

知 CR16008X打印诊断信息过程中telnet断开问题经验案例

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组网及说明



PC远程telnet登录设备保存诊断信息。

问题描述

PC远程telnet登录设备保存诊断信息。因为设备远程ftp不便，选择将诊断直接打印出来。在打印诊断过程中，发现输出一部分信息后会停住，几秒后telnet会断开，每次能打印出的信息数量不固定。更换PC测试情况依旧。

过程分析

只看现象，怀疑有三个可能原因。一，设备telnet功能异常，发送一段tcp报文后telnet主动断开；二，PC无法快速接收大量tcp数据主动断开tcp/telnet；三，设备和PC之间某些报文不同步，导致tcp断开。首先尝试PC登录其他同型号设备打印诊断，相同操作无异常，说明非PC不能接收tcp。之后在该PC打印诊断过程中，找另一台PC2登录设备debug telnet，当第一台PC的telnet断开时设备debug无异常，telnet功能有问题可能性很小。基本能排除前两种可能性。

对于第三种可能性，具体的可能原因很多，无法事先一一列举。直接在PC抓包看。

正常过程，设备连续发数个telnet数据报文，PC回一个ack确认收到。

10169	10:49:22.363	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	79	Telnet Data ...
10170	10:49:22.363	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	79	Telnet Data ...
10171	10:49:22.363	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	77	Telnet Data ...
10172	10:49:22.363	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	78	Telnet Data ...
10173	10:49:22.363	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	78	Telnet Data ...
10174	10:49:22.363	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	78	Telnet Data ...
10175	10:49:22.363	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	77	Telnet Data ...
10176	10:49:22.363	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	77	Telnet Data ...
10177	10:49:22.363	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	74	51003 → 23 [ACK] Seq=129 Ack=76099 Win=256 Len=0

在第10179行，可以看到有过丢包，wireshark提示有部分tcp没抓到。

10178	10:49:22.368	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	323	Telnet Data ...
10179	10:49:22.368	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	79	[TCP Previous segment not captured] Telnet Data ...
10180	10:49:22.368	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	78	Telnet Data ...
10181	10:49:22.368	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	76	Telnet Data ...
10182	10:49:22.368	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	79	Telnet Data ...
10183	10:49:22.368	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	78	Telnet Data ...
10184	10:49:22.368	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	77	Telnet Data ...
10185	10:49:22.368	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	51003 → 23 [ACK] Seq=129 Ack=76348 Win=255 Len=0 SLE=77782
10186	10:49:22.368	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	[TCP Dup ACK 10185#1] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10187	10:49:22.368	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	[TCP Dup ACK 10185#2] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10188	10:49:22.368	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	[TCP Dup ACK 10185#3] 51003 → 23 [ACK] Seq=129 Ack=76348 W

第10184行，设备告诉PC，当前发送报文sn是77802，下一个sn是77805。

10183	10:49:22.368	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	78	Telnet Data ...
10184	10:49:22.368	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	77	Telnet Data ...
10185	10:49:22.368	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	51003 → 23 [ACK] Seq=129 Ack=76348 Win=255 Len=0 SLE=77782
10186	10:49:22.368	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	[TCP Dup ACK 10185#1] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10187	10:49:22.368	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	[TCP Dup ACK 10185#2] 51003 → 23 [ACK] Seq=129 Ack=76348 W

```
Ethernet II, Src: NewH3cTe_29:f2:01 (74:ea:c8:29:f2:01), Dst: IntelCor_ab:71:ab (fc:f8:ae:ab:71:ab)
Internet Protocol Version 6, Src: 2001:da8:2:141::2, Dst: 2402:f000:3:8001:a561:566d:6809:f89b
Transmission Control Protocol, Src Port: 23, Dst Port: 51003, Seq: 77802, Ack: 129, Len: 3
Source Port: 23
Destination Port: 51003
[Stream index: 0]
[TCP Segment Len: 3]
Sequence number: 77802 (relative sequence number)
Next sequence number: 77805 (relative sequence number)
Acknowledgment number: 129 (relative ack number)
0101 .... = Header Length: 20 bytes (5)
```

之后10185行，PC回复ack说收到了sn 76348，后面的没有正常收到，需要设备重传。之后，PC把这条ack连续重传了5次，说明这期间一直没有收到设备重传给PC的tcp包。

10184	10:49:22.368	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	77	Telnet Data ...
10185	10:49:22.368	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	51003 → 23 [ACK] Seq=129 Ack=76348 Win=255 Len=0 SLE=77782
10186	10:49:22.368	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	[TCP Dup ACK 10185#1] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10187	10:49:22.368	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	[TCP Dup ACK 10185#2] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10188	10:49:22.368	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	[TCP Dup ACK 10185#3] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10189	10:49:22.369	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	[TCP Dup ACK 10185#4] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10190	10:49:22.369	2402:f000:3:8001:a...	2001:da8:2:141::2	TCP	86	[TCP Dup ACK 10185#5] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10191	10:49:22.370	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	93	Telnet Data ...
10192	10:49:22.370	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	76	Telnet Data ...
10193	10:49:22.370	2001:da8:2:141::2	2402:f000:3:8001:a...	TELNET	80	Telnet Data ...

```
Ethernet II, Src: IntelCor_ab:71:ab (fc:f8:ae:ab:71:ab), Dst: NewH3cTe_29:f2:01 (74:ea:c8:29:f2:01)
Internet Protocol Version 6, Src: 2402:f000:3:8001:a561:566d:6809:f89b, Dst: 2001:da8:2:141::2
Transmission Control Protocol, Src Port: 51003, Dst Port: 23, Seq: 129, Ack: 76348, Len: 0
Source Port: 51003
Destination Port: 23
[Stream index: 0]
[TCP Segment Len: 0]
Sequence number: 129 (relative sequence number)
Acknowledgment number: 76348 (relative ack number)
1000 .... = Header Length: 32 bytes (8)
Flags: 0x010 (ACK)
```

PC重传几次ack后，第10191行设备继续发tcp，sn是77805，是接着10184行的。

```

10189 10:49:22.369 2402:f000:3:8001:a... 2001:da8:2:141::2 TCP 86 [TCP Dup ACK 10185#4] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10190 10:49:22.369 2402:f000:3:8001:a... 2001:da8:2:141::2 TCP 86 [TCP Dup ACK 10185#5] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10191 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 93 Telnet Data ...
10192 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 76 Telnet Data ...
10193 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 80 Telnet Data ...
10194 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 77 Telnet Data ...
10195 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 78 Telnet Data ...

Ethernet II, Src: NewH3cTe_29:f2:01 (74:ea:c8:29:f2:01), Dst: IntelCor_ab:71:ab (fc:f8:ae:ab:71:ab)
Internet Protocol Version 6, Src: 2001:da8:2:141::2, Dst: 2402:f000:3:8001:a561:566d:6809:f89b
Transmission Control Protocol, Src Port: 23, Dst Port: 51003, Seq: 77805, Ack: 129, Len: 19
Source Port: 23
Destination Port: 51003
[Stream index: 0]
[TCP Segment Len: 19]
Sequence number: 77805 (relative sequence number)
[Next sequence number: 77824 (relative sequence number)]
Acknowledgment number: 129 (relative ack number)
0101 .... = Header Length: 20 bytes (5)
Flags: 0x018 (PSH, ACK)

```

之后的交互过程中，设备一直在给PC发新的tcp包，PC一直重传ack要求76348之后的报文。诊断打印就是到这一块停止显示新的信息。一段时间后PC发tcp rst报文将tcp和telnet断开。

```

10189 10:49:22.369 2402:f000:3:8001:a... 2001:da8:2:141::2 TCP 86 [TCP Dup ACK 10185#4] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10190 10:49:22.369 2402:f000:3:8001:a... 2001:da8:2:141::2 TCP 86 [TCP Dup ACK 10185#5] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10191 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 93 Telnet Data ...
10192 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 76 Telnet Data ...
10193 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 80 Telnet Data ...
10194 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 77 Telnet Data ...
10195 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 78 Telnet Data ...
10196 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 78 Telnet Data ...
10197 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 77 Telnet Data ...
10198 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 77 Telnet Data ...
10199 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 78 Telnet Data ...
10200 10:49:22.370 2001:da8:2:141::2 2402:f000:3:8001:a... TELNET 77 Telnet Data ...
10201 10:49:22.370 2402:f000:3:8001:a... 2001:da8:2:141::2 TCP 86 [TCP Dup ACK 10185#6] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10202 10:49:22.370 2402:f000:3:8001:a... 2001:da8:2:141::2 TCP 86 [TCP Dup ACK 10185#7] 51003 → 23 [ACK] Seq=129 Ack=76348 W
10203 10:49:22.370 2402:f000:3:8001:a... 2001:da8:2:141::2 TCP 86 [TCP Dup ACK 10185#8] 51003 → 23 [ACK] Seq=129 Ack=76348 W

```

了解问题现象，后续就比较明确了，需要看出现问题时是设备没有重传，还是设备发出的重传没有到达PC。在设备侧抓包，发现设备收到PC有重传要求的ack时，正确回复了重传报文，但是该报文是一个大包，大包没有到达PC，中间线路丢包了。

总结上述过程，触发该问题的直接原因是中间线路丢包，PC要求重传时，设备重传报文是一个大包，线路上由于MTU原因大包不通，导致后续PC和设备报文的交互都不正常了。

解决方法

在设备接口更改MTU，避免发出大包被线路丢弃。