SRv6 Unleashed: Architecting Scalable, SLA-Aware Networks for the Multicloud Era

Leveraging TIME's 3Cs of Digitalization Strategy for Business Success

time™

Section 1 The Multicloud Landscape & Its Demands

Section 2 Introducing SRv6 – The Path to Modern Networking

Section 3 TIME's SRv6 Solution for Seamless Multicloud Connectivity

Section 4 Ensuring Business Continuity & Looking Ahead

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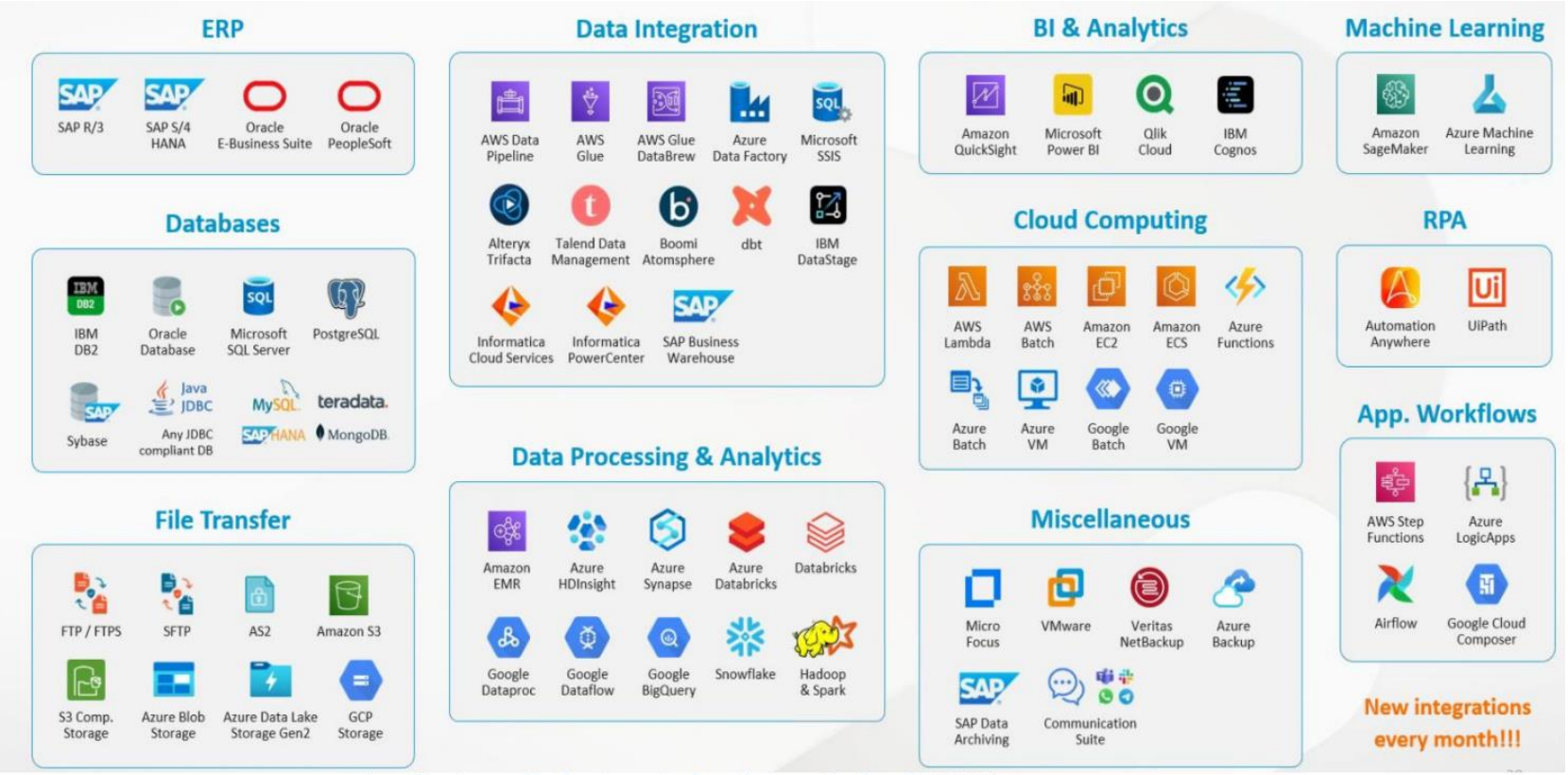
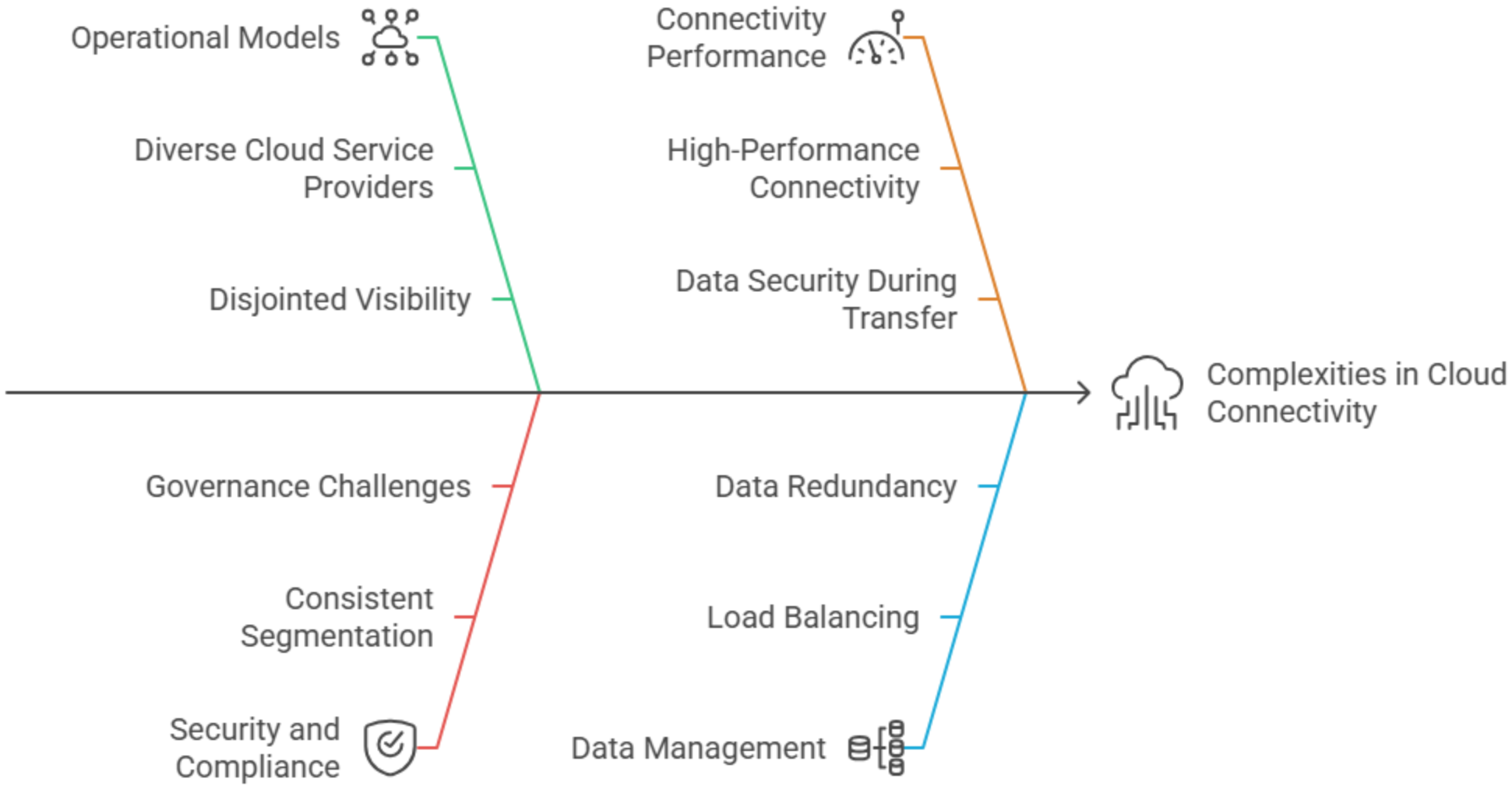
Introduction- Rise of multicloud & enterprise demands

- Cloud services have become an integral part of modern business operations due to their scalability, flexibility, and cost-efficiency. Coupled with the growing demand for reliable and high-performance connectivity, it is evident that a robust network infrastructure is crucial for businesses.

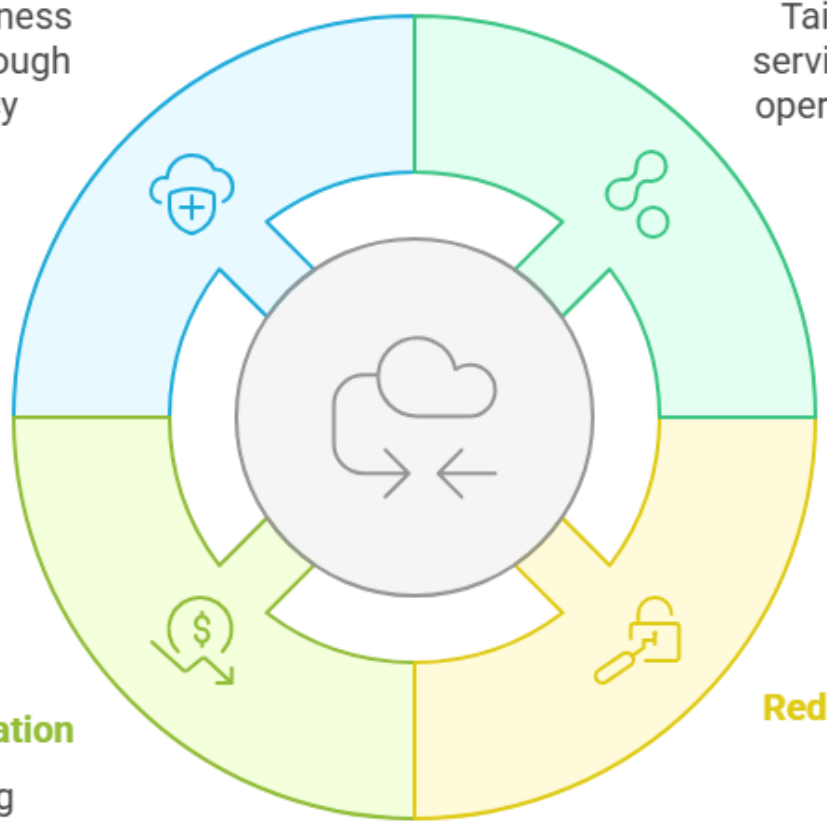


https://docs.bmc.com/docs/ctm_integrations/control-m-integrations-home-994589883.html

Key Networking Pain Points in Multicloud Environments



Key reasons for adoption of Multi-cloud architecture



Improved Disaster Recovery
Ensuring business continuity through redundancy

Flexibility
Tailoring cloud services to unique operational needs

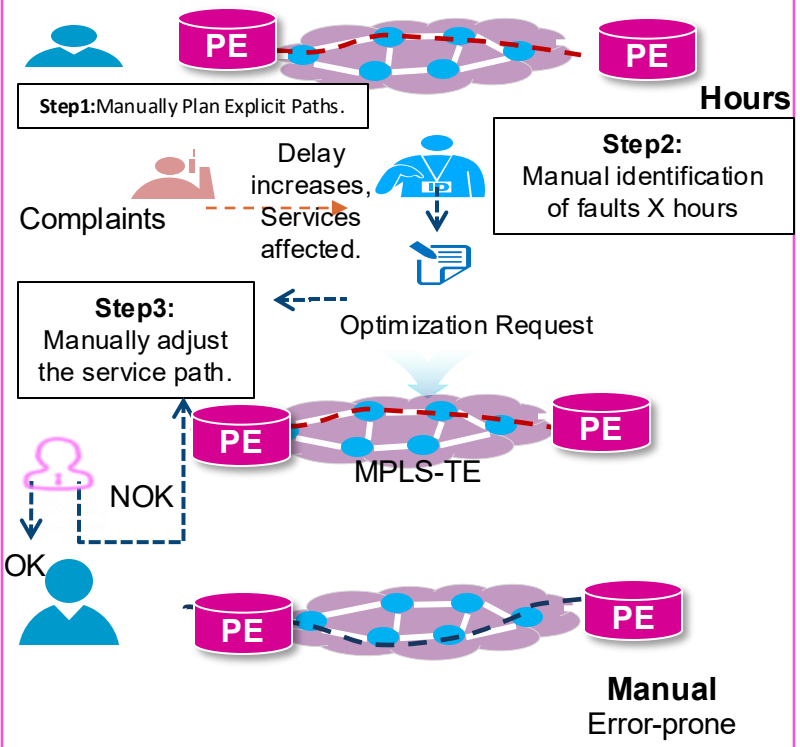
Cost Optimization
Leveraging competitive pricing models

Reduced Vendor Lock-in
Avoiding dependency on a single provider

SRv6 with Network Programmability-What is changing in the network?

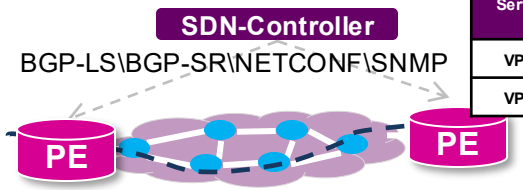
Industry Solution: SLA lacks proactive monitoring, and quality deterioration does not have automatic closed-loop measures.

- **Service quality** (packet loss, congestion and Latency) **cannot be perceived in real time**.
- Services **cannot be automatically optimized** after SLA deterioration. The delay of high-value services cannot be guaranteed.



Time Solution: Proactive SLA monitoring, proactive adjustment of quality deterioration paths, and closed-loop self-healing

- Real-time: **Monitor and adjust SLAs dynamically**, calculating service paths accordingly.
- Closed-loop: **Guarantee SLA policies**; display on optimization page and auto-optimize when SLA breaches.

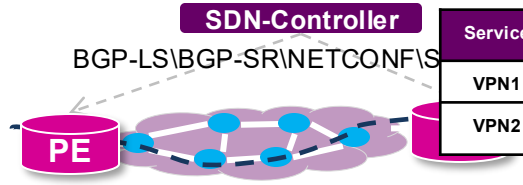


Service	Delay Threshold
VPN1	10ms
VPN2	20ms

S1: One-click service provisioning with service SLA

Service	Real-time Latency	Action
VPN1	15ms	Trigger Path Recalculation.
VPN2	18ms	

S2: Real-time statistics of link/node/service latency

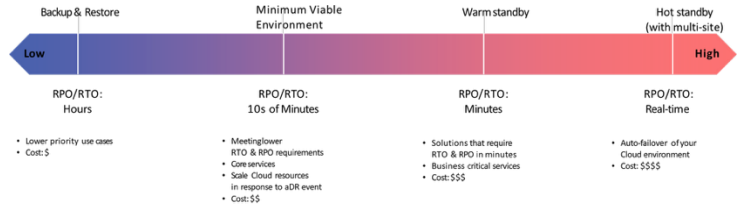


Service	Real-time Latency
VPN1	9 ms
VPN2	18 ms

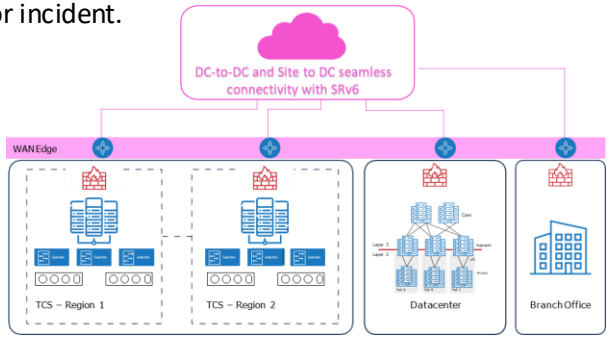
S3: Latency cracking, triggering path recalculation

Use Cases: Seamless DC connectivity with SRv6

- With **proactive SLA** monitoring, the system **dynamically adjusts the data path** between DCs based on real-time conditions, ensuring seamless replication and minimal service disruption
- **Cost effectivity** solution as DWDM alternative



- Recovery Time Objective (RTO): The maximum allowable length of time that can pass after a disruption before the system must be restored.
- Recovery Point Objective (RPO): The maximum allowable length of time during which data might be lost due to a major incident.



Section 1:
- The Multicloud Landscape & Its Demands

Section 2:
- : Introducing SRv6 – The Path to Modern Networking

Section 3:
- Solution for Seamless Multicloud Connectivity

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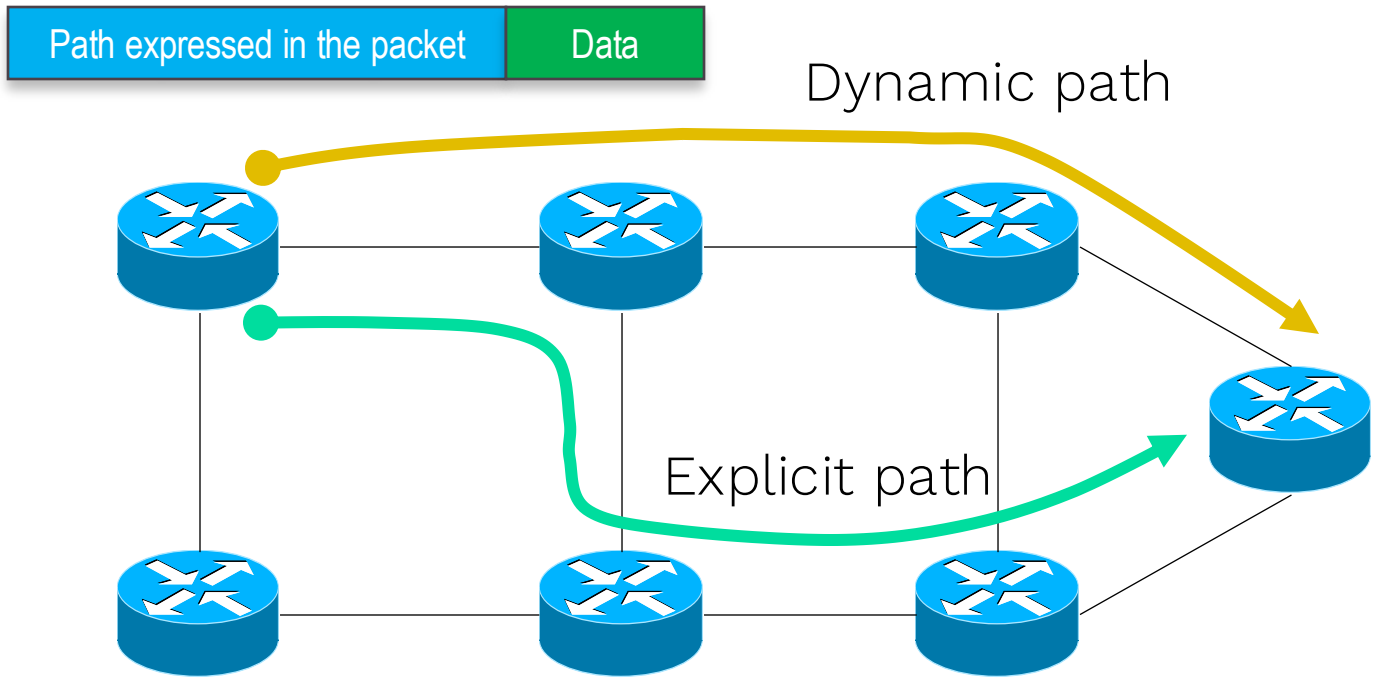
Segment Routing

Slide with animation

An IP and MPLS source-routing architecture that seeks the **right balance** between **distributed intelligence** and **centralized optimization**



Paths options

- Dynamic (Headend computation)
- Explicit (Operator / Controller)

Control Plane

- Routing protocols with extensions (IS-IS,OSPF, BGP)
- SDN Controller

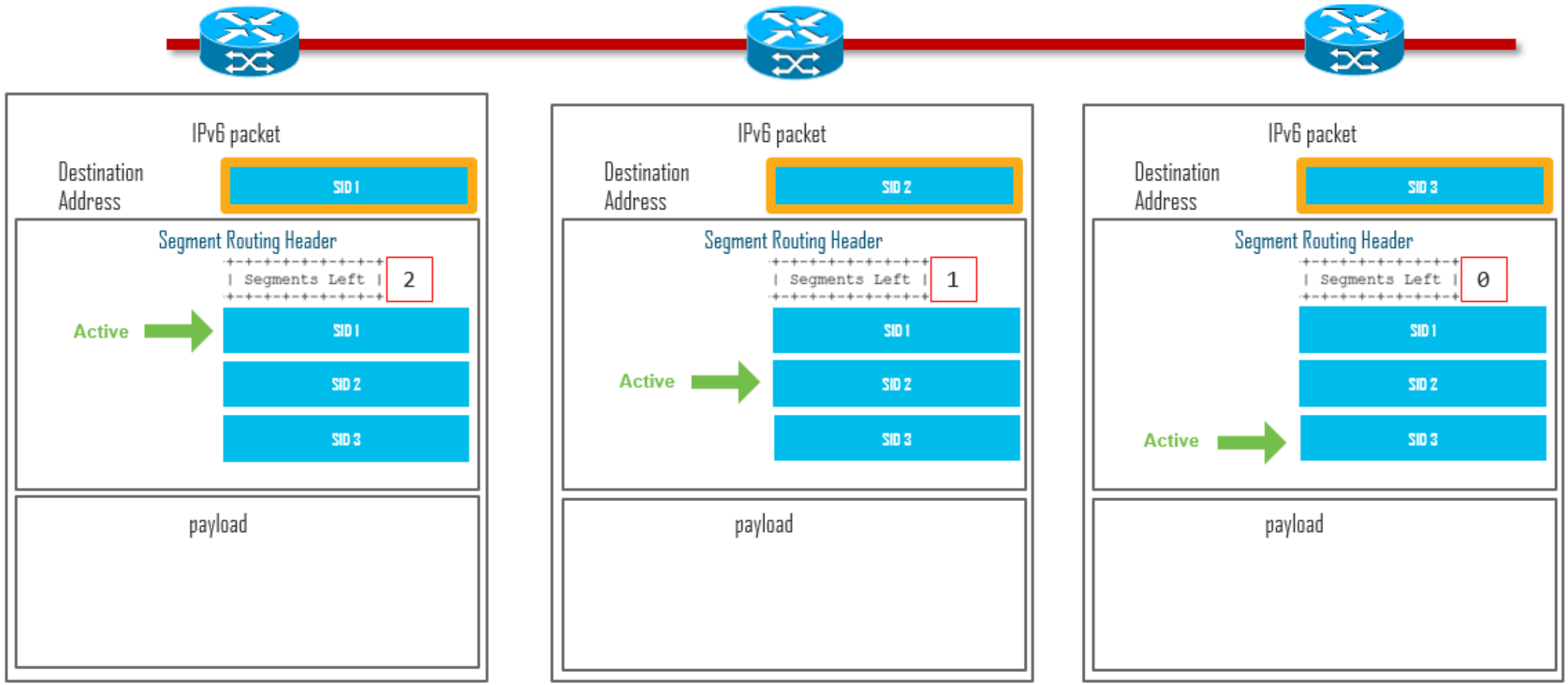
Data Plane

- MPLS (segment labels)
- IPv6 (+SR header)

IPv6 Forwarding Plane Operation

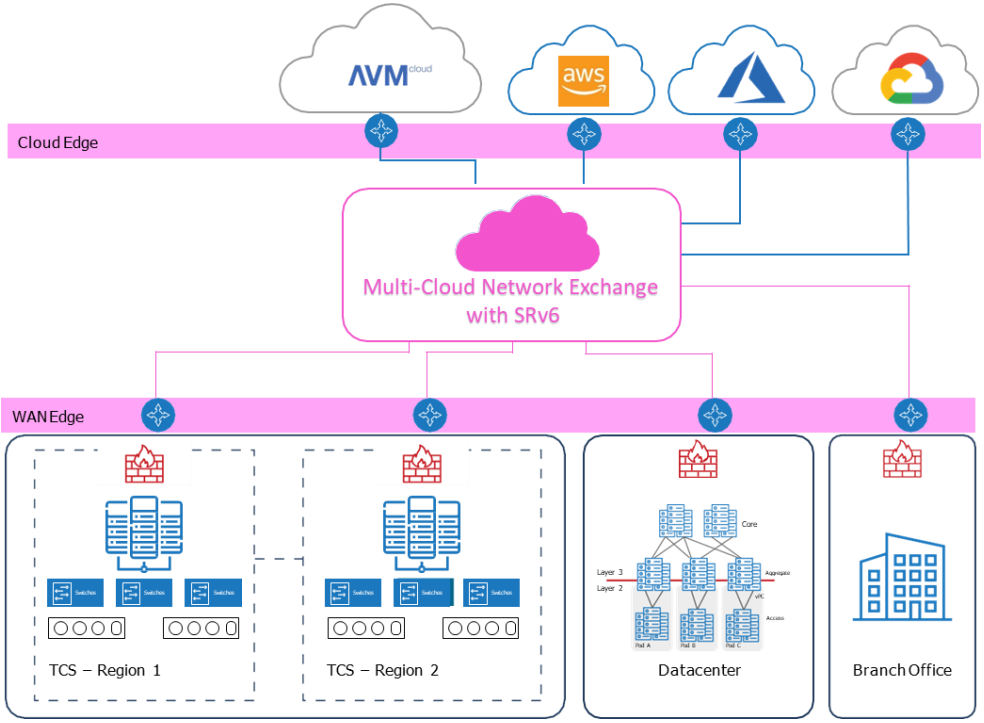
Active segment is in the destination address

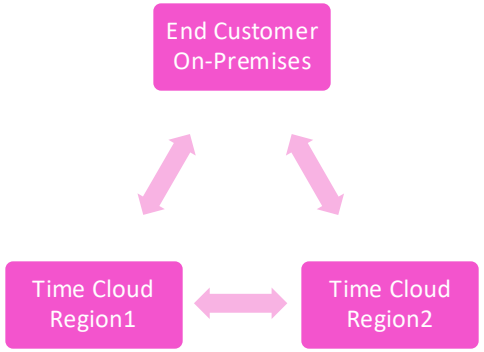
List of Segments in Segment Routing Header

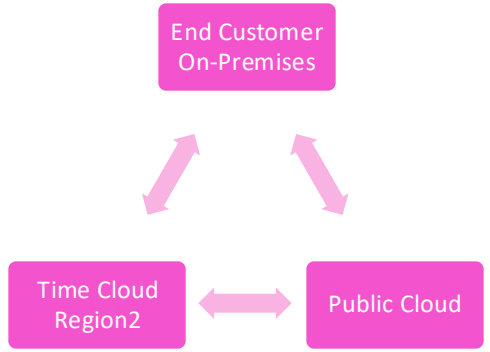


Solution Overview

- The proposed solution leverages TIME's extensive network infrastructure and expertise in cloud services to address these challenges.
- It adopts a holistic approach that combines cloud services and connectivity to deliver a seamless experience for enterprise customers.
- The solution also emphasizes the importance of a "cloud-aware" network architecture, which offers benefits such as unified management and security compliance across the organization's IT infrastructure, cloud-native integration, application-aware network infrastructure, faster time to market, and programmability and automation.







Demo Video

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Operational Impact: Key Observations

Category	Before SRv6 (Traditional MPLS/IP)	With SRv6 + SDN (Deployed Architecture)
Provisioning Time	Manual service provisioning via CLI or NMS; high risk of human error. Takes **2–4 hours** per service depending on complexity.	**One-click service provisioning** via SDN controller using SRv6 traffic engineering templates. Completed in **10–15 minutes**.
Path Optimization	Pre-defined static or semi-manual MPLS-TE paths. Changes require manual intervention and maintenance window.	**Real-time path optimization** triggered by SLA policy breach. Controller dynamically calculates alternate paths.
SLA Violation Detection	Reactive, based on end-user complaints or SNMP monitoring. Delays in detection and root cause identification.	**Proactive SLA monitoring** via telemetry. Latency, jitter, and loss thresholds continuously monitored by the controller.
Failover Response	May involve manual switch-over or depend on IGP convergence. RTO in **several minutes** or longer.	**Sub-second reroute** upon SLA breach or node/link failure. RTO in **1–3 seconds**.
Visibility & Analytics	Limited visibility into per-path performance. Relies on static monitoring and historical logs.	**Real-time telemetry and path statistics** at service level (VPN, DC path, etc.), enabling faster troubleshooting and reporting.
Service Consistency	Inconsistent due to manual changes, legacy systems, and lack of feedback loop.	Consistent SLA assurance via closed-loop control with automated remediation.
Scalability	Operationally intensive to scale. More services = more complexity.	Scales elastically via policy templates and programmable dataplane.

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Service Deployment Scenario/Customer Need and Use Cases

The table below outlines the scenarios, customer needs, and use cases for the proposed solution:

Scenario	Customer Need	Use Cases
End Customer On-Premises to Public Cloud	Reliable and high-performance connectivity for seamless access to public cloud services	• Data backup and disaster recovery • Accessing cloud-based applications and services • Offloading compute-intensive workloads to the cloud • Leveraging cloud-based storage solutions
End Customer On-Premises to TIME Cloud	Reliable network service for seamless connection between on-premises infrastructure and TIME's cloud	• Private cloud hosting • Data storage and backup • Collaborative workspaces • Virtual desktop infrastructure (VDI) • Secure remote access to enterprise resources hosted in TIME Cloud
TIME Cloud to Public Cloud (e.g., AWS)	Reliable and secure connectivity between TIME's cloud infrastructure and public cloud providers	• Hybrid cloud deployments • Workload offloading for burstable workloads • Leveraging specialized services available in public clouds • Data synchronization for multi-cloud environments • Disaster recovery scenarios
Between Regionwithin TIME Cloud	Network service for smooth communication and data synchronization between different availability zones	• High availability and fault tolerance • Load balancing for optimized resource utilization • Data redundancy for improved data integrity • Seamless failover capabilities for business continuity

Disaster Recovery (DR) strategies

When selecting a data replication method, it is crucial to assess your RTO and RPO needs and align these with your network capabilities. Here is a table that outlines the characteristics of each data replication method:

	Backup & Restore	Minimum Viable Environment	Warm Standby	Multi-Site
Application Criticality (Low to High)	Low	Medium	High	Very High
Budget (Low to High)	Low	Medium	High	Very High
Acceptable Data Loss (RPO: High to Low)	High	Medium	Low	Very Low
Acceptable Downtime (RTO: High to Low)	High	Medium	Low	Very Low

RPO/RTO: Hours

- Lower priority use cases
- Cost: $

RPO/RTO: 10s of Minutes

- Meeting lower RTO & RPO requirements
- Core services
- Scale Cloud resources in response to aDR event
- Cost: $$

RPO/RTO: Minutes

- Solutions that require RTO & RPO in minutes
- Business critical services
- Cost: $$$

RPO/RTO: Real-time

- Auto-failover of your Cloud environment
- Cost: $$$$

Summary

Section 1 The Multicloud Landscape & Its Demands

- Understanding the rise of multicloud and enterprise requirements for robust, agile connectivity.
- Exploring key drivers for multicloud adoption (flexibility, cost, DR, vendor choice).
- Identifying critical networking pain points in complex multicloud environments.

Section 2 Introducing SRv6 – The Path to Modern Networking

- Overview of Segment Routing principles and its evolution.
- Deep dive into SRv6 forwarding plane operations and its native IPv6 capabilities.
- How SRv6 enables network programmability and proactive, SLA-driven path management.

Section 3 TIME’s SRv6 Solution for Seamless Multicloud Connectivity

- Detailing TIME's holistic approach and "cloud-aware" network architecture, powered by SRv6.
- Showcasing the Multi-Cloud Network Exchange with SRv6 as a core enabler.
- Illustrating how SRv6 addresses diverse customer deployment scenarios and use cases.

Section 4 Ensuring Business Continuity & Looking Ahead

- The role of SRv6 in supporting robust Disaster Recovery (DR) strategies by meeting RTO/RPO.
- Future outlook for SRv6, its potential developments, and its impact on next-generation services.

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Any questions?

And that’s time

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