

WAAS — 串行内联集群故障排除

章节：串行内联集群故障排除

本文介绍如何排除串行内联集群故障。

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NOTE:WAAS版本4.2.1中引入了非优化对等体和侦听ACL之间的串行内联集群。本节不适用于早期的WAAS版本。

检查串行对等体之间的连接

指南

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要查看哪些设备连接到内联接口，请使用**show cdp neighbors**命令，如下所示：

```
WAE#show cdp neighbors
```

```
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
```

```
                  S - Switch, H - Host, I - IGMP, r - Repeater
```

Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
BBSw-R32-R62	Inline 1/1/lan	154	S I	WS-C3750G-Gig	3/0/17
BBSw-R32-R62	Inline 1/0/lan	154	S I	WS-C3750G-Gig	2/0/18
BBSw-R32-R62	Gig 1/0	126	S I	WS-C3750G-Gig	2/0/22
PLT-32-08-7301	Inline 1/1/wan	148	R	7301	Gig 0/2
PLT-32-08-7301	Inline 1/0/wan	147	R	7301	Gig 0/1
WAE-32-08-7341	Inline 1/1/wan	145	T H	OE7341	Inline 1/1/w
WAE-32-08-7341	Inline 1/0/wan	145	T H	OE7341	Inline 1/0/w

如果串行对等体由一台或多台交换机分隔，则上述输出中不会显示对等体。

验证串行对等体配置正确

要验证串行对等体是否配置正确，请使用**show peer optimization**命令，如下所示：

```
WAE#show peer optimization
```

```
Configured Non-optimizing Peers:
```

```
    Peer Device Id: 00:1a:64:c2:40:8c
```

在两个对等体上运行此命令，并确保每台设备在另一台上正确显示。

使用**show device-id**命令检查设备ID，如下所示：

```
WAE#show device-id
```

```
System Device ID is: 00:21:5e:57:e9:d4
```

验证串行内联集群是否运行正常

给定以下拓扑示例：

BR-WAE — WAN — DC-WAE2 — DC-WAE1

或

BR-WAE1 — BR-WAE2 — WAN — DC-WAE2 — DC-WAE1

通常，应在最外层的WAE（即BR-WAE和DC-WAE1）或BR-WAE1和DC-WAE1之间进行优化。要确保这一点，请使用**show statistics connection**命令验证连接上的设备ID。BR-WAE上的PeerID应表示它正在使用DC-WAE1进行优化，而DC-WAE1上的PeerID应表示它正在使用BR-WAE进行优化。

。

```
BR-WAE#show statistics connection
```

```
Current Active Optimized Flows:                                  7552
  Current Active Optimized TCP Plus Flows:                      7563
  Current Active Optimized TCP Only Flows:                      0
  Current Active Optimized TCP Preposition Flows:               0
```

```

Current Active Auto-Discovery Flows:          12891
Current Reserved Flows:                      100
Current Active Pass-Through Flows:          3053
Historical Flows:                            429

```

D:DRE,L:LZ,T:TCP Optimization RR:Total Reduction Ratio
A:AOIM,C:CIFS,E:EPM,G:GENERIC,H:HTTP,M:MAPI,N:NFS,S:SSL,V:VIDEO

ConnID	Source IP:Port	Dest IP:Port	PeerID	Accel	RR
786432	190.190.3.175:19268	155.155.7.208:80	00:21:5e:52:25:5c	THDL	00.0%
786435	190.190.5.115:19283	155.155.0.144:80	00:21:5e:52:25:5c	THDL	86.0%
786438	199.199.3.0:58436	155.155.9.15:443	00:21:5e:52:25:5c	TSDL	00.0%
786440	190.190.2.231:19312	155.155.0.112:80	00:21:5e:52:25:5c	THDL	86.0%

上述输出中的PeerID应与DC-WAE1的PeerID匹配。

DC-WAE2上的所有连接都应处于“PT Intermediate”状态。

如果DC-WAE1发生故障或过载，应在BR-WAE1和DC-WAE2之间优化新连接。您可以在DC-WAE2上使用**show statistics connection optimized**命令来验证这一点。在DC-WAE2上，应使用BR的对等ID查看优化连接 — WAE1作为对等设备。

如果BR-WAE1发生故障或过载，则DC-WAE2和DC-WAE1之间不应存在优化。所有连接在DC-WAE1上应处于“PT非优化对等体”状态，在DC-WAE2上应处于“PT无对等体”状态。以下是预期的**show statistics connection**命令输出示例：

DC-WAE1# **sh stat conn**

```

Current Active Optimized Flows:              0
  Current Active Optimized TCP Plus Flows:   0
  Current Active Optimized TCP Only Flows:   0
  Current Active Optimized TCP Preposition Flows: 0
Current Active Auto-Discovery Flows:         0
Current Reserved Flows:                      100
Current Active Pass-Through Flows:           1
Historical Flows:                            1

```

Local IP:Port	Remote IP:Port	Peer ID	ConnType
2.74.2.162:37116	2.74.2.18:80	00:21:5e:27:ae:14	PT Non-optimizing Peer
2.74.2.18:80	2.74.2.162:37116	00:21:5e:27:ae:14	PT Non-optimizing Peer

DC-WAE2# **sh stat conn**

```

Current Active Optimized Flows:              0
  Current Active Optimized TCP Plus Flows:   0
  Current Active Optimized TCP Only Flows:   0
  Current Active Optimized TCP Preposition Flows: 0
Current Active Auto-Discovery Flows:         0
Current Reserved Flows:                      100
Current Active Pass-Through Flows:           1
Historical Flows:                            1

```

Local IP:Port	Remote IP:Port	Peer ID	ConnType
---------------	----------------	---------	----------

2.74.2.162:37116	2.74.2.18:80	N/A	PT No Peer
2.74.2.18:80	2.74.2.162:37116	N/A	PT No Peer

您还可以使用Central Manager Connection Statistics报告(*Device > Monitor > Optimization > Connections Statistics*)在表中显示设备连接统计信息，如图1所示。对等体ID由设备名称指示。

图1.中央管理器设备连接统计报告

检测串行对等配置不匹配

必须配置串行对等体，以便将每个对等体指定为彼此的非优化对等体。如果设备A配置为B的对等体，但B未配置为A的对等体，则表示不匹配。要发现不匹配，可以使用Central Manager **My WAN > Configure > Peer Settings**页，该页报告所有串行对等体的状态，如图2所示。所有正确配置的串行对等体在Mutual Pair列中都有绿色勾选号。没有绿色复选标记的任何设备都错误地配置了串行对等体，而串行对等体没有将设备配置为其串行对等体。

图2.中央管理器对等体设置

要检测串行对等体配置不匹配，您还可以查找系统日志消息，例如：

```
%WAAS-SYS-4-900000: AD: Serial Mode configuration mismatch with peer_id=00:21:5e:27:a8:80
```

此错误表示两个对等设备上的串行对等配置不对称。

排除MAPI加速故障

一般MAPI AO故障排除在故障排除应用加速[文章的“MAPI加速器”](#)一节中介绍。

在串行内联群集上，MAPI加速可能会出现以下问题：

- Outlook与Exchange服务器的连接已断开并恢复
- Outlook与Exchange服务器的连接已断开，并保持连接
- Outlook在建立与Exchange服务器的连接时遇到问题
- WAAS未优化与Exchange服务器的Outlook连接（它处于传递状态或未完成MAPI AO优化）
- 由于DC WAE中的EPM策略超时，MAPI转义连接

检查EPM和MAPI动态策略

使用show policy-engine application dynamic命令检查EPM和MAPI动态策略，如下所示：

```
WAE34#show policy-engine application dynamic
```

```
Dynamic Match Freelist Information:
```

```
Allocated: 32768 In Use: 3 Max In Use: 4 Allocations: 14
```

```
Dynamic Match Type/Count Information:
```

```
None 0
Clean-Up 0
Host->Host 0
Host->Local 0
Local->Host 0
Local->Any 0
Any->Host 3
Any->Local 0
Any->Any 0
```

```
Individual Dynamic Match Information:
```

```
Number: 1 Type: Any->Host (6) User Id: EPM (3) <----- EPM Policy
Src: ANY:ANY Dst: 10.56.45.68:1067
Map Name: uuid1544f5e0-613c-11d1-93df-00c04fd7bd09
Flags: TIME_LMT REPLACE FLOW_CNT
Seconds: 1200 Remaining: 8 DM Index: 32765
Hits: 1 Flows: 0 Cookie: 0x00000000
DM Ref Index: -None- DM Ref Cnt: 0
```

```
Number: 2 Type: Any->Host (6) User Id: EPM (3) <----- EPM Policy
Src: ANY:ANY Dst: 10.56.45.68:1025
Map Name: uuidf5cc5a18-4264-101a-8c59-08002b2f8426
Flags: TIME_LMT REPLACE FLOW_CNT
Seconds: 1200 Remaining: 10 DM Index: 32766
Hits: 1 Flows: 0 Cookie: 0x00000000
DM Ref Index: -None- DM Ref Cnt: 0
```

```
Number: 3 Type: Any->Host (6) User Id: EPM (3)
Src: ANY:ANY Dst: 10.56.45.68:1163
Map Name: uuida4f1db00-ca47-1067-b31f-00dd010662da
Flags: TIME_LMT REPLACE FLOW_CNT
Seconds: 1200 Remaining: 509 DM Index: 32767
Hits: 5 Flows: 0 Cookie: 0x00000000
DM Ref Index: -None- DM Ref Cnt: 0
```

```
WAE33#show policy-engine application dynamic
```

```
Dynamic Match Freelist Information:
```

```
Allocated: 32768 In Use: 2 Max In Use: 5 Allocations: 12
```

```
Dynamic Match Type/Count Information:
```

```
None 0
Clean-Up 0
Host->Host 1
```

```

Host->Local          0
Local->Host          0
Local->Any           0
Any->Host            1
Any->Local           0
Any->Any             0

```

Individual Dynamic Match Information:

```

Number:      1  Type: Host->Host (2)  User Id: MAPI (5)      <----- MAPI Policy
  Src: 10.56.45.246:ANY  Dst: 10.56.45.68:1163
  Map Name: uuida4f1db00-ca47-1067-b31f-00dd010662da
  Flags: REPLACE FLOW_CNT RSRVD_POOL REF_SRC_ANY_DM
  Seconds: 0  Remaining: - NA -  DM Index: 32764
  Hits: 12  Flows: 5  Cookie: 0x00000000
  DM Ref Index: 32767  DM Ref Cnt: 0

Number:      2  Type: Any->Host (6)  User Id: EPM (3)
  Src: ANY:ANY  Dst: 10.56.45.68:1163
  Map Name: uuida4f1db00-ca47-1067-b31f-00dd010662da
  Flags: TIME_LMT REPLACE FLOW_CNT
  Seconds: 1200  Remaining: - NA -  DM Index: 32767
  Hits: 2  Flows: 0  Cookie: 0x00000000
  DM Ref Index: -None-  DM Ref Cnt: 1

```

检查过滤和自动发现统计信息

检查以下命令的输出，查看相关MAPI计数器是否递增。

WAE#**show stat auto-discovery**

```

Auto discovery structure:
  Allocation Failure:          0
  Allocation Success:         12886550
  Deallocations:              12872245
  Timed Out:                  1065677
.
.
.
Auto discovery Miscellaneous:
  RST received:               87134
  SYNs found with our device id: 0
  SYN retransmit count resets: 0
  SYN-ACK sequence number resets (syncookies): 0
  SYN-ACKs found with our device id: 0
  SYN-ACKs found with mirrored options: 0
  Connections taken over for MAPI optimization: 0      <----- MAPI & Serial Inline cluster
statistic

```

WAE#**show stat filtering**

```

Number of filtering tuples:          44892
Number of filtering tuple collisions: 402
Packets dropped due to filtering tuple collisions: 3
Number of transparent packets locally delivered: 287133100
Number of transparent packets dropped: 0
Packets dropped due to ttl expiry: 0
Packets dropped due to bad route: 589
Syn packets dropped with our own id in the options: 0
In ternal client syn packets dropped: 0
Syn packets received and dropped on estab. conn: 1
Syn-Ack packets received and dropped on estab. conn: 22016
Syn packets dropped due to peer connection alive: 0

```

```

Syn-Ack packets dropped due to peer connection alive: 4
Packets recvd on in progress conn. and not handled: 0
Packets dropped due to peer connection alive: 1806742
Packets dropped due to invalid TCP flags: 0
Packets dropped by FB packet input notifier: 0
Packets dropped by FB packet output notifier: 0
Number of errors by FB tuple create notifier: 0
Number of errors by FB tuple delete notifier: 0
Dropped WCCP GRE packets due to invalid WCCP service: 0
Dropped WCCP L2 packets due to invalid WCCP service: 0
Number of deleted tuple refresh events: 0
Number of times valid tuples found on refresh list: 0
SYN packets sent with non-opt option due to MAPI: 0 <----- MAPI & Serial Inline Cluster
statistic
Internal Server conn. not optimized due to Serial Peer: 0
Duplicate packets to synq dropped: 8

```

启用调试日志记录

如果查看动态策略和过滤和自动发现统计信息无济于事，则启用调试日志记录，以便技术支持工程师可以排除串行内联集群中MAPI加速连接发生的故障。

通过运行以下命令启用调试：

```

WAE#debug policy-engine connection
WAE#debug auto-discovery connection
WAE#debug filtering connection
WAE#debug connection acl

```

与以往一样，需要启用磁盘日志记录，并且必须将磁盘的日志记录级别设置为调试。

NOTE:调试日志记录占用大量CPU资源，并且可以生成大量输出。在生产环境中谨慎、谨慎地使用它。

拦截访问列表故障排除

本节介绍如何排除与拦截ACL相关的以下问题：

- 连接未优化
- 连接未按预期绕过

连接未优化

如果连接未按预期优化，则可能是由于以下原因。

1.接口可能已关闭。如果它是内联接口，则所有流量都将在硬件中绕过。使用以下命令检查接口状态：

```

WAE#show interface inlinegroup 1/0
Interface is in intercept operating mode. <----- Interface must be in intercepting mode
Standard NIC mode is off.

```

2.如果接口为up状态，请检查连接状态，如果连接处于直通状态，请使用以下命令检查原因：

```

WAE#show stat connection pass-through
Current Active Optimized Flows:                9004
  Current Active Optimized TCP Plus Flows:    9008
  Current Active Optimized TCP Only Flows:    0
  Current Active Optimized TCP Preposition Flows: 0
Current Active Auto-Discovery Flows:          10294
Current Reserved Flows:                       100
Current Active Pass-Through Flows:            2994
Historical Flows:                             443
Local IP:Port      Remote IP:Port      Peer ID      ConnType
155.155.14.9:21    199.199.1.200:28624  N/A          PT App Cfg
155.155.13.92:21   199.199.1.147:26564  N/A          PT App Cfg  <----- Pass-through
reason

```

3.如果原因显示为“PT拦截ACL”，则原因是拦截ACL拒绝SYN数据包。

您可以查看以下输出，深入查看ACL，查看匹配的条件：

```

WAE#show ip access-list
Space available:
  49 access lists
  499 access list conditions
Standard IP access list test
  1 permit any (1296 matches)
  (implicit deny any: 0 matches)
  total invocations: 1296
Interface access list references:
None Configured
Application access list references:
INTERCEPTION                Standard          test
  Any IP Protocol

```

连接未按照预期绕过

如果连接未按预期绕过，请确保侦听ACL配置使用以下命令生效：

```

WAE#show ip access-list
Space available:
  49 access lists
  499 access list conditions
Standard IP access list test
  1 permit any (1296 matches)
  (implicit deny any: 0 matches)
  total invocations: 1296
Interface access list references:
None Configured
Application access list references:
INTERCEPTION                Standard          test
  Any IP Protocol

```

检查上述输出的命中计数，查看其是否按预期递增。

启用调试日志记录

如果使用上述命令显示一切正确，但仍然存在问题，请启用以下调试日志记录并查找有关SYN数据包的策略引擎决策。


```
WAE#debug policy-engine connection
```

与以往一样，需要启用磁盘日志记录，并且必须将磁盘的日志记录级别设置为调试。

NOTE:调试日志记录占用大量CPU资源，并且可以生成大量输出。在生产环境中谨慎、谨慎地使用它。