Architecture Decision Record (ADR) - Regional Local Data Storage

Decision Summary

Utilize a dedicated local datastore at different regions in conjunction with a cloud database for enhanced data resilience and performance.

Context

In our system architecture, we are using a cloud database to store and manage data for our application. However, due to factors such as data sovereignty requirements, latency concerns, and the need for enhanced resilience, we are considering incorporating dedicated local datastores at different regions alongside the cloud database.

Decision Drivers

1. **Data Sovereignty**: Certain regulations mandate that data must be stored within specific geographic regions.
2. **Latency**: Users in different regions may experience latency when accessing data from a centralized cloud database.
3. **Resilience**: Local datastores provide redundancy and resilience against outages or disruptions in the cloud infrastructure.
4. **Performance**: Accessing data from local datastores can improve performance by reducing latency.

Considered Options

1. **Centralized Cloud Database Only**: Store all data in a centralized cloud database without utilizing local datastores.
2. **Dedicated Local Datastores at Different Regions**: Implement dedicated local datastores at different regions in addition to the cloud database.

Decision Outcome

We choose to implement dedicated local datastores at different regions alongside the cloud database.

Pros and Cons of the Selected Option

Pros

- **Data Sovereignty**: Local datastores ensure compliance with data sovereignty regulations.
- **Latency Reduction**: Users experience reduced latency when accessing data from nearby local datastores.
- **Resilience**: Local datastores provide redundancy, ensuring data availability even in the event of cloud outages.
- **Performance**: Improved performance due to reduced latency when accessing data from local datastores.

Cons

- **Complexity**: Managing and synchronizing data across multiple datastores adds complexity to the system architecture.
- **Cost**: Implementation and maintenance of local datastores may incur additional costs compared to a centralized cloud database-only approach.

Risks and Mitigations

- **Data Consistency**: Implement robust synchronization mechanisms to ensure data consistency between the cloud database and local datastores.
- **Cost Management**: Monitor and optimize costs associated with local datastores to prevent cost overruns.

Consequences

The decision to utilize dedicated local datastores at different regions enhances data sovereignty, reduces latency, improves resilience, and boosts performance. However, it introduces complexity and potential cost implications associated with managing and maintaining multiple datastores. Overall, the chosen approach aligns with the requirements and goals of the system architecture.