Debug Shell中的Linux TCP转储，用于排除Diameter连接问题

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简介

本文档介绍如何在StarOS调试外壳中使用TCP转储来排除Diameter连接问题。通常会出现问题，请求帮助排除Diameter连接未接通或断开的原因，即使（据说）未发生配置或网络更改。 在初始TCP/IP协商级别或在功能交换请求(CER)/功能交换应答(CEA)级别，直径连接可能无法建立。

背景信息

虽然不存在典型的直径对等问题，但它们确实属于以下几类：

- 特定终端和/或协议的所有对等体都关闭。 <====本示例
- 特定端口号的对等体关闭。
- 与特定PSC、DPC或SF卡绑定的对等体已关闭。

通常，TCP端口3868（默认）用于Diameter服务器端，但也可以指定其他端口，并且如果对等配置线路在行尾指定了端口号，则确认该端口与配置中的3868不同。

对等问题

在本例中，终端3gpp-aaa-s6b的对等体通过**show diameter peer full all向下报告**，并且在对等体线路中未指定端口#，因此默认情况下使用端口3868，而Gy的对等体使用不同对等体的3868、3869和3870组合。

show diameter peers all报告所有直径端点的所有已配置对等体。此处我们看到为3gpp-aaa-s6b（已断开）和Gy（工作）配置了6个对等体和关联的配置行，并注意到Gy有一些自定义端口#s:

```
diameter endpoint 3gpp-aaa-s6b

origin realm epc.mnc260.mcc310.3gppnetwork.org
use-proxy
origin host s6b.IEPCF201.epc.mnc260.mcc310.3gppnetwork.org address 10.168.86.144
max-outstanding 64
route-failure threshold 100
route-failure deadtime 600
route-failure recovery-threshold percent 50
dscp af31
peer mp2.daldra01.dra.epc.mnc260.mcc310.3gppnetwork.org realm epc.mnc260.mcc310.3gppnetwork.org
```

```
address 10.160.113.136
peer mp2.elgdra01.dra.epc.mnc260.mcc310.3gppnetwork.org realm epc.mnc260.mcc310.3gppnetwork.org
address 10.160.114.136
peer mp2.nvldra01.dra.epc.mnc260.mcc310.3gppnetwork.org realm epc.mnc260.mcc310.3gppnetwork.org
address 10.160.115.136
peer tsa06.draaro01.dra.epc.mnc260.mcc310.3gppnetwork.org realm
epc.mnc260.mcc310.3gppnetwork.org address 10.162.6.73
peer tsa06.drasyo01.dra.epc.mnc260.mcc310.3gppnetwork.org realm
epc.mnc260.mcc310.3gppnetwork.org address 10.164.57.41
peer tsa06.drawsc01.dra.epc.mnc260.mcc310.3gppnetwork.org realm
epc.mnc260.mcc310.3gppnetwork.org address 10.177.70.201
route-entry peer mp2.daldra01.dra.epc.mnc260.mcc310.3gppnetwork.org
route-entry peer mp2.elgdra01.dra.epc.mnc260.mcc310.3gppnetwork.org
route-entry peer mp2.nvldra01.dra.epc.mnc260.mcc310.3gppnetwork.org
route-entry peer tsa06.draaro01.dra.epc.mnc260.mcc310.3gppnetwork.org
route-entry peer tsa06.drasyo01.dra.epc.mnc260.mcc310.3gppnetwork.org
route-entry peer tsa06.drawsc01.dra.epc.mnc260.mcc310.3gppnetwork.org

#exit



[local]IEPCF201# show diameter peers all

Friday December 11 20:27:43 UTC 2020

Diameter Peer details

======================

-------------------------------------------------------------------------------

Context: billing              Endpoint: 3gpp-aaa-s6b

-------------------------------------------------------------------------------

Peer: mp2.daldra01.dra.epc.mnc260.mc Addr:Port 10.160.113.136:3868

Peer: mp2.elgdra01.dra.epc.mnc260.mc Addr:Port 10.160.114.136:3868

Peer: mp2.nvldra01.dra.epc.mnc260.mc Addr:Port 10.160.115.136:3868

Peer: tsa06.draaro01.dra.epc.mnc260. Addr:Port 10.162.6.73:3868

Peer: tsa06.drasyo01.dra.epc.mnc260. Addr:Port 10.164.57.41:3868

Peer: tsa06.drawsc01.dra.epc.mnc260. Addr:Port 10.177.70.201:3868

-------------------------------------------------------------------------------







diameter endpoint credit-control

origin realm starent.gy.com
use-proxy
origin host iepcf201.gy address 10.168.86.151
destination-host-avp always
route-failure threshold 100
route-failure deadtime 600
```

```
route-failure recovery-threshold percent 50
peer ln24.daldra01.dra.epc3.mnc260.mcc310.3gppnetwork.org realm nsn-gy address 10.160.113.136
port 3869
peer ln24.drawsc01.dra.epc3.mnc260.mcc310.3gppnetwork.org realm nsn-gy address 10.177.70.201
port 3870
peer tsa05.drachr01.dra.epc3.mnc260.mcc310.3gppnetwork.org realm nsn-gy address 10.164.144.88
peer tsa05.draphx01.dra.epc3.mnc260.mcc310.3gppnetwork.org realm nsn-gy address 10.198.93.88
peer tsa05.drapol01.dra.epc3.mnc260.mcc310.3gppnetwork.org realm nsn-gy address 10.182.16.88
peer tsa06.drachr01.dra.epc3.mnc260.mcc310.3gppnetwork.org realm nsn-gy address 10.164.144.89
peer tsa06.draphx01.dra.epc3.mnc260.mcc310.3gppnetwork.org realm nsn-gy address 10.198.93.89
peer tsa06.drapol01.dra.epc3.mnc260.mcc310.3gppnetwork.org realm nsn-gy address 10.182.16.89
route-entry peer ln24.drawsc01.dra.epc3.mnc260.mcc310.3gppnetwork.org weight 20
route-entry peer ln24.daldra01.dra.epc3.mnc260.mcc310.3gppnetwork.org
route-entry peer tsa05.drapol01.dra.epc3.mnc260.mcc310.3gppnetwork.org
route-entry peer tsa06.drapol01.dra.epc3.mnc260.mcc310.3gppnetwork.org
route-entry peer tsa05.drachr01.dra.epc3.mnc260.mcc310.3gppnetwork.org weight 5
route-entry peer tsa05.draphx01.dra.epc3.mnc260.mcc310.3gppnetwork.org weight 5
route-entry peer tsa06.drachr01.dra.epc3.mnc260.mcc310.3gppnetwork.org weight 5
route-entry peer tsa06.draphx01.dra.epc3.mnc260.mcc310.3gppnetwork.org weight 5

#exit
```

同样值得注意的是，对于大多数设置，use-proxy configurable指定为在ASR端设置对等，以使用在所有活动卡上运行的diamproxy进程，例如，这是一个vPC-DI，其中卡称为服务功能卡。

```
[local]IEPCF201# show task resources facility diamproxy all
Friday December 11 20:34:37 UTC 2020
                    task   cputime        memory     files      sessions
cpu facility      inst  used  allc   used  alloc used allc  used  allc S status
---------------------- ----------- ------------- --------- ------------- ------
3/0 diamproxy        5 0.12%   90% 41.62M 250.0M   38 2500    --    -- -   good
5/0 diamproxy        2 0.11%   90% 41.63M 250.0M   51 2500    --    -- -   good
6/0 diamproxy        6 0.13%   90% 41.62M 250.0M   35 2500    --    -- -   good
7/0 diamproxy        3 0.12%   90% 41.64M 250.0M   34 2500    --    -- -   good
8/0 diamproxy        4 0.13%   90% 41.65M 250.0M   34 2500    --    -- -   good
10/0 diamproxy       1 0.10%   90% 41.64M 250.0M   49 2500    --    -- -   good
Total                6  0.71%     249.8M            241           0
[local]IEPCF201#
```

此处**show diameter peers full all是从show support details获取的，它捕获了3gpp-aaa-s6b终端的Diameter对等体全部关闭的事实。请注意，这是从show support details(SSD)获取的show diameter peers full** 命令的特殊调试版本，因此它还显示与**aaamgr**进程的所有对等连接（此处未显示输出）因此，连接的最终计数比正常运行时高得多，但底部显示的是摘要输出，就像它正常运行时连接数较少(144)一样。 FULL输出附于本文，因此只显示一个对等体（但与所有6个双向代理）的连接，以便简单。

另示为Gy终端的一个开放工作连接的示例，您可以看到一个名为**Local Address**的额外字段，该字段捕获ASR端的连接处于启用状态，而在断开的3gpp-aaa-s6b对等体上，该字段不存在。(后面显示的是客户为包含本地地址的3gpp-aaa-s6b对等体修复问题后**的输**出。)

```
******** show diameter peers full *******
Sunday December 13 15:19:00 UTC 2020
-------------------------------------------------------------------------------
Context: billing Endpoint: 3gpp-aaa-s6b
-------------------------------------------------------------------------------

Peer Hostname: mp2.daldra01.dra.epc.mnc260.mcc310.3gppnetwork.org
Local Hostname: 0001-diamproxy.s6b.IEPCF201.epc.mnc260.mcc310.3gppnetwork.org
Peer Realm: epc.mnc260.mcc310.3gppnetwork.org
Local Realm: epc.mnc260.mcc310.3gppnetwork.org
```

Peer Address: 10.160.113.136:3868
State: IDLE [TCP]
CPU: 10/0 Task: diamproxy-1
Messages Out/Queued: 0/0
Supported Vendor IDs: None
Admin Status: Enable
DPR Disconnect: N/A
Peer Backoff Timer running:N/A

Peer Hostname: mp2.daldra01.dra.epc.mnc260.mcc310.3gppnetwork.org
Local Hostname: 0002-diamproxy.s6b.IEPCF201.epc.mnc260.mcc310.3gppnetwork.org
Peer Realm: epc.mnc260.mcc310.3gppnetwork.org
Local Realm: epc.mnc260.mcc310.3gppnetwork.org
Peer Address: 10.160.113.136:3868
State: IDLE [TCP]
CPU: 5/0 Task: diamproxy-2
Messages Out/Queued: 0/0
Supported Vendor IDs: None
Admin Status: Enable
DPR Disconnect: N/A
Peer Backoff Timer running:N/A

Peer Hostname: mp2.daldra01.dra.epc.mnc260.mcc310.3gppnetwork.org
Local Hostname: 0003-diamproxy.s6b.IEPCF201.epc.mnc260.mcc310.3gppnetwork.org
Peer Realm: epc.mnc260.mcc310.3gppnetwork.org
Local Realm: epc.mnc260.mcc310.3gppnetwork.org
Peer Address: 10.160.113.136:3868
State: IDLE [TCP]
CPU: 7/0 Task: diamproxy-3
Messages Out/Queued: 0/0
Supported Vendor IDs: None
Admin Status: Enable
DPR Disconnect: N/A
Peer Backoff Timer running:N/A

Peer Hostname: mp2.daldra01.dra.epc.mnc260.mcc310.3gppnetwork.org
Local Hostname: 0004-diamproxy.s6b.IEPCF201.epc.mnc260.mcc310.3gppnetwork.org
Peer Realm: epc.mnc260.mcc310.3gppnetwork.org
Local Realm: epc.mnc260.mcc310.3gppnetwork.org
Peer Address: 10.160.113.136:3868
State: IDLE [TCP]
CPU: 8/0 Task: diamproxy-4
Messages Out/Queued: 0/0
Supported Vendor IDs: None
Admin Status: Enable
DPR Disconnect: N/A
Peer Backoff Timer running:N/A

Peer Hostname: mp2.daldra01.dra.epc.mnc260.mcc310.3gppnetwork.org
Local Hostname: 0005-diamproxy.s6b.IEPCF201.epc.mnc260.mcc310.3gppnetwork.org
Peer Realm: epc.mnc260.mcc310.3gppnetwork.org
Local Realm: epc.mnc260.mcc310.3gppnetwork.org
Peer Address: 10.160.113.136:3868
State: IDLE [TCP]
CPU: 3/0 Task: diamproxy-5
Messages Out/Queued: 0/0

```
Supported Vendor IDs: None
Admin Status: Enable
DPR Disconnect: N/A
Peer Backoff Timer running:N/A



Peer Hostname: mp2.daldra01.dra.epc.mnc260.mcc310.3gppnetwork.org
Local Hostname: 0006-diamproxy.s6b.IEPCF201.epc.mnc260.mcc310.3gppnetwork.org
Peer Realm: epc.mnc260.mcc310.3gppnetwork.org
Local Realm: epc.mnc260.mcc310.3gppnetwork.org
Peer Address: 10.160.113.136:3868
State: IDLE [TCP]
CPU: 6/0 Task: diamproxy-6
Messages Out/Queued: 0/0
Supported Vendor IDs: None
Admin Status: Enable
DPR Disconnect: N/A
Peer Backoff Timer running:N/A

...

--------------------------------------------------------------------------------
Context: billing Endpoint: credit-control
--------------------------------------------------------------------------------

...

Peer Hostname: ln24.daldra01.dra.epc3.mnc260.mcc310.3gppnetwork.org
Local Hostname: 0001-diamproxy.iepcf201.gy
Peer Realm: nsn-gy
Local Realm: starent.gy.com
Peer Address: 10.160.113.136:3869
Local Address: 10.168.86.151:55584
State: OPEN [TCP]
CPU: 10/0 Task: diamproxy-1
Messages Out/Queued: 0/0
Supported Vendor IDs: 10415
Admin Status: Enable
DPR Disconnect: N/A
Peer Backoff Timer running:N/A

Peers Summary:
Peers in OPEN state: 1404
Peers in CLOSED state: 468
Peers in intermediate state: 0
Total peers matching specified criteria: 1872
```

以下是此命令的正常输出，以供参考，显示没有aaamgr的连接计数：

```
Peers Summary:
Peers in OPEN state: 107
Peers in CLOSED state: 36
Peers in intermediate state: 1
Total peers matching specified criteria: 144
```

数据包捕获收集

如前所述，此场景显示s6b终端的所有直径对等体都处于关闭状态，问题不在于特定的diamproxy/card，这意味着任何卡的PCAP收集应适当地代表故障排除问题。如果仅在特定

Diamproxy上发现问题，则捕获该过程的PCAP将更为重要。这一点很重要，因为收集过程需要指定特定卡，而不能通过单次捕获在所有卡上运行，尽管在这种情况下，问题确实会在所有卡上出现，下面显示的是对两张卡的捕获，以帮助就如何分析结果数据提出一些看法。

首先，查看卡表，挑选几张要运行捕获的ACTIVE卡（3和5），并注明哪张是不应指定的解复用卡。

```
[local]IEPCF201# show card table
Friday December 11 17:15:28 UTC 2020
Slot         Card Type                                Oper State     SPOF  Attach
-----------  ---------------------------------------  -------------  ----  ------
 1: CFC      Control Function Virtual Card            Active         No
 2: CFC      Control Function Virtual Card            Standby        -
 3: FC       4-Port Service Function Virtual Card     Active         No       <=====
 4: FC       4-Port Service Function Virtual Card     Standby        -
 5: FC       4-Port Service Function Virtual Card     Active         No       <=====
 6: FC       4-Port Service Function Virtual Card     Active         No
 7: FC       4-Port Service Function Virtual Card     Active         No
 8: FC       4-Port Service Function Virtual Card     Active         No
 9: FC       4-Port Service Function Virtual Card     Active         No
10: FC       4-Port Service Function Virtual Card     Active         No
[local]IEPCF201#

[local]IEPCF201# show session recovery status verbose
Saturday December 12 21:43:11 UTC 2020
Session Recovery Status:
  Overall Status        : Ready For Recovery
  Last Status Update    : 4 seconds ago

              ----sessmgr---  ----aaamgr----  demux
 cpu state    active standby  active standby  active  status
---- -------  ------ -------  ------ -------  ------  -------------------------
 3/0 Active   12     1        12     1        0       Good
 4/0 Standby  0      12       0      12       0       Good
 5/0 Active   12     1        12     1        0       Good
 6/0 Active   12     1        12     1        0       Good
 7/0 Active   12     1        12     1        0       Good
 8/0 Active   12     1        12     1        0       Good
 9/0 Active   0      0        0      0        8       Good (Demux)
10/0 Active   12     1        12     1        0       Good
[local]IEPCF201#
```

此外，需要检索定义直径对等体的上下文#，在这种情况下，计费上下文为#2。

```
 ******** show context *******
Sunday December 13 15:14:24 UTC 2020
Context Name    ContextID    State     Description
--------------- --------- ----------   ----------------------
local           1            Active
billing         2            Active    <==========
calea           3            Active
gi              4            Active
sgw             5            Active
```

接下来，登录Linux调试外壳，以在其自己的CLI会话中收集PCAP的卡（本例中为卡3和5）：

注意：大多数操作员可能不会访问调试外壳，除非他们被告知密码，该密码特定于机箱/客户，具体取决于其设置方式。登录调试外壳时请小心，因为它登录到卡的底层操作系统（PSC或

ASR 5000或ASR 5500）或虚拟机(vPC-DI的服务功能(SF))。

```
[local]IEPCF201# cli test password <password>
Saturday December 12 21:43:54 UTC 2020
Warning: Test commands enables internal testing and debugging commands
         USE OF THIS MODE MAY CAUSE SIGNIFICANT SERVICE INTERRUPTION
[local]IEPCF201#
[local]IEPCF201# debug shell card 3 cpu 0
Saturday December 12 21:44:02 UTC 2020
Last login: Fri Dec 11 19:26:34 +0000 2020 on pts/1 from card1-cpu0.
qvpc-di:card3-cpu0#
```

现在，请运行仅在此自定义StarOS版本的Linux中可用的特殊Linux命令**setvr(set virtual router)**，指定之前检索的上下文编号。请注意，提示符会更改：

```
qvpc-di:card3-cpu0# setvr 2 bash
bash-2.05b#
```

此时，可以使用以下参数运行TCP转储。请注意，如果端口号与前面gy示例中所示的端口号不同，则应使用该端口号。此外，如果有特定的对等地址要捕获数**据包，则可**以使用host <host ip address>指定主机IP地址。运行该命令几分钟，然后使用Control-C停止捕获。如果捕获了IF数据包，则显示数据包数。

```
bash-2.05b# tcpdump -i any -s 0 -w /tmp/diameter_SF3.pcap "port 3868"
tcpdump: listening on any
^C
1458 packets received by filter
0 packets dropped by kernel
bash-2.05b#
```

接下来，使用exit命令退出虚拟路由器空间，然后将文件复制到主用管理卡的闪存中，对于ASR 5500，闪存为MIO 5或6，对于vPC-DI，则此处为1或2。

```
bash-2.05b# exit
exit
qvpc-di:card3-cpu0# scp /tmp/diameter_SF3.pcap card1:/flash/sftp/diameter_SF3.pcap
diameter_SF3.pcap            100%  110KB 110.4KB/s   00:00
qvpc-di:card3-cpu0# exit
[local]IEPCF201#
```

此时，可使用sftp检索文件，使用网络中存在的任何方法访问/flash目录。

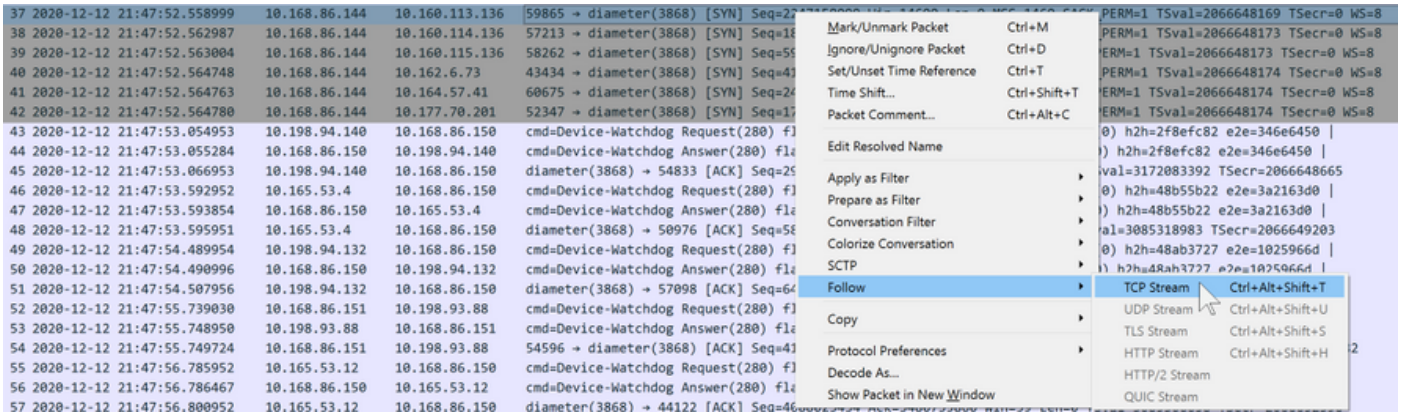
以下是SF 5的命令，这与刚才显示的SF 3的命令相同。理想情况下，同时运行两个会话，以便同时捕获以供分析（尽管这可能不是必需的）。

```
[local]IEPCF201# cli test password <password>
Saturday December 12 21:43:28 UTC 2020
Warning: Test commands enables internal testing and debugging commands
         USE OF THIS MODE MAY CAUSE SIGNIFICANT SERVICE INTERRUPTION
[local]IEPCF201# debug shell card 5 cpu 0
Saturday December 12 21:44:13 UTC 2020
qvpc-di:card5-cpu0#
qvpc-di:card5-cpu0# setvr 2 bash
bash-2.05b#  tcpdump -i any -s 0 -w /tmp/diameter_SF5.pcap "port 3868"
tcpdump: listening on any
^C
1488 packets received by filter
```

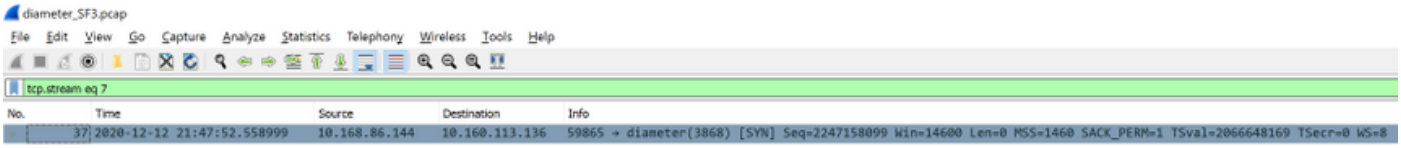
```
0 packets dropped by kernel
bash-2.05b# exit
exit
qvpc-di:card5-cpu0# scp /tmp/diameter_SF5.pcap card1:/flash/sftp/diameter_SF5.pcap
diameter_SF5.pcap           100%  113KB 112.7KB/s   00:00
qvpc-di:card5-cpu0# exit
[local]IEPCF201#
```

PCAP分析

此处的目标是确定在直径连接建立过程中故障的位置。如前所述，它可能在TCP/IP连接中，也可能在随后的CER/CEA步骤中。对于TCP/IP，查看是否正在发送TCP SYN以及是否正在接收TCP SYN ACK，然后是从ASR发送的ACK。 可以使用任意数量的过滤器过滤数据包，以帮助分析。在这种情况下，过滤器tcp.flags.syn == 1显示SYN正针对此特定卡的所有6个对等体发送。查看未过滤的视图，右击SYN数据包并利用Wireshark中的TCP数据流功能，通过选择Follow ...（跟踪），该功能聚合了使用相同TCP端口号的所有TCP数据包。TCP数据流，查看是否存在建立连接的TCP数据包的对应交换。

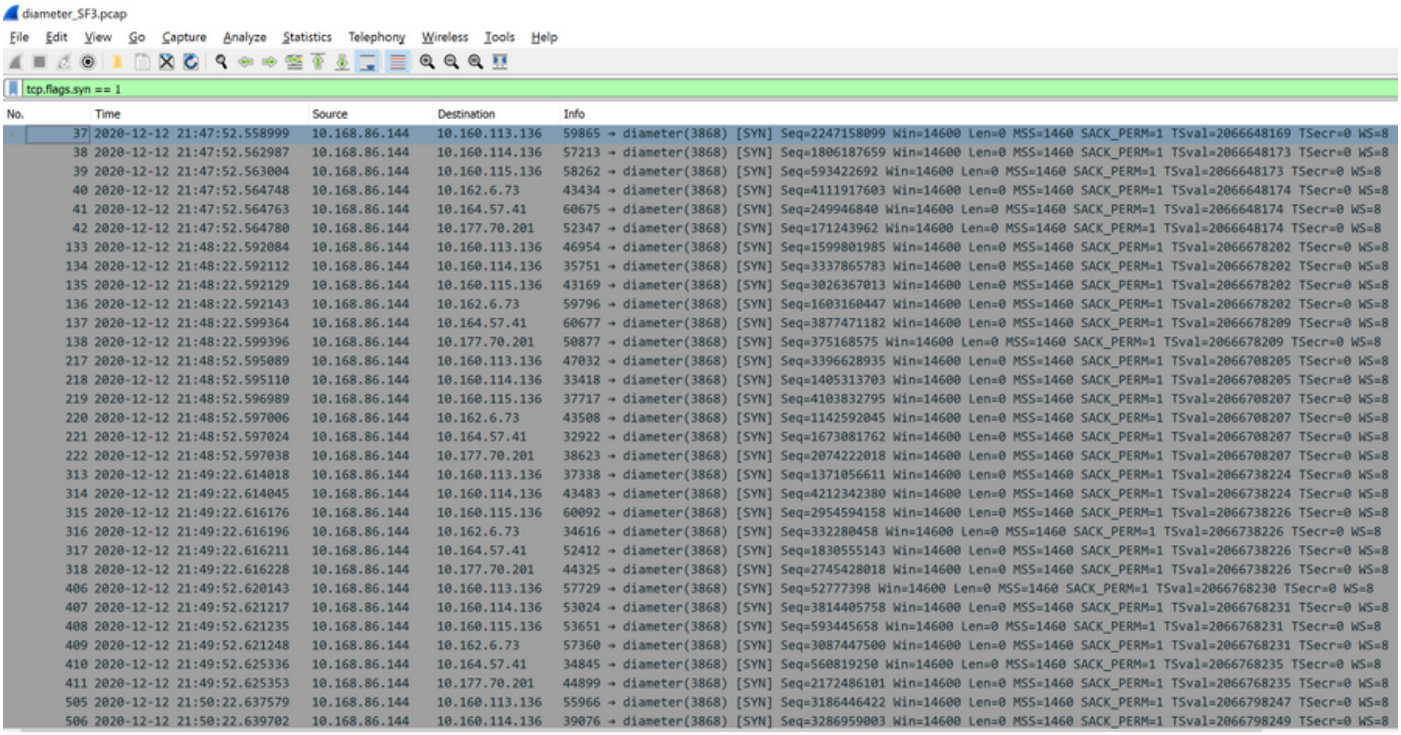


在此场景中，请注意SYN之外没有其他数据包，这确认了ASR可能发送SYN但不会返回任何响应，这将消除ASR是连接设置失败的原因（虽然这不能保证是这样，可能不发送数据包，或者响应被丢弃，在这种情况下，外部PCAP会有帮助进一步缩小问题范围）。



另需注意的是，模式每30秒重复一次，与直径端点的默认配置30秒匹配以重试连接 — ASR不会放弃，而是会永远重试，直到成功。 SF 5的PCAP显示完全相同的行为。

```
context billing
    diameter endpoint 3gpp-aaa-s6b
      connection timeout 30
      connection retry-timeout 30
```



将事物连在一起，直径基本统计数据显示，失败连接的数量以与SF/diamproxies数量和重试超时相称的速率递增。计算方法如下：6个对等体* 6个diamproxies =每30秒尝试36次。因此，在一分钟内将有72次尝试，这可以通过运行**show diameter statistics proxy**和查看**Connection Timeouts** (连接超时从60984增加到61056 = 72)来看到，如CLI时间戳所示。

```
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:10 UTC 2020
  Connection Timeouts:                                          60984
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:12 UTC 2020
  Connection Timeouts:                                          60984
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:14 UTC 2020
  Connection Timeouts:                                          60984
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:17 UTC 2020
  Connection Timeouts:                                          60990
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:19 UTC 2020
  Connection Timeouts:                                          60990
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:21 UTC 2020
  Connection Timeouts:                                          60996
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:25 UTC 2020
  Connection Timeouts:                                          61002
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:27 UTC 2020
  Connection Timeouts:                                          61002
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:29 UTC 2020
  Connection Timeouts:                                          61008
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:32 UTC 2020
   Connection Timeouts:                                          61014
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:35 UTC 2020
  Connection Timeouts:                                          61014
```

```
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:37 UTC 2020
  Connection Timeouts:                                          61020
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:40 UTC 2020
  Connection Timeouts:                                          61020
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:43 UTC 2020
  Connection Timeouts:                                          61020
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:45 UTC 2020
  Connection Timeouts:                                          61026
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:47 UTC 2020
  Connection Timeouts:                                          61026
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:50 UTC 2020
   Connection Timeouts:                                          61038
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:56 UTC 2020
  Connection Timeouts:                                          61038
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:39:58 UTC 2020
  Connection Timeouts:                                          61044
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:01 UTC 2020
  Connection Timeouts:                                          61044
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:03 UTC 2020
  Connection Timeouts:                                          61050
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:05 UTC 2020
  Connection Timeouts:                                          61056
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:07 UTC 2020
  Connection Timeouts:                                          61056
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:09 UTC 2020
  Connection Timeouts:                                          61056
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:12 UTC 2020
  Connection Timeouts:                                          61056
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:14 UTC 2020
  Connection Timeouts:                                          61056
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:16 UTC 2020
  Connection Timeouts:                                          61062
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:18 UTC 2020
  Connection Timeouts:                                          61062
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:20 UTC 2020
  Connection Timeouts:                                          61068
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:22 UTC 2020
  Connection Timeouts:                                          61074
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:25 UTC 2020
  Connection Timeouts:                                          61074
[local]IEPCF201# show diameter statistics proxy | grep "Connection Timeouts"
Friday December 11 20:40:27 UTC 2020
  Connection Timeouts:                                          61074
[local]IEPCF201#
```

另请注意，CER/CEA（跨所有直径对等体）的数量很少，这证明它永远无法尝试交换这些数据包，这意味着这是TCP/IP设置问题。

```
[local]IEPCF201# show diameter statistics proxy
Friday December 11 20:57:09 UTC 2020
...
Capabilities Exchange Requests and Answers statistics:
  Connection CER sent:                                          109
  Connection CER send errors:                                     0
  CERs received:                                                  0
  Connection CER create failures:                                 0
  CEAs received:                                                108
  CEA AVPs unknown:                                               0
  CEA Application ID mismatch:                                    0
  Read CEA Messages:                                            108
  Read CEA Messages Unexpected:                                   0
  Read CEA Missing:                                               0
  Read CEA Negotiation Failure:                                   0
  Read CER Messages:                                              0
  Read CER Messages Unexpected:                                   0
  Read CER Missing:                                               0
  Tw Expire Waiting for CEA:                                      0
```

最后请注意，在客户解决问题后，处于CLOSED状态的对等体将返回0,**Local Address**字段显示**在show diameter peers中，全部输出。**

```
 Peer Hostname: mp1.daldra01.dra.epc.mnc260.mcc310.3gppnetwork.org
  Local Hostname: 0001-diamproxy.s6b.IEPCF201.epc.mnc260.mcc310.3gppnetwork.org
  Peer Realm: epc.mnc260.mcc310.3gppnetwork.org
  Local Realm: epc.mnc260.mcc310.3gppnetwork.org
  Peer Address: 10.160.113.133:3868
  Local Address: 10.168.86.144:32852
  State: OPEN [TCP]
  CPU: 10/0                              Task: diamproxy-1
  Messages Out/Queued: 0/0
  Supported Vendor IDs: None
  Admin Status: Enable
  DPR Disconnect: N/A
  Peer Backoff Timer running:N/A


 Peers Summary:
  Peers in OPEN state: 144
  Peers in CLOSED state: 0
  Peers in intermediate state: 0
  Total peers matching specified criteria: 144
[local]IEPCF101#
```