access list and use the access list with these debug commands:

- **debug list 1100** filters debugging information
- **debug token ring** displays messages about Token Ring interface activity

The result is a trace of what happens on the router for the MAC address pairs listed in the access list. Use the debug filter utility in source–route bridging (SRB), remote source–route bridging (RSRB), and data–link switching (DLSw). Look for the path the debug filter uses to get in and out of the Token Ring interface. Use the debug filter utility in any of these conditions:

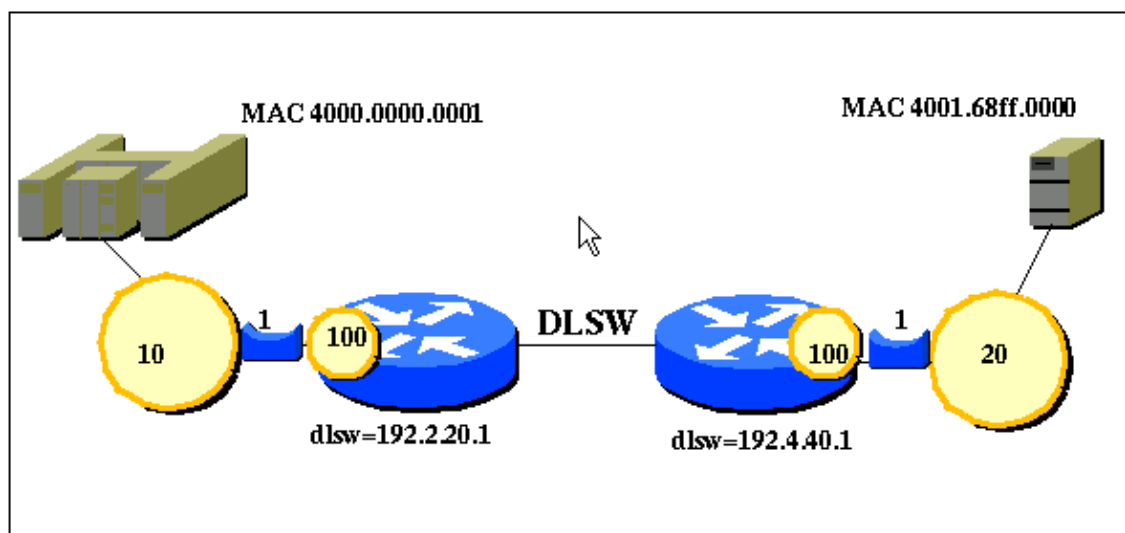
- When an SRB Token Ring interface is on the router.
- When the traffic in question uses an SRB Token Ring interface.
- When the router runs Cisco IOS Software Release 10.3 or later

Note: When you run Cisco IOS Software Release 11.3, version 11.3(9) is the minimum version necessary for the software to work properly. Similarly, when you use Cisco IOS Software Release 12.0, 12.0(4) is the minimum requirement.

Use Debug Filter Utility to Establish a MAC Address Session

The example in this section is Data–Link Switching (DLSw)–oriented. However, the 1100 access list is for SRB traffic. The DLSw aspect of the example does not affect the outcome.

Example



MAC address 4001.68ff.0000 cannot establish a session with MAC address 4000.0000.0001.

Establish a MAC Address Session

Complete these steps:

1. Build the 1100 access list for the dlsw=192.2.20.1 router.

```
access-list 1100 permit 4001.68ff.0000 8000.0000.0000 4000.0000.0001 0000.0000.0000
access-list 1100 permit 4000.0000.0001 8000.0000.0000 4001.68ff.0000 0000.0000.0000
```

2. Apply the access list to the command line of the dlsw=192.2.20.1 router.

```
taz#debug list 1100
taz#debug token ring
Token Ring Interface debugging is on
for access list: 1100
```

The debugs are taken from the dlsw=192.2.20.1 router.

Note: The 1100 access list picks up incoming packets in the SRB/fast-switching code and the bridging code. All SRB/fast-switching lines in these examples are deleted.

3. Make sure the MAC address exists before exchange identification (XID) negotiations begin. This is called the "TEST" portion (MAC address ping) in this example:

```
To0: out: MAC: acfc: 0x0040 Dst: 4000.0000.0001 Src: c001.68ff.0000 bf: 0x
0x3150E0C
To0: out: RIF: c630.0641.00A0
To0: out: LLC: 0004F300 000848B4 03032630 001C0F41 002E6004 0012DD5C ln: 23
To0: br: MAC: acfc: 0x1040 Dst: 4001.68ff.0000 Src: c000.0000.0001 bf: 0x
0x3151778
To0: br: RIF: 8230
To0: br: LLC: 0401F300 E338C800 08020000 3052A302 C851749F 0A01E000 ln: 19
TR0: br: riflen 2, rd_offset 0, llc_offset 16
```

Annotations in the image:

- "Test" points to the first two lines of output (out: MAC and out: RIF).
- "Test +rsp" points to the third line of output (br: RIF).
- "SRB (ring 100, bridge1, ring 10)" points to the Src field in the first line.
- "ARE (from 4000.0000.00001)" points to the Src field in the third line.

The Systems Network Architecture (SNA) suite of protocols is used to bridge. The basic SNA start up sequence is TEST, TEST+rsp, XID (which can be a few or many lines), and a Set Asynchronous Balanced Mode Extended (SABME) and Unnumbered Acknowledgment (UA).

As you can see from the output, the TEST and the TEST+rsp works. If this phase fails, you must find the cause. Nothing happens until the TEST/TEST+rsp pairing is complete.

4. Begin communication after the identification of the MAC address. Both ends must agree upon communication rules to adhere to during the conversation. This occurs during the XID exchange portion. Some devices do not allow both ends to actively participate in rule changes. With a PU2.0 device, the XID exchange is typically rather short.

After the TEST and TEST+rsp, look for the XID ("BF") and the SABME/UA combination.

Here is an example for a PU2.0 XID exchange:

```
To0: out: MAC: acfc: 0x8040 Dst: 4000.0000.0001 Src: c001.68ff.0000 bf: 0x
x3150EOC
To0: out: RIF: 06B0.00A1.0640 NULL XID
To0: out: LLC: 0404BF00 01000000 00000400 13531C00 12039400 00000400 ln: 23
To0: br: MAC: acfc: 0x1040 Dst: 4001.68ff.0000 Src: c000.0000.0001 bf: 0x
x3151778
To0: br: RIF: 0630.00A1.0640
To0: br: LLC: 0405BFF8 66584300 00000258 0E5EC001 0A01E000 000A0205 ln: 23
TR0: br: riflen 6, rd_offset 16, llc_offset 20
To0: out: MAC: acfc: 0x8040 Dst: 4000.0000.0001 Src: c001.68ff.0000 bf: 0x
x3150EOC
To0: out: RIF: 06B0.00A1.0640
To0: out: LLC: 0404BF02 00096000 01004000 00000001 C6300641 00A00000 ln: 29
To0: br: MAC: acfc: 0x1040 Dst: 4001.68ff.0000 Src: c000.0000.0001 bf: 0x
x3151778
To0: br: RIF: 0630.00A1.0640 SABME
To0: br: LLC: 04047F77 F5090600 00000258 0E5EC001 0A01E000 000A0205 ln: 23
TR0: br: riflen 6, rd_offset 16, llc_offset 20
To0: out: MAC: acfc: 0x8040 Dst: 4000.0000.0001 Src: c001.68ff.0000 bf: 0x
x3150EOC
To0: out: RIF: 06B0.00A1.0640 UA
To0: out: LLC: 04057300 00000000 085C0003 03263000 1E8D0000 0C600200 ln: 23
To0: br: MAC: acfc: 0x1040 Dst: 4001.68ff.0000 Src: c000.0000.0001 bf: 0x
x3151778
To0: br: RIF: 0630.00A1.0640
To0: br: LLC: 04040101 A0E62B93 66DD69D8 00F5C3F5 711D6011 40403C4B ln: 24
TR0: br: riflen 6, rd_offset 16, llc_offset 20
```

The XID Exchange Portion with PU2.1 Conversation Tactics

PU2.1-capable devices allow the end stations flexibility to negotiate communication rules. One device sends an XID3 (BF3) with the desired rules. The other device receives the rules, makes necessary changes, and sends the rules back to the first device. This activity continues until the devices reach the SABME/UA combination. If no rules are determined, the exchange can terminate.

If the devices do not reach the SABME/UA portion, there can be a configuration issue that causes the devices to never synchronize. For example, if both devices send messages, which state that they want to be the primary and the point is nonnegotiable, the two sides never get to SABME/UA.

Here is a sample PU2.1 XID exchange:

NULL XID

```

To0: out: MAC: acfc: 0x8040 Dst: 4000.0000.0001 Src: c001.68ff.0000 bf: 0x82 0
x3150E0C
To0: out: RIF: 06B0.00A1.0640
To0: out: LLC: 0404BF00 01000000 00000400 13531C00 12039400 00000400 ln: 23
To0: br: MAC: acfc: 0x1040 Dst: 4001.68ff.0000 Src: c000.0000.0001 bf: 0x02 0
x3151778
To0: br: RIF: 0630.00A1.0640
To0: br: LLC: 0405BFF8 66584301 686901B4 CBE07DA8 0A01E000 000A0205 ln: 23
TR0: br: riflen 6, rd_offset 16, llc_offset 20
To0: out: MAC: acfc: 0x8040 Dst: 4000.0000.0001 Src: c001.68ff.0000 bf: 0x82 0
x3150E0C
To0: out: RIF: 06B0.00A1.0640
To0: out: LLC: 0404BF32 5C096000 01000080 08C10000 00008000 010B7100 ln: 115
To0: br: MAC: acfc: 0x1040 Dst: 4001.68ff.0000 Src: c000.0000.0001 bf: 0x02 0
x3151778
To0: br: RIF: 0630.00A1.0640
To0: br: LLC: 0405BF32 47FFFFFF FC000010 8A000000 00000000 010B7100 ln: 94
TR0: br: riflen 6, rd_offset 16, llc_offset 20
To0: out: MAC: acfc: 0x8040 Dst: 4000.0000.0001 Src: c001.68ff.0000 bf: 0x82 0
x3150E0C
To0: out: RIF: 06B0.00A1.0640
To0: out: LLC: 0404BF32 5C096000 01000080 04C10000 00008000 010B4100 ln: 115
To0: br: MAC: acfc: 0x1040 Dst: 4001.68ff.0000 Src: c000.0000.0001 bf: 0x02 0
x3151778
To0: br: RIF: 0630.00A1.0640
To0: br: LLC: 0405BF32 47FFFFFF FC000010 86000000 00000000 010B5100 ln: 94
TR0: br: riflen 6, rd_offset 16, llc_offset 20
To0: out: MAC: acfc: 0x8040 Dst: 4000.0000.0001 Src: c001.68ff.0000 bf: 0x82 0
x3150E0C
To0: out: RIF: 06B0.00A1.0640
To0: out: LLC: 0404BF32 5C096000 01000080 04C10000 00008000 010B4100 ln: 115
To0: br: MAC: acfc: 0x1040 Dst: 4001.68ff.0000 Src: c000.0000.0001 bf: 0x02 0
x3151778
To0: br: RIF: 0630.00A1.0640
To0: br: LLC: 04047F77 F5090688 997817FF CBE07DA8 0A01E000 000A0205 ln: 23
TR0: br: riflen 6, rd_offset 16, llc_offset 20
To0: out: MAC: acfc: 0x8040 Dst: 4000.0000.0001 Src: c001.68ff.0000 bf: 0x82 0
x3150E0C
To0: out: RIF: 06B0.00A1.0640
To0: out: LLC: 04057300 00000000 0845BC03 03263000 1E8D0000 0C600200 ln: 23

```

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