

Amazon AWS上的CSR1000v HA冗餘部署指南

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[相關資訊](#)

簡介

本文檔介紹如何在Amazon AWS雲上部署CSR1000v路由器以實現高可用性的配置指南。其目的是讓使用者實際瞭解HA並有能力部署一個功能完整的測試平台。

有關AWS和HA的更多深入背景，請參閱一節。

必要條件

需求

思科建議您瞭解以下主題：

- Amazon AWS賬戶
- 同一區域中有2個CSR1000v和1個Linux/Windows AMI
- Cisco IOS-XE® 16.5到16.9版支援HA版本1。 從16.11及更高版本開始使用HA版本3。

採用元件

本檔案中的資訊是根據Cisco IOS-XE® Denali 16.7.1。

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。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

目標

在多可用區環境中，模擬從專用資料中心(VM)到Internet的連續流量。模擬HA容錯移轉，並觀察HA是否成功，因為路由表已確認從CSRHA到CSRHA1的專用介面的流量。

拓撲

在配置開始之前，必須完全瞭解拓撲和設計。這有助於排除以後可能出現的問題。

有多種基於網路要求的HA部署方案。在本示例中，使用以下設定配置HA冗餘：

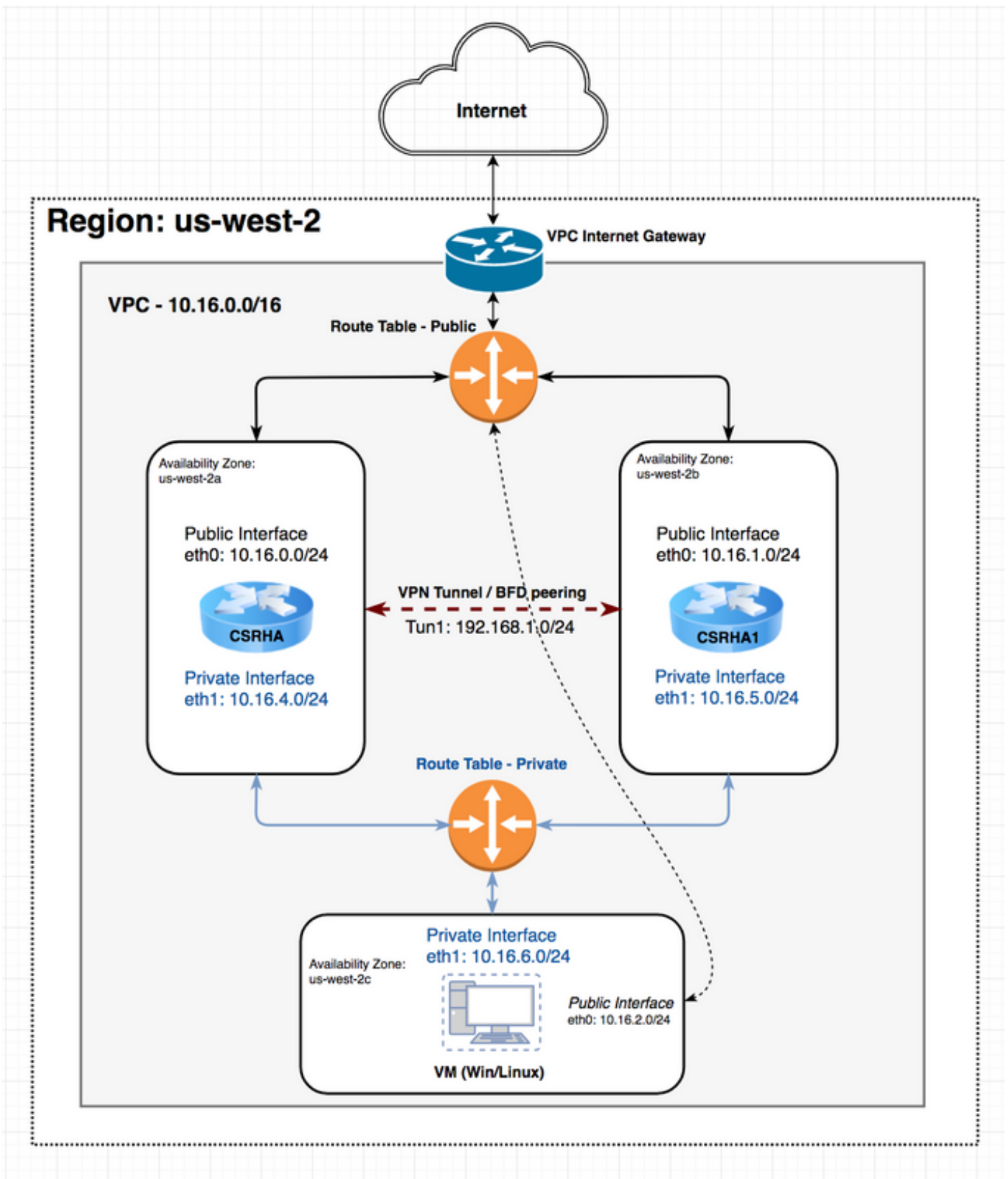
- 1x — 區域
- 1個 — VPC
- 3x — 可用區
- 6x — 網路介面/子網（3x公共介面/3x專用介面）
- 2x — 路由表（公用和專用）
- 2x - CSR1000v路由器(Cisco IOS-XE® Denali 16.3.1a或更高版本)
- 1x — 虛擬機器(Linux/Windows)

一個HA對中有2台CSR1000v路由器，位於兩個不同的可用區中。將每個可用區視為獨立的資料中心，以實現額外的硬體恢復能力。

第三個區域是虛擬機器，用於模擬專用資料中心中的裝置。目前，通過上的公共介面啟用了Internet訪問，以便您可以訪問和配置VM。通常，所有正常流量都應通過專用路由表。

在CSRHA 8.8.8.8上對VM的→用介面Ping→專用→由表，以進行流量模擬。在故障轉移場景中，觀察私有路由表已將路由交換為指向CSRHA1的私有介面。

網路圖表



技術

RTB — 路由表ID。

CIDR — 要在路由表中更新的路由的目標地址。

ENI — 將流量路由到的CSR 1000v gigabit介面的網路介面ID。

例如，如果CSRHA發生故障，則CSRHA1會接管並更新AWS路由表中的路由，使其指向自己的

ENI。

區域 — CSR 1000v的AWS區域。

限制

- 對於專用子網，請勿使用IP地址10.0.3.0/24，該地址在Cisco CSR 1000v內部使用，以實現高可用性。Cisco CSR 1000v需要具有公共網際網路訪問能力，才能進行更改AWS路由表的REST API呼叫。
- 請勿將CSR1000v的gig1介面放在VRF中。 HA無法正常工作。

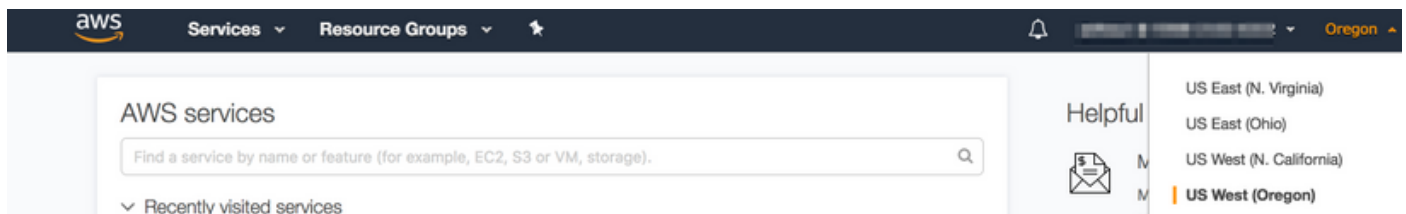
組態

一般配置流程是從最頂層的功能（區域/VPC）開始，然後向下移動到最具體的功能（介面/子網）。但是，沒有特定的配置順序。開始之前，首先瞭解拓撲非常重要。

提示：為您的所有設定（VPC、介面、子網、路由表等）指定名稱。

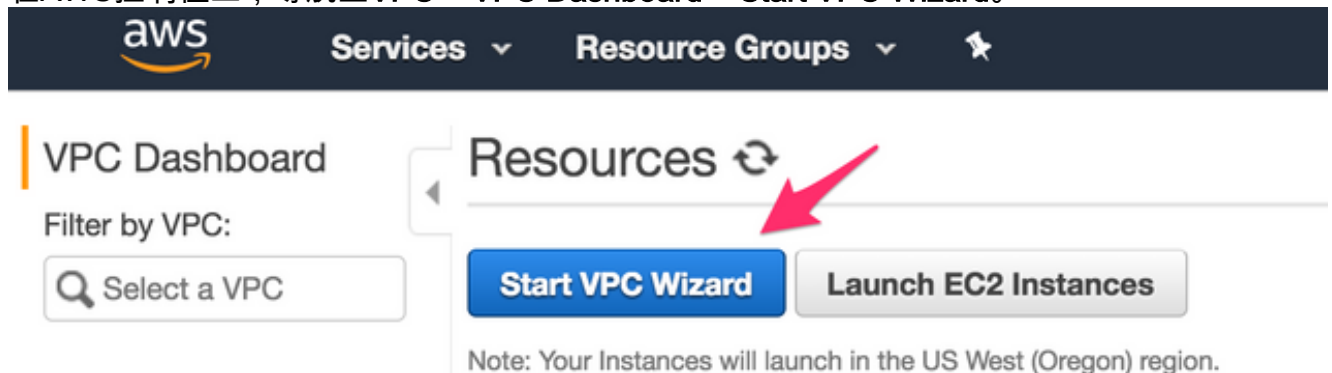
步驟1.選擇區域。

本示例使用US West(Oregon)。



步驟2.建立VPC。

1. 在AWS控制檯上，導航至VPC > VPC Dashboard > Start VPC Wizard。



2. 選擇具有單個公共子網的VPC。

Step 1: Select a VPC Configuration

VPC with a Single Public Subnet

Your instances run in a private, isolated section of the AWS cloud with direct access to the Internet. Network access control lists and security groups can be used to provide strict control over inbound and outbound network traffic to your instances.

Creates:

A /16 network with a /24 subnet. Public subnet instances use Elastic IPs or Public IPs to access the Internet.

Select

Internet, S3, DynamoDB, SNS, SQS, etc.

Public Subnet

Amazon Virtual Private Cloud

3. 建立VPC時，會為您分配一個/16網路，供您隨意使用。

4. 系統還會為您分配一個/24公共子網。公共子網例項使用彈性IP或公共IP讓您的裝置訪問Internet。

Step 2: VPC with a Single Public Subnet

IPv4 CIDR block*: 10.16.0.0/16 (85531 IP addresses available)

IPv6 CIDR block: No IPv6 CIDR Block
 Amazon provided IPv6 CIDR block

VPC name: HA

Public subnet's IPv4 CIDR*: 10.16.0.0/24 (251 IP addresses available)

Availability Zone*: No Preference

Subnet name: Public subnet

You can add more subnets after AWS creates the VPC.

Service endpoints

Enable DNS hostnames*: Yes No

Hardware tenancy*: Default

5. vpc-b98d8ec0已建立。

VPC Dashboard

Filter by VPC:

Virtual Private Cloud

Your VPCs

<input type="checkbox"/>	Name	VPC ID	State	IPv4 CIDR
<input type="checkbox"/>	HA	vpc-b98d8ec0	available	10.16.0.0/16

步驟3.為VPC建立安全組。

安全組類似於允許或拒絕流量的ACL。

1. 在Security下，點選Security Groups和Create your Security Group (建立與上面建立的名為HA的VPC相關的安全組)。



2. 在Inbound Rules (入站規則) 下，定義要允許sg-1cf47d6d的流量。在本例中，您允許所有流量。

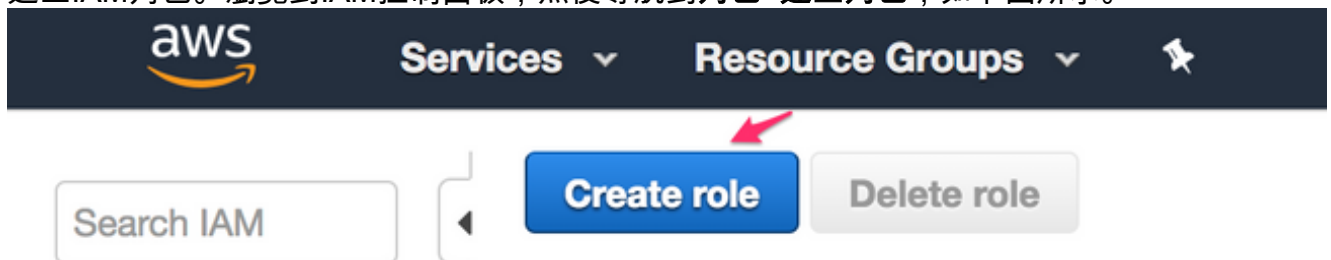


步驟4.使用策略建立IAM角色並將其與VPC關聯。

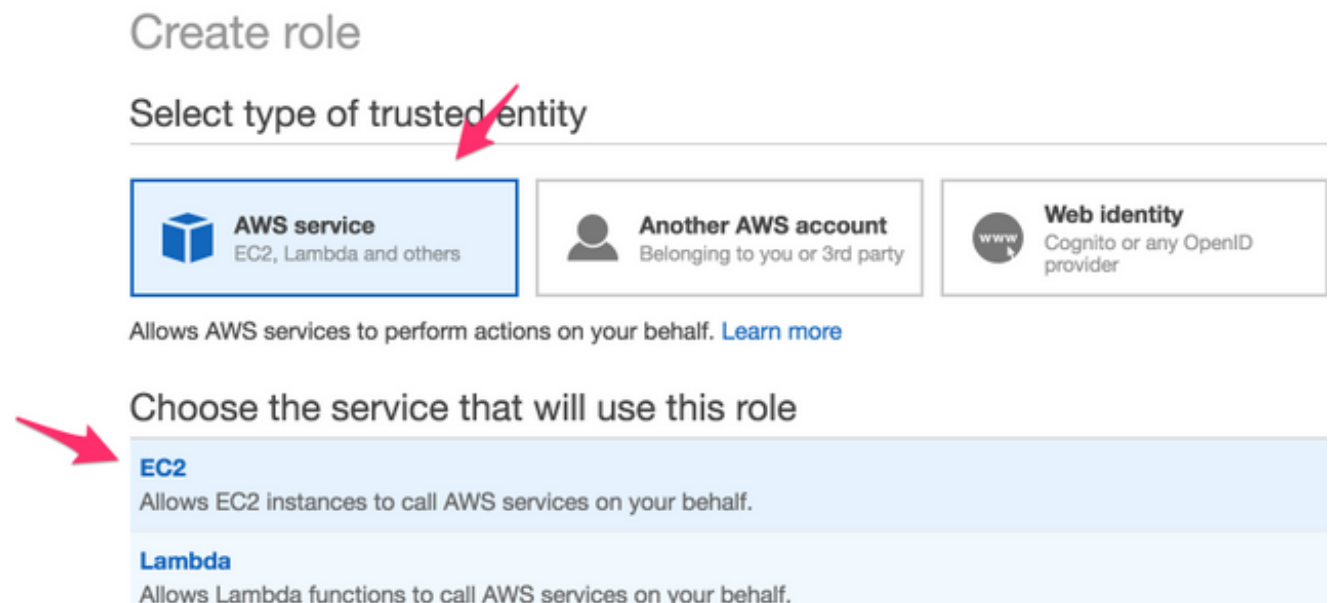
IAM授予您的CSR訪問Amazon API的許可權。

CSR1000v用作代理，以呼叫AWS API命令來修改路由表。預設情況下，不允許AMI訪問API。此過程將建立IAM角色，並在CSR例項啟動期間使用此角色。IAM為CSR提供使用和修改AWS API的訪問憑證。

1. 建立IAM角色。瀏覽到IAM控制面板，然後導航到**角色>建立角色**，如下圖所示。



2. 如圖所示，允許EC2例項代表您呼叫AWS。



3. 建立角色並點選下一步：**檢查**，如下圖所示。

Create role

1 2 3

Attach permissions policies

Choose one or more policies to attach to your new role.

[Create policy](#) [Refresh](#)

Filter: Policy type Showing 394 results

	Policy name	Attachments	Description
<input type="checkbox"/>	AdministratorAccess	7	Provides full access to AWS services and resources.
<input type="checkbox"/>	AlexaForBusinessDeviceSetup	0	Provide device setup access to AlexaForBusiness services
<input type="checkbox"/>	AlexaForBusinessFullAccess	0	Grants full access to AlexaForBusiness resources and acces...
<input type="checkbox"/>	AlexaForBusinessGatewayExecution	0	Provide gateway execution access to AlexaForBusiness serv...
<input type="checkbox"/>	AlexaForBusinessReadOnlyAccess	0	Provide read only access to AlexaForBusiness services
<input type="checkbox"/>	AmazonAPIGatewayAdministrator	0	Provides full access to create/edit/delete APIs in Amazon AP...
<input type="checkbox"/>	AmazonAPIGatewayInvokeFullAccess	0	Provides full access to invoke APIs in Amazon API Gateway.
<input type="checkbox"/>	AmazonAPIGatewayPushToCloudWatchLogs	0	Allows API Gateway to push logs to user's account.
<input type="checkbox"/>	AmazonAppStreamFullAccess	0	Provides full access to Amazon AppStream via the AWS Ma...
<input type="checkbox"/>	AmazonAppStreamReadOnlyAccess	0	Provides read only access to Amazon AppStream via the AW...
<input type="checkbox"/>	AmazonAppStreamServiceAccess	0	Default policy for Amazon AppStream service role.
<input type="checkbox"/>	AmazonAthenaFullAccess	0	Provide full access to Amazon Athena and scoped access to...

* Required

Cancel

Previous

Next: Review

4. 為其指定角色名稱。在本例中，如圖所示，角色名稱為routetablechange。

Create role

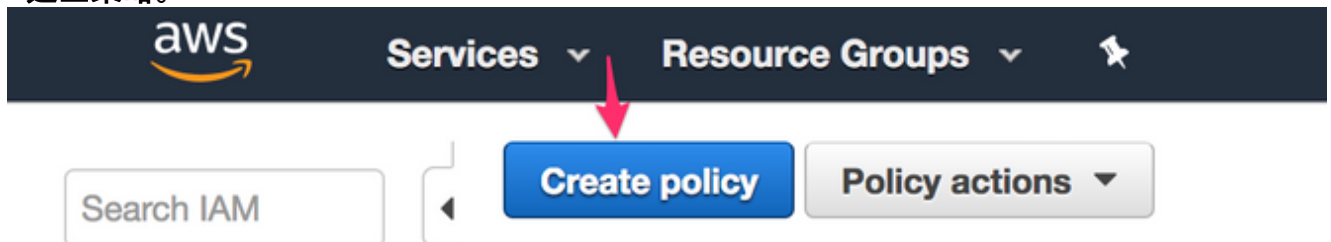
Review

Provide the required information below and review this role before you create it.

Role name*

Use alphanumeric and '+,=,@,-' characters. Maximum 64 characters.

5. 接下來，您需要建立一個策略，並將其附加到上面建立的角色。IAM控制面板，並導航至策略 > 建立策略。



```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "ec2:AssociateRouteTable",
        "ec2:CreateRoute",
        "ec2:CreateRouteTable",
        "ec2>DeleteRoute",
        "ec2>DeleteRouteTable",
        "ec2:DescribeRouteTables",
        "ec2:DescribeVpcs",
        "ec2:ReplaceRoute",
        "ec2:DisassociateRouteTable",
        "ec2:ReplaceRouteTableAssociation"
      ]
    }
  ]
}
```

```
"Resource": "*"
}
]
}
```

Create policy

1 2

A policy defines the AWS permissions that you can assign to a user, group, or role. You can create and edit a policy in the visual editor and using JSON. [Learn more](#)

This policy validation failed and might have errors converting to JSON: The policy must have at least one statement. For more information about the IAM policy grammar, see [AWS IAM Policies](#).

Visual editor JSON

Import managed policy

```
1- {
2-   "Version": "2012-10-17",
3-   "Statement": [
4-     {
5-       "Effect": "Allow",
6-       "Action": [
7-         "ec2:AssociateRouteTable",
8-         "ec2:CreateRoute",
9-         "ec2:CreateRouteTable",
10-        "ec2>DeleteRoute",
11-        "ec2>DeleteRouteTable",
12-        "ec2:DescribeRouteTables",
13-        "ec2:DescribeVpcs",
14-        "ec2:ReplaceRoute",
15-        "ec2:DisassociateRouteTable".
```

6. 為其指定一個策略名稱，並將其附加到您建立的角色。在本示例中，策略名稱稱為具有管理員訪問許可權的CSRHA，如下圖所示。

The screenshot shows the AWS IAM console interface. On the left is a navigation sidebar with options like Dashboard, Groups, Users, Roles, Policies, and Identity providers. The main content area displays a green success message: "CSRHA has been created." Below this, there are buttons for "Create policy" and "Policy actions". The "Policy actions" dropdown menu is open, showing options for "Attach", "Detach", and "Delete". A red arrow points to the "Attach" option. Below the dropdown, a table lists policies, with "AdministratorAccess" highlighted in blue. The table has columns for "Policy" and "Type", with "Job function" listed under "Type".

7. 如圖所示，將策略附加到您建立的名為routetablechange的角色。

Attach Policy

Attach the policy to users, groups, or roles in your account.

The screenshot shows the "Attach Policy" page in the AWS IAM console. At the top, there is a search bar with the text "routetablechange". Below the search bar, there is a table with a "Name" column. The table lists two policies: "adikaulroutetablechange" and "routetablechange". The "routetablechange" policy is selected, indicated by a checked checkbox and a blue background. A red arrow points to the "routetablechange" entry.

8. 摘要.

Summary

Delete role

Role ARN	arn:aws:iam::936821026322:role/routetablechange ↗
Role description	Allows EC2 instances to call AWS services on your behalf. Edit
Instance Profile ARNs	arn:aws:iam::936821026322:instance-profile/routetablechange ↗
Path	/
Creation time	2018-06-02 10:29 PDT
Maximum CLI/API session duration	1 hour (3,600 seconds) Edit

Permissions Trust relationships Access Advisor Revoke sessions

[Attach policy](#) Attached policies: 1

Policy name	Policy type
CSR1A	Managed policy

Policy summary [JSON] Edit policy [Simulate policy](#)

Q Filter

Service	Access level	Resource	Request condition
Allow (1 of 141 services) Show remaining 140			
EC2	Limited: List, Write	All resources	None

步驟5.使用您建立的AMI角色啟動CSR1000v並關聯公共/專用子網。

每個CSR1000v路由器有2個介面（1個公共介面，1個專用介面），並位於自己的可用區中。您可以將每個CSR視為位於單獨的資料中心中。

1. 在AWS控制檯上，選擇EC2，然後按一下Launch Instance。



2. 選擇AWS Marketplace。

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

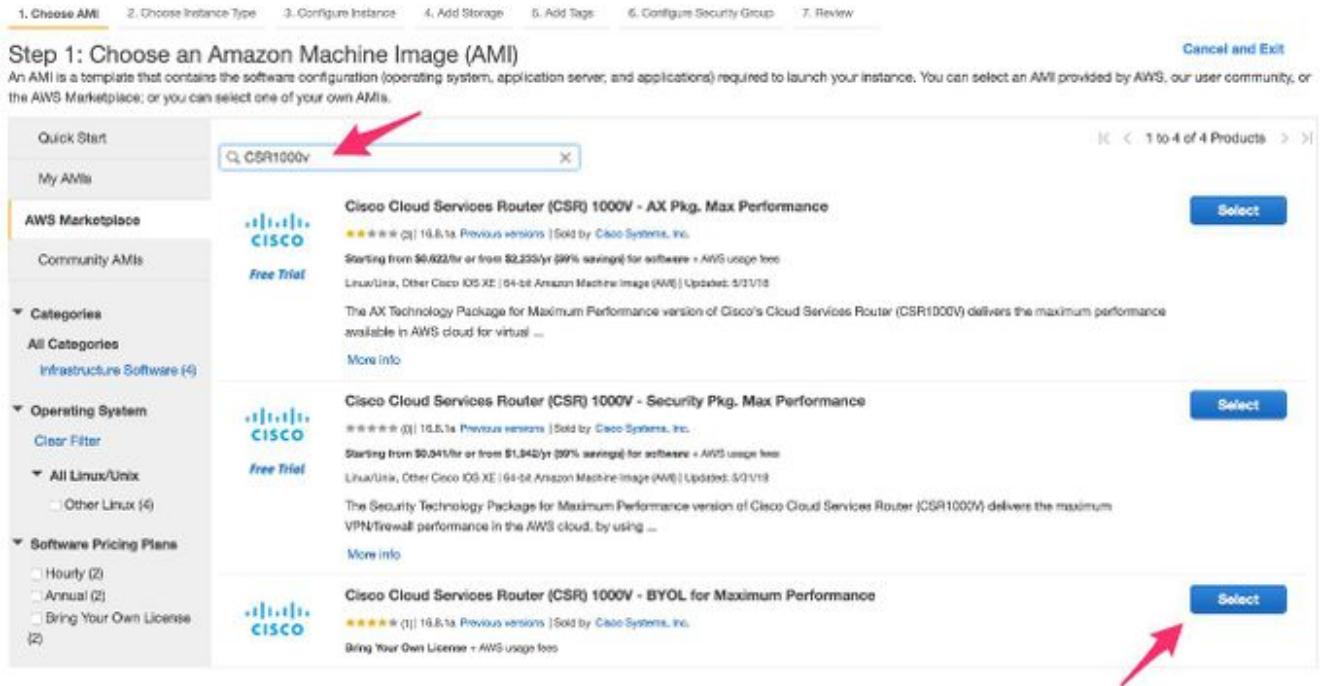
Step 1: Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance in the AWS Marketplace; or you can select one of your own AMIs.

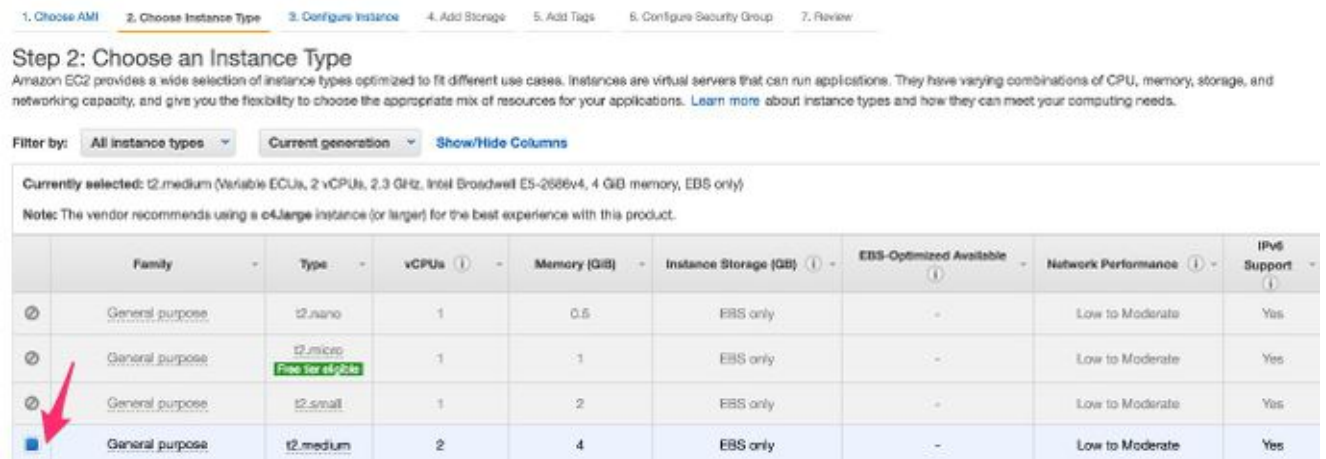
Quick Start

My AMIs		Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type - ami-e251209a
AWS Marketplace	Amazon Linux Free tier eligible	The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.

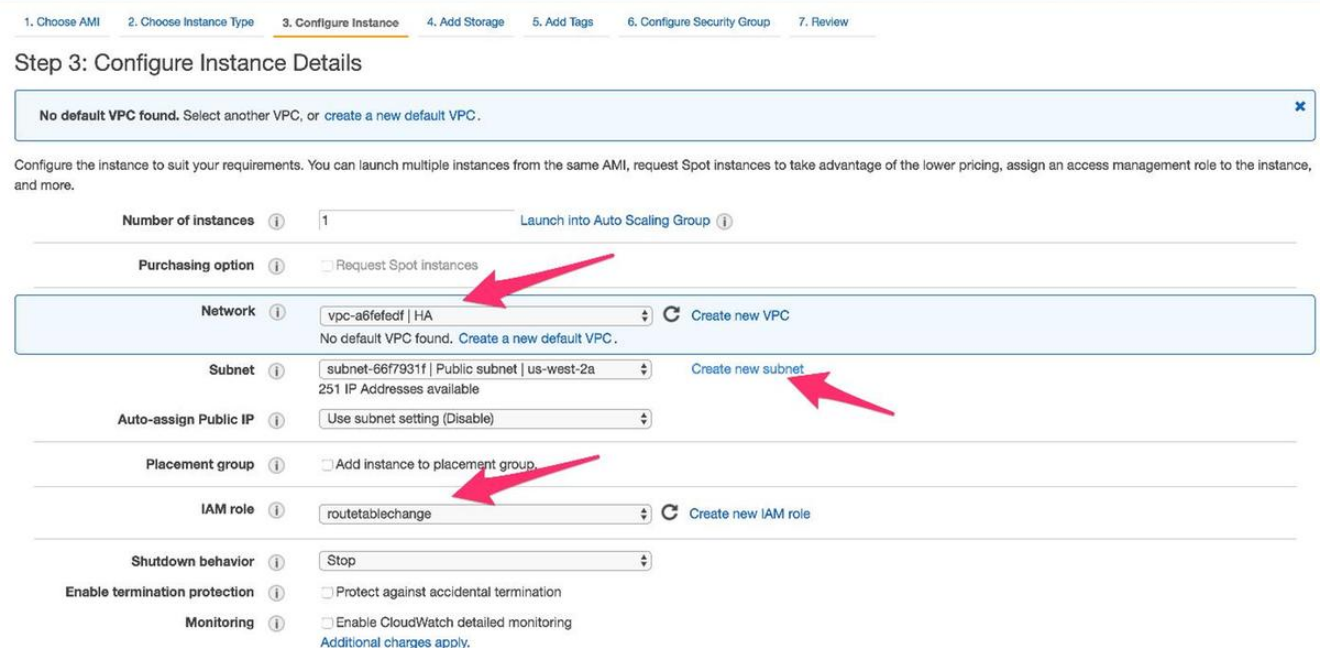
3. 輸入CSR1000v，在本範例中，您使用思科雲端服務路由器(CSR)1000V - BYOL來達到最佳效能。



4. 選擇例項型別。在本示例中，選定的型別為t2.medium。



5. 配置例項時，您需要確保選擇上面建立的VPC以及上面的IAM角色。此外，請建立一個與面向專用介面的專用子網。



6. 點選Create new Subnet for Private Subnet。在本示例中，Name標籤是HA Private。確保它

與公共子網位於同一可用區域。

7. 向下滾動，在「Configure Instance Details」下，按一下Add Device，如下圖所示。

8. 新增輔助介面後，關聯您建立的名為HA Private的專用子網。Eth0是公共介面，Eth1是專用介面。附註：在此下拉選單中不會顯示上一步建立的子網。您可能需要刷新或取消該頁，然後重新開始才能顯示子網。

9. 選擇您在VPC下建立的安全組，並確保規則定義正確。

10. 建立新的金鑰對並確保下載私鑰。您可以為每台裝置重複使用一個金鑰。附註：如果您丟失了私鑰，則無法再次登入您的CSR。沒有方法恢復金鑰。

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Create a new key pair

Key pair name
CSRHA

Download Key Pair

You have to download the **private key file** (*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

Cancel Launch Instances

11. 將Elastic IP與您建立的例項的公共介面的ENI相關聯，然後導航至AWS控制檯> EC2管理> 網路安全> Elastic IP。附註：公共術語/私人術語可能會在這裡混淆您。在本示例中，公共介面的定義是Eth0，即面向網際網路的介面。從AWS的角度來看，我們的公共介面是他們的私有IP。

EC2 Dashboard

Allocate new address

Events

Addresses > Associate address

Associate address

Select the instance OR network interface to which you want to associate this Elastic IP address (54.244.108.43)

Resource type Instance Network interface

Network interface: eni-2515633d

Private IP: 10.16.2.215

Reassociation Allow Elastic IP to be reassociated if already attached

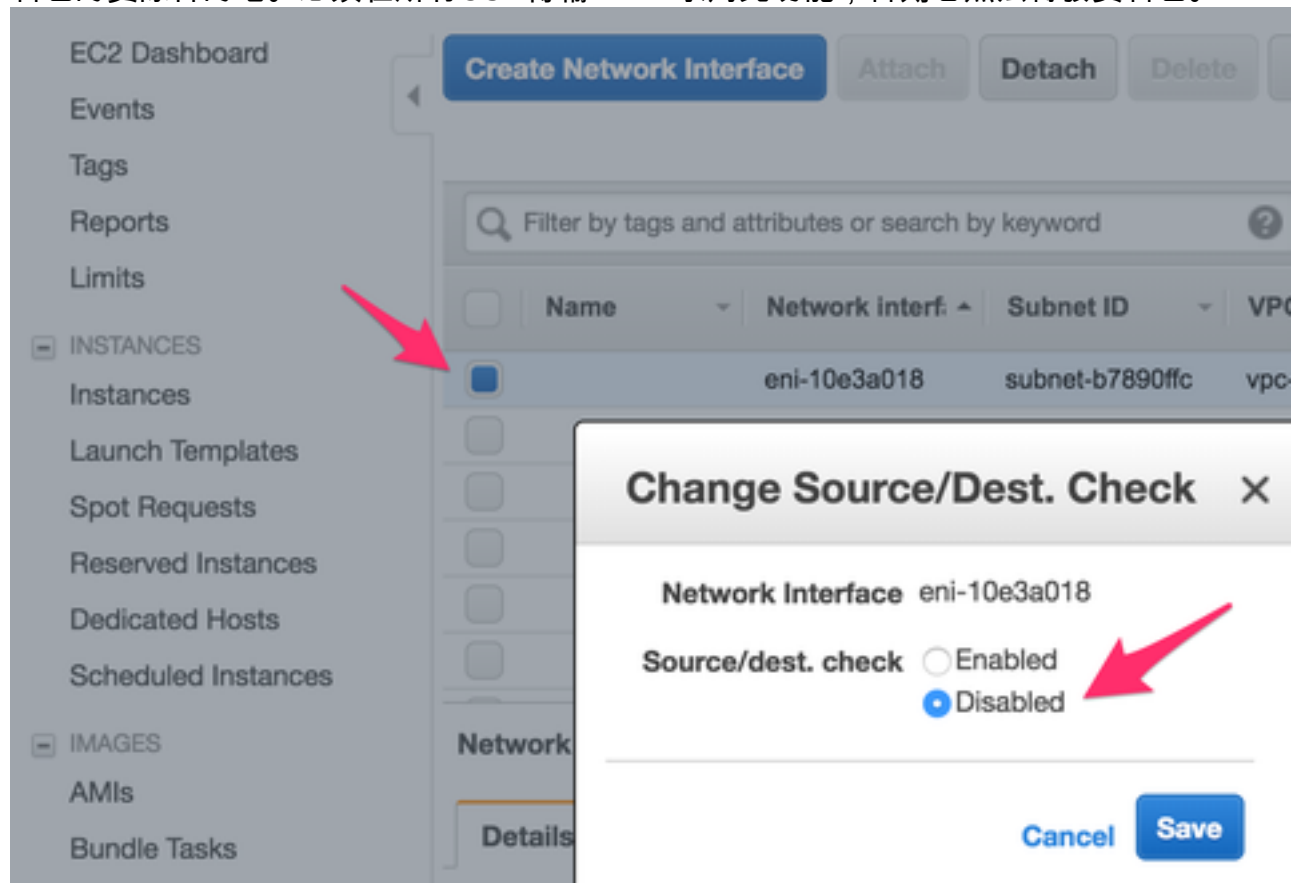
Warning: If you associate an Elastic IP address with your instance, your current public IP address is released. Learn more.

AWS Command Line Interface command

Cancel Associate

12. 導航到EC2 > Network Interfaces時，禁用Source/Dest Check。驗證每個ENI以進行源/目標檢查。預設情況下，所有ENI都啟用此源/目標檢查。一種反欺騙功能，旨在通過在轉發流量

之前驗證ENI是流量的目的地，從而避免讓ENI出現並非真正針對它的流量。路由器很少是資料包的實際目的地。必須在所有CSR傳輸ENI上禁用此功能，否則它無法轉發資料包。



13. 連線到您的CSR1000v。附註：通過SSH連線到CSR1000v的AWS提供的使用者名稱可能錯誤地列為root。如果需要，請將其更改為ec2-user。附註：在中必須能夠對DNS地址執行SSH執行ping操作。此處為ec2-54-208-234-64.compute-1.amazonaws.com。檢查路由器的公共子網/埃尼是否與公共路由表關聯。請簡要轉到步驟8，瞭解如何將子網與路由表相關聯。

Connect To Your Instance



I would like to connect with

A standalone SSH client

A Java SSH Client directly from my browser (Java required)

To access your instance:

1. Open an SSH client. (find out how to [connect using PuTTY](#))
2. Locate your private key file (HA.pem). The wizard automatically detects the key you used to launch the instance.
3. Your key must not be publicly viewable for SSH to work. Use this command if needed:

```
chmod 400 HA.pem
```

4. Connect to your instance using its Public DNS:

```
ec2-54-208-234-64.compute-1.amazonaws.com
```

Example:

```
ssh -i "HA.pem" root@ec2-54-208-234-64.compute-1.amazonaws.com
```

Please note that in most cases the username above will be correct, however please ensure that you read your AMI usage instructions to ensure that the AMI owner has not changed the default AMI username.

If you need any assistance connecting to your instance, please see our [connection documentation](#).

Close

步驟6.重複步驟5，為HA建立第二個CSR1000v執行個體。

公共子網： 10.16.1.0/24

專用子網： 10.16.5.0/24

如果無法ping通這個新AMI的彈性IP地址，請簡要轉到步驟8，並確保公用子網與公用路由表關聯。

步驟7.重複步驟5並從AMI應用商店建立VM(Linux/Windows)。

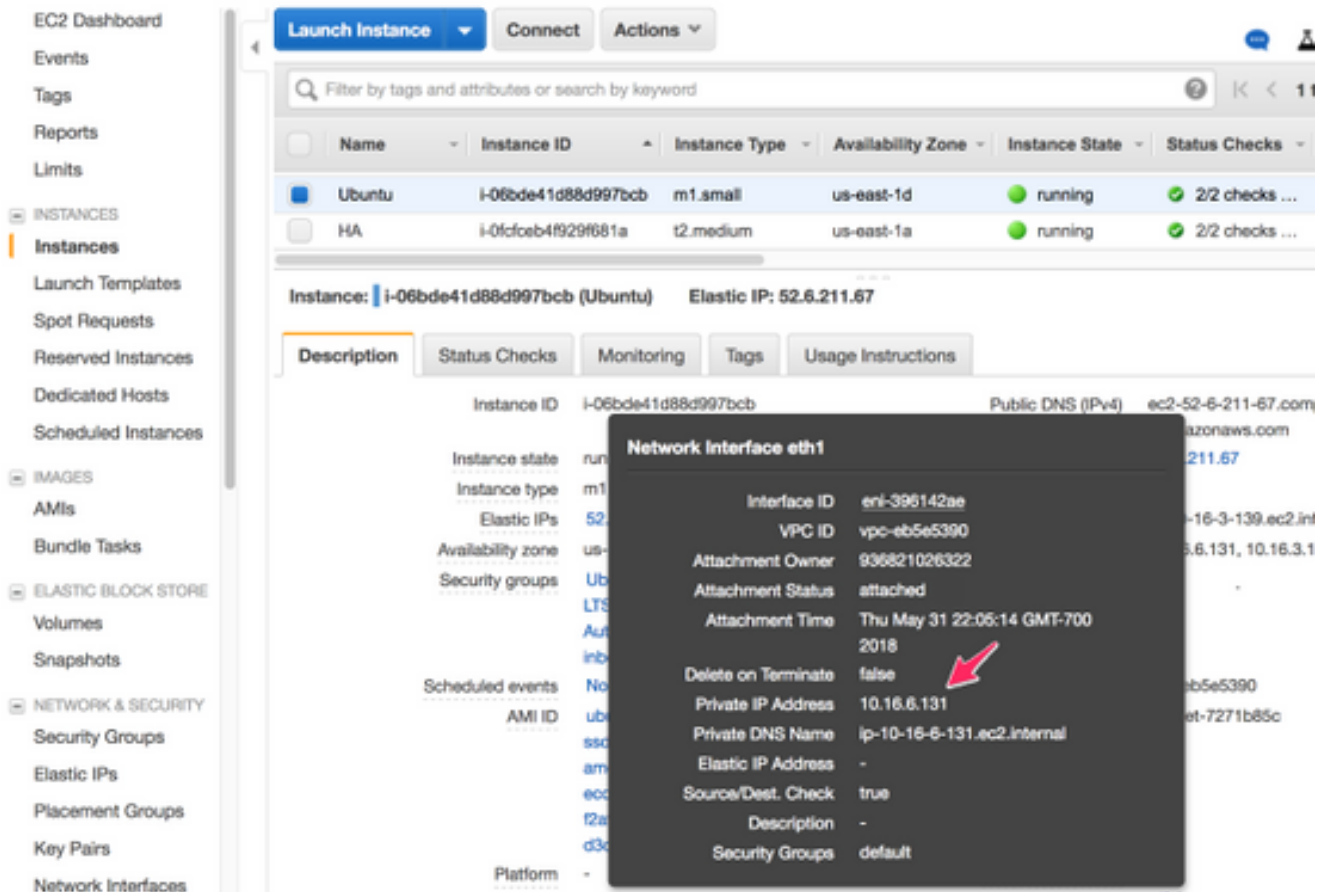
在本示例中，請使用Ubuntu Server 14.04 LTS。

公共子網： 10.16.2.0/24

專用子網： 10.16.6.0/24

如果無法ping通這個新AMI的彈性IP地址，請簡要轉到步驟8，並確保公用子網與公用路由表關聯。

1. 預設情況下，會為公共介面建立Eth0。為專用子網建立另一個名為eth1的介面。



2. 您在Ubuntu中配置的IP地址是AWS分配的eth1專用介面。

```
ubuntu@ip-10-16-2-139:~$ cd /etc/network/interfaces.d/
```

```
ubuntu@ip-10-16-2-139:/etc/network/interfaces.d$ sudo vi eth1.cfg
```

```
auto eth1
iface eth1 inet static
    address 10.16.6.131
    netmask 255.255.255.0
    network 10.16.6.0
    up route add -host 8.8.8.8 gw 10.16.6.1 dev eth1
```

3. 關閉介面或重新啟動VM。

```
ubuntu@ip-10-16-2-139:/etc/network/interfaces.d$ sudo ifdown eth1 && sudo ifup eth1
```

```
ubuntu@ip-10-16-2-139:/etc/network/interfaces.d$ sudo reboot
```

4. Ping 8.8.8.8進行測試。確保已在步驟7中新增了8.8.8.8路由。

```
ubuntu@ip-10-16-2-139:~$ route -n
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
0.0.0.0 10.16.2.1 0.0.0.0 UG 0 0 0 eth0
8.8.8.8 10.16.6.1 255.255.255.255 UGH 0 0 0 eth1 <-----
10.16.3.0 0.0.0.0 255.255.255.0 U 0 0 0 eth0
10.16.6.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1
```

如果未在表中列出8.8.8.8，請手動新增：

```
ubuntu@ip-10-16-2-139:~$ sudo route add -host 8.8.8.8 gw 10.16.6.1 dev eth1
```

步驟8.配置私有路由表和公共路由表。

1. 通過步驟2中的嚮導建立VPC時，將自動建立兩個路由表。如果只有一個路由表，請為您的專用子網建立另一個路由表，如下圖所示。

The image shows two screenshots from the AWS VPC console. The top screenshot is the 'Create Route Table' dialog box. It has a title bar with 'Create Route Table', 'Delete Route Table', and 'Set As Main Table' buttons. Below the title bar is a search bar 'Search Route Tables and their...'. The main content area contains a description: 'A route table specifies how packets are forwarded between the subnets within your VPC, the Internet, and your VPN connection.' Below this are two input fields: 'Name tag' with the value 'HA PRIVATE' and 'VPC' with the value 'vpc-b98d8ec0 | HA'. At the bottom right are 'Cancel' and 'Yes, Create' buttons.

The bottom screenshot shows the 'Route Tables' page in the VPC console. It has a similar top bar with 'Create Route Table', 'Delete Route Table', and 'Set As Main Table' buttons. Below is a search bar. A table lists route tables:

<input type="checkbox"/>	Name	Route Table ID	Explicitly Associat	Main	VPC
<input type="checkbox"/>	HA PUBLIC	rtb-2752415f	1 Subnet	No	vpc-39222f40 HA
<input checked="" type="checkbox"/>	HA PRIVATE	rtb-ca5340b2	0 Subnets	Yes	vpc-39222f40 HA

A red arrow points to the 'HA PRIVATE' row. Below the table, the details for 'rtb-ca5340b2 | HA PRIVATE' are shown. There are tabs for 'Summary', 'Routes', 'Subnet Associations', 'Route Propagation', and 'Tags'. The 'Routes' tab is active. An 'Edit' button is visible. Below the 'Edit' button is a 'View: All rules' dropdown. A table shows the route rules:

Destination	Target	Status	Propagated
10.16.0.0/16	local	Active	No

A red arrow points to the 'Edit' button.

2. 以下是兩個路由表的檢視。公共路由表已自動連線Internet網關(igw-95377973)。請相應地為這兩個表新增標籤。PRIVATE表不應具有此路由。

VPC Dashboard

Filter by VPC:

Virtual Private Cloud

Your VPCs

Subnets

Route Tables

Internet Gateways

Egress Only Internet Gateways

DHCP Options Sets

Elastic IPs

Endpoints

Endpoint Services

NAT Gateways

Peering Connections

Security

Network ACLs

<input type="checkbox"/>	Name	Route Table ID	Explicitly Associat	Main	VPC
<input checked="" type="checkbox"/>	HA PUBLIC	rtb-2752415f	1 Subnet	No	vpc-39222f40 HA
<input type="checkbox"/>	HA PRIVATE	rtb-ca5340b2	0 Subnets	Yes	vpc-39222f40 HA

rtb-2752415f | HA PUBLIC

View:

Destination	Target	Status	Propagated
10.16.0.0/16	local	Active	No
0.0.0.0/0	igw-953779f3	Active	No

3. 將所有6個子網關聯到正確的路由表 3個公共介面與公共路由表關聯：公共子網
 : 10.16.0.0/24, 10.16.1.0/24, 10.16.2.0/24 3個專用介面與專用路由表關聯：專用子網
 : 10.16.4.0/24、10.16.5.0/24、
 10.16.6.0/24

rtb-ec081d94 | HA PRIVATE

Subnet	IPv4 CIDR	IPv6 CIDR
You do not have any subnet associations. The following subnets have not been explicitly associated with any route tables and are therefore associated with the main route table:		

步驟9.使用BFD和任何路由協定配置網路地址轉換(NAT)和GRE隧道。

透過CSR 1000v的彈性IP設定通用路由封裝(GRE)通道 (建議避免偵測false失敗的DHCP租約續約問題。) 如果需要更快的收斂，則雙向轉發檢測(BFD)值可以配置為比本示例所示值更積極。但是，這可能會導致在間歇性連線期間發生BFD對等體關閉事件。此示例中的值在1.5秒內檢測對等體故障。在執行AWS API命令的時間和VPC路由表更改生效的時間之間，存在大約幾秒的可變延遲。

- CSRHA上的配置
 GRE和BFD — 用於觀察HA故障轉移的條件

```
interface Tunnell
ip address 192.168.1.1 255.255.255.0
```

```

bfd interval 500 min_rx 500 multiplier 3
tunnel source GigabitEthernet1
tunnel destination 52.10.183.185 /* Elastic IP of the peer CSR */
!
router eigrp 1
  bfd interface Tunnell
  network 192.168.1.0
  passive-interface GigabitEthernet1

```

NAT和路由 — 用於通過專用介面實現虛擬機器網際網路可達性

```

interface GigabitEthernet1
  ip address dhcp
  ip nat outside
  no shutdown
!
interface GigabitEthernet2
  ip address dhcp
  ip nat inside
  no shutdown
!
ip nat inside source list 10 interface GigabitEthernet1 overload
!
access-list 10 permit 10.16.6.0 0.0.0.255
!
ip route 10.16.6.0 255.255.255.0 GigabitEthernet2 10.16.4.1

```

• CSRHA1上的配置

GRE和BFD — 用於觀察HA故障轉移的條件

```

interface Tunnell
  ip address 192.168.1.2 255.255.255.0
  bfd interval 500 min_rx 500 multiplier 3
  tunnel source GigabitEthernet1
  tunnel destination 50.112.227.77 /* Elastic IP of the peer CSR */
!
router eigrp 1
  bfd interface Tunnell
  network 192.168.1.0
  passive-interface GigabitEthernet1

```

NAT和路由 — 用於通過專用介面實現虛擬機器網際網路可達性

```

interface GigabitEthernet1
  ip address dhcp
  ip nat outside
  no shutdown
!
interface GigabitEthernet2
  ip address dhcp
  ip nat inside
  no shutdown
!
ip nat inside source list 10 interface GigabitEthernet1 overload
!
access-list 10 permit 10.16.6.0 0.0.0.255
!
ip route 10.16.6.0 255.255.255.0 GigabitEthernet2 10.16.5.1

```

步驟10.配置高可用性 (Cisco IOS XE Denali 16.3.1a或更高版本)。

使用下面指定的雲提供商aws命令配置每個CSR 1000v，監控BFD對等體關閉事件。在檢測到AWS HA錯誤 (例如BFD對等體關閉) 後，使用此命令定義對(VPC)Route-table-id、Network-interface-id和CIDR的路由更改。

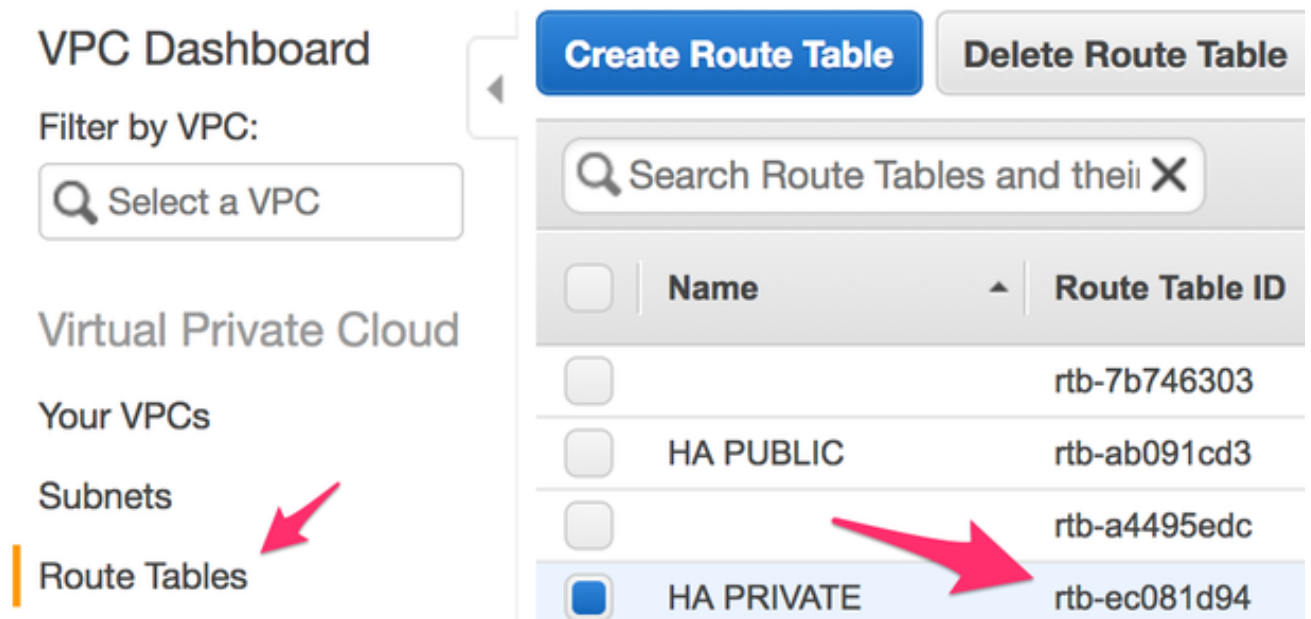
```
CSR(config)# redundancy
CSR(config-red)# cloud provider [aws | azure] node-id
# bfd peer ipaddr
# route-table table-name
# cidr ip ipaddr/prefix
# eni elastic-network-intf-name
# region region-name
```

- 1. 第#bfd對等ipaddr是對等通道IP地址。

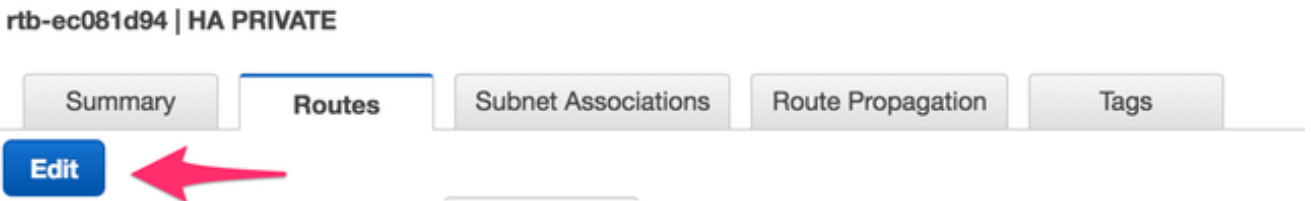
```
CSRHA#show bfd neighbors
```

```
IPv4 Sessions
NeighAddr LD/RD RH/RS State Int
192.168.1.2 4097/4097 Up Up Tu1
```

- 2. 在AWS#route-table制台下找到路由表名稱，請導航至VPC > Route Tables。此操作會更改專用路由表。



- 3. #cidr ip ipaddr/字首是路由表中要更新的路由的目標地址。在AWS控制檯下，導航到VPC >路由表。向下滾動，按一下Edit，然後按一下Add another route。新增我們的測試目的地址8.8.8.8和CSRHA的專用ENI。



Summary Routes Subnet Associations Route Propagation Tags

Cancel Save

View: All rules

Destination	Target	Status	Propagated	Remove
10.16.0.0/16	local	Active	No	
8.8.8.8/32	eni-10e3a018	Active	No	✕

Add another route

4. 在#eni例項中找到elastic-network-intf-name。按一下每個相應CSR的專用介面eth1，並使用介面ID。

Instances Launch Templates Spot Requests Reserved Instances Dedicated Hosts Scheduled Instances

IMAGES AMIs Bundle Tasks

ELASTIC BLOCK STORE Volumes Snapshots

NETWORK & SECURITY Security Groups Elastic IPs Placement Groups Key Pairs Network Interfaces

LOAD BALANCING Load Balancers

Instance	Instance ID	Instance Type	Availability Zone	Status	Checks
CSRHA	i-0223f5ca1d6068424	c4.large	us-west-2a	running	2/2 checks ...
CSRHA1	i-0bed9ff2bd6996ca4	t2.medium	us-west-2b	running	2/2 checks ...
WINDOWS	i-07a0fecde36302c6a	t2.small	us-west-2c	running	2/2 checks ...

Instance: i-0223f5ca1d6068424 (CSRHA) Elastic Network Interfaces

Description	Status Checks	Monitoring
Instance ID	i-0223f5ca1d6068424	
Instance state	running	
Instance type	c4.large	
Elastic IPs	50.112.227.77*	
Availability zone	us-west-2a	
Security groups	HAKAUL - view in...	
Scheduled events	No scheduled eve...	
AMI ID	cisco-CSR-.16.06... HVM-a6eb2ef0-95... 8de7709ee6d5-an... (ami-2c3ef554)	
Platform	-	

Network interface eth1

Interface ID	eni-90b500a8
VPC ID	vpc-19c1c060
Attachment Owner	936821026322
Attachment Status	attached
Attachment Time	Thu May 31 21:57:41 GMT-700 2018
Delete on Terminate	true
Private IP Address	10.16.4.198
Private DNS Name	ip-10-16-4-198.us-west-2.compute.internal
Elastic IP Address	-
Source/Dest. Check	false
Description	-
Security Groups	HAKAUL

Network interfaces eth0 eth1

5. AWS#region稱是在AWS文檔中找到的代碼名稱。此清單可能會更改或增大。要查詢最新更新，請訪問Amazon的[區域和可用區](#)文檔。

Code	Name
us-east-1	US East (N. Virginia)
us-east-2	US East (Ohio)
us-west-1	US West (N. California)
us-west-2	US West (Oregon)
ca-central-1	Canada (Central)
eu-central-1	EU (Frankfurt)
eu-west-1	EU (Ireland)
eu-west-2	EU (London)
eu-west-3	EU (Paris)
ap-northeast-1	Asia Pacific (Tokyo)
ap-northeast-2	Asia Pacific (Seoul)
ap-northeast-3	Asia Pacific (Osaka-Local)
ap-southeast-1	Asia Pacific (Singapore)
ap-southeast-2	Asia Pacific (Sydney)
ap-south-1	Asia Pacific (Mumbai)
sa-east-1	South America (São Paulo)

CSRHA上的冗餘配置示例

```

redundancy
cloud provider aws 1
  bfd peer 192.168.1.2
  route-table rtb-ec081d94
  cidr ip 8.8.8.8/32
  eni eni-90b500a8
  region us-west-2

```

CSRHA1上的冗餘配置示例

```

redundancy
cloud provider aws 1
  bfd peer 192.168.1.1
  route-table rtb-ec081d94
  cidr ip 8.8.8.8/32
  eni eni-10e3a018
  region us-west-2

```

驗證高可用性

1. 檢查BFD和雲配置。

```
CSRHA#show bfd nei
```

```
IPv4 Sessions
NeighAddr LD/RD RH/RS State Int
192.168.1.2 4097/4097 Up Up Tu1
```

```
CSRHA#show ip eigrp neighbors
EIGRP-IPv4 Neighbors for AS(1)
H Address Interface Hold Uptime SRTT RTO Q Seq
(sec) (ms) Cnt Num
0 192.168.1.2 Tu1 12 00:11:57 1 1470 0 2
```

```
CSRHA#show redundancy cloud provider aws 1
```

```
Cloud HA: work_in_progress=FALSE
Provider : AWS node 1
State : idle
BFD peer      = 192.168.1.2
BFD intf      = Tunnel1
route-table   = rtb-ec081d94
cidr          = 8.8.8.8/32
eni           = eni-90b500a8
region        = us-west-2
```

2. 從VM對目標運行連續ping。確保ping通過專用eth1介面。

```
ubuntu@ip-10-16-3-139:~$ ping -I eth1 8.8.8.8
PING 8.8.8.8 (8.8.8.8) from 10.16.6.131 eth1: 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=50 time=1.60 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=50 time=1.62 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=50 time=1.57 ms
```

3. 檢查專用路由表。Eni目前是CSRHA的專用介面，此介面是流量。

rtb-ec081d94 | HA PRIVATE

Destination	Target	Status	Propagated
10.16.0.0/16	local	Active	No
8.8.8.8/32	eni-90b500a8 / i-0fcfceb4f929f681a	Active	No

4. 關閉CSRHA的Tunnel1以模擬HA故障切換。

```
CSRHA(config)#int Tu1
CSRHA(config-if)#shut
```

5. 請注意，路由表指向新的ENI，即CSRHA1的專用介面。

Summary	Routes	Subnet Associations	Route Propagation	Tags
Edit				
View: <input type="text" value="All rules"/>				
Destination	Target	Status	Propagated	
10.16.0.0/16	local	Active	No	
8.8.8.8/32	eni-10e3a018 / i-0fcfceb4f929f681a	Active	No	

疑難排解

- 確保資源相關聯。建立VPC、子網、介面、路由表等時，其中許多介面不會自動相互關聯。他們彼此不瞭解。
- 確保Elastic IP和任何專用IP與正確的介面關聯，並將正確的子網新增到正確的路由表中，連線到正確的路由器以及正確的VPC和區域，並與IAM角色和安全組關聯。
- 禁用每個ENI的源/目標檢查。
- 對於Cisco IOS XE 16.3.1a或更高版本，這是可用的其他驗證命令。

```
show redundancy cloud provider [aws | azure] node-id
debug redundancy cloud [all | trace | detail | error]
debug ip http all
```

- 以下是調試中常見的故障：

問題：httpc_send_request失敗

解析度：Http用於從CSR向AWS傳送API呼叫。確保DNS可以解析例項中列出的DNS名稱。確保http流量未被阻止。

```
*May 30 20:08:06.922: %VXE_CLOUD_HA-3-FAILED: VXE Cloud HA BFD state transitioned, AWS node 1
event httpc_send_request failed
*May 30 20:08:06.922: CLOUD-HA : AWS node 1 httpc_send_request failed (0x12)
URL=http://ec2.us-east-2b.amazonaws.com
```

問題：路由表rtb-9c0000f4和介面eni-32791318屬於不同的網路

解析度：不同網路中的區域名稱和ENI配置不正確。區域和ENI應與路由器位於同一區域。

```
*May 30 23:38:09.141: CLOUD-HA : res content iov_len=284 iov_base=<?xml version="1.0"
encoding="UTF-8"?>
<Response><Errors><Error><Code>InvalidParameterValue</Code><Message>route table rtb-9c0000f4 and
interface eni-32791318 belong to different
networks</Message></Error></Errors><RequestID>af3f228c-d5d8-4b23-b22c-
```

f6ad999e70bd</RequestID></Response>

問題：您無權執行此操作。編碼授權失敗消息。

解析度：IAM JSON角色/策略建立錯誤或未應用於CSR。IAM角色授權CSR進行API呼叫。

```
*May 30 22:22:46.437: CLOUD-HA : res content iov_len=895 iov_base=<?xml version="1.0"
encoding="UTF-8"?>
<Response><Errors><Error><Code>UnauthorizedOperation</Code><Message>You are not authorized to
perform this operation. Encoded
authorization failure message: qYvEB4MUdOB8m2itSteRgnOuslAaxhAbDph5qGRJk jJbrESa jbmF5HWUR-
MmHYeRALpKZ3Jg_y-
_tMlYe15l_ws8Jd9q2W8YDXB13uXQqfW_cjjrgy9jhnGY0nOaNu65aLpfqui8kS_4RPOpm5grRffo99-
8uv_N3mYaBqKFPn3vUcSYKBmxFIikJKc jY9esOeLIOWDcnYGGu6AGGMoMxWDtk0K8nwk4IjLDcnd2cDXeENS45w1PqzKGPsh
v3wD28TS5xRjIrPXyrT18UpV6lLA_090h4737VncQKfzbz4tPpnAkoW0mJLQ1vDpPmNvHUpEng8KrGWYNfbfemoDtWqIdABf
aLLm4saNtnQ_OMB0Ti4toBLEb2BNdMkl1UVBIXqTqdFUVRS**MSG 00041 TRUNCATED** **MSG 00041
CONTINUATION
#01**qLosAb5Yx0DrOsLSQwzS95VGvQM_n87LBHYbAWWhqWj3UfP_zmiak7d1m9P41mFCucEB3Cs4FRsFtb-
9q44VtyQJaS2sU2nhGe3x4uGEsl7F1pNv5vhVeYOZB3tbOfbV1_Y4trZwYPPfGLKgBShZp-WNmUKUJsKc1-
6KGqmp7519imvh66Jgwgmu9DT_qAZ-jEjkqWjBrxg6krw</Message></Error></Errors><RequestID>4cf31249-
2a6e-4414-ae8d-6fb825b0f398</RequestID></Response>
```

相關資訊

- [VPC 網路備援 — Cisco](#)
- [適用於 Amazon Web Services 的 Cisco CSR 1000v 系列雲服務路由器部署指南](#)
- [例項型別細分](#)
- [EC2 和 VPC](#)
- [《EC2 使用手冊》中的「彈性網路介面」包括每個例項型別的 ENI 數量](#)
- [增強的 Linux 網路操作說明，有用的背景資訊](#)
- [專用例項/租賃說明和操作說明](#)
- [一般 EC2 文檔](#)
- [一般 VPC 文檔](#)
- [區域和可用區域](#)
- [CSR 1000v 高可用性版本 3](#)

關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。