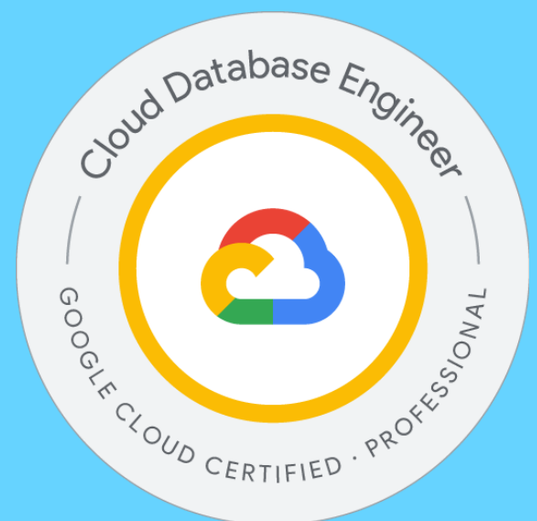
# GOOGLE CLOUD PROFESSIONAL DATABASE ENGINEER

PREP NOTES BY

AMMETT

# Google Cloud Professional Cloud Database Engineer
## Exam Prep Sheet by Ammett

References from Google docs and other sources.
V1: 1-2023

**Helpful white papers**

1- Cloud SQL
2- Cloud Spanner
3- Firestore
4- BigTable
5- Baremetal
6- Memorystore
7- Database migration pt 1
8- Database migration pt 2
9- Oracle
10- Migrating Databases to managed services

| | | | | | | |
|---|---|---|---|---|---|---|
| IAM | **What it is**<br>IAM which lets you manage access control by defining who (identity) has what access (role) for which resource. | **Key points**<br>1- Best way to manage (use groups)<br>2- Roles (primitive, predefined & custom)<br>3- Roles necessary to do certain functions (network, security, IAM, cloud storage) | **What you should know**<br>1- Permissions level necessary | **Review documents**<br>Cloud IAM overview | **Video**<br>Cloud IAM<br><br>Best practices for identity | **My experience**<br>IAM general awareness |
| CIDR RFC-1918 | **What it is**<br>You can choose any private RFC 1918 CIDR block for the primary IP address range of the subnet | **Key points**<br>1- The difference between internal and external IP | **What you should know**<br>1- Be able to identify them. | **Review documents**<br>IP Addresses | **Video**<br><br>Networking with IP Address<br><br>Cloud SQL Concepts of networking | **My experience**<br>How to use Databases with private IP addresses |
| External IP | **What it is**<br>These are routable on the public internet and allow you access to the internet. | **Key points**<br>1- Know the private ranges and public | **What you should know**<br>1- Be able to identify them. | **Review documents** | | **My experience**<br>Know the difference between public and private IP addresses |
| Subnet Types | **What it is**<br>Subnets are used to separate resources and control communication between tiers. Access can be controlled via routes and firewalls | **Key points**<br>1- Default (automatically generated with a project) they have default firewall rules and a subnet in every region<br>2- Auto-mode- automatically creates a subnet in every region (the default subnet is an auto mode subnet) IP range 10.128.0.0/9 | **What you should know**<br>1- Custom is fully user controlled<br>2- Avoid overlapping ranges<br>3- You can convert from auto to custom (one way). Things can get affected.<br>4- You can increase range not decrease | Subnets | **Video**<br>Create Custom Subnet | **My experience**<br>General awareness |

| Databases | | | | | | |
|---|---|---|---|---|---|---|
| Cloud SQL  | Cloud SQL for MySQL  | Cloud SQL for PostgreSQL  | Cloud SQL for SQL Server  | Secure Cloud SQL  | Cloud SQL – Troubleshoot and operations | **Review documents**<br>Choosing a load balanced<br>gcloud sql commands<br>High availability<br>replication<br>PITR<br>DR |
| **What it is**<br>Managed SQL database service that support (MySQL, PostgreSQL and SQL Server) | **What it is**<br>Cloud SQL fully-managed database service for MySQL | **What it is**<br>Cloud SQL fully-managed database service for PostgreSQL | **What it is**<br>Cloud SQL fully-managed database service for Microsoft SQL Service | **What it is**<br>Security features of Cloud SQL | **What it is**<br>Operations of Cloud SQL | parallel replication<br>gcloud sql instances promote-replica<br>maintenance<br>External read replicas |
| **What you should know**<br>1- Use cases and features<br>2- Configure high availability<br>3- Scaling secondary, read replicas, failover<br>4- Importing and exporting<br>5- Monitoring | **What you should know**<br>1- How to migrate<br>2- Features | **What you should know**<br>1- How to migrate<br>2- Features | **What you should know**<br>1- How to migrate<br>2- How to migrate to different server versions (e.g. 2016, 2019 etc). Lab here | **What you should know**<br>1- Cloud SQL Auth proxy<br>2- Encryption (Client side, CMEK)<br>3- VPC service controls,<br>4- Private IP | **What you should know**<br>1- Monitor, troubleshoot<br>2- Update, failover, promote)<br>3- gcloud commands (**gcloud sql instances patch, gcloud sql operations)**<br>4- Query insights | **Video**<br>High availability with Cloud SQL<br>Cloud SQL for SQL server<br>Migrate MySQL to Cloud SQL<br>Cloud SQL Insights |
| **Documentation**<br>Cloud SQL<br>Set maintainance | **Documentation**<br>Cloud SQL for MySQL | **Documentation**<br>Cloud SQL for PostgreSQL | **Documentation**<br>Cloud SQL for SQL server | **Documentation**<br>Data residency | **Documentation**<br>Database observability | **My experience**<br>**Cloud SQL, is a hot topic.** If you don't know this in depth don't do the exam |
| Cloud Spanner  | Cloud Spanner High Availability  | Cloud Spanner Migration  | Cloud Spanner Security  | Cloud Bigtable  | Cloud Bigtable Security  | **Review documents**<br>Best practices spanner gaming DB<br>Detect query performance<br>Query optimizer<br>Unmanaged instances<br>Spanner Import/export |
| **What it is**<br>Fully managed relational database with unlimited scale | **What it is**<br>Fully managed relational database with unlimited scale | **What it is**<br>Options available to migrate to cloud spanner. | **What it is**<br>Security features of Spanner. | **What it is**<br>This is a NoSQL database offering from Google Cloud. | **What it is**<br>This is a NoSQL database offering from Google Cloud. | **Video**<br>Cloud spanner unlimited<br>Highly available deployments<br>Scaling |
| **What you should know**<br>1- Use case for Spanner vs MySQL<br>2- Scaling<br>3-Schema | **What you should know**<br>1- Regional and multi-regional<br>2- Back up, PITR<br>3- Scaling | **What you should know**<br>1-Which option to use based on situation<br>2- Import /export section, Formats | **What you should know**<br>1- When to use.<br>2- Different template.<br>3- Introspection | **What you should know**<br>1- Know about NoSQL and use cases<br>2- Design<br>3- key visualizer | **What you should know**<br>1- Security in bigtable | **My experience**<br>Cloud Spanner appears. The trick is to know when to use this instead of Cloud SQL and how it really works. If you don't know this in depth don't do the exam |
| **Documentation**<br>Cloud SQL<br>Set maintainance | **Documentation**<br>Cloud Spanner backup<br>PITR | **Documentation**<br>Migration section | **Documentation**<br>Cloud SQL for SQL server | **Documentation**<br>Bigtable overview | **Documentation**<br>Customer-managed encryption keys (CMEK) | |

| Databases | | | | | | |
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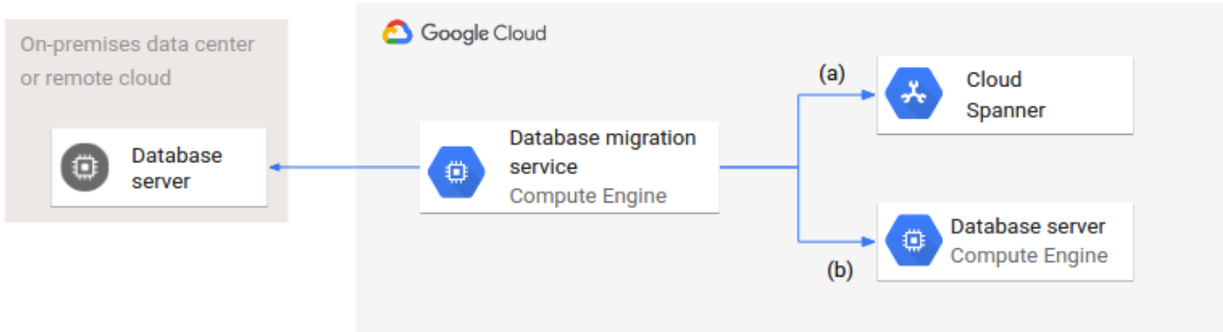
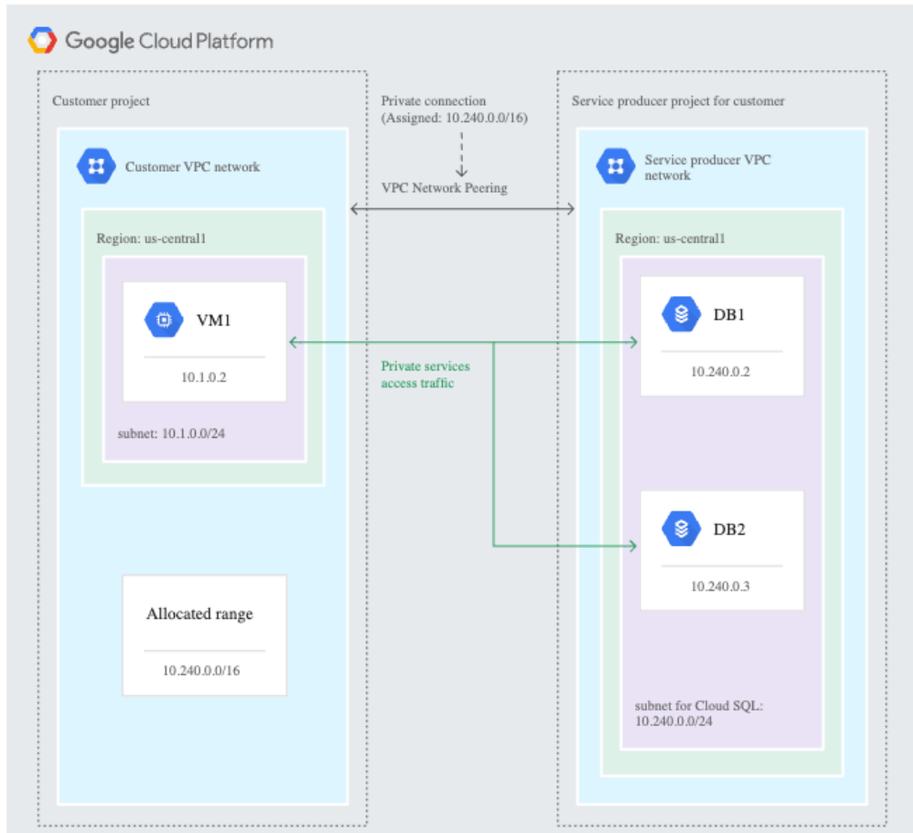
| Oracle  | Oracle-baremetal  | Oracle-tools  | Firestore  | Firestore/ Datastore modes  | Memorystore  | **Review documents**<br>Memorystore |
| **What it is**<br>Oracle Database system on Google Cloud. | **What it is**<br>Solution for running Oracle workload on Google Cloud | **What it is**<br>RMAN | **What it is**<br>NoSQL document oriented dataabse | **What it is**<br>Native/Datastore modes | **What it is**<br>Memorystore for Redis is a fully managed Redis service for Google Cloud | **Video**<br>Run specialized workloads with Bare Metal Solution<br>Get to know firestore<br>Memorystore for redis<br><br>**My experience**<br>**Working with Oracle on GCP is good to know. Firestore options will pick you up a point or two.** |
| **What you should know**<br>1- Bare metal<br>2- How to migrate<br>3- Oracle tools<br>4-**Oracle RAC** | **What you should know**<br>1- Components | **What you should know**<br>1- RMAN | **What you should know**<br>1- What type of data it supports<br>2- Exports<br>3. Offline persistence | **What you should know**<br>1- Native vs Datastoremode | **What you should know**<br>1- How it works | |
| **Documentation**<br>Bring new life to your databases with an Oracle migration. | **Documentation**<br>Bare metal for Oracle | | **Documentation**<br>firestore | | | |
| Datastream  | Datafusion  | Dataflow  | Cloud scheduler  | Cloud composer  | Persistent disk  | **Review documents**<br>Persistent disk<br>Cloud Composer |
| **What it is**<br>Datastream is a serverless and easy-to-use change data capture (CDC) and replication service. | **What it is**<br>Cloud Data Fusion is a fully managed, cloud-native, enterprise data integration service for quickly building and managing data pipelines. | **What it is**<br>Unified stream and batch data processing that's serverless, fast, and cost-effective. | **What it is**<br>Cloud Scheduler you set up scheduled units of work to be executed at defined times or regular intervals | **What it is**<br>Cloud Composer is a fully managed workflow orchestration service, Cloud Composer is built on the popular Apache Airflow | **What it is**<br>Persistent disks are durable network storage devices | **Video**<br>Optimizing Block Storage for Workload Performance |
| **What you should know**<br>1- CDC<br>2- How to use datastrem | **What you should know**<br>1- How it works | **What you should know**<br>1- How it works | **What you should know**<br>1- How it works | **What you should know**<br>1- How to use it | **What you should know**<br>1- Calculate IOPS<br>2- Disk types and sizes | |
| **Key Points**<br>Overview of data stream | **Key Points**<br>What is cloud fusion | **Key Points**<br>About dataflow | **Key Points**<br>Cloud scheduler | | | **My experience**<br>All these option integrate with your DB for data migration and more. Know them. |

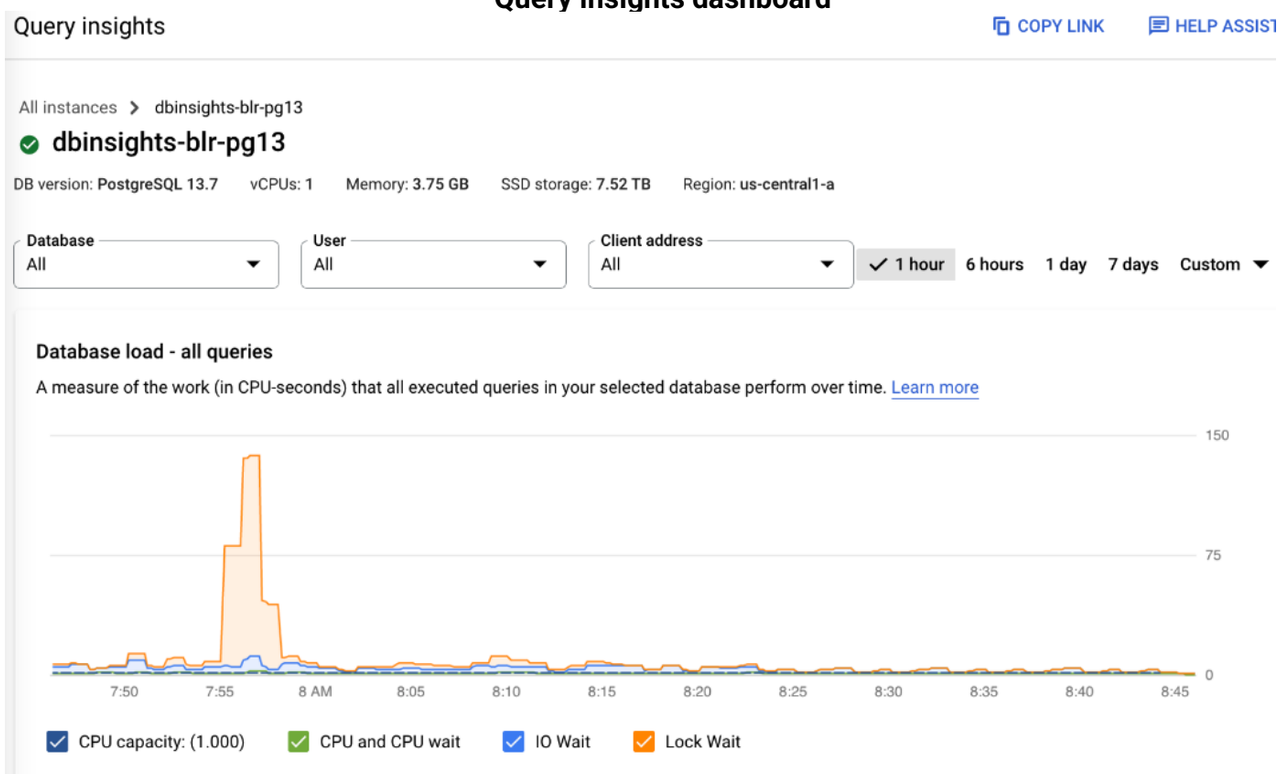
## General DMS




## Private IP




## Query insights dashboard






Start Cloud Now

BY: AMMETT

| Tools | | | | | | |
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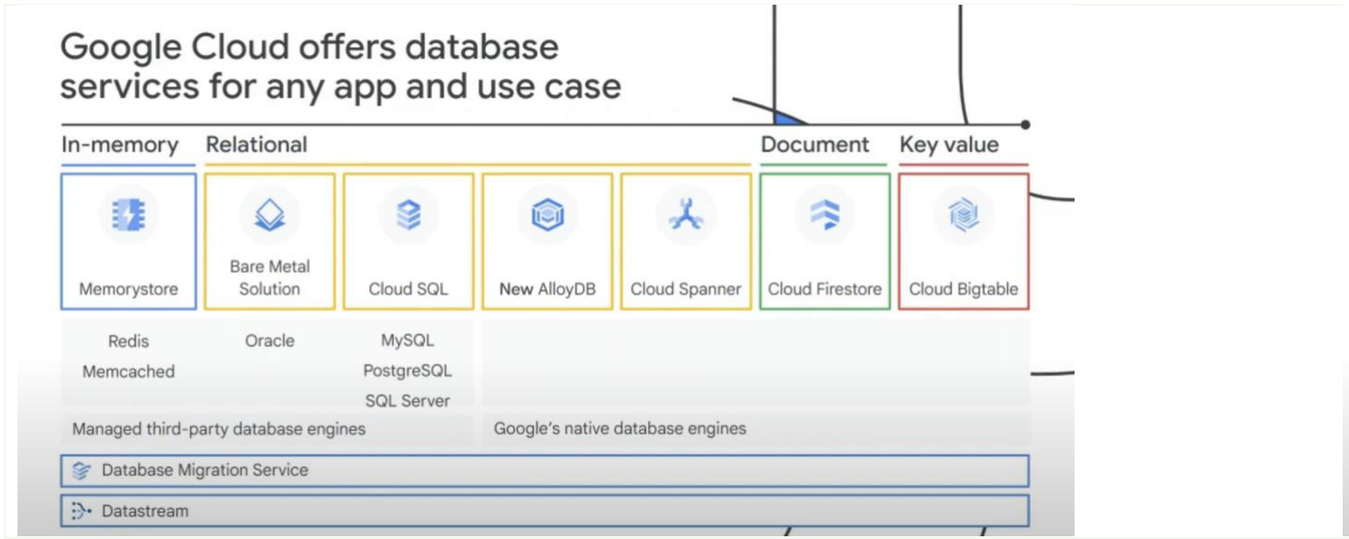
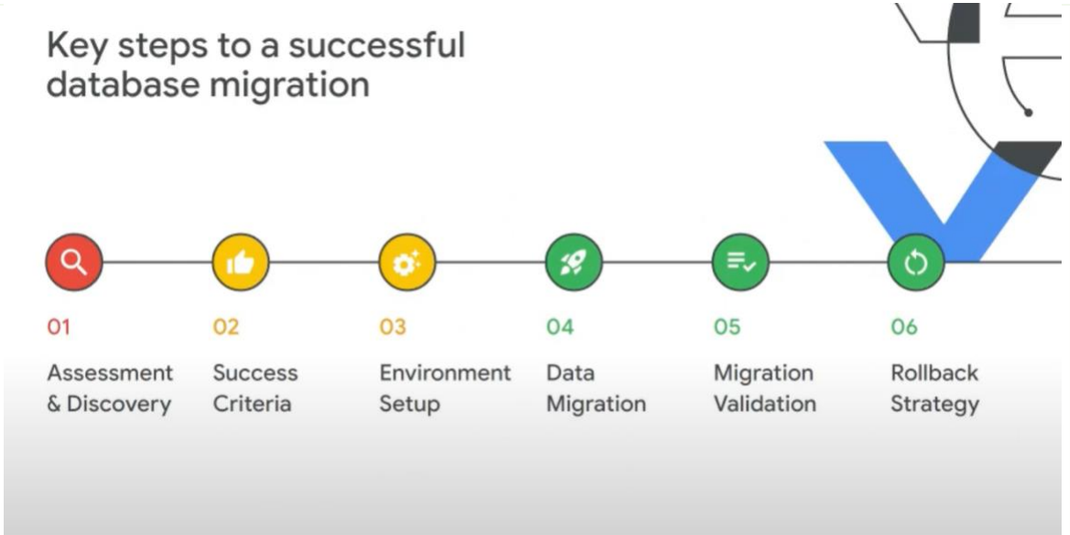
| Database Migration Service  | Actifio Go  | PG tools  | Vault  | Secret manager  | Mongro DB Atlast  | **Review documents**<br>Database migration part 1<br>Database migration part 2<br>Secrets manager |
| **What it is**<br>Simplify migrations to the cloud. Available now for MySQL and PostgreSQL, with SQL Server and Oracle migrations in preview | **What it is**<br>Actifio GO is a Google Cloud backup and disaster recovery offering for Google Cloud and hybrid workloads. | **What it is**<br>Postgres tools | **What it is**<br>Secrets manager from Hashicorp | **What it is**<br>Store API keys, passwords, certificates, and other sensitive data. | **What it is**<br>A fully managed, global cloud database from MongoDB | **Video**<br>Introduction to DMS<br>What is Actifio GO<br>HashiCorp vault on GCP<br>Intro to DMS<br><br>**My experience**<br><br>**Knowledge of these various tools will be helpful** |
| **What you should know**<br>1- Overview of Database Migration Service | **What you should know**<br>1-It's use in backup and recovery, DR. Both cloud and on-prem. | **What you should know**<br>1- Know general pg tools<br>2- pg-bouncer | **What you should know**<br>1- How it works | **What you should know**<br>1- How it works | **What you should know**<br>1- How it works | |
| | **Documentation**<br>Actifio<br>Actifio pdf | **Documentation**<br>PG tools | | | **Documentation**<br>White paper | |
| Scaling | NoSQL  | RTO/RPO | mysql | **AlloyDB** | | |
| **What it is**<br>Adjusting size of database based on needs | **What it is**<br>provides a mechanism for storage and retrieval of data that is modelled in means other than the tabular relations used in relational databases. | **What it is**<br>DR is a subset of business continuity planning. DR planning begins with a business impact. | **What it is**<br>is a simple SQL shell with input line editing capabilities | **What it is**<br>AlloyDB is a fully-managed, PostgreSQL-compatible database for demanding transactional and analytical workloads. | | **Video**<br><br>Choosing the right database<br><br>Migrate and modernise apps with Google Cloud databases |
| **What you should know**<br>1- Scaling methods | **What you should know**<br>1- NoSQL options | **What you should know**<br>1- RTO<br>2- RPO<br>3- Options to achieve this | **What you should know**<br>1- Simple commands | | | |
| **Documentation**<br>**Scaling methods** | **Key Points**<br>1- Database options | **Key Points**<br>Basics of DR planning | **Key Points**<br>mysql | **General**<br>About AlloyDB | | **My experience**<br>Knowledge of these areas can be helpful |

| Networking / general | | | | | | |
|---|---|---|---|---|---|---|
| VPC Peering  | VPC shared  | Cloud NAT  | Dedicated Interconnect  | Partner Connect  | Private Access types  | **Review documents**<br>Choosing a load balanced<br>Troubleshooting health<br>HTTPS logging<br>Kubernetes HTTP(s) LB ingress |
| **What it is**<br>Allows internal IP address connectivity across two Virtual Private Cloud (VPC) networks regardless of whether they belong to the same project or the same organization | **What it is**<br>Used to connect to a common VPC network. Resources in those projects can communicate with each other securely and efficiently across project boundaries using internal IPs. | **What it is**<br>Allows virtual machine (VM) instances without external IP addresses and private (GKE) clusters to connect to the Internet. | **What it is**<br>Use dedicated Interconnect to connect to Google's network through a highly available, low latency connection. (**10GB** or higher) | **What it is**<br>Use Google Cloud Interconnect - Partner (Partner Interconnect) to connect to Google through a supported service provider. (from 50 MB up) | **What it is**<br>Private options | Setting up HTTP Ingress LB<br>**Video**<br>Cloud Load balancers<br>Cloud SQL for SQL server<br><br>**My experience**<br>**These networking elements play a part in connectivity to your database application.** |
| **Key points**<br>1- When to peer<br>2- What services you have access to | **Key points**<br>1- Centralised management<br>2- Firewall control | **What you should know**<br>1- How it works<br>Port allocations<br>2- Use egress manner, help system pull updates | **What you should know**<br>1- Purpose of this connection<br>2- Band width options | **What you should know**<br>1- Best case use<br>2- Min size 50MB | **What you should know**<br>1- Private Google Access<br>2- Private Service Access<br>3- Private Service Connect<br>4-VPC service controls | |
| **Documentation**<br>VPC Peering | **Documentation**<br>Shared VPC | **Documentation**<br>NAT | **Documentation**<br>Dedicated Interconnect | **Documentation**<br>Partner Interconnect | | |




**Thanks for reviewing.**
**Special note this exam is very challenging so go as deep as possible into all areas of each database type.**

Please visit the official certification outline HERE
Official practice test HERE

ps. These are my notes and tips that helped me pass the Database exam in the beta version. Every area on the document represents a topic that has a strong probability of appearing. Google may change the exam requirements at any time so always review the outline. The knowledge is free it just cost me some time to put together. Please share with your network who may be interested in GCP Database cert or need a quick refresher on database topics.
You can also check my other Google **prep notes** for the **Security, Networking, Architect, Engineer, DevOps and Engineer** exam **HERE**

**Bonne Journée**