Allied Telesis™

Google Cloud VPN
Configuration Guide

Introduction

This guide describes how to configure access to the Google Cloud VPN service. This provides secure access to their data-center services. Three different VPN options are available:

- Static routing

- Dynamic routing with BGP

- High availability dynamic routing

Static routing should be used if there are only a few routes that will be used between the Google cloud network and the remote router. Each required route must be manually configured on all peers to reach respective remote networks.

Dynamic routing with BGP should be used where there are potentially many routes to be used via the VPN. Dynamic routing is simpler than configuring a large number manually. Dynamic routing with BGP will also automatically advertise new routes as required.

High availability dynamic routing should be used where there is a requirement for an additional backup connection to the Google cloud.

AlliedWare Plus™
OPERATING SYSTEM

Contents

Products and software version that apply to this guide

This guide applies to AR4050S, AR3050S, AR2050V, and AR2010V firewalls and routers, running AlliedWare Plus™ version **5.5.0-1** or later.

For more information, see the following documents:

- The product's Datasheet

- The product's Command Reference

These documents are available from the above links on our website at alliedtelesis.com.

Related documents
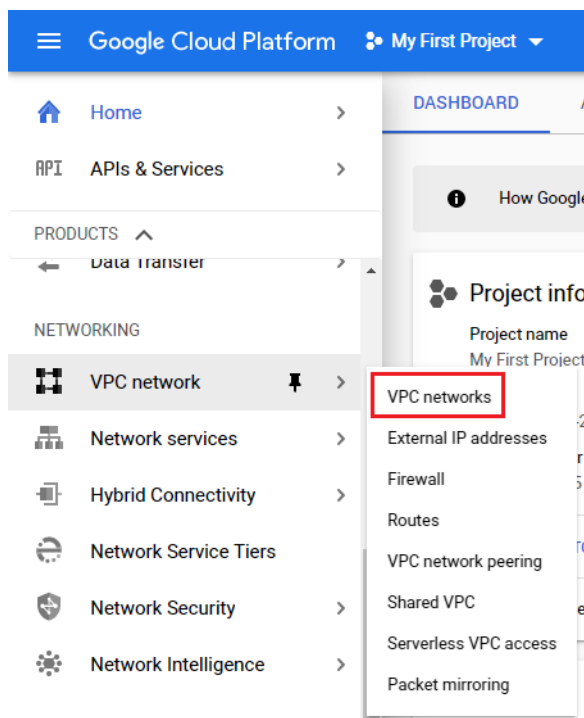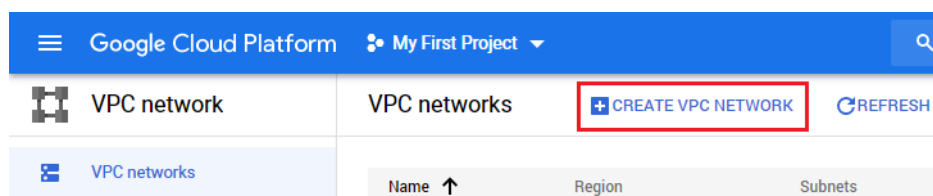
The following documents give more information about the supported products:

- Getting Started with the Device GUI on VPN Routers

- Getting Started with the Device GUI on UTM Firewalls

- The product's Command Reference

These documents are available from the links above or on our website at alliedtelesis.com

Static routing

To configure static routing to a Google Cloud VPN, use the following steps:

1. Log in to your Google Cloud Account. Navigate to the Home Page. From the menu on the left, under **Networking**, select the **VPC Network** page.

2. On the VPC network page, click on **Create VPC Network**.

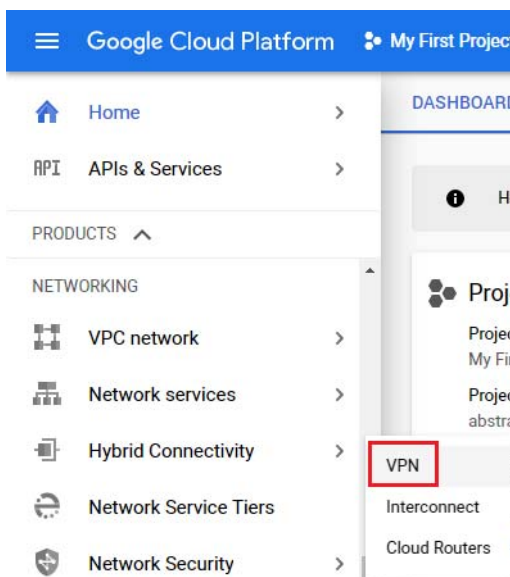3. Fill in a **Name** and, optionally, a **Description**.

4. In the **New subnet** section, fill in a **Name**, **Region**, and **IP address range**.
   The **Region** is where the VPN will exit the Google cloud. Normally, this would be the closest point to the AR-Series router.
   In the **IP address range** add your local IP address range. This will be your local address selector for the Google Cloud VPN. For this example, we are using **192.168.2.0/24**.

5. Click on **Create** to create the VPC network.

6. Once the VPC network has been created, you will be returned to the Home Page. On the Home Page, from the menu on the left under **Networking**, select **Hybrid Connectivity**, then **VPN**.

7. On the VPN page, click on **Create VPN connection**.

8. Select **Classic VPN**, then click on **Continue**.

9. In the **VPN gateway** section, fill in a **Name**, **Region**, and **IP address**, and, optionally, a **Description**.
The **Region** is where you want to locate the VPN Gateway.
The **IP address** is the local-address-selector that we created earlier. This will also provide our external IP address (in this case 34.93.250.183), and will be the router's ISAKMP and IPSec peer address.

10. In the **Tunnels** section, fill in a **Name** and, optionally, a **Description**.

11. In **Remote peer IP address**, enter the public external IP address of your router.

12. In the **IKE version** drop-down, select **IKE-v2**.

13. Enter a key for the **IKE pre-shared key**. This will be the same key used on your router for the ISAKMP peer.

14. Copy this and save it somewhere secure

15. Under **Routing options**, choose **Policy-based**.

16. Under **Remote network IP ranges**, enter the internal IP address range of your router.

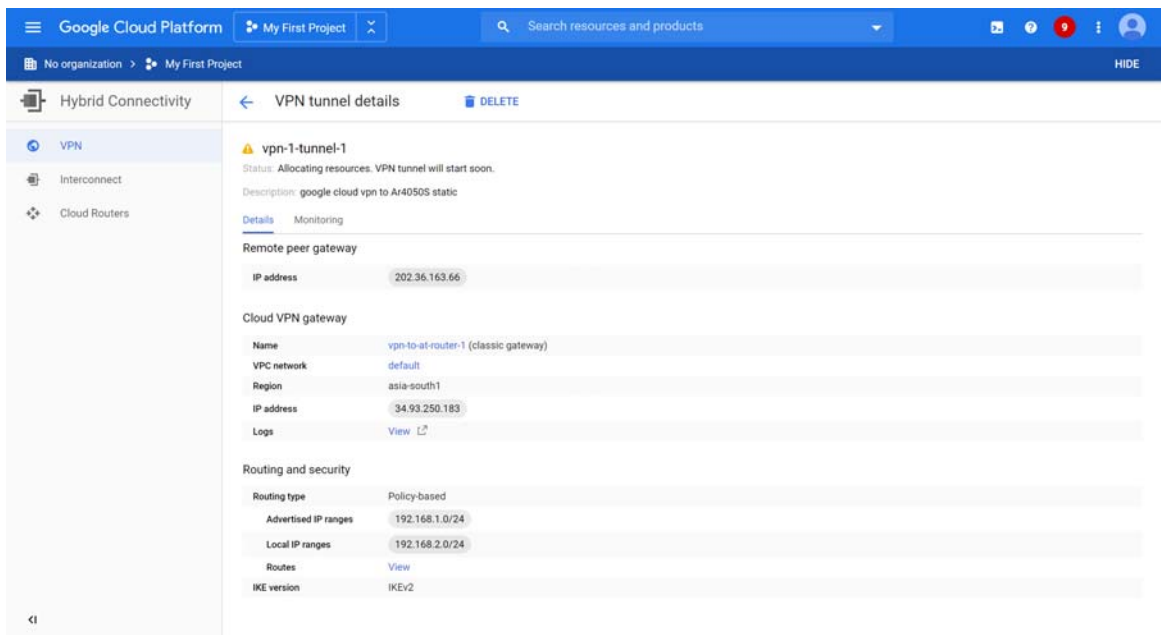17. Under **Local IP ranges**, enter the local-address-selector that you created earlier.

18. Click on **Create**.

19. Once the tunnel has been created, if you select **VPN** on the left menu, you can see the new tunnel. When you select this tunnel, you can see the details and connection status.
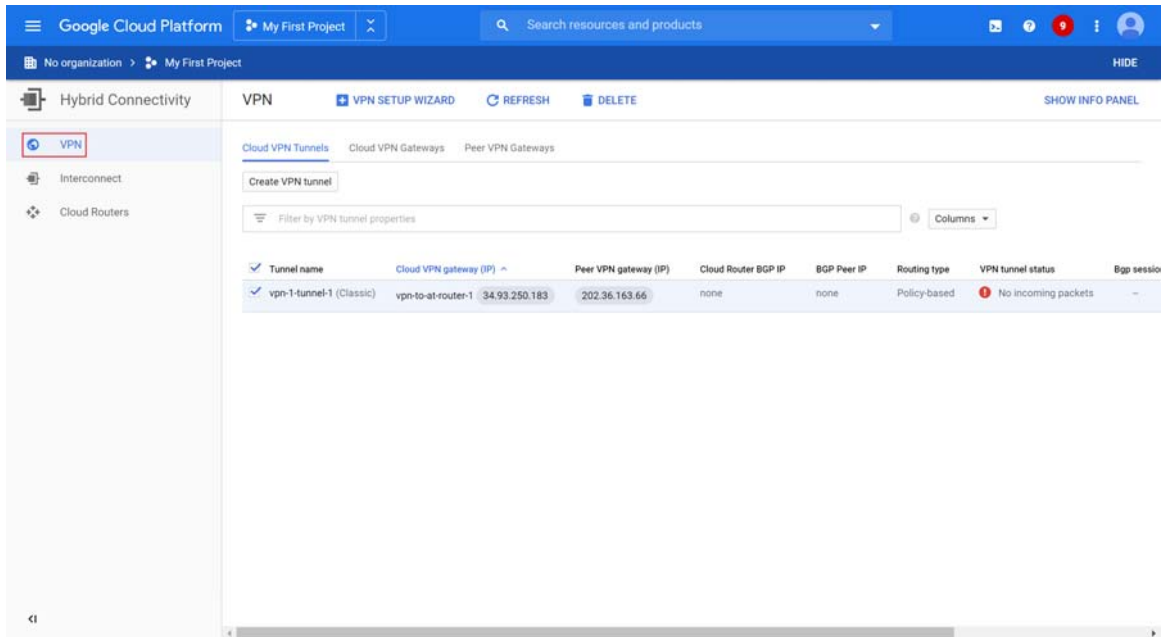
20. You can click on the tunnel to display more information.

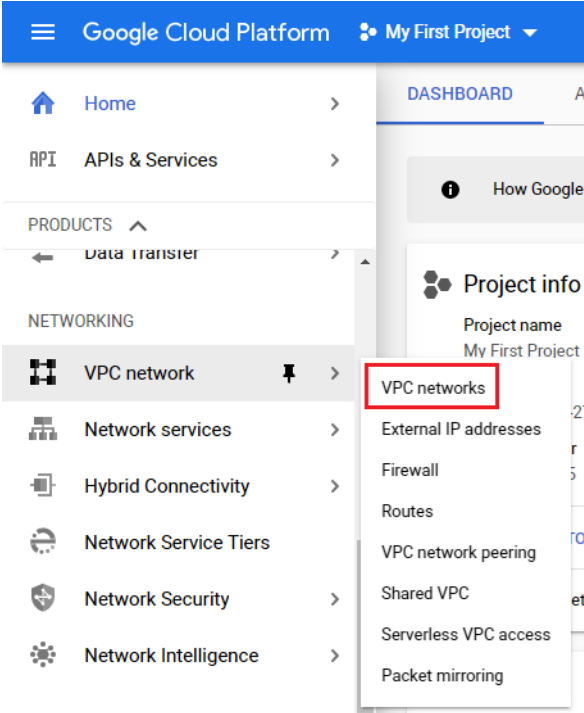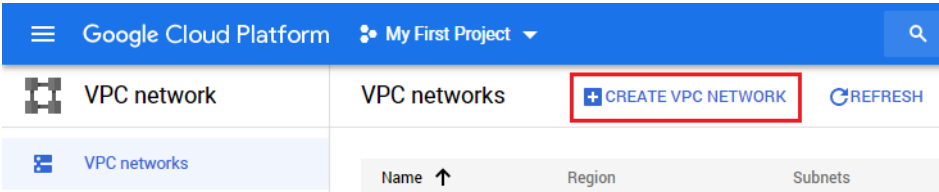21. You can see that the VPN has established successfully.

Dynamic routing

To configure dynamic routing to a Google Cloud VPN, use the following steps:

1. Log in to your Google Cloud Account. Navigate to the Home Page. From the menu on the left, under **Networking**, select the **VPC Network** page.

2. On the VPC network page, click on **Create VPC Network**.

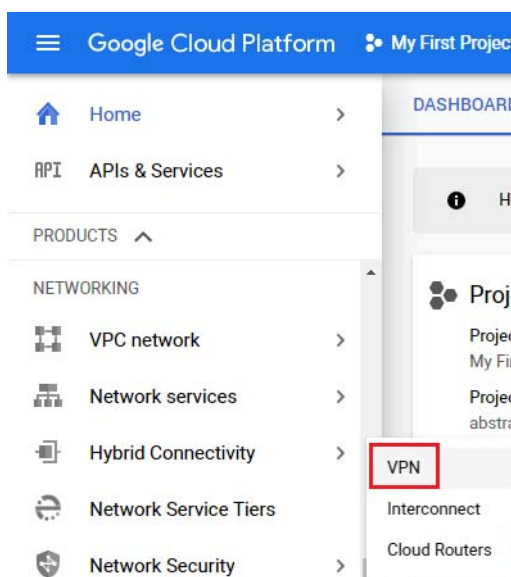

3. Fill in a **Name** and, optionally, a **Description**.

4. In the **New subnet** section, fill in a **Name**, **Region**, and **IP address range**.
   The **Region** is where the VPN will exit the Google cloud. Normally, this would be the closest point to the AR-Series router.
   In the **IP address range** add your local IP address range. This will be your local address selector for the Google Cloud VPN. For this example, we are using **192.168.2.0/24**.

5. Click on **Create** to create the VPC network.

6. Once the VPC network has been created, you will be returned to the Home Page. On the Home Page, from the menu on the left under **Networking**, select **Hybrid Connectivity**, then **VPN**.

7. On the VPN page, click on **Create VPN connection**.

8. Select **Classic VPN**, then click on **Continue**.

9. In the **VPN gateway** section, fill in a **Name**, **Region**, and, optionally, a **Description**.
    The **Region** is where you want to locate the VPN Gateway.

10. From the **IP address** drop-down, select **Create IP address**. Enter the **local-address-selector**
    that we created earlier. This will give our external IP address, and will be the router's ISAKMP and
    IPSec peer address.
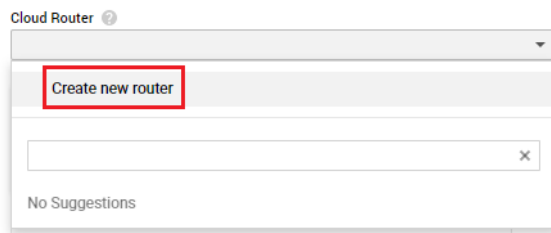
11. In the **Tunnels** section, fill in a **Name** and, optionally, a **Description**.

12. In **Remote peer IP address**, enter the public external IP address of your router.

13. In the **IKE version** drop-down, select **IKE-v2**.

14. Enter a key for the **IKE pre-shared key**. This will be the same key used on your device for the ISAKMP peer. Copy this and save it somewhere secure.

15. Under **Routing Options** select **Dynamic (BGP)**.

16. From the **Cloud Router** drop-down box, choose **Create new router**. This will take you to a new screen.

17. Fill in a **Name** and, optionally, a **Description**.

18. Enter a value for the **Google ASN**. You can use any number in the 64512 - 65534 or 4200000000 - 4294967294 range.

19. Under **Advertised routes**, select **Create custom routes**.

20. Click on the **+Add custom route** button.

21. From the **Source** drop-down box, select **local-address-selector** (192.168.2.0/24). The **IP address range** will be shown as 192.168.2.0/24.

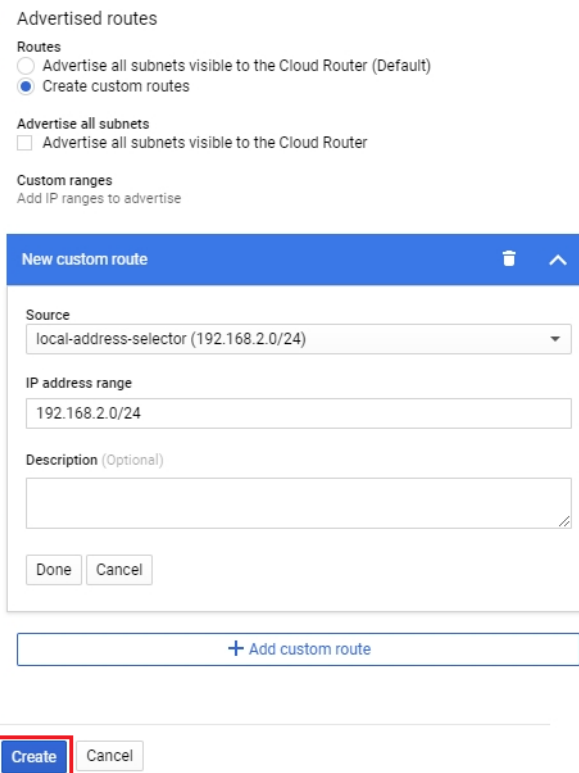22. Click on the **Create** button.

Advertised routes

Routes
○ Advertise all subnets visible to the Cloud Router (Default)
● Create custom routes

Advertise all subnets
☐ Advertise all subnets visible to the Cloud Router

Custom ranges
Add IP ranges to advertise

New custom route

Source
local-address-selector (192.168.2.0/24)   ▼

IP address range
192.168.2.0/24

Description (Optional)

[Done] [Cancel]

+ Add custom route

[Create] [Cancel]

23. You will be returned to the **Create a VPN Connection** page.

24. Next to the **BGP Session** dialog box, click on the button to the right to add a BGP session. You will then be taken to the Create BGP session page.

BGP session

None   ✎
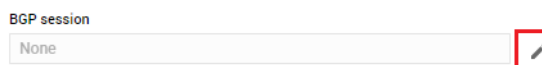
25. Enter the details for the **BGP session**.
    The **Peer ASN** is the BGP ASN number of the device. In this case we used 65000.
    The **Cloud Router BGP IP** and **BGP peer IP** addresses must be in the same /30 subnet. The **Cloud Router BGP IP** address we have used here is 169.254.0.1. This is the IP address used on the Google Cloud VPN tunnel and BGP peer.
    The **BGP peer IP** address is 169.254.0.2. This is the IP address of the tunnel on the device router and will be the device's BGP peer address.

26. Click on **Save and Continue**. This will return you to the **Create a VPN Connection** page.

27. Click on the Create button. Once the VPN is created, you are taken to the VPN page. You can see the VPN that you have created under **Cloud VPN Gateways**.

28. If you click on the **Cloud VPN Tunnels** tab, you can see the tunnel that you have created. This shows additional information including the **VPN tunnel status** and the **BGP session status**. Here you can see that the VPN and BGP peer have established successfully.

Dynamic routing with high availability

To configure dynamic routing with high availability to a Google Cloud VPN, use the following steps:

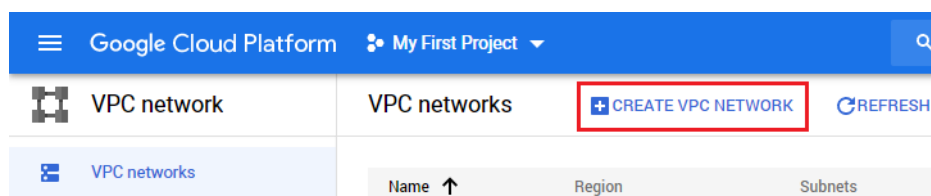1. Log in to your Google Cloud Account. Navigate to the Home Page. From the menu on the left, under **Networking**, select the **VPC Network** page.

2. On the VPC network page, click on **Create VPC Network**.

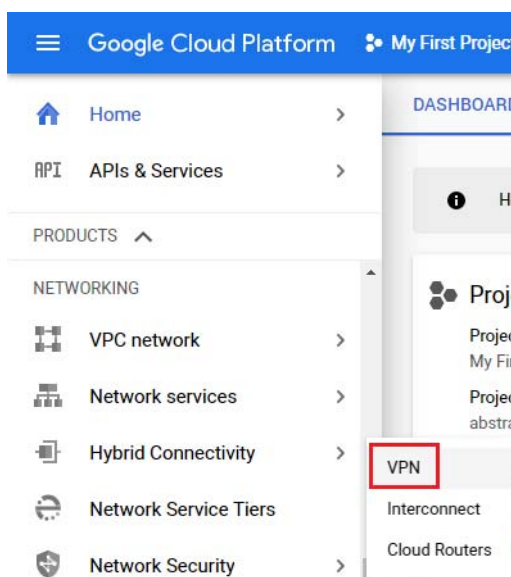3. Fill in a **Name** and, optionally, a **Description**.

4. In the **New subnet** section, fill in a **Name**, **Region**, and **IP address range**.
   The **Region** is where the VPN will exit the Google cloud. Normally, this would be the closest point to the AR-Series router.
   In the **IP address range** add your local IP address range. This will be your local address selector for the Google Cloud VPN. For this example, we are using **192.168.2.0/24**.

5. Click on **Create** to create the VPC network.

6. Once the VPC network has been created, you will be returned to the Home Page. On the Home Page, from the menu on the left under **Networking**, select **Hybrid Connectivity**, then **VPN**.

7. On the VPN page, click on **Create VPN connection**.

8. Select **High Availability (HA) VPN** then click on **Continue**.

9. In the **Create Cloud HA VPN gateway** section, fill in a **Name** and **Region**, and select the **VPC network**.
   The **Region** is where you want to locate the VPN Gateway.
   For the **VPC network**, select the network you created earlier.
   Click **Create and continue**.

10. You can see that 2 external interface addresses have been created, in this case **35.242.41.67** and **35.220.41.224**.

11. From the **Peer VPN gateway name** drop-down, select **Create new peer VPN gateway**. This will open the **Add a peer VPN gateway** dialog.

12. Fill in a **Name**.

Select how many **Peer VPN gateway interfaces** you will be using. In this example, we are using two.

Click on **Create**.

13. You will be returned to the **Create cloud HA VPN gateway** page.

14. Under **Routing options**, in the **Cloud router** box, select **Create new router** from the drop-down menu.

15. Enter a value for the **Google ASN**. You can use any number in the 64512 - 65534 or 4200000000 - 4294967294 range.

Create a router

Google Cloud Router dynamically exchanges routes between your Virtual Private Cloud (VPC) and on-premises networks by using Border Gateway Protocol (BGP)

Name ⓘ
Name is permanent

atl-cloud-router-ha

Description (Optional)

Network ⓘ

atl-vpc-network-ha

Region ⓘ
Region is permanent

australia-southeast1 (Sydney)

Google ASN ⓘ

64512

Advertised routes

Routes
○ Advertise all subnets visible to the Cloud Router (Default)
◉ Create custom routes

Advertise all subnets
☐ Advertise all subnets visible to the Cloud Router

Custom ranges
Add IP ranges to advertise

Create   Cancel

16. Under **Advertised routes**, select **Create custom routes**, and click on the **+Add custom route** button.

17. In the **New custom route** section, select the local address that you created earlier. This will automatically fill in the IP address range.

18. Click on **Create**.

19. You will be returned to the **Create cloud HA VPN gateway** page.

20. Click on the first of the two **VPN tunnel (not yet configured)** boxes.

21. Fill in the **Name** and the **Pre-shared key**.

22. Then click on the second **VPN tunnel (not yet configured)** box, and fill in the **Name** and **Pre-shared key**.

23. Once both tunnels have been configured, click on **Create and continue**. The 2 tunnels will now be created.

24. On the **Configure BGP sessions** page, there is a **Configure** button for each tunnel.

25. Click on the first **Configure** button. This will open the **Create BGP session** dialog.

26. On the **Create BGP session** page, enter the remote BGP **Peer ASN** number.

27. Enter an IP address for the **Cloud router BGP IP** field. This will be the IP address for this cloud tunnel and BGP peer.

28. Enter an IP address for the **BGP peer IP**. This will be the IP address of this tunnel on the device, and the BGP IP address.

29. Click on **Save and continue**.

Create BGP session

Name ⑦
Name is permanent

atl-bg-ha-1

Peer ASN ⑦

65000

Advertised route priority (MED) (Optional) ⑦
MED value is used for Active/Passive configuration

Cloud Router BGP IP ⑦ | BGP peer IP ⑦
169.254.0.1 | 169.254.0.2

⌄ Advertised routes

Save and continue | Cancel

30. You will be returned to the **Create cloud HA VPN gateway** page.

31. Repeat the process for the second BGP session.

32. Once both BGP sessions have been configured, click on **Save BGP configuration**.

Click Configure BGP Session to set up the BGP session on the Cloud Router atl-cloud-router-ha for each tunnel.

BGP session	Cloud VPN tunnel	Cloud VPN gateway	Cloud VPN gateway interface
atl-bg-ha-1	atl-tunnel-ha-1	atl-vpc-gateway-ha	0 35.242.41.67
atl-bgp-ha-2	atl-tunnel-ha-2	atl-vpc-gateway-ha	1 35.220.41.224

Save BGP configuration | Configure BGP sessions later

33. You will then see the **Summary** page.

34. Click on the **OK** button at the bottom of the page.

35. You will then be taken to the **Cloud VPN tunnels** page. You can see that the two tunnels have been created. You can see that both VPN tunnels are **Established** and both BGP sessions are **Established**.

Tunnel name	Cloud VPN gateway (IP) ∧	Peer VPN gateway (IP)	Cloud Router BGP IP	BGP Peer IP	Routing type	VPN tunnel status	Bgp session s
atl-tunnel-ha-1	atl-vpc-gateway-ha 35.242.41.67	atl-peer-gateway-ha 202.36.163.66	169.254.0.1	169.254.0.2	Dynamic (BGP)	✅ Established	✅ BGP esta
atl-tunnel-ha-2	atl-vpc-gateway-ha 35.220.41.224	atl-peer-gateway-ha 202.36.163.144	169.254.0.5	169.254.0.6	Dynamic (BGP)	✅ Established	✅ BGP esta