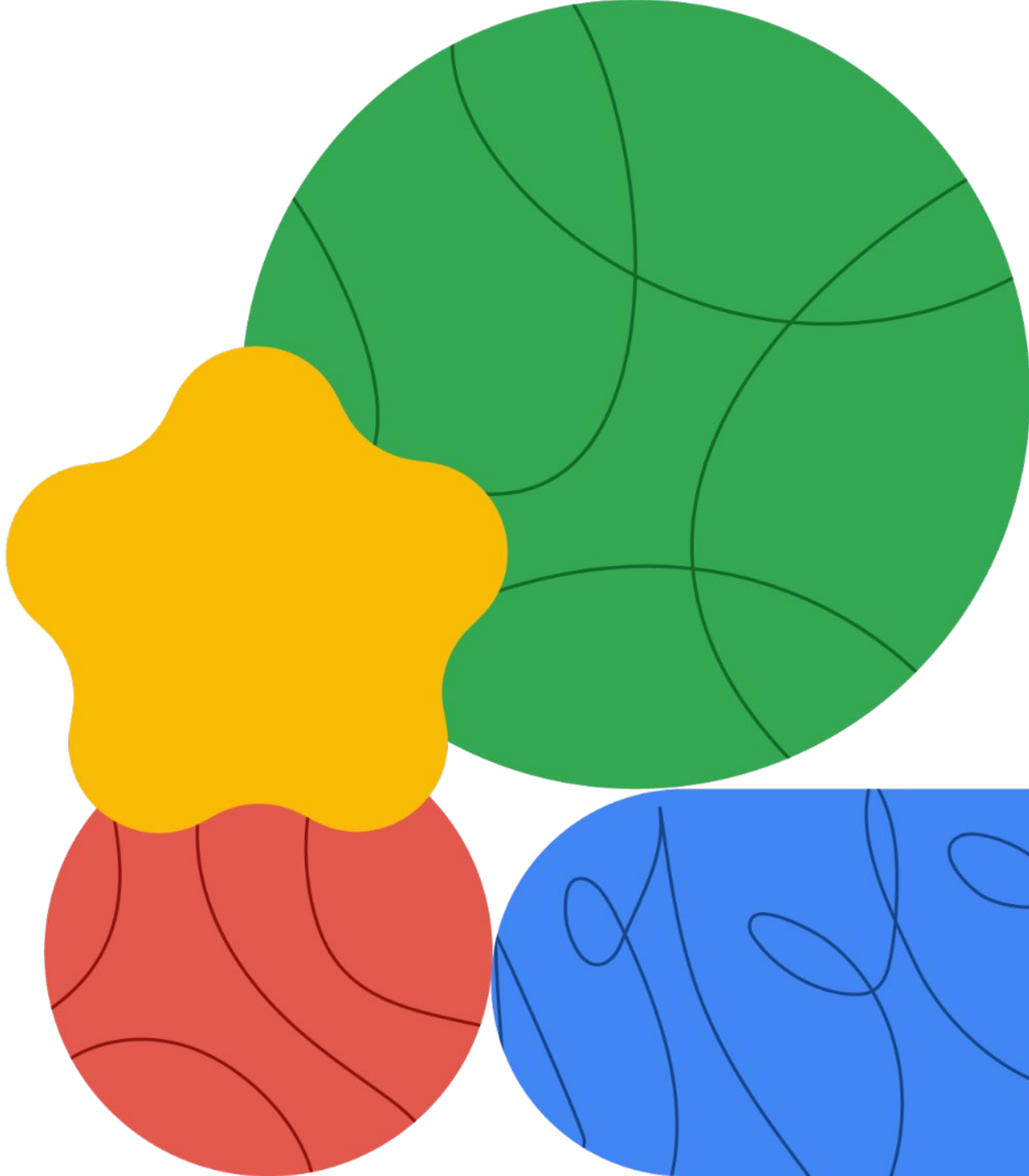
Google Cloud

Networking in Google Cloud

Cloud VPN



Today's agenda

01 Cloud VPN Overview

02 HA VPN Topologies

03 Influence best path selection

04 Lab: Configuring Google Cloud HA VPN

05 Quiz

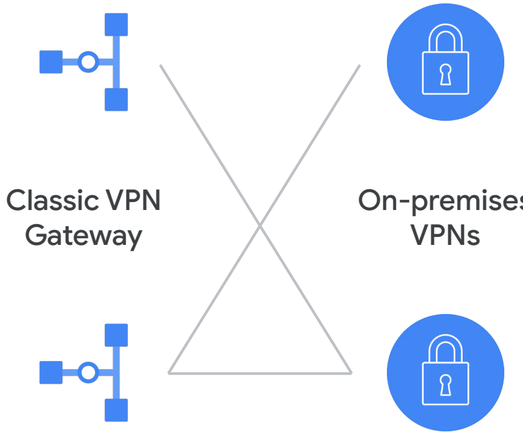
Cloud VPN securely extends your peer network to your VPC

- Cloud VPN securely connects your peer network to a Virtual Private Cloud (VPC) network through IPsec tunnels.
- Use Cloud VPN when you:
  - Don’t need the connection speed of Cloud Interconnect.
  - Must encrypt data in transit.
  - Prefer the economics of an IPsec tunnel over the internet.
  - When your network infrastructure cannot support dedicated fiber connections to Google Cloud.
  - Want to selectively advertise routes between VPC networks.

HA VPN and Classic VPN

site to site

There are two types of Cloud VPN – **HA (high availability) VPN** and **Classic VPN**.



99.99%

HA VPN

BGP

The preferred solution for dynamic routing and enhanced reliability.

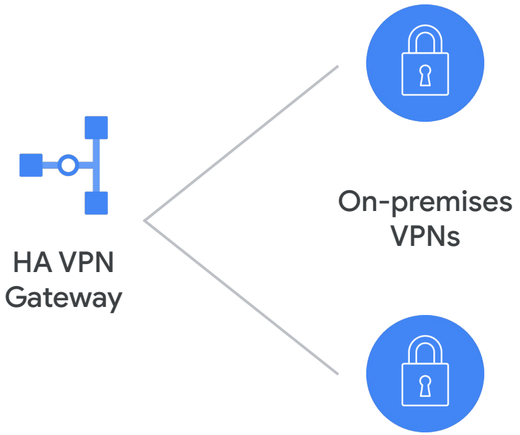
multiple tunnels

99.9%

Classic VPN

single tunnel

An available option for specific use cases requiring static routing.



Use case: High availability connection between on-prem and Google Cloud

Requirements

01 Eliminate connectivity issues

02 Enhance network reliability

03 Improve network performance

HA VPN is the pragmatic choice.

Use case: High availability connection between on-prem and Google Cloud

HA VPN provides

01 High availability

02 A secure and simplified connection

03 Automatic failover capabilities

HA VPN is the pragmatic choice.

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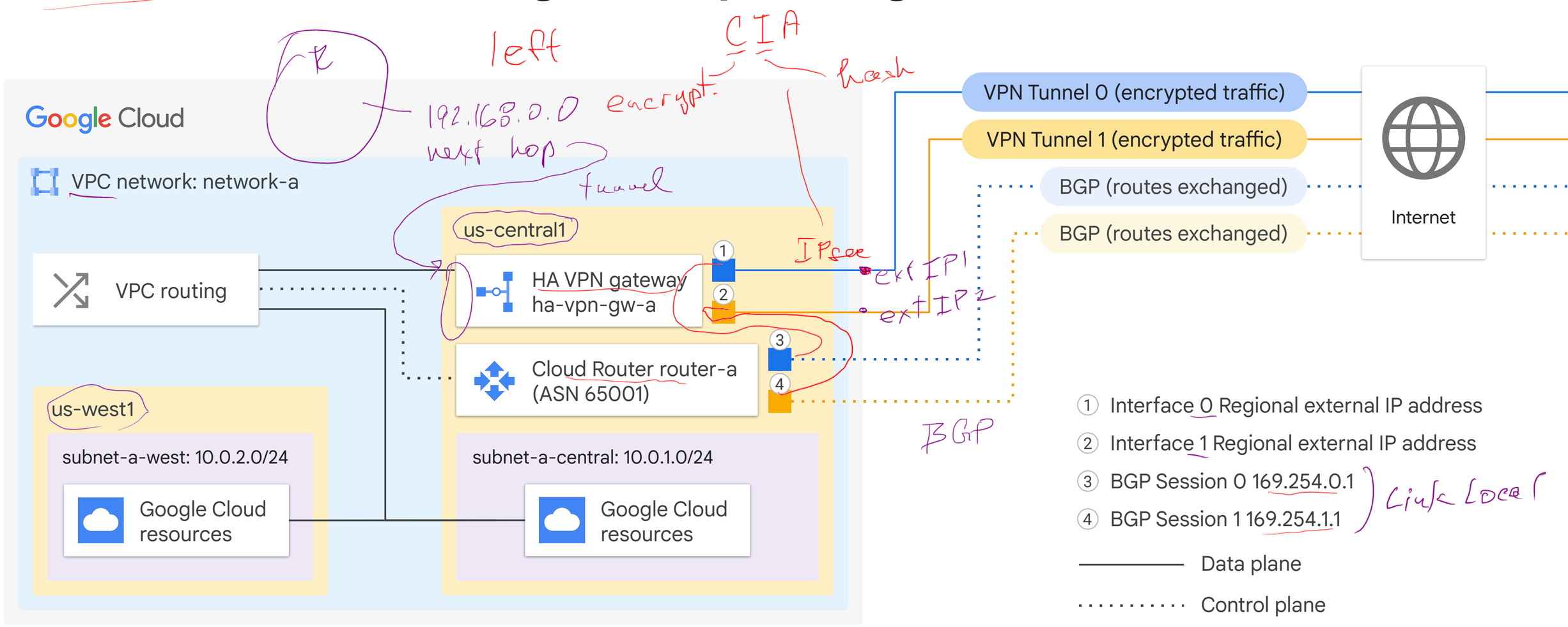
HA VPN topologies

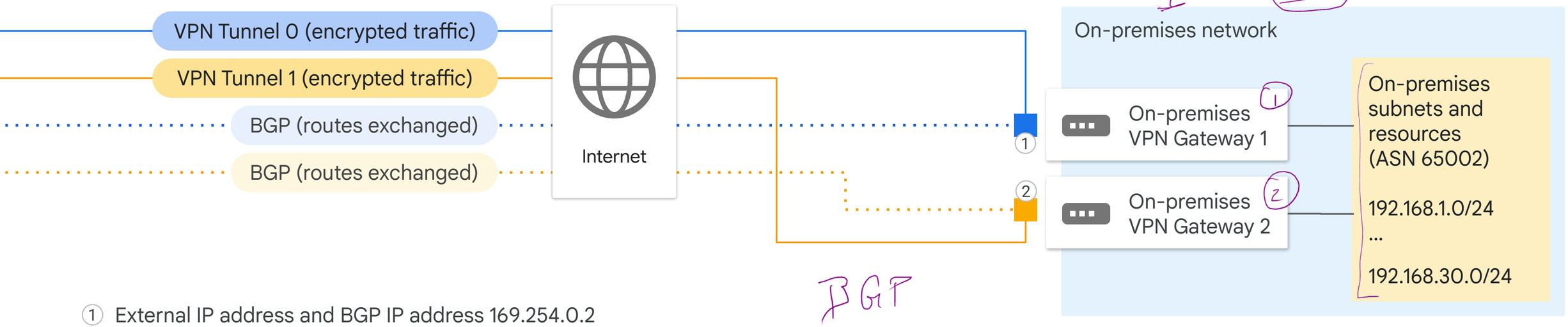
HA VPN supports site-to-site VPN for different configuration topologies:

- An HA VPN gateway to peer VPN devices.
- An HA VPN gateway to an Amazon Web Services (AWS) virtual private gateway.
- Two HA VPN gateways connected to each other.
- HA VPN to Compute Engine VM instances.

HA VPN to VPN Peer gateway: Google Cloud to internet



HA VPN to VPN Peer gateway: Internet to the on-premises network



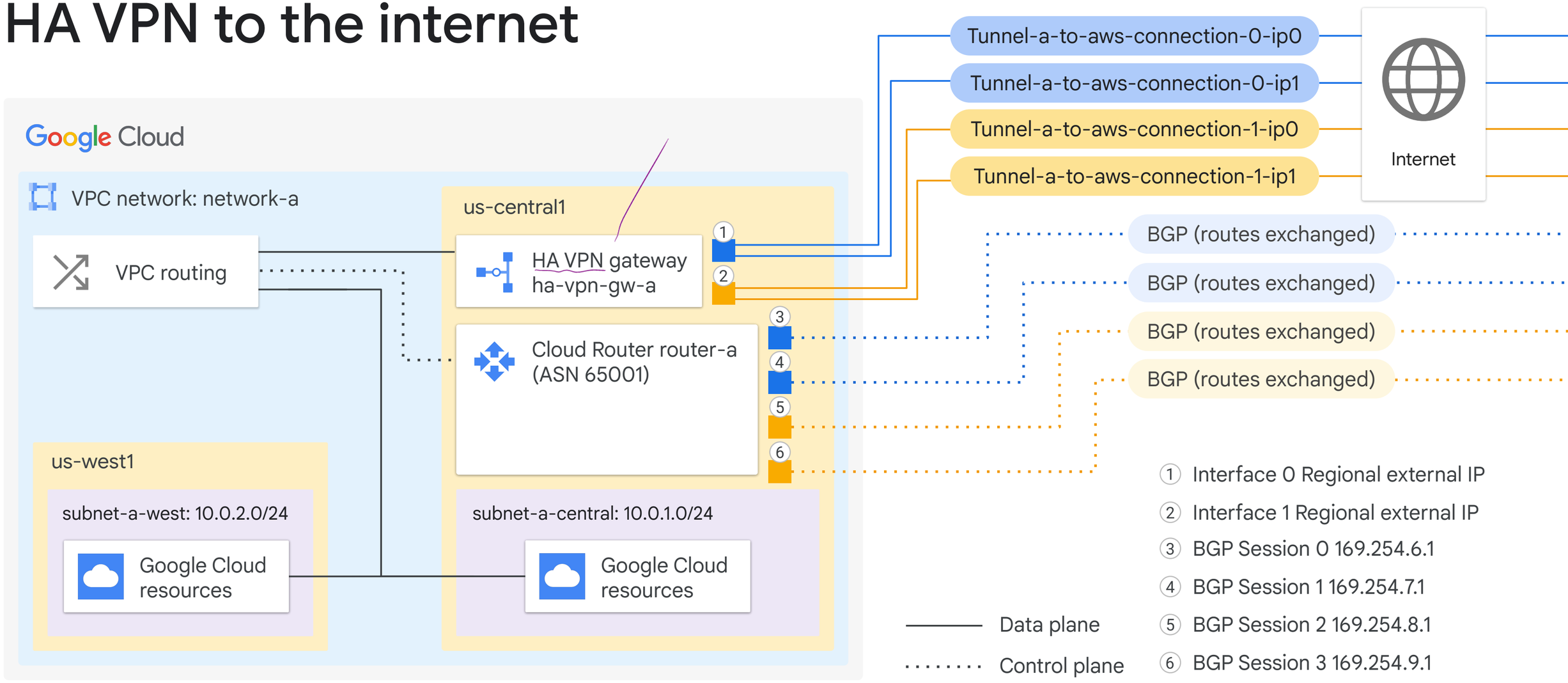
① External IP address and BGP IP address 169.254.0.2

② External IP address and BGP IP address 169.254.1.2

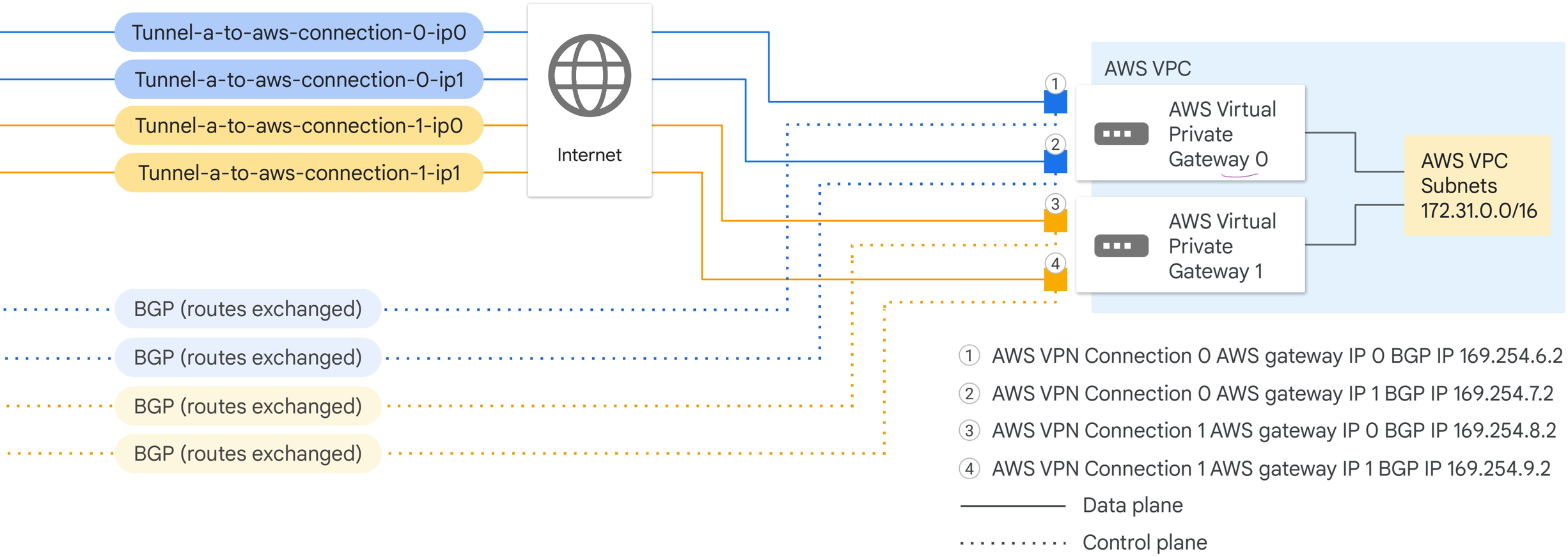
——— Data plane

· · · · · · · · · · · Control plane

HA VPN to the internet

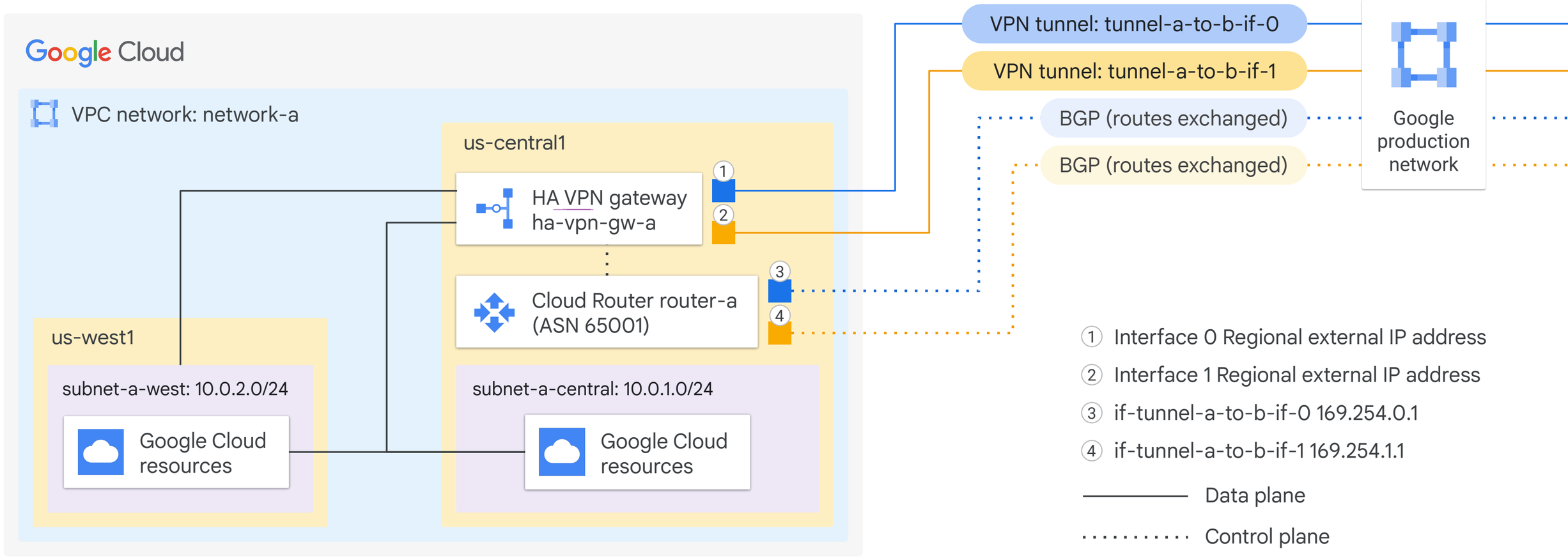


HA VPN to AWS peer gateway topology: Internet to AWS

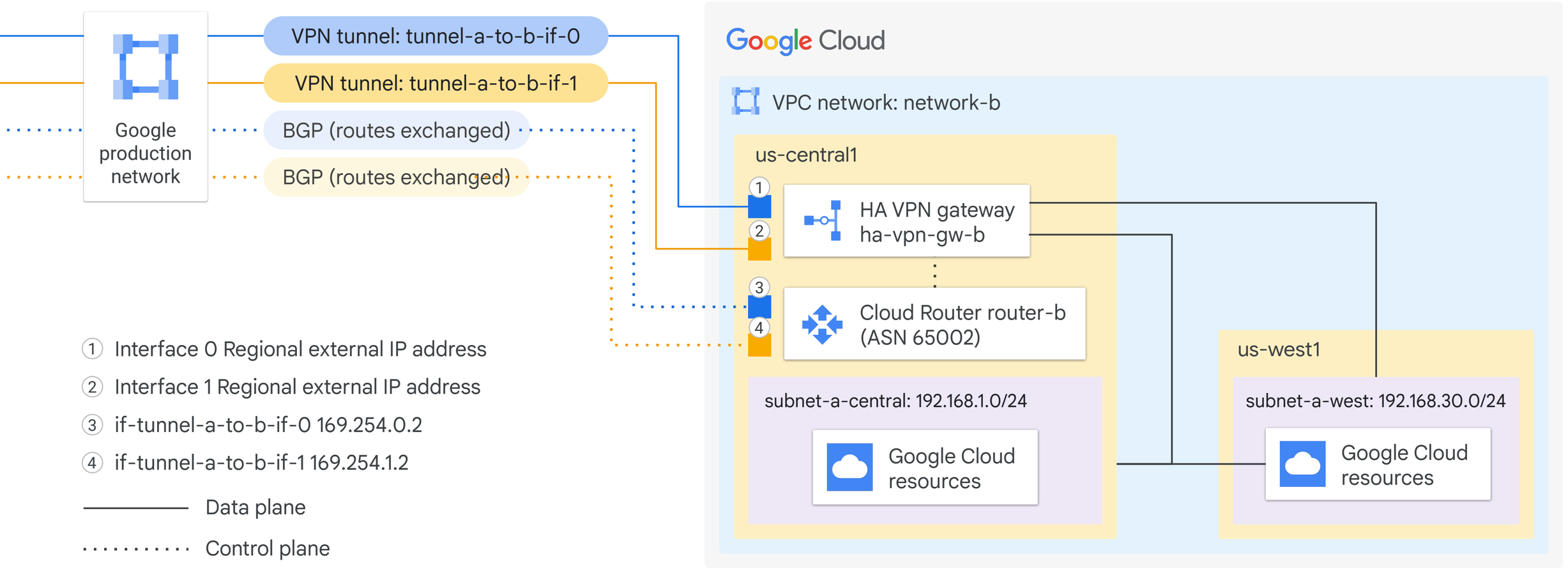


LAB

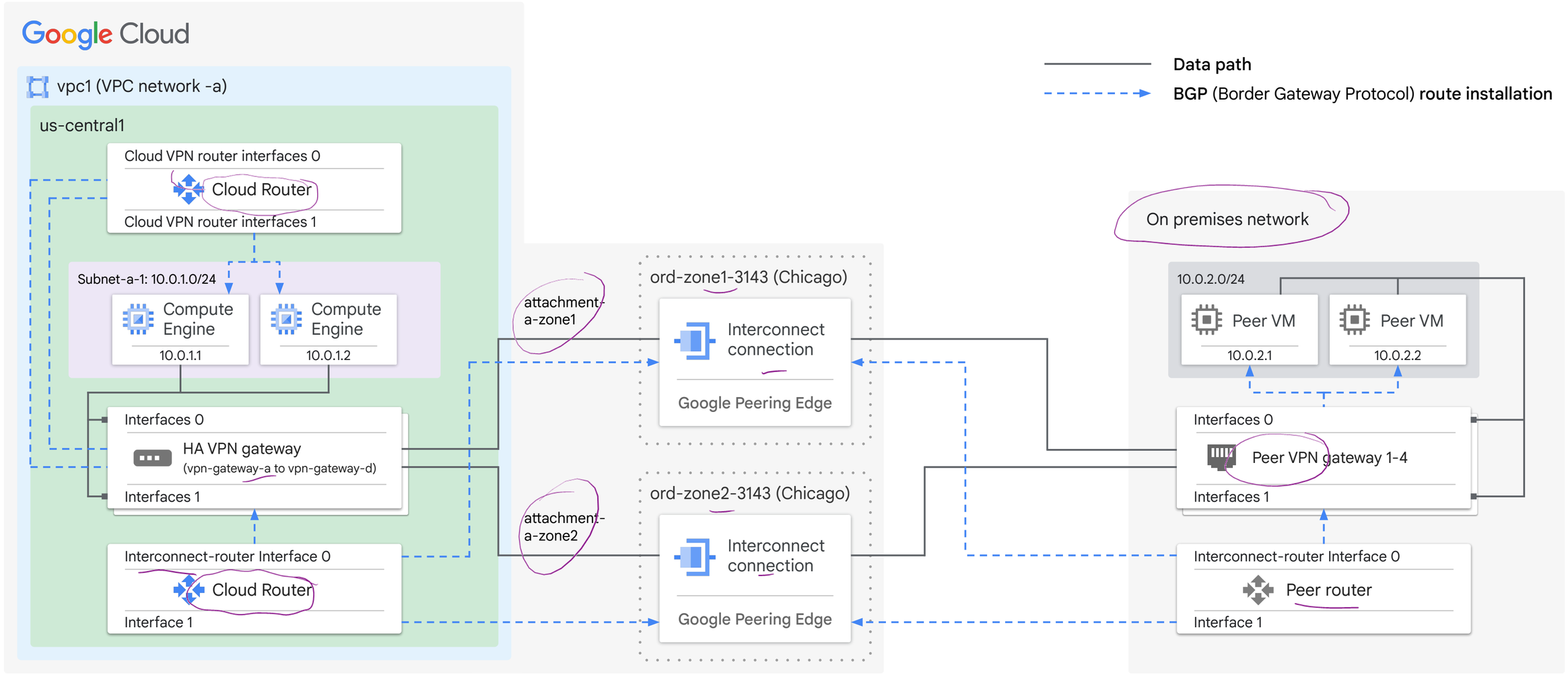
HA VPN to peer VPN gateway topology: Left side



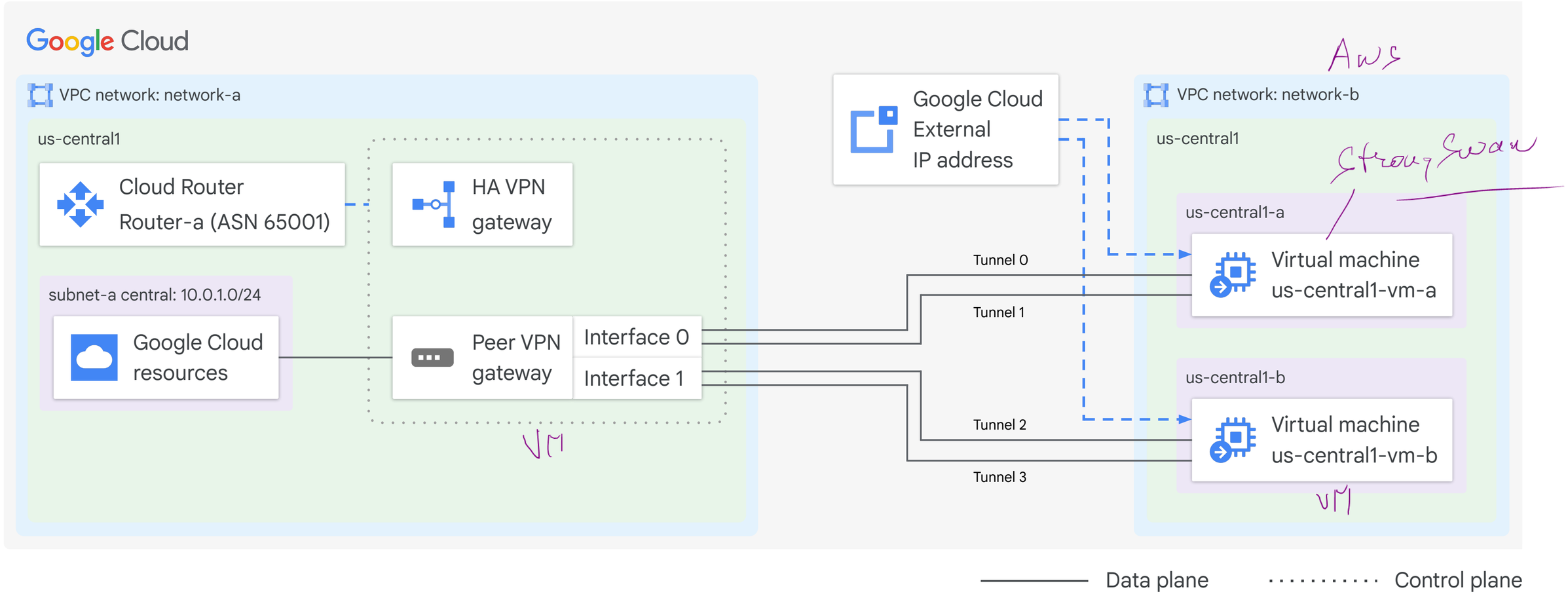
HA VPN to peer VPN gateway topology: Right side



HA VPN over Cloud Interconnect deployment architecture

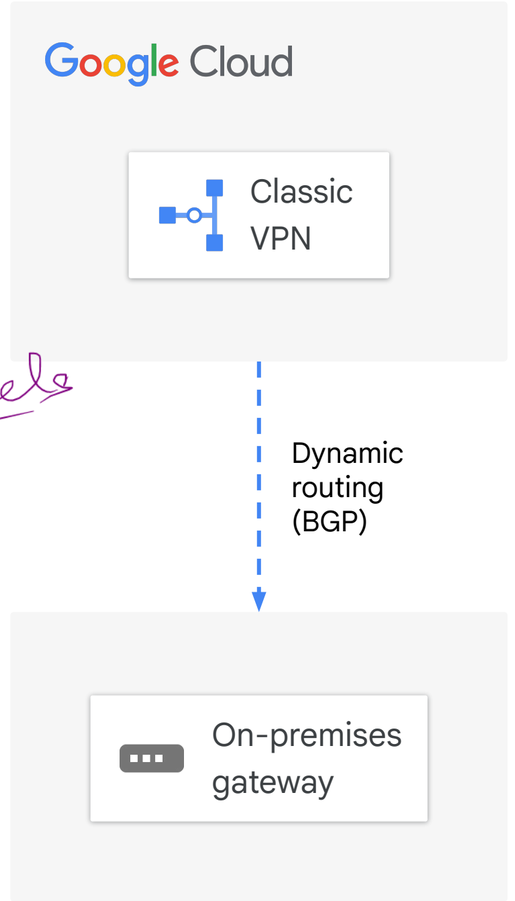


HA VPN to Compute Engine VM instances in multiple zones



HA VPN recommendations

- HA VPN
  - Provides 99.99% service availability (instead of 99.9% for Classic VPN).
  - Supports multiple VPN tunnels.
- Google Cloud automatically chooses two external IP addresses.
- VPN tunnels connected to HA VPN gateways must use dynamic (BGP) routing.
- We recommend an active/active configuration for an increased throughput.



Let’s ask Gemini

How can I connect a VPC network in Google Cloud to an on-premises private network?

There are two ways to connect a VPC in Google Cloud to an on-premises private network:

1. Cloud VPN uses encrypted tunnels to connect your VPC network to your on-premises network.
2. Cloud Interconnect uses a physical connection to connect your VPC network to your on-premises network.

*Gemini responses may vary

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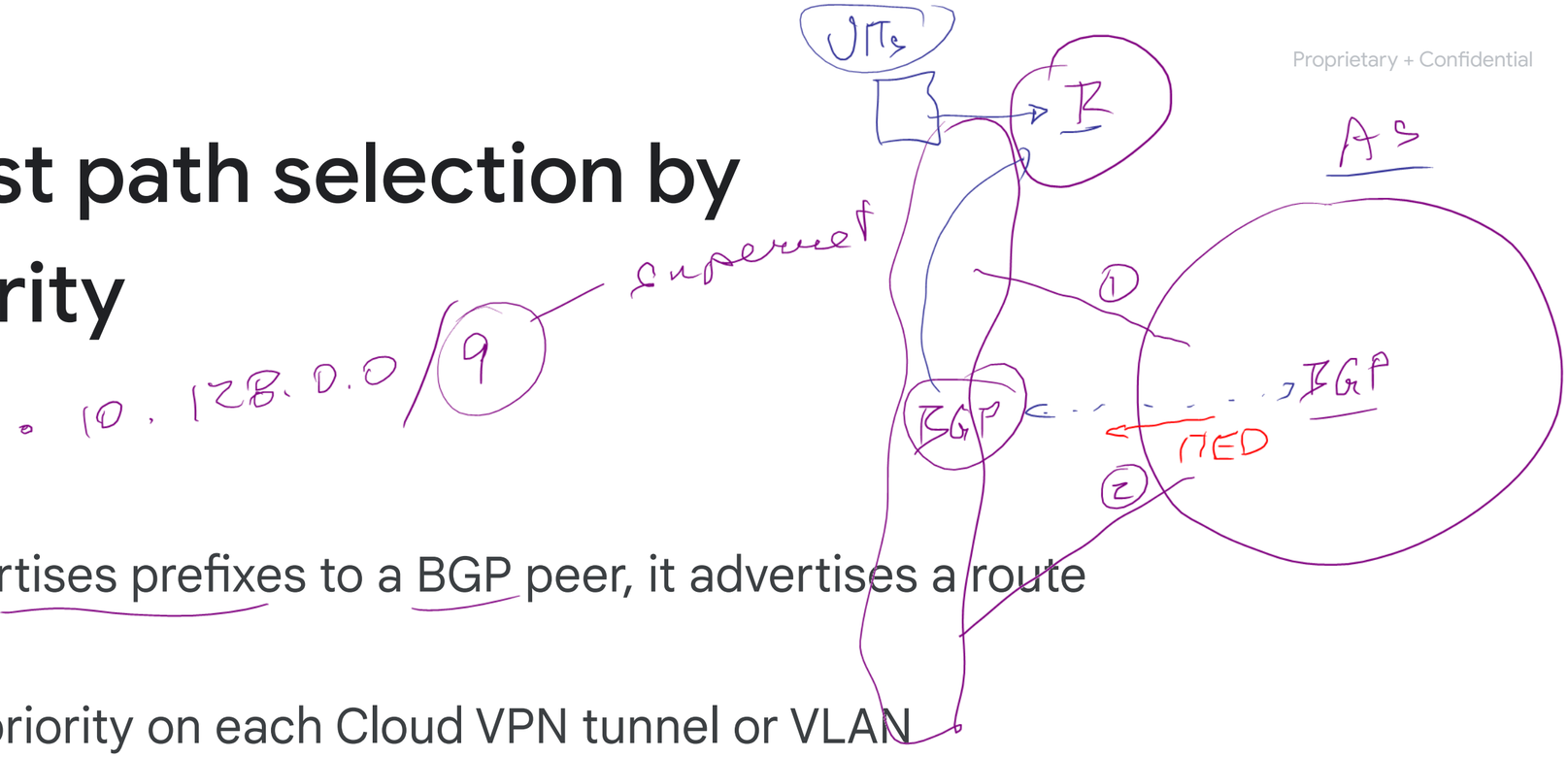
Influencing the best path selection by setting a base priority



- When a Cloud Router advertises prefixes to a BGP peer, it advertises a route priority for each prefix.
- You can change the base priority on each Cloud VPN tunnel or VLAN attachment.
- If your VPC network uses global dynamic routing mode, the base priority is added to the region-to-region cost to calculate the value of the BGP multi-exit discriminator(MED) attribute.

MED = base priority + region-to-region cost

Setting a base priority

01 Base priorities are whole numbers from 0 to 65535.

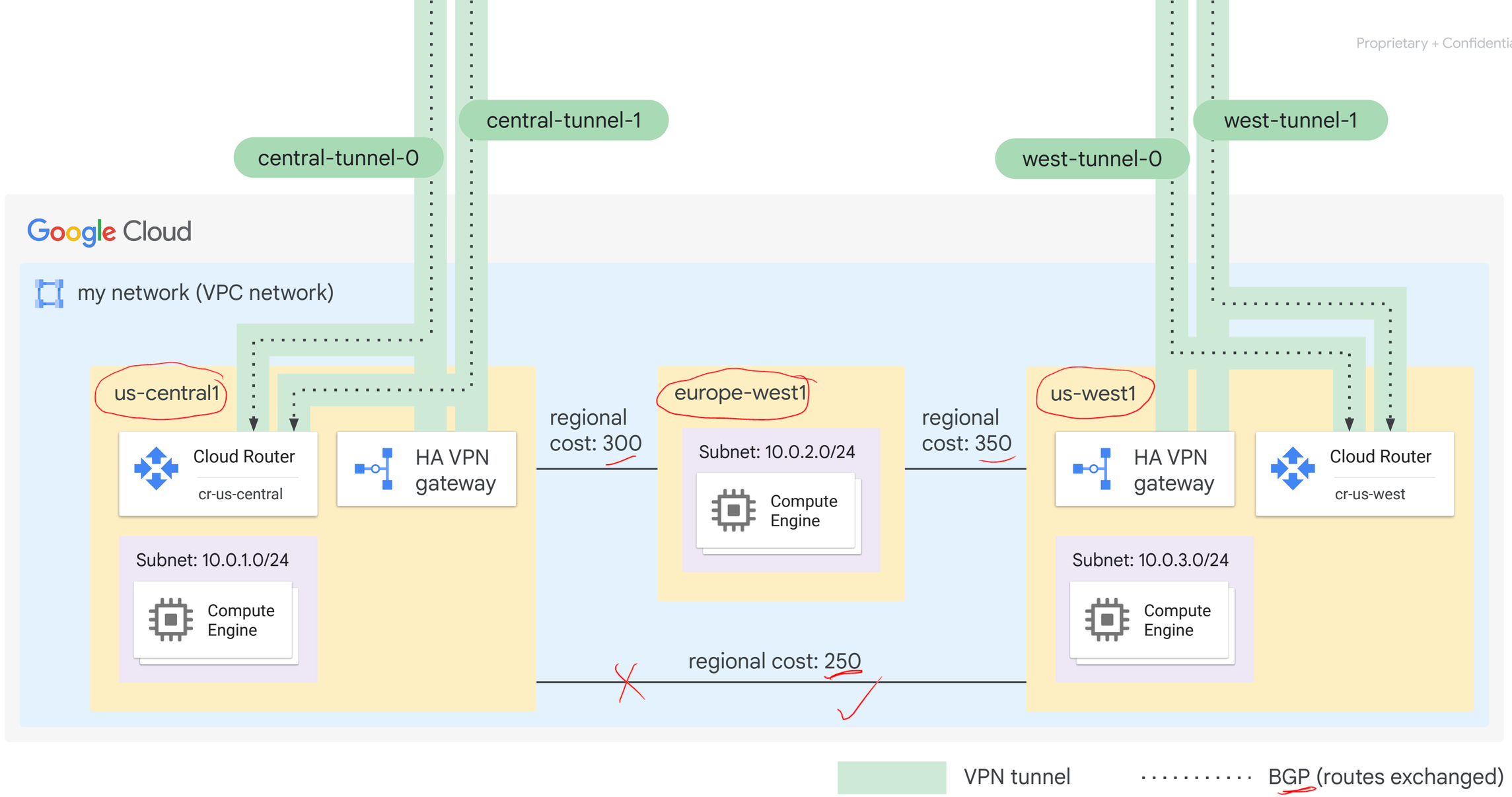
02 The highest possible base priority is 0.

03 The default base priority is 100.

04 If you don't specify a base priority, the default priority is used.

Region-to-region costs

- This cost only applies when the VPC is in global dynamic routing mode.
- Region-to-region costs are from 201 through 9999, inclusive.
- The value depends on the distance, latency, and other factors between two regions.
- Google generates the region-to-region cost values, and you can't modify them.



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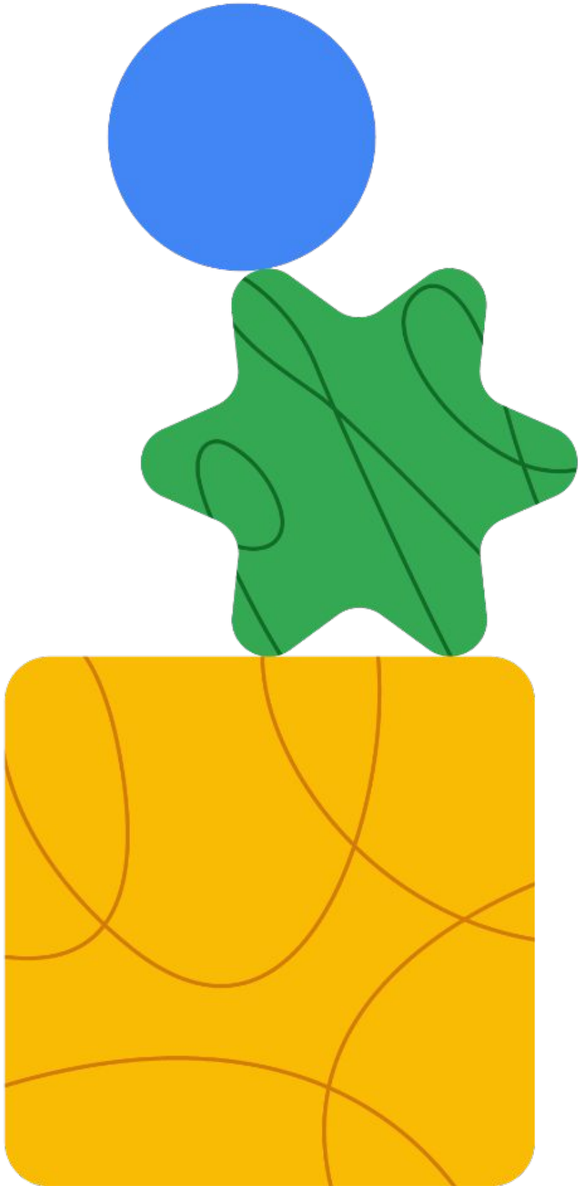
Lab intro

Configuring Google Cloud HA VPN



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05 Quiz

Quiz | Question 1

Question

What is the purpose of a Cloud Router, and why is that important?

A. To create and manage virtual private networks (VPNs) between on-premises networks and Google Cloud.

B. To load balance traffic across multiple Google Cloud regions and zones.

C. To dynamically exchange routing information using BGP between Google Cloud VPCs and other networks.

D. To filter and restrict traffic based on predefined security rules.

Quiz | Question 1

Answer

What is the purpose of a Cloud Router, and why is that important?

A. To create and manage virtual private networks (VPNs) between on-premises networks and Google Cloud.

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Quiz | Question 3

Question

In Network Connectivity Center, what are the two main types of spokes that can be connected to a hub?

A. VPC spokes and Global spokes

B. VPC spokes and Hybrid spokes

C. Global spokes and Hybrid spokes

D. Regional spokes and Global spokes

Quiz | Question 3

Answer

In Network Connectivity Center, what are the two main types of spokes that can be connected to a hub?

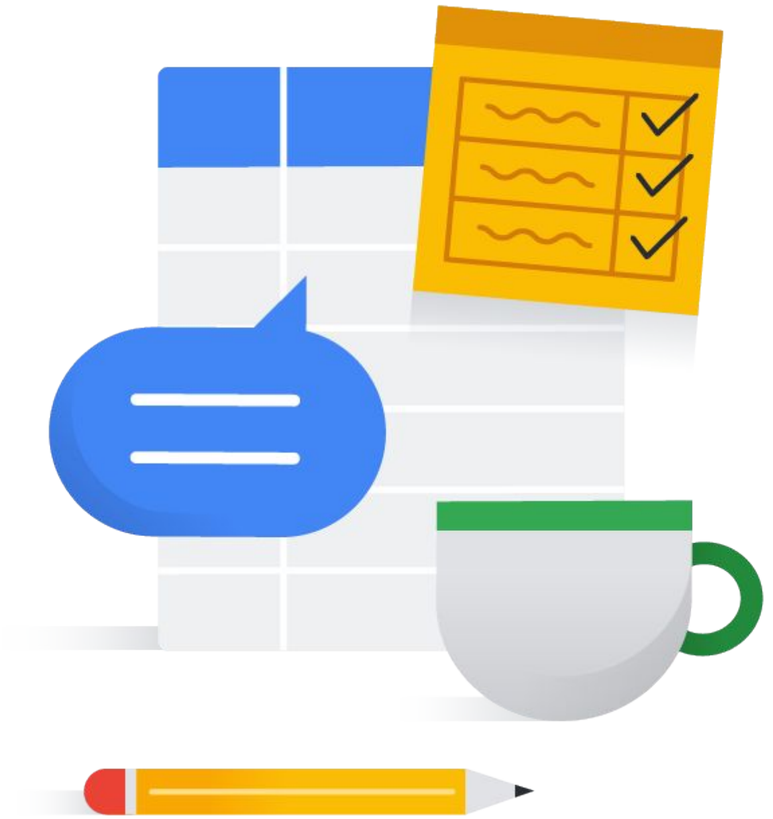
A. VPC spokes and Global spokes

B. VPC spokes and Hybrid spokes 

C. Global spokes and Hybrid spokes

D. Regional spokes and Global spokes

Debrief



Thank you.


Google Cloud