
GCP version 2 Assignment 2

1. How to manage a single network across several projects from a central location.

Answer:

One way to manage a single network across several projects from a central location is to use Shared VPC. Shared VPC enables you to share Virtual Private Cloud (VPC) networks across projects in your Google Cloud organization. You can create instances associated with a Shared VPC network that is hosted in a centralized Shared VPC host project. You can also delegate administrative permissions to service projects that are attached to the Shared VPC network.

Another way to manage a single network across several projects from a central location is to use Network Connectivity Center. Network Connectivity Center offers the ability to easily connect your on-premises, Google Cloud, and other cloud enterprise networks and manage them as spokes through a single, centralized logical hub on Google Cloud. You can also use Network Connectivity Center to monitor and troubleshoot your network connectivity.

2. Explain how migration waves can be used to migrate a large number of computers at once.

Answer:

Migration waves are a way to migrate a large number of computers at once by grouping them into batches that are moved in the same time period. Migration waves can help to reduce the complexity, risk, and downtime of the migration process by allowing you to plan, test, and execute the migration in stages.

To use migration waves, you need to:

Identify the computers that you want to migrate and their dependencies, such as servers, databases, applications, and network connections.

Analyze the migration readiness, complexity, and priority of each computer and its dependencies.

Group the computers into migration waves based on factors such as dependency, functionality, performance, security, and business impact.

Define the migration strategy, timeline, and resources for each migration wave.
Execute the migration wave using the appropriate tools and methods, such as Google Cloud's Migrate to Virtual Machines service.
Monitor and validate the migration wave results and resolve any issues.

3. How do I construct subnets and what are the firewall rules?

Answer:

To construct subnets, you need to:

Create a VPC network in custom mode.

Specify the name, region, and IP address range for each subnet¹. You can also enable IPv6 addresses for each subnet.

Optionally, configure the subnet options, such as private Google access, Cloud NAT, and flow logs.

To create firewall rules, you need to:

Specify the VPC network and the direction of traffic (ingress or egress) for the rule. Specify the priority, action (allow or deny), and target (source or destination) for the rule.

Specify the protocols and ports that the rule applies to.

Optionally, configure the firewall rule options, such as logging, service accounts, and network tags.

You can use firewall rules to isolate subnets by specifying the source and destination IP ranges of the subnets in the rule conditions.

4. Explain the concept of a container in the Google Cloud Platform.

Answer:

A container is a package of software that contains all of the necessary elements to run in any environment. Containers virtualize the operating system and isolate the application code from the underlying infrastructure. Containers are lightweight, portable, and consistent, which makes them ideal for developing, deploying, and scaling applications in the cloud.

Google Cloud Platform (GCP) offers several options for working with containers, such as:

Google Kubernetes Engine (GKE) —a managed service for running containerized applications on clusters of virtual machines using the Kubernetes orchestration system.

Google Anthos —a hybrid and cloud-agnostic container environment management platform that lets you replace virtual machines with container clusters to create a unified environment across public cloud and on-premises data centers.

Google Cloud Run —a serverless computing management platform that lets you run stateless containers on a fully managed environment or on your own GKE clusters.

5. What are the steps to create several VPC Networks?

Answer:

To create several VPC networks, you need to follow these steps for each network:

In the Google Cloud console, go to the VPC networks page¹.

Click Create VPC network.

Enter a name for the network.

Choose the subnet creation mode: auto or custom.

If you choose auto mode, the network will have one subnet per region with a predefined IP range.

If you choose custom mode, you can specify the name, region, and IP range for each subnet. You can also enable IPv6 addresses for each subnet.

Optionally, configure the network options, such as routing mode, DNS policy, and private service access.

Optionally, add predefined or custom firewall rules to the network¹.

Click Create to create the network.

You can verify the network and its subnets in the VPC networks page or by using the `gcloud` command-line tool. You can also test the network connectivity by creating instances in different subnets and pinging them.

6. Explain what is Kubernetes? How to orchestrate it on the cloud?

Answer:

Kubernetes is a container orchestration tool that facilitates the deployment, resiliency and scalability of applications, even in hybrid or multi-cloud infrastructures. Kubernetes can manage the lifecycle of containers, such as creating, updating, deleting, scaling, and load balancing them. Kubernetes also provides features such as service discovery, networking, storage, security, and monitoring.

To orchestrate Kubernetes on the cloud, you need to:

Provision a Kubernetes cluster on a cloud platform, such as Google Cloud Platform (GCP), Amazon Web Services (AWS), Microsoft Azure, Oracle Cloud Infrastructure (OCI), or VMware Cloud.

Deploy your containerized applications to the cluster using kubectl, a command-line tool that interacts with the Kubernetes API.

Use Kubernetes objects, such as pods, deployments, services, ingresses, configmaps, secrets, and persistent volumes, to define the desired state of your applications and their configuration.

Use Kubernetes controllers, such as replica sets, deployments, stateful sets, daemon sets, and jobs, to ensure that the actual state of your applications matches the desired state.

Use Kubernetes labels and selectors to group and filter your resources based on various criteria.

Use Kubernetes namespaces to isolate your resources within a cluster.

7. Use Spinnaker and the Kubernetes engine to implement Continuous Delivery.

Answer:

To use Spinnaker and the Kubernetes engine to implement Continuous Delivery, you need to:

Create a Kubernetes cluster on Google Cloud Platform (GCP) using Kubernetes Engine.

Install and configure Spinnaker on the cluster using Helm, a package manager for Kubernetes.

Create a source code repository on GCP using Cloud Source Repositories.

Push your application code to the repository.

Create a Docker image for your application using Cloud Build, a service that builds container images in the cloud.

Push the image to Container Registry, a private container registry on GCP.

Configure Spinnaker to access your source code repository, container registry, and Kubernetes cluster.

Create a Spinnaker application and pipeline that defines the stages of your Continuous Delivery process, such as trigger, bake, deploy, manual judgment, and canary analysis.

Run the pipeline and monitor its progress and results using Spinnaker's user interface.

