## **Spanner**

Knowing about *default indexes* and *secondary indexes* is a must and when to choose Spanner over Datastore, Bigtable, or CloudSQL.

* Regional configuration and replicas.
* Monitoring CPU
* Not much in the exam, just basic concepts
* Primary and secondary indexes

Cloud Spanner **uses compute nodes to read and write data**. The data of tables is stored lexicographically by the primary key. Data is distributed among multiple storage “splits.”

1. Fully managed  
2. Able to automatically scale up  
3. Transactionally consistent  
4. Able to scale up to 6 TB  
5. Able to be queried using SQL

This is the reason why choosing the right primary key for Cloud Spanner is important for performance. If the primary key is monotonic, it leads to storing table data to one storage split, which in return leads to compute nodes to hit the same storage split for reading & writing. A good primary key is a key that helps in distributing data evenly among different storage splits.

A version 4 UUID or a universally unique identifier is a 128-bit number used to identify information in computer systems. An example of a UUID is “81c96908-6a8f-46b2-bc16-3ee4c5376182” which consists of 32 hex characters.  
UUIDs generate widely unique and diverse keys that allow potential primary keys, so it can be a good choice to consider generating primary keys for records in Cloud Spanner.

Spanner provides Global scale, low latency and the ability to scale horizontally.  
Refer GCP documentation – Storage Options:- <https://cloud.google.com/storage-options/>

Cloud Spanner is a relational database service. It is not recommended for JSON- format data that may have a changing structure.

*Cloud Spanner supports interleaving that guarantees data being stored in the same split, which is performant when you need a strong data locality relationship.*