**Introduction**

Google Cloud Spanner is a fully managed relational database service that provides high availability, scalability, and consistency. While it is often viewed as a solution for large datasets, it can also be utilized for smaller data sets with lower costs. This report explores the features and capabilities of Google Cloud Spanner and its potential use for a humanitarian center.

**Features and Capabilities**

Google Cloud Spanner offers several features that make it an attractive solution for a humanitarian center:

1. **Online Schema Updates**: Spanner allows for online schema updates without any downtime, ensuring that the database remains available and accessible during updates.
2. **Audit Logs**: Spanner provides audit logs for security purposes, ensuring that all database activities are tracked and monitored.
3. **High Availability**: Spanner offers high availability, with a single region deployment guaranteeing 99.99% uptime and a multi-region deployment guaranteeing 99.999% uptime.
4. **Unlimited Capacity**: Spanner provides unlimited capacity, allowing for large amounts of data to be stored and processed.
5. **Global Replication**: Spanner supports global replication, ensuring that data is replicated across multiple regions for high availability and disaster recovery.
6. **Granular Instance Sizing**: Spanner allows for granular instance sizing, enabling users to tailor their instance configuration to their specific needs.

**Cost and Pricing**

Using the Google Cloud Services Cost Calculator, the estimated monthly cost for a Spanner instance was calculated to be $83.44. This cost is based on the assumption that the instance will be used for a small humanitarian center with limited data storage and processing needs.

**Data Ingestion and Reporting**

To get data onto Spanner, Dataflow can be utilized for the initial import of bulk data to populate the database. CSV files can be used, but they can only be used for a table at a time and not for the entire database. Integrate.io is a platform that can be used to schedule data uploads from a local machine to Spanner. However, the pipeline to move data from a local device to the Spanner instance cannot be easily created by a non-technical person.

**Reporting and Visualization**

Spanner does not have a built-in reporting tool. However, it can easily be connected to Google Looker Studio for reporting purposes. Looker Studio is free to use and enables users to create reports with dashboards and tables. The visualizations on the dashboard change as the underlying data in the Spanner database changes.

**Conclusion**

In conclusion, Google Cloud Spanner is a powerful and scalable database solution that can be utilized for a humanitarian center. While it requires some technical expertise to set up and manage, it offers several features and capabilities that make it an attractive solution for organizations with limited data storage and processing needs

**Links**

* **Google Cloud Spanner Page -** [**https://cloud.google.com/spanner/**](https://cloud.google.com/spanner/)
* **Google Cloud Services Cost Calculator -** [**https://cloud.google.com/products/calculator?dl=CiQ2MDE2YzMwMy02NTE2LTQyZDUtOWU2Ny0yODg3Mjc5ZTFmMTEQCxokMzgwMUQ3NjMtRjJFMC00Mjk2LUFDRDAtOEU5NzYwNTJCREZE**](https://cloud.google.com/products/calculator?dl=CiQ2MDE2YzMwMy02NTE2LTQyZDUtOWU2Ny0yODg3Mjc5ZTFmMTEQCxokMzgwMUQ3NjMtRjJFMC00Mjk2LUFDRDAtOEU5NzYwNTJCREZE)
* **Looker Dashboard Tutorial -** [**https://youtu.be/nLHypcQymkY?si=0mLbBIqyPwLIzOcX**](https://youtu.be/nLHypcQymkY?si=0mLbBIqyPwLIzOcX)
* **Backup -** [**https://cloud.google.com/spanner/docs/backup/choose-backup-import**](https://cloud.google.com/spanner/docs/backup/choose-backup-import)
* **Ales Penkaver -** [**https://www.lightspeedhq.com/blog/google-cloud-spanner-good-bad-ugly/**](https://www.lightspeedhq.com/blog/google-cloud-spanner-good-bad-ugly/)
* **Spanner Docs -** [**https://cloud.google.com/spanner/docs**](https://cloud.google.com/spanner/docs)