

了解 Cisco 路由器的环回模式

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简介

环回是故障排除的重要部分;(特别是当电路发生故障)时,他们用于隔离故障和端到端电路。本文检查环回的两种类型在Cisco路由器ATM接口的:

- Loopback Diagnostic -这帮助您确定您的接口是否是工作正常。
- 环回线路-这帮助确定是否有与服务提供商的一问题。

开始使用前

规则

有关文档规则的详细信息,请参阅 [Cisco 技术提示规则](#)。

先决条件

本文档没有任何特定的前提条件。

使用的组件

本文档中的信息基于以下软件和硬件版本。

- 在本文的示例不要求任何特定的软件版本。当PA-A1、PA-A2和PA-A3支持两种模式时,AIP支持Loopback Diagnostic。LANE模块支持环回线路,并且其他Cisco路由器支持两种模式。
- 这仅适用于主接口,不是子接口。

本文档中的信息都是基于特定实验室环境中的设备创建的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您是在真实网络上操作，请确保您在使用任何命令前已经了解其潜在影响。

网络图

我们将使用以下网络说明Loopback模式。

Loopback Diagnostic

loopback diagnostic命令在Cisco路由器的ATM接口下导致流量出去接口回到路由器。图1和示例1如何说明该进程。为[Non-ATM接口要看到环回信息，请点击此处并且移下来对关于特殊串行线路测试的部分。](#)

注意： Tx=transmit接口和Rx=Receive接口。

注意： 要保证适当的时钟频率，设置路由器作为时钟源。要执行此，请指定设置在主接口配置里的 atm clock internal。

示例 1

在Loopback Diagnostic前在接口设置

```
Lt-7507b
lt7507b# show running-config Building configuration...
Current configuration: ! version 12.0 ! hostname lt-
7507b ! ip subnet-zero no ip domain-lookup ! interface
ATM1/0 no ip address no ip directed-broadcast no ip
mroute-cache no atm ilmi-keepalive ! interface ATM1/0.1
multipoint ip address 10.1.1.2 255.255.255.0 no ip
directed-broadcast pvc 0/85 protocol ip 10.1.1.1
encapsulation aal5snap ! ip classless no ip http server
! line con 0 transport input none line aux 0 line vty 0
4 login ! end
```

```
lt-7507b#show interface atm 1/0 ATM1/0 is up, line protocol is up Hardware is cxBus ATM MTU 4470
bytes, sub MTU 4470, BW 155520 Kbit, DLY 80 usec, reliability 255/255, txload 1/255, rxload
1/255 Encapsulation ATM, loopback not set Keepalive not supported Encapsulation(s): AAL5, PVC
mode 256 TX buffers, 256 RX buffers, 2048 maximum active VCs, 1024 VCs per VP, 1 current VCCs VC
idle disconnect time: 300 seconds Last input 00:01:55, output 00:01:55, output hang never Last
clearing of "show interface" counters never Queueing strategy: fifo Output queue 0/40, 0 drops;
input queue 0/75, 0 drops 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0
bits/sec, 0 packets/sec 163861 packets input, 3164940 bytes, 0 no buffer Received 0 broadcasts,
0 runts, 0 giants, 0 throttles 33 input errors, 33 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
144191 packets output, 2138298 bytes, 0 underruns 0 output errors, 0 collisions, 0 interface
resets 0 output buffer failures, 0 output buffers swapped out
```

注意： 要说明回环机制，我们显示我们能发送在PVC的ATM信元。如果环回没有设置，那些信元不会是环回的给我们。请关闭ATM接口在另一路由器lt-7200b。

```
lt-7507b#debug atm packet interface a1/0.1 vc 0/85 ATM packets debugging is on Displaying
packets on interface ATM1/0 VPI 0, VCI 85 only lt-7507b#ping Protocol [ip]: Target IP address:
10.1.1.1 Repeat count [5]: 2 Datagram size [100]: Timeout in seconds [2]: Extended commands [n]:
Sweep range of sizes [n]: Type escape sequence to abort. Sending 2, 100-byte ICMP Echos to
10.1.1.1, timeout is 2 seconds:
```

ping发生故障，并且ATM调试show traffic出去和不回来。

```
lwd: ATM1/0.1(O): VCD:0x5 VPI:0x0 VCI:0x55 DM:0x100 SAP:AAAA CTL:03 OUI:000000 TYPE:0800
Length:0x70 lwd: 4500 0064 001C 0000 FF01 B778 0A01 0102 0A01 0101 0800 9994 0E58 068B 0000
lwd: 0000 2D42 A290 ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd: ABCD ABCD
ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd: ABCD ABCD ABCD ABCD ABCD
lwd: . lwd: ATM1/0.1(O): VCD:0x5 VPI:0x0 VCI:0x55 DM:0x100 SAP:AAAA CTL:03 OUI:000000
TYPE:0800 Length:0x70 lwd: 4500 0064 001D 0000 FF01 B777 0A01 0102 0A01 0101 0800 91C3 0E59
068B 0000 lwd: 0000 2D42 AA60 ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd:
ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd: ABCD ABCD ABCD
ABCD ABCD lwd: . Success rate is 0 percent (0/2)
```

现在请添加Loopback Diagnostic，并且show interface显示环回设置。

```
lt-7507b#configure terminal Enter configuration commands, one per line. End with CNTL/Z. lt-
7507b(config)#int a1/0 lt-7507b(config-if)#loopback diagnostic lt-7507b(config-if)#atm clock
internal
```

注意：必须配置Loopback命令在主接口，不在子接口。

```
lt-7507b#show interface a1/0 ATM1/0 is up, line protocol is up Hardware is cxBus ATM MTU 4470
bytes, sub MTU 4470, BW 155520 Kbit, DLY 80 usec, reliability 255/255, txload 1/255, rxload
1/255 Encapsulation ATM, loopback set Keepalive not supported Encapsulation(s): AAL5, PVC mode
256 TX buffers, 256 RX buffers, 2048 maximum active VCs, 1024 VCs per VP, 1 current VCCs VC idle
disconnect time: 300 seconds Last input 00:03:16, output 00:03:16, output hang never Last
clearing of "show interface" counters never Queueing strategy: fifo Output queue 0/40, 0 drops;
input queue 0/75, 0 drops 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0
bits/sec, 0 packets/sec 163861 packets input, 3164940 bytes, 0 no buffer Received 0 broadcasts,
0 runts, 0 giants, 0 throttles 33 input errors, 33 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
144191 packets output, 2138298 bytes, 0 underruns 0 output errors, 0 collisions, 1 interface
resets 0 output buffer failures, 0 output buffers swapped out
```

ping将发生故障，但是ATM调试show traffic出去的(o)和回来在(i)。

```
lt-7507b#ping Protocol [ip]: Target IP address: 10.1.1.1 Repeat count [5]: 2 Datagram size
[100]: Timeout in seconds [2]: Extended commands [n]: Sweep range of sizes [n]: Type escape
sequence to abort. Sending 2, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds: lwd:
ATM1/0.1(O): VCD:0x5 VPI:0x0 VCI:0x55 DM:0x100 SAP:AAAA CTL:03 OUI:000000 TYPE:0800 Length:0x70
lwd: 4500 0064 001A 0000 FF01 B77A 0A01 0102 0A01 0101 0800 119A 13A2 07C5 0000 lwd: 0000 2D41
2408 ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd: ABCD ABCD ABCD ABCD ABCD
ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd: ABCD ABCD ABCD ABCD ABCD
lwd: ATM1/0.1(I): VCD:0x5 VPI:0x0 VCI:0x55 Type:0x0 SAP:AAAA CTL:03 OUI:000000 TYPE:0800 Length:0x70
lwd: 4500 0064 001A 0000 0101 B57B 0A01 0102 0A01 0101 0800 119A 13A2 07C5 0000 lwd: 0000 2D41
2408 ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd: ABCD ABCD ABCD ABCD ABCD
ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd: ABCD ABCD ABCD ABCD ABCD
lwd: ATM1/0.1(O): VCD:0x5 VPI:0x0 VCI:0x55 DM:0x100 SAP:AAAA CTL:03 OUI:000000 TYPE:0800 Length:0x70
lwd: 4500 0064 001B 0000 FF01 B779 0A01 0102 0A01 0101 0800 09C9 13A3 07C5 0000 lwd: 0000 2D41
2BD8 ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd: ABCD ABCD ABCD ABCD ABCD
ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd: ABCD ABCD ABCD ABCD ABCD
lwd: ATM1/0.1(I): VCD:0x5 VPI:0x0 VCI:0x55 Type:0x0 SAP:AAAA CTL:03 OUI:000000 TYPE:0800 Length:0x70
lwd: 4500 0064 001B 0000 0101 B57A 0A01 0102 0A01 0101 0800 09C9 13A3 07C5 0000 lwd: 0000 2D41
2BD8 ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd: ABCD ABCD ABCD ABCD ABCD
ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD lwd: ABCD ABCD ABCD ABCD ABCD
lwd: . Success
rate is 0 percent (0/2)
```

loopback line 命令

loopback line命令在Cisco路由器的ATM接口下造成流入的数据流被退还的到网络。请参阅下面图2和示例2。

示例 2

路由器配置lt-7200b

Lt-7200b

```
lt-7200b#show running-config Building configuration...
Current configuration: ! version 12.0 service timestamps
debug uptime service timestamps log uptime no service
password-encryption ! hostname lt-7200b ! interface
ATM2/0 no ip address no ip directed-broadcast no atm
ilmi-keepalive ! interface ATM2/0.1 multipoint ip
address 10.1.1.1 255.255.255.0 no ip directed-broadcast
pvc 0/85 protocol ip 10.1.1.2 encapsulation aal5snap ! !
ip classless no ip http server ! line con 0 transport
input none line aux 0 line vty 0 4 login ! end
```

在环回线路前在接口设置

```
lt-7200b# show interface atm 2/0 ATM2/0 is up, line protocol is up Hardware is TI1570 ATM MTU
4470 bytes, sub MTU 4470, BW 155520 Kbit, DLY 80 usec, reliability 255/255, txload 1/255, rxload
1/255 Encapsulation ATM, loopback not set Keepalive not supported Encapsulation(s): AAL5, PVC
mode 2048 maximum active VCs, 1024 VCs per VP, 1 current VCCs VC idle disconnect time: 300
seconds Last input 00:00:43, output 00:00:43, output hang never Last clearing of "show
interface" counters never Queueing strategy: fifo Output queue 0/40, 0 drops; input queue 0/75,
0 drops 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0
packets/sec 94912 packets input, 1637823 bytes, 0 no buffer Received 0 broadcasts, 0 runts, 0
giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort 102893 packets
output, 2042225 bytes, 0 underruns 0 output errors, 0 collisions, 3 interface resets 0 output
buffer failures, 0 output buffers swapped out
```

注意：ATM信息包调试打开和ping从路由器lt-7507b到路由器lt-7200b。您能看到测验从7500再进行(其中我们删除最初的环回)。这是正常，因为环回线路允许我们发现电信网络是否是工作正常。

```
lt-7507b#debug atm packet ATM packets debugging is on Displaying all ATM packets lt-7507b#debug
atm packet sh debug lt-7507b#ping 10.1.1.1 Type escape sequence to abort. Sending 1, 100-byte
ICMP Echos to 10.1.1.1, timeout is 2 seconds: ! Success rate is 100 percent (1/1), round-trip
min/avg/max = 1/2/4 ms
```

ping是成功的，并且ATM调试show traffic是出去和回来。

```
00:45:14: ATM1/0.1(O): VCD:0x1 VPI:0x0 VCI:0x55 DM:0x100 SAP:AAAA CTL:03 OUI:000000 TYPE:0800
Length:0x70 00:45:14: 4500 0064 0005 0000 FF01 B78F 0A01 0102 0A01 0101 0800 028C 02D4 0C51 0000
00:45:14: 0000 0029 6C70 ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD 00:45:14:
ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD
00:45:14: ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD
00:45:14: 00:45:14: ATM1/0.1(I): VCD:0x1 VPI:0x0 VCI:0x55 Type:0x0 SAP:AAAA
CTL:03 OUI:000000 TYPE:0800 Length:0x70 00:45:14: 4500 0064 0005 0000 FE01 B88F 0A01 0101 0A01
0102 0000 0A8C 02D4 0C51 0000 00:45:14: 0000 0029 6C70 ABCD ABCD ABCD ABCD ABCD ABCD ABCD
ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD
00:45:14: ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD
00:45:14: ABCD ABCD ABCD ABCD ABCD Success rate is 100 percent (1/1)
```

配置在路由器lt-7200b ATM接口的环回线路

```
lt-7200b#configure terminal Enter configuration commands, one per line. End with CNTL/Z. lt-
7200b(config)#int a2/0 lt-7200b(config-if)#loopback line lt-7200b(config-if)#^Z lt-7200b#config
show interface a2/0 ATM2/0 is up, line protocol is up Hardware is TI1570 ATM MTU 4470 bytes, sub
MTU 4470, BW 155520 Kbit, DLY 80 usec, reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ATM, loopback set Keepalive not supported Encapsulation(s): AAL5, PVC mode 2048
maximum active VCs, 1024 VCs per VP, 1 current VCCs VC idle disconnect time: 300 seconds Last
input 00:02:45, output 00:02:45, output hang never Last clearing of "show interface" counters
never Queueing strategy: fifo Output queue 0/40, 0 drops; input queue 0/75, 0 drops 5 minute
input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0 packets/sec 94917
packets input, 1638383 bytes, 0 no buffer Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort 102898 packets output, 2042785
bytes, 0 underruns 0 output errors, 0 collisions, 5 interface resets 0 output buffer failures, 0
output buffers swapped out
```

注意：从路由器lt-7507b的Ping。ping将发生故障正如所料，但是流量是循环往从网络的路由器lt-7507b，并且ATM调试显示流量出去的(o)然后回来在(i)。

```
lt-7507b#ping 10.1.1.1 Type escape sequence to abort. Sending 2, 100-byte ICMP Echos to
10.1.1.1, timeout is 2 seconds: .. Success rate is 0 percent (0/2) 00:52:00: ATM1/0.1(O):
VCD:0x1 VPI:0x0 VCI:0x55 DM:0x100 SAP:AAAA CTL:03 OUI:000000 TYPE:0800 Length:0x70 00:52:00:
4500 0064 000F 0000 FF01 B785 0A01 0102 0A01 0101 0800 CE44 1 21D 0009 0000 00:52:00: 0000 002F
9DB0 ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD 00:52:00: ABCD ABCD ABCD ABCD
ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD 00:52:00: ABCD ABCD ABCD ABCD ABCD
00:52:00: 00:52:00: ATM1/0.1(I): VCD:0x1 VPI:0x0 VCI:0x55 Type:0x0 SAP:AAAA CTL:03 OUI:000000
TYPE:0800 Length:0x70 00:52:00: 4500 0064 000F 0000 0101 B586 0A01 0102 0A01 0101 0800 CE44 121D
0009 0000 00:52:00: 0000 002F 9DB0 ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD
00:52:00: ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD 00:52:00:
ABCD ABCD ABCD ABCD ABCD 00:52:00: . 00:52:02: ATM1/0.1(O): VCD:0x1 VPI:0x0 VCI:0x55 DM:0x100
SAP:AAAA CTL:03 OUI:000000 TYPE:0800 Length:0x70 00:52:02: 4500 0064 0010 0000 FF01 B784 0A01
0102 0A01 0101 0800 C673 121E 0009 0000 00:52:02: 0000 002F A580 ABCD ABCD ABCD ABCD ABCD ABCD
ABCD ABCD ABCD ABCD ABCD ABCD 00:52:02: ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD
ABCD ABCD ABCD ABCD 00:52:02: ABCD ABCD ABCD ABCD ABCD 00:52:02: 00:52:02: ATM1/0.1(I): VCD:0x1
VPI:0x0 VCI:0x55 Type:0x0 SAP:AAAA CTL:03 OUI:000000 TYPE:0800 Length:0x70 00:52:02: 4500 0064
0010 0000 0101 B585 0A01 0102 0A01 0101 0800 C673 121E 0009 0000 00:52:02: 0000 002F A580 ABCD
ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD 00:52:02: ABCD ABCD ABCD ABCD ABCD
ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD 00:52:02: ABCD ABCD ABCD ABCD ABCD Success rate is
0 percent (0/2)
```

结论

当您排除故障失败的电路时，环回是使用的有用工具。他们可以：

- 帮助您确定物理接口问题。
- 帮助您排除故障ATM服务提供商。

我们运行了在本文的测验就象通常方式：ping另一侧。如果使用正确的映射，或者，如果使用一个点对点接口，用户可能ping他自己的IP地址。所以，ICMP回音在接口明确地将发送，并且由路由器回答。换句话说，在一个实际环境，您能运行同样测验，不用启用的任何调试。您能检查是否能ping您自己的IP地址和看到测验是否成功。

相关信息

- [ATM技术支持页](#)
- [技术支持和文档 - Cisco Systems](#)