

**Problem**

Heterogeneous analytic platforms deployed across clouds and hybrid environments aren't guaranteed to interact or share data in a secure, seamless or timely manner because they aren't directly interconnected.

**Solution**

Establish a secure digital edge to interconnect all cloud deployments in a region, localizing cloud key stores. This greatly improves performance while reducing the complexity of inter-cloud connectivity. Enhance responsiveness of multicloud-based analytic application workloads by securely integrating them at the edge through APIs, leveraging deep packet inspection services. This lowers latency and optimizes access to the growing density of data which consists of multiple file sources in a myriad of formats. This will improve the responsiveness of recommended actions given by systems of engagement that target mobile retail consumer devices. Establish a single namespace across multicloud deployment of the file system, focusing on high availability and data protection. Introduce data lakes which will house all data formats including object and blob stores.

**Constraints**

1. As more analytic applications and services are pushed to multicloud and hybrid cloud, their interactions are affected by performance and security constraints, especially across the public internet, hurting user experience.
2. Increased data volumes increase data gravity at the edge, impeding effective transfer.
3. Cloud-based analytic SaaS applications (e.g., data reduction) are not always deployed near user population centers.
4. Investing significant capital for bandwidth is not cost-effective, as increased MPLS usage will not guarantee better latency which is critical in minimizing response time for actionable decision-making.
5. Custom connections to each cloud-based service create delays in deployment and increase cost.
6. Identity and key management across clouds must be solved to ensure safe interactions between cloud-based applications and services.

**Steps**

1. Use digital ecosystems to interconnect to multiple cloud deployments at the edge where data collection and analysis occur.
2. Install a cloud key store to ensure safe inter-cloud exchange within the edge.
3. Inter-cloud security is enhanced by expanding in-band security services at the edge (deep packet inspection, cloud key management).
4. Control the flow of application integration at the edge across clouds, reducing response time and latency.
5. Enhance caching to include storage for inter-cloud workloads and faster user uploads.
6. Create a single namespace over the entire file system.
7. Introduce a data lake to store any type of data and employ blob and object storage.
8. Focus on service chaining and faster cloud interactions, employing data replication between clouds using the edge-based cache.

**Forces**

- Legacy grid compute infrastructure must be replaced by cloud-based resources to meet performance and cost objectives.
- Delivering heterogeneous, mobile end-point devices in multiple formats with superior scale and performance and meeting increased expectations of interactivity for data collection and analytic decision-making requires support.
- Integrate disparate heterogeneous applications deployed across multiple cloud platforms to improve response times and provide predictable latency.
- Higher density of data streams needs to be tailored/cleansed to local population needs even as inter-cloud communication delays degrade user experience.
- Cloud-based SaaS platforms need extra investment to solve for inter-cloud performance and security issues.
- Guarding against theft across multiple clouds is a critical concern.

**Results****Technical**

- Cloud-agnostic data services with secure low-latency, multicloud access to myriad data sets.
- Real-time event correlation supported by fast access to historical data based in easy-to-access clouds.
- Examples of use include shared drive, package distribution for apps/containers, logging repository and staging area for analytics.

**Business**

- Cloud network costs are reduced.
- Cloud resource capacity can be acquired based on fluctuating demand.
- Operational and data management costs are reduced.

**Potential New Challenges**

- To realize the potential of analytics requires global expansion, which creates volume and application management issues.

**Reference View**