Table of contents:

Google Cloud Course

04/02/2023: Section 1: Introduction

This section covered the course structure

1) Got to know what the course is going to cover
2) Briefly went over the dashboard and sidebar in google cloud so navigating through the different sections is clear.

04/02/2023: Section 2: Intro to GCP

This section covered the structure of GCP and how the different API's are structures

1) We covered what cloud computing is and how its focused on pay as you use instead of reservation of resources
2) Covered different cloud services
    a. GCP computing services
    b. GCP storage
    c. GCP networking
    d. Other services

In this section there was a small exercise regarding pinning objects to make navigation to frequently used services easier. There was also a quiz of three questions.

04/02/2023: Section 3: Cloud Console

This section covered the cloud console

1) The cloud console is not the shell but the GUI overview of the cloud
2) We have projects-based organization so one account can have multiple different projects with different IAM access
3) The activity tab shows all activity and can be filtered

04/02/2023: Section 4: Cloud Shell

This section covered the cloud shell and a GC SDK introduction

1) Cloud console is Linux based
2) The cloud console can store 5gb on its file system
3) Two main GC SDK commands are: gsutil and gcloud
4) The cloud console has languages pre-installed and comes with a VScode based editor
    a. In the exercises file I ran an example python script

Exercises included running google SDK commands to create a bucket and to list computing instances introducing using google SDK in the cloud shell.

04/02/2023: Section 5: API's and Resource Hierarchy

This section covered how API's work and billing accounts together with the resource hierarchy in google cloud

1) API's need to be enable before usage and can be shut down to prevent accidental charges
2) To create a billing account for a project you need the appropriate permissions
3) The resource hierarchy allows for different scopes in policies allowing for access management of different users
    a. Organization Folder project resources

This section also included a quiz with three questions going over the material covered.

04/02/2023: Section 6: IAM

This section covered IAM and it's implementation in the google cloud

1) IAM is based on identities of which there are 4 types
    a. Google account
    b. Google Identity / Gsuite
    c. Google Group
    d. Service Account
2) IAM members and roles can be accessed through IAM console
3) There are number of best practices regarding IAM
    a. Use predefined Roles
    b. Define the resource hierarchy to manage scope
    c. Use google groups over user specific roles

This section also had a short quiz with 4 questions

04/02/2023: Section 7: Starting a VM

This section covered creating new VM instances and installing cloud SDK locally

1) Learned how to create a VM instances in two ways
    a. Cloud GUI
    b. Cloud SDK
        i. We went over several different options like zone, machine-type and boot-disk-size
2) Learned how to install google cloud locally and that it can be used the same way as the cloud console.
3) We also learned how to access a VM with both SSH and RDP

This section included an assignment that had you make the virtual machine with the cloud SDK

04/02/2023: Section 8: Advanced VM Configurations

This section covered more advanced options in VM configurations

1) Learned about the different types of computing instances google deploys
    a. Shared core
    b. Standard
    c. Memory optimized
    d. CPU optimized
    e. Mega and ultra memory
2) Learned about disk management and additional disks next to boot disks
3) Learned about different options including
    a. Attaching a GPU
    b. Custom machine Types
    c. Snapshots
    d. Preemptible disk images

This section included an assignment in which we had to make a spot machine, this was good to go over since the instructions changed from the video, however the google GUI is clear so no issues there.

04/09/2023: Section 9: Instance Groups

This section covered instance groups and how to make them

1) Instance groups are grouped VM's that can work together to allow for additional features
    a. Auto scaling
    b. Auto healing
    c. Multi-zone availability
    d. Auto updating
2) Mostly we use managed instance groups since unmanaged instance group have a very specific use case
3) Instance groups are based on templates so all machines are the same
4) Load balancing allows for cooldown periods and stabilization periods to prevent continuously creating and shutting down new VM's

The exercise connected to this section had us made an instance group

04/09/2023: Section 10: Kubernetes Engine

This section was an introduction to Kubernetes

1) Learned what Kubernetes is and what purpose It has
2) Went over how to create and deploy a cluster from the command line
3) Went over how to deploy a workflow through the GUI

This section included a quiz with 3 questions. Additionally while it was not a requirement I made sure to actually deploy a cluster and workload as two exercises.

04/09/2023: Section 11: Kubernetes Engine

This section covered Kubectl and monitoring of Kubernetes clusters

1) Kubectl is used to run commands within a cluster where gcloud is for setup and managing the cluster itself
2) This section about monitoring was most out of date so far since stack driver has been depreciated
    a. Clustered can be monitored on the monitoring dashboard
    b. Clusters can also be monitored from the Kubernetes dashboard up until a more basic level

This section included a quiz with two questions covering the material. I also created an exercise that made me check if monitoring was on and go to the monitoring dashboard to make sure I knew where everything was located regardless of the instructions that were depreciated.

04/09/2023: Section 12: App Engine

This Section covered App engine

1) App engine is a serverless environment for deploying microservices
2) Supports multiple languages and uses docker for containerization
3) App engines need at least a yaml and script file to work
    a. When the yaml is created app engine is managed by google so deploying it is very easy
    b. Made for microservices.

This section included a quiz with three questions. I made sure to actually implement the demonstration of the lecturer as an exercises to get hands on experience pulling from git and launching an app engine application

04/09/2023: Section 13: Cloud Functions

This section covered cloud functions and how to implement them

1) Cloud functions are serverless and respond to triggers/events to run functions
2) Cloud functions allow for custom functions in a multitude of different languages
3) To create a cloud function, you can use the GUI and the SDK
    a. The type of trigger is important and can be either HTTP or service related
    b. The Authentication is important too as it either allows everyone to use the service or just authenticated users

This section included a quiz with 4 questions. Again, I also made sure to treat the demo as an exercise and followed along while applying the instructions myself. I did run into an error with my python code but since it was the last step and the lecturer let us know not to worry about it, I moved on.

04/09/2023: Section 14: Cloud Run and Anthos

This section covered cloud run and Anthos

1) Cloud run focusses on stateless containers and deploying them
    a. Stateless means that a container is not dependent in its workings on the current state of the node
2) The main function of cloud run is concurrency where multiple requests can be handled at the same time
3) Anthos is a cross cloud application management platform that allows to move applications between different clouds and on-premise networks
4) Anthos allows for several important management options
    a. Traffic control
    b. Monitoring
    c. Service to service authorization and authentication
    d. Configuration management

04/09/2023: Section 15: Review of GCP computing services

This section covered how to chose between different services and what to know for the exam.

1) All services have their use cases and choosing the right one is important
    a. Compute engine allows for max control
    b. Kubernetes is a containerized cluster engine that is configurable
    c. App engine is a containerized cluster engine that is not very configurable
    d. Cloud functions are event based
2) We also went over what do know for the exam which is basically all the material we covered so far for each computing service.

04/09/2023: Section 16: Planning and configuring storage

This section covered all different storage options available in google cloud

1) Covered the available options for storage in the cloud
    a. Standard
    b. Nearline
    c. Cold Line
    d. Archive
2) Covered when cloud storage is beneficial to other types of storage and what unstructured data is.
3) Went over the differences between different services and what their strong and weak points are
4) We went over different storage classes and how to setup object life cycle management to minimize cost
5) Learned about the differences between SQL and NoSQL and cache databases and how each of these are optimal solutions for different problems.

This section had a quiz with 4 questions. In the assignments we also covered setting up a NoSQL database in datastore and how to add data to it. We also completed an exercise that taught us how to setup object life cycle management to move data to different storage tiers based on triggers.

04/09/2023: Section 17: Review of GCP Storage Options

This section was a summary of the previous section and gave tips for the exam.

1) We went over how to pick different storage systems and when one is supposed to be used
2) Covered types of cloud storage once again
3) Further tips for the exam in terms of what we need to know

04/16/2023: Section 18: Overview of bigdata services

This section covered big data services and had the most connection to the Hadoop Class I took this semester as well.

1) Learn what google Pub/Sub is and how to set it up
2) Cover cloud dataproc and its use case as a Hadoop cluster
3) Covered cloud Dataflow and how its based-on Apache bean
4) Went over cloud transfer and moving large amounts of data
5) Covered Bigquery and Bigquery machine learning and gave examples on how to run machine learning jobs in Bigquery ML
6) Went over cloud composer and it's architecture how it is two sided in a customer and google project
7) Went over datafusion as a code-less ETL development tool

This section included a quiz with 4 questions and two assignments. The assignments gave insight into how to create and run a dataproc job and how to create and publish/pull G Sub/Pub messages.

04/30/2023: Section 19: Networking in the cloud

This section covered different networking technologies and VPC's in the cloud

1) What is a VPC and how does it work
2) What is a VPN and how is it used in conjunction with a VPC security wise
3) How do you connect multiple VPC together based on their characteristics
4) What is a tunnel and how do fill in the tunnel options in the google cloud

This section included a quiz with 3 questions. We also set-up a load balancer for an exercise focusing on how to fill in the required networking fields.

04/30/2023: Section 20: Networking in the cloud 2

This section focused on firewalls, DNS, IP's and load balancing

1) Go over the firewall UI in google and understand all the different options
2) Set-up a DNS and understand how a DNS works
3) Revisit the basics of an IPV4 address to understand different options in google cloud
4) Set-up a load balancer for a regional VPC

This section included an exercise in which we had to set-up a load balancer focusing on reserving subnets and frontend and backend set-ups.

04/30/2023: Section 21: Networking review

This section gave a short summary of networking topics we have coverd and gave tips for the exam

1) Make sure to know the specific topics mentioned for the exam mostly focused on
    a. VPC's
        i. Peering vs shared
    b. Hybrid cloud options
    c. Load balancing

05/02/2023: Section 22: Deployment manager

This section covered the deployment manager

1) What deployment manager is, a way to launch premade applications
2) Requires hardly any configuration since all services and configs are premade by a developer

05/02/2023: Section 23: Observability

This section covered three main logging tools on GCP

1) Know what cloud Monitoring is and how to access it
    a. Can make alerts
    b. Predefined vs custom metrics
    c. Monitoring agent can collect more data than cloud monitoring for higher detail
    d. Uptime checks can check if a service is down completely
2) Metrics explorer shows metrics of different services overtime
3) Cloud logging focusses on data retention and filtering and there are 3 important tools
    a. Log explorer

    b. Log Router
    c. Log analytics
4) Cloud trace is to identify bottlenecks in services by collecting latency statistics

This section included a quiz with three questions.

05/02/2023: Section 24: Exam Tips

Section 24 was a brief section with some exam tips and what the exam would focus on