**STEP-BY-STEP GUIDE**

**STEP 1: Set Up 2 VPC Networks**

You’ll simulate on-prem using a second VPC (not actual on-prem hardware).

1. Go to **VPC Network > VPC networks**
2. Click **Create VPC network**

**VPC 1: gcp-vpc**

* Subnet: 10.0.0.0/24 in us-central1

**VPC 2: onprem-vpc**

* Subnet: 192.168.0.0/24 in us-east1

Repeat for both VPCs. Enable firewall rules for **SSH**, **ICMP**, **HTTP**.

**STEP 2: Create VMs in Both VPCs**

1. Go to **Compute Engine > VM Instances**
2. Click **Create Instance**

* For gcp-vpc: gcp-instance-1 in us-central1
* For onprem-vpc: onprem-instance-1 in us-east1

**Install Apache for testing**

bash

sudo apt update

sudo apt install apache2 -y

**STEP 3: Set Up Cloud VPN + Cloud Router**

**On gcp-vpc Side:**

1. Go to **Hybrid Connectivity > VPN**
2. Click **Create VPN**
3. Select **High Availability (HA) VPN**
4. Gateway Name: gcp-vpn-gateway
5. Select **gcp-vpc** and region us-central1

**On onprem-vpc Side:**

1. Create another HA VPN gateway: onprem-vpn-gateway
2. Use **onprem-vpc** and region us-east1Both gateways should be **peer-connected** using **IKEv2 and shared secret**

**Add Cloud Routers:**

* Create a **Cloud Router** for each gateway (enable BGP)
* Use ASN (e.g., 65001 and 65002)

**STEP 4: Verify BGP Routing**

* After tunnel setup, go to **Cloud Router > Routes**
* Confirm that **dynamic routes** are exchanged between the two networks

**STEP 5: Test VPN**

* SSH into gcp-instance-1 and ping onprem-instance-1

bash

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ping 192.168.0.2 # Replace with on-prem VM internal IP

* You should get a successful response

**STEP 6: Set Up HTTP(S) Load Balancer**

1. Go to **Network Services > Load balancing**
2. Create **HTTP(S) Load Balancer**
3. Backend: Instance group from gcp-vpc
4. Frontend: Public IP
5. Health check: HTTP port 80
6. Test the LB IP — it should reach your VM's Apache server

**STEP 7: Enable Monitoring and Logging**

1. Go to **Monitoring > Dashboards**
2. Create custom dashboards for:
   * VPN Tunnel Health
   * VM CPU usage
   * Load balancer traffic
3. Go to **Logging** and filter logs by:
   * VPN activity
   * Load balancer access logs