

ASR 1000機箱間NAT高可用性配置示例

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簡介

本檔案將介紹Cisco IOS[®]-XE裝置上機箱間NAT高可用性(B2B NAT HA)的配置，重點介紹聚合服務路由器(ASR)1000系列。

B2B NAT HA是在ASR 1000系列路由器之間實現高可用性應用的方法，例如基於區域的防火牆(ZBFW)、網路地址轉換(NAT)、VPN、會話邊界控制器(SBC)等。本文檔介紹如何在Cisco ASR 1000平台上配置B2B NAT HA以及驗證。

必要條件

需求

思科建議您瞭解以下主題：

- ASR 1000平台架構的概述知識
- 有關高可用性和NAT技術的基礎知識

採用元件

本檔案中的資訊是根據搭載Cisco IOS版本XE 3.10及更新版本的ASR 1000系列而來。Cisco IOS-XE 3.5版及更新版本支援B2B NAT HA。

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路正在作用，請確保您已瞭解任何指令可能造成的影響。

設定

B2BHA故障轉移觸發器

一些常見的故障切換觸發器包括：

- 活動狀態斷電/重新載入 (包括崩潰)。
- 重新載入嵌入式服務處理器(ESP) (計畫內或計畫外)。
- 冗餘組(RG)的控制介面關閉/鏈路關閉。
- RG的資料介面關閉/鏈路關閉。
- 跟蹤的對象故障 (IP服務級別協定)。
- 協定保持連線失敗。
- 活動的運行時優先順序低於配置的閾值。
- 主用裝置的運行時優先順序低於備用裝置的運行優先順序。

最低配置

本節介紹如何配置B2B NAT HA以及拓撲資訊。

B2 BHA部署可能有以下三種拓撲：

- LAN-LAN
- LAN-WAN
- LAN網狀

附註：平均冗餘資料包大小為256位元組。

具有基本L2/L3連線的網路圖

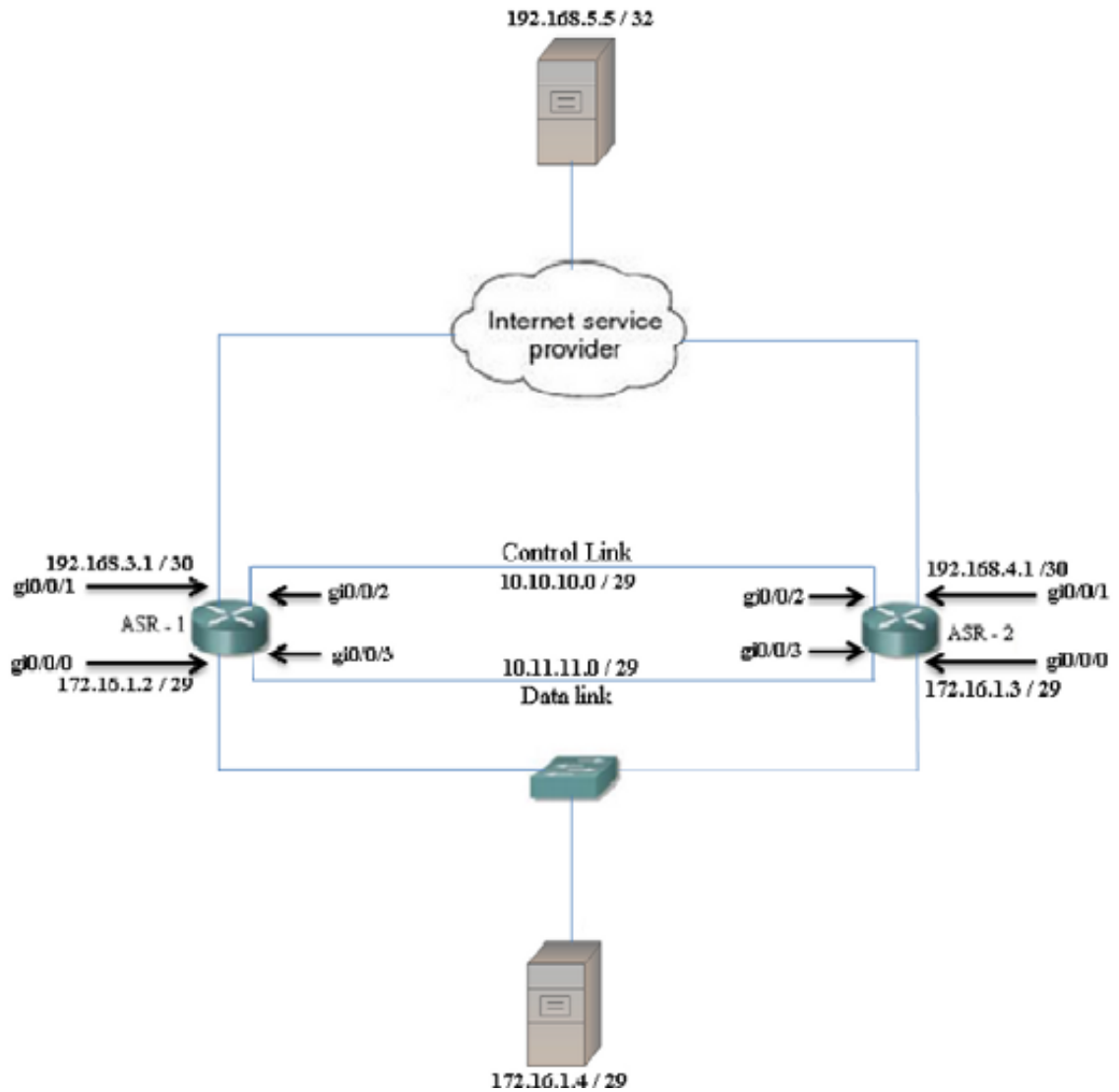
基本L2/L3連線

組態可分為兩個主要部分。一部分是啟用RG、冗餘協定、計時器、控制和資料介面的基本配置。第二部分涉及實際資料/流量介面及其與RG的關聯。

此示例嘗試在LAN 172.16.1.4的遠端伺服器192.168.5.5的ASR上實現B2B NAT HA。這些配置目前使用靜態NAT配置進行準備。

```
ip nat pool POOL1 200.200.200.200 200.200.200.200 netmask 255.255.255.252
ip nat inside source list NAT pool POOL1 redundancy 1 mapping-id 252
```

```
Extended IP access list NAT
 10 permit ip host 172.16.1.4 host 192.168.5.5
```



ASR-1

```

redundancy
 mode none
 application redundancy
 group 1
 name TEST
 preempt
 priority 150
 control GigabitEthernet0/0/2

```

```

protocol 1
 data GigabitEthernet0/0/3

```

ASR-2

```

redundancy
 mode none
 application redundancy
 group 1
 name TEST
 preempt
 priority 50
 control GigabitEthernet0/0/2

```

```

protocol 1
 data GigabitEthernet0/0/3

```

兩個ASR都應該能夠到達ISP提供的公共IP地址。

ASR-1#**ping 200.200.200.200**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 200.200.200.200, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms

ASR-2#**ping 200.200.200.200**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 200.200.200.200, timeout is 2 seconds:

!!!!

面向區域網的介面連線到分佈層交換機，分佈層交換機又連線到主機。

```
ASR-1#show run int GigabitEthernet0/0/0
interface GigabitEthernet0/0/0
 ip address 172.16.1.2 255.255.255.248
 ip nat inside
 negotiation auto
 cdp enable
 redundancy rii 100
 redundancy group 1 ip 172.16.1.5
 exclusive decrement 100
end
```

```
ASR-2#show run int GigabitEthernet0/0/0
interface GigabitEthernet0/0/0
 ip address 172.16.1.3 255.255.255.248
 ip nat inside
 negotiation auto
 cdp enable
 redundancy rii 100
 redundancy group 1 ip 172.16.1.5
 exclusive decrement 100
end
```

面向ISP的介面具有以下配置：

```
ASR-1#show run int gi0/0/1
interface GigabitEthernet0/0/1
 ip address 192.168.3.2 255.255.255.252
 ip nat outside
 negotiation auto
 cdp enable
 redundancy rii 101
 redundancy asymmetric-routing enable
 redundancy group 1 decrement 20
end
```

```
ASR-2#show run int gi0/0/1
interface GigabitEthernet0/0/1
 ip address 192.168.4.2 255.255.255.252
 ip nat outside
 negotiation auto
 cdp enable
 redundancy rii 101
 redundancy asymmetric-routing enable
 redundancy group 1 decrement 20
end
```

ASR之間的「資料」和「控制」介面已配置如以下各節所示。

控制介面

```
ASR-1#show run int gi0/0/2
interface GigabitEthernet0/0/2
 description CONTROL-INTERFACE
 ip address 10.10.10.1 255.255.255.252
 negotiation auto
 cdp enable
end
```

```
ASR-2#show run int gi0/0/2
interface GigabitEthernet0/0/2
 description CONTROL INTERFACE
 ip address 10.10.10.2 255.255.255.252
 negotiation auto
 cdp enable
end
```

資料介面

```
ASR-1#show run int gi0/0/3
interface GigabitEthernet0/0/3
 description DATA INTERFACE
 encapsulation dot1Q 10
 ip address 10.11.11.1 255.255.255.252
end
```

```
ASR-2#show run int gi0/0/3
interface GigabitEthernet0/0/3
 description DATA INTERFACE
 encapsulation dot1Q 10
 ip address 10.11.11.2 255.255.255.252
end
```

附註：

- 不得在配置為資料介面或控制介面的介面上配置冗餘介面識別符號(RII)。
- 您必須在活動裝置和備用裝置上配置RII和非對稱路由。
- 不能在已配置虛擬IP地址的介面上啟用非對稱路由。

驗證

驗證命令和預期輸出

[Cisco CLI Analyzer](#) (僅供已註冊客戶使用) 支援某些 show 指令。使用 Cisco CLI Analyzer 檢視 show 指令輸出的分析。

```
ASR-1#show redundancy application group
```

Group ID	Group Name	State
1	TEST	ACTIVE

```
ASR-2#show redundancy application group
```

Group ID	Group Name	State
1	TEST	STANDBY

```
ASR-1#show redundancy application group 1
```

```
Group ID:1  
Group Name:TEST
```

```
Administrative State: No Shutdown  
Aggregate operational state : Up  
My Role: ACTIVE  
Peer Role: STANDBY  
Peer Presence: Yes  
Peer Comm: Yes  
Peer Progression Started: Yes
```

```
RF Domain: btob-one  
RF state: ACTIVE  
Peer RF state: STANDBY HOT
```

```
ASR-2#show redundancy application group 1
```

```
Group ID:1  
Group Name:TEST
```

```
Administrative State: No Shutdown  
Aggregate operational state : Up  
My Role: STANDBY  
Peer Role: ACTIVE  
Peer Presence: Yes  
Peer Comm: Yes  
Peer Progression Started: Yes
```

```
RF Domain: btob-one  
RF state: STANDBY HOT  
Peer RF state: ACTIVE
```

```
ASR-1#show ip nat translations
```

Pro	Inside global	Inside local	Outside local	Outside global
---	200.200.200.200	172.16.1.4	---	---
icmp	200.200.200.200:98	172.16.1.4:98	192.168.5.5:98	192.168.5.5:98

Total number of translations: 2

```
ASR-2#show ip nat translations
```

Pro	Inside global	Inside local	Outside local	Outside global
---	200.200.200.200	172.16.1.4	---	---
icmp	200.200.200.200:98	172.16.1.4:98	192.168.5.5:98	192.168.5.5:98

Total number of translations: 2

ASR-1#show redundancy application protocol group 1

RG Protocol RG 1

Role: Active
Negotiation: Enabled
Priority: 150
Protocol state: Active
Ctrl Intf(s) state: Up
Active Peer: Local
Standby Peer: address 10.10.10.2, priority 50, intf Gi0/0/2
Log counters:
 role change to active: 7
 role change to standby: 7
 disable events: rg down state 7, rg shut 0
 ctrl intf events: up 7, down 8, admin_down 7
 reload events: local request 0, peer request 0

RG Media Context for RG 1

Ctx State: Active
Protocol ID: 1
Media type: Default
Control Interface: GigabitEthernet0/0/2
 Current Hello timer: 3000
Configured Hello timer: 3000, Hold timer: 9000
Peer Hello timer: 3000, Peer Hold timer: 9000
Stats:
 Pkts 386597, Bytes 23969014, HA Seq 0, Seq Number 386597, Pkt Loss 0
 Authentication not configured
 Authentication Failure: 0
 Reload Peer: TX 0, RX 0
 Resign: TX 0, RX 1
Standby Peer: Present. Hold Timer: 9000
 Pkts 386589, Bytes 13144026, HA Seq 0, Seq Number 1503658, Pkt Loss 0

ASR-2#show redundancy application protocol group 1

RG Protocol RG 1

Role: Standby
Negotiation: Enabled
Priority: 50
Protocol state: Standby-hot
Ctrl Intf(s) state: Up
Active Peer: address 10.10.10.1, priority 150, intf Gi0/0/2
Standby Peer: Local
Log counters:
 role change to active: 8
 role change to standby: 16009
 disable events: rg down state 1, rg shut 0
 ctrl intf events: up 9, down 10, admin_down 1
 reload events: local request 15999, peer request 2

RG Media Context for RG 1

Ctx State: Standby
Protocol ID: 1
Media type: Default
Control Interface: GigabitEthernet0/0/2
 Current Hello timer: 3000
Configured Hello timer: 3000, Hold timer: 9000
Peer Hello timer: 3000, Peer Hold timer: 9000

Stats:

Pkts 1503674, Bytes 93227788, HA Seq 0, Seq Number 1503674, Pkt Loss 0
Authentication not configured
Authentication Failure: 0
Reload Peer: TX 2, RX 2
Resign: TX 8, RX 7
Active Peer: Present. Hold Timer: 9000
Pkts 386603, Bytes 13144502, HA Seq 0, Seq Number 386613, Pkt Loss 0

ASR-1#show platform hardware qfp active system rg 1

Redundancy Group 1

State: RG_ACTIVE
Bulksync: NO BULKSYSNCR REQ
Transport:
SYNC_B2B LISTEN
cp hdl 0x01013e8d dp hdl 0x03010006, platfm hdl 0x0000fa35
L3_IPV4
src addr 10.11.11.1 dest addr 10.11.11.2
L4_UDP_RELIABLE
src port 19510 dest port 3497

AR transport not available

Stats:

RG Request:
CREATE 0
UPDATE 32048
DELETE 0
RG State:
RG_PREINIT 0
RG_INIT 7
RG_STANDBY 21
RG_ACTIVE 32020
RG Transport Request:
NA 0
OPEN 16014
CLOSE 0
RG Transport Status:
CONN_ESTB 7
CONN_FAIL 0
TRANS_DOWN 0
TRANS_DOWN_GRACEFUL 8
Bulksync:
Request 7
Success 7
Fail 0

ASR-1#show platform hardware qfp active system rg 1 stats

trans index: 00000006 Trans Type: 00000001 RG 1
mf_flags 0x40000000 seq_flags 0x700003ff
ha_control_state 0x5
pending ack 00000000
keepalive_timeout 00000100
rx_seq_flags 0x80000000
rx_seq_num 0x2c0d4a44
tx_seq 0xb4965908
tx_ack_tail 0xb4965908
tx_seq_flags 0x700003ff
tx 0000000000580126
rx 0000000000580089
retx 0000000000000000
rx dropped 0000000000000000
records dropped 0000000000000000
tx dropped 0000000000000000
ack dropped 00000000 oob pkts dropped 00000000

```
send dropped 00000000 rx_control_msgs 00580090
tx control_msgs 00580078 for_us_hits 01160217
sync_alloc_failures 00000000 status_notifications 00000001
sync_msgs_received 00580093 sync_msgs_sent 00580133
for_us_udp_checksum_drops 00000000
acks sent 00580089 rcvd 00580126 nacks sent 00000000 rcvd 00000000
```

有用的命令

- 在exec模式下，使用**redundancy application reload group <rg-number> self**命令重新載入處於活動狀態的RG。
- 活動狀態的RG在冗餘配置模式下使用以下CLI命令關閉：

```
ISR1(config-red-app)#group 1
ISR1(config-red-app-grp)#shutdown
```

疑難排解

目前尚無適用於此組態的具體疑難排解資訊。