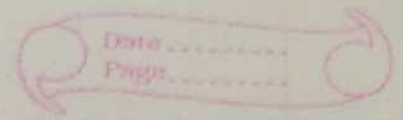


05/02/24



GCP for enterprise essential training

1) GCP for Enterprise :-

Availability : app run on google infra

Reliability : google runs some of the world's largest services: youtube, gmail, and google docs

Performance : GCP services run on global backbone.

2) Enterprise Setup & security :-

- Identity & Organization in IAM works at org level
- One super administrator user (by default)
- Folders & Project.
- Object tags — Key value pair that you associate to (labels) service ~~tags~~ instances

→ Resource hierarchy :

- Various policy to be applied at this level

→ Billing

- Types - self serve or invoice
- payment profile - individual or business
- Charging cycle - monthly or threshold.
↳ for intensive application

IAM > Billing

→ Tooling & Code :-

- `gsutil` `gsutil ls` - list buckets
- `gcloud` for scripting
- Programming API - mostly Py but not restricted

→ Setup Hybrid connectivity. → type on GCP

1) VPN connectivity

2) Interconnect : establish connection between google VPC networks and outside infra.

3) Cloud router : enable dynamic routes between compute engine VPC and dy non google networks

→ set up a VPC

- boundaries for security

- shared VPC

- serverless VPC access - manages VPC access across connectors

→ Cloud Adoption pattern

1) Existing app moved to cloud.

2) New app into cloud

3) Enterprise Compute :

→ Lift & Shift.

Type	Service	Notes
Compute	GCE, Google Kubernetes Engine (GKE) or Cloud run or GKE, Cloud run or cloud function	VMs, container, or functions
Files	Google cloud storage	Storage class, Bucket configuration and permission

Data	CloudSQL	Relational
Other	Virtual Private Cloud or	Network Security
	Cloud Interconnect IAM	
	Object.	

→ Migrate VM's to GCE :

- Google provides and recommends partner such as Veloxstra for migration

→ Serverless Containers :

- Cloud functions
- App Engine
- Cloud Run → Cloud run native
↳ also known as serverless containers
↓
Bring your own container

→ Kubernetes abstraction level :

→ Anthos :

- Set of services that allows to run containerized application anywhere on Google cloud, on prem
- Contains set of interfaces for management, monitoring & more.

b) Enterprise storage Data :

→ Disaster Recovery

- Snapshot, files

→ Cloud KMS (Key Management System) and encryption:

- Security section → Cryptographic key
- Key ring → top level
- Can use google provided key or provide custom key

→ Cloud SQL:

- Partially managed DB service.
- SQL > Create instance
- You can migrate data.
- You can trigger failover and a backup will be created

→ Cloud Spanner:

- Globally scalable SQL Multi-master nodes
DB. Relational

DR Info Summarized

Files : Google Cloud Storage - Bucket config and permission Storage class & life cycle

Cloud file store - fully managed NFS service for GCE

Data : Cloud SQL : MySQL, PostgreSQL, and SQL Server
Can have replicas

Cloud Spanner - globally scalable SQL
Multi-master nodes

- Dataflow template - for import & export
- Spanner > create instance

→ Data Warehouse

- BigQuery Cookbook for best practice to optimize query.
- BigQuery help in executing data warehouse queries.
- Query can be view in data studio.

→ BigQuery Enterprise feature:

- Integration of data studio with BigQuery.
- Cost is reduced
-

→ BigQuery ML:

- Supports linear regression, Binary logistic regression, Multiclass logistic regression.
- GCP support Jupyter Notebook.

→ Google data prep:

- Data life cycle: Ingest, store, process and analyze, explore and visualize.
- Data fusion - super set of data prep.
- Data prep provides tabular visualization of our data.

→ Google data fusion:

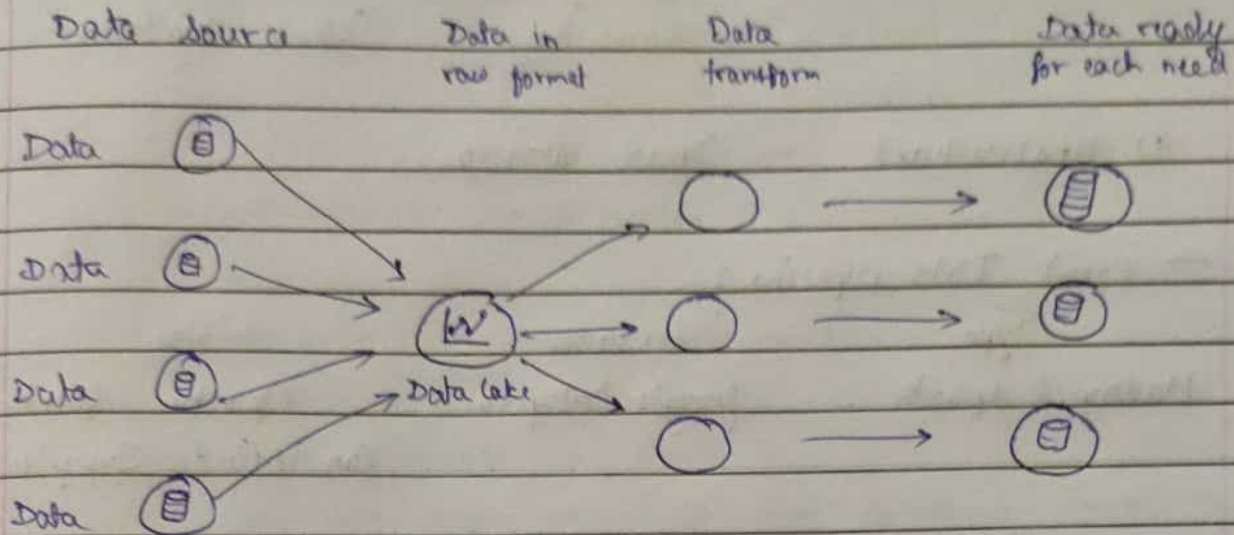
- Data integration service for building & managing datapipeline

- Runs within 1 compute zone
- Instance is composed of GKE, cloud SQL, cloud storage, persistent disk, and cloud key Management service.

Data Warehouse Summarized:

- 1) Data - BigQuery - Data Warehouse (SQL and NoSQL) Batch or stream insert.
- 2) Files : BigQuery storage
Google Cloud Storage - Bucket Configuration and life cycle
- 3) Data movement : Dataprep - uses Dataflow (Apache Beam on GCP)
Data fusion - uses Dataproc (Apache Hadoop on GCP)
- 4) Data Visualization : Data Studio - Tableau and more Partner
- 5) Enterprise Data pipeline :
→ Serverless service by google :
 - App Engine - 2008
 - Big Query - 2010
 - Cloud Storage - 2011
 - Cloud Datastore - 2013
 - Cloud Dataflow - 2014
 - firebase - 2014 - 2015
 - Cloud Pub/Sub - 2015 - 2016
 - Cloud function - 2016
 - Cloud ML Engine - 2016 - 2017

→ Serverless Data Lake Pattern



→ IOT Application

- Cloud IOT Edge - real time analytics & mc
- Centralized hub where data is send after Iot Edge
- Cloud IOT Core.

→ Cloud IOT Core :

- Registry - set in a region, associated to 1 or more protocols
1 or more cloud Pub/sub topics.
- Devices : logical representation of physical IOT devices.
- Gateway : associated to a registry
- Monitoring :

→ cloud Big Table :

Storage of data :

- 1) structured : Transactional - Cloud SQL
Analytical - Big Query

2) Semi-structured - fully Indexed - Cloud data store
Row key - Cloud Bigtable

3) Unstructured - Cloud storage.

→ Event Data pipeline:

Type	Services	Notes
Hadoop & Spark	Google Dataproc	Apache Spark Can Include Jupyter Notebook
Data processing	Google Dataflow	Apache Beam
Orchestration	Cloud Composer	Apache Airflow
Query	Big Query	SQL & ML

→ Google Dataproc:

- Objects are Cluster, Jobs & Workflows

→ Google Dataflow:

- works with template
- Streaming or batch, templates

→ Cloud Composer

- Apache Airflow
- for pipelines

6) Dev and DevOps tools:

→ Cloud Native CI/CD:

- CI - Code repo & version control
Build and Integration Automation
- CD - Release automation
delivery automation
- Continuous Deployment - Production Automation.

• CI/CD pipeline:

code → Build → Test → Artifact Management → Deploy

→ Cloud Source Repository:

- Source repo for code and config.

→ Cloud Build:

- executes your builds on google cloud platform infra.
- can import source code from variety of sources
- Build tools are integrated.

→ CI/CD Walkthrough:

- 1) Create a GKE cluster
- 2) Review the application structure
- 3) Manually deploy the application
- 4) Create a repo to host the sample app source code
- 5) Setup automated trigger in cloud builder
- 6) Deploy branches to namespace.
- 7) Deploy master to canary