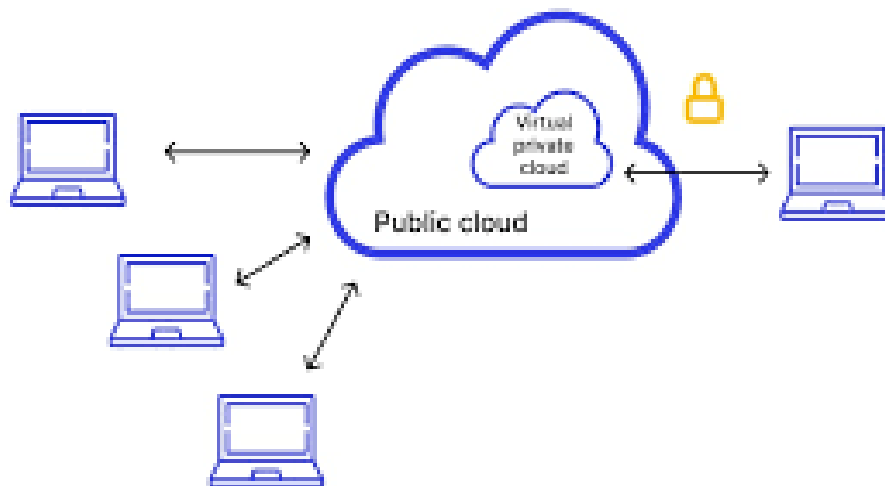


Virtual Private Cloud (VPC's)



- A virtual private cloud (VPC) is a secure, isolated [private cloud](#) hosted within a [public cloud](#). VPC customers can run code, store data, host websites, and do anything else they could do in an ordinary private cloud, but the private cloud is hosted remotely by a public cloud provider. (Not all private clouds are hosted in this fashion.) VPCs combine the scalability and convenience of public cloud computing with the data isolation of private cloud computing.
- A Virtual Private Cloud (VPC) is a secure, isolated network environment within a public cloud that allows you to deploy and manage resources, such as virtual machines, databases, and applications, in a controlled and flexible manner. Essentially, a VPC is your own private slice of the cloud, where you can configure networking settings, such as IP address ranges, subnets, route tables, and security policies, just like you would in a traditional on-premises data center.
- The VPC provides several key features to enhance control and security. **Internet Gateways** facilitate connectivity between public subnets and the internet, allowing resources to communicate with external networks. Conversely, **NAT Gateways** or instances enable resources in private subnets to access the internet for updates or

external services without exposing them to direct inbound traffic.

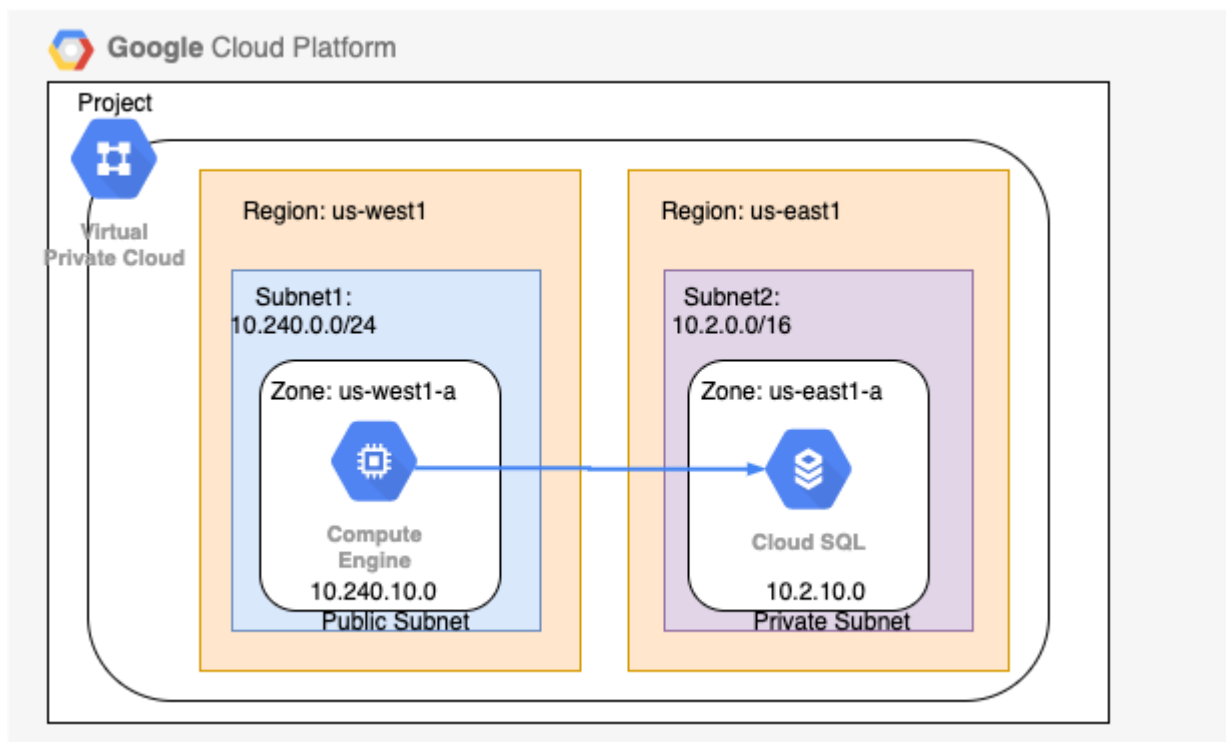
Route Tables play a critical role in directing traffic within the VPC and to/from external networks, ensuring that data flows efficiently and securely according to your configuration.

➤ **Key Features of a VPC:**

- **Isolation:** Each VPC is logically isolated from other VPCs and the public internet, ensuring that your resources are protected and accessible only to authorized entities.
- **Customization:**
You can define your own network topology, including subnets, routing, and security configurations, to meet specific needs.
- **Scalability:**
VPCs are designed to scale with your workload, allowing you to add or remove resources as your requirements change.
- **Security:**
VPCs offer robust security features, such as network access control lists (ACLs), security groups, and VPN connectivity, to protect your data and applications.
- **Private Link:**
Provides secure and private connectivity to services hosted within a VPC, allowing you to access services across VPCs and regions without exposing them to the public internet.
- **Cost Management:**
VPCs offer various cost management options, including monitoring and managing network traffic, optimizing resource usage, and leveraging cloud provider pricing models.

➤ **Use Cases:**

- **Hosting Applications:** Deploy web servers, databases, and other applications in a secure, isolated environment.
- **Hybrid Cloud Architectures:** Extend your on-premises network into the cloud using VPNs or dedicated connections, creating a seamless hybrid cloud environment.
- **Compliance:** Meet regulatory and compliance requirements by isolating sensitive data and workloads within a VPC.



Google Private Cloud (GPC)




Google Cloud Platform (GCP), which is a cloud computing service offered by Google. GCP provides a wide range of cloud services and solutions, including computing power, storage, databases, machine learning, and networking.

Google Cloud Platform (GCP) is a suite of cloud computing services developed by Google that runs on the same infrastructure that Google uses internally for its end-user products, such as Google Search and YouTube. GCP offers a comprehensive set of cloud services, including computing, storage, databases, machine learning, and big data, designed to help organizations and developers build, deploy, and scale applications and services.

- **Features Of GCP**

- **Compute Engine:** Provides scalable and flexible virtual machines (VMs) for running applications. Users can configure VMs with custom machine types and manage their lifecycle through an easy-to-use interface.
- **App Engine:** A Platform-as-a-Service (PaaS) that allows developers to build and deploy applications without managing the underlying infrastructure. It supports various programming languages and frameworks.
- **Kubernetes Engine:** A managed Kubernetes service that automates the deployment, scaling, and management of containerized applications. It simplifies the orchestration of containers in a scalable and secure environment.

- **Cloud Storage:** Provides scalable and durable object storage for storing and retrieving any amount of data at any time. It supports various storage classes to optimize cost and performance.
- **Cloud SQL:** A managed relational database service that supports MySQL, PostgreSQL, and SQL Server. It offers automated backups, patch management, and high availability.
- **Cloud Functions:** A serverless compute service that lets you execute code in response to events without provisioning or managing servers. It supports a variety of event sources and languages.
- **AI and Machine Learning:** GCP provides a range of AI and machine learning services, including pre-trained models and tools for building custom models. Services include AutoML, TensorFlow, and Vision AI.
- **Networking:** Includes services like Virtual Private Cloud (VPC) for network management, Cloud Load Balancing for distributing traffic, and Cloud CDN for delivering content with low latency.

 Default	 Auto Mode	 Custom Mode
<ul style="list-style-type: none"> • Every project • One subnet per region • Default firewall rules 	<ul style="list-style-type: none"> • Default network • One subnet per region • Regional IP allocation • Fixed /20 subnetwork per region • Expandable up to /16 	<ul style="list-style-type: none"> • No default subnets created • Full control of IP ranges • Regional IP allocation • Expandable to any RFC 1918 size

➤ **Conclusion :** In this practical we learnt about Virtual private cloud that is how it is created , how it works , what are the practical implementations and studied VPC providers available In the market.