



### Problem

The growing pace of distributed content creation and consumption drives multicloud and hybrid cloud deployments in multiple regions. This creates user experience and security issues as cross-cloud application integration is required to fulfill delivery service expectations and Service Level Agreements (SLAs).



### Solution

Enhance responsiveness of growing multicloud-based application workloads by securely integrating them at the edge. Lower latency and leverage data gravity to improve user productivity and engagement. Use the digital edge to interconnect all cloud deployments in a region, localizing cloud key stores and greatly improving performance, while reducing the complexity of inter-cloud connectivity. Safely interconnect to digital ecosystems for greater partner choice and lower network costs. Place a distributed cache to enhance inter-cloud response time. Improve content delivery across hybrid and multicloud environments by leveraging dynamic content packaging services at the digital edge near user populations so that multisource content is delivered rapidly as a consistent whole. These actions drive more applications and content to the edge, leverage data gravity, and are consistent with the growing trend to send local content updates via metro links instead of backhauling them through a centralized hub, saving time and reducing costs.



### Constraints

1. Delivering large, rich content to a local population with high QoS is difficult because endpoint devices and paths have varying bandwidth and format requirements.
2. Services to tailor formats for delivery may not be in the same cloud as the content, causing processing delays between cloud platforms.
3. Content contribution and repurposing processed at the local level is not addressed by traditional long-haul network architectures. Investing more capital in MPLS long-haul networks will not solve this problem.
4. Multicloud deployments of content are inevitable, but cross cloud integration is complex and requires extra safety measures.
5. SaaS-based collaboration services do not solve for distance to the edge, creating response delays.



### Steps

1. Use digital ecosystems to interconnect to multiple cloud deployments at the edge where content resides.
2. Control the flow of application integration at the edge across clouds, reducing response time and latency.
3. Install a cloud key store to ensure safe inter-cloud exchange within the edge.
4. Inter-cloud security is enhanced by expanding in-band security services at the edge (deep packet inspection, cloud key management).
5. Enhance caching to include storage for inter-cloud workloads and faster user uploads.
6. Recalibrate storage tiering policies to account for multicloud.
7. Use service chaining to include dynamic content packaging that aggregates multi-sourced content before delivery.
8. Employ content replication between clouds.



### Forces

- Enterprise content applications and services are being replaced with or pushed to cloud-based SaaS platforms to cut costs and improve time to market, but resulting unpredictable latency and response times affect user experience and results.
- Support needed for the delivery of heterogeneous, mobile end-point devices in multiple formats with superior scale and performance along with increased expectations of interactivity.
- Higher density of information streams needs to be tailored to local population needs as inter-cloud communication delays hurt user experience.
- Guarding against theft across multiple clouds is a critical concern.
- Responsive content consumption and contribution require applications to run and access data at the edge, not just the cloud.



### Results

- Technical**
- Multicloud application workloads have secure, low-latency access to data.
  - Data loss, leakage and theft are minimized without compromising accessibility or user experience.
- Business**
- More content is driven to the edge, improving user experience and engagement.
  - User experience for mobile devices is enhanced.
  - Investment is in line with data growth, and IT can leverage multiple cloud choices.
- Potential New Challenges**
- Growth to new locations with new users, and more devices with richer content and greater volumes, will stress any one cloud-based content delivery service.

### Reference View

