WAAS — 串列內聯群集故障排除

章節：串列內聯群集故障排除

本文描述如何排除串列內聯群集故障。

目錄

附註：WAAS 4.2.1版引入了非最佳化對等體與攔截ACL之間的串列內聯集群。本節不適用於較早的WAAS版本。

檢查串列對等裝置之間的連線

要檢視哪些裝置連線到內聯介面，請使用**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
```

如果串列對等點被一台或多台交換機分隔，則對等點不會顯示在上面的輸出中。

驗證串列對等裝置是否配置正確

要驗證串列對等體是否配置正確，請使用**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
```

對兩個對等體運行此命令，並確保每台裝置在另一個裝置上正確顯示。

使用**show device-id**命令檢查裝置ID，如下所示：

```
WAE#show device-id
System Device ID is: 00:21:5e:57:e9:d4
```

驗證串列內聯群集是否正常運行

給定以下拓撲示例：

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

或

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

通常，最外部的WAE（即BR-WAE和DC-WAE1）或BR-WAE1和DC-WAE1)之間應進行最佳化。要確保這一點，請使用**show statistics connection**命令檢驗連線上的裝置ID。BR-WAE上的PeerID應指示它正在使用DC-WAE1進行最佳化，而DC-WAE1上的PeerID應指示它正在使用BR-WAE進行最佳化。

```
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%
```

上述輸出中的PeerID應與DC-WAE1匹配。

DC-WAE2上的所有連線都應處於「PT Intermediate」狀態。

如果DC-WAE1發生故障或進入過載狀態，則應在BR-WAE1和DC-WAE2之間最佳化新連線。您可以在DC-WAE2上使用**show statistics connection optimized**命令進行驗證。應在DC-WAE2上看到已最佳化的連線，並將對等ID BR-WAE1作為對等裝置。

如果BR-WAE1發生故障或進入過載狀態，則*DC*-WAE2和DC-WAE1之間不應進行最佳化。所有連線都應在DC-WAE1上處於「PT Non-optimizing Peer」狀態，在DC-WAE2上處於「PT No Peer」狀態。下面是預期的**show statistics connection**命令輸出的示例：

```
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
```

您也可以使用Central Manager Connection Statistics報告(***Device > Monitor > Optimization > Connections Statistics***)在表中顯示裝置連線統計資訊，如圖1所示。對等ID由裝置名稱指示。

圖1. Central Manager裝置連線統計資訊報告

檢測串列對等配置不匹配

必須配置串列對等點，以便將每個對等點指定為非最佳化對等點。如果裝置A配置為B的對等裝置，但B未配置為A的對等裝置，則說明不匹配。要發現不匹配，可以使用Central Manager **My WAN > Configure > Peer Settings**頁，該頁報告所有串列對等裝置的狀態，如圖2所示。所有正確配置的串列對等裝置在相互配對列中都有一個綠色複選標籤。沒有綠色複選標籤的任何裝置都錯誤地配置了串列對等裝置，而串列對等裝置未配置該裝置作為其串列對等裝置。

圖2. Central Manager對等體設定

要檢測串列對等配置不匹配，還可以查詢系統日誌消息，如下所示：

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

此錯誤表示兩台對等裝置上的串列對等配置不對稱。

排除MAPI加速故障

一般MAPI AO故障排除在故障排除應用加速文章的「MAPI加速器」一節中介紹。

串列內聯群集上的MAPI加速可能出現以下問題：

- 與Exchange伺服器的Outlook連線已斷開連線並恢復
- 與Exchange伺服器的Outlook連線已斷開，並且保持該連線
- Outlook在建立與Exchange伺服器的連線時遇到問題
- Outlook與Exchange伺服器的連線未通過WAAS進行最佳化（它處於傳遞狀態或未執行MAPI AO最佳化）
- 由於DC WAE中的EPM策略超時，MAPI轉義了連線

檢查EPM和MAPI動態策略

使用**show policy-engine application dynamic**命令檢查EPM和MAPI動態策略，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
```

檢查過濾和自動發現統計資訊

檢查以下命令的輸出，檢視相關的MAPI計數器是否遞增。

```
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
```

啟用調試日誌記錄

如果檢視動態策略以及過濾和自動發現統計資訊沒有幫助，則啟用調試日誌記錄，以便技術支援工程師對串列內聯群集中MAPI加速連線的情況進行故障排除。

通過運行以下命令啟用調試：

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

與往常一樣，需要啟用磁碟日誌記錄，並且必須將磁碟的日誌記錄級別設定為調試。

附註：調試日誌記錄是CPU密集型，可以生成大量輸出。在生產環境中慎重而謹慎地使用它。

偵聽訪問清單故障排除

本節介紹如何解決與攔截ACL相關的以下問題：

- 連線未最佳化
- 未按預期繞過連線

連線未最佳化

如果連線未按預期進行最佳化，可能是由於以下原因。

1.介面可能已關閉。如果是內嵌介面，所有流量都會在硬體中繞過。使用以下命令檢查介面狀態：

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

2.如果介面已啟動，請檢查連線的狀態，如果連線處於傳遞狀態，請使用以下命令檢查原因：

```
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.如果原因顯示為「PT攔截ACL」，則是由於攔截ACL拒絕SYN封包。

您可以檢視以下輸出來深入檢視ACL，以檢視符合的條件：

```
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
```

未按預期跳過連線

如果沒有按照預期繞過連線，請確保攔截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
```

從上述輸出中檢查命中計數，看它們是否按預期遞增。

啟用調試日誌記錄

如果使用上述命令後一切正常，但仍然存在問題，請啟用以下調試日誌記錄，並在所關注的SYN資料包上查詢策略引擎決策。

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

與往常一樣，需要啟用磁碟日誌記錄，並且必須將磁碟的日誌記錄級別設定為調試。

附註：調試日誌記錄是CPU密集型，可以生成大量輸出。在生產環境中慎重而謹慎地使用它。