Building a Resilient Branch

CHALLENGES

Inefficient architecture
Active-standby architecture with long re-convergence times in event of failure

Manual configuration and complex management
Prone to manual configuration errors, difficult to manage and support

Expensive to architect
High operational and capital cost with minimal return on investment

SOLUTION

Operational efficiency through simplicity
Extending SD-WAN capabilities and simplicity to the HA architecture

Active-active HA cluster
Utmost application availability; no single point of failure

Cost efficient architecture
Streamlined design with automated configuration and deployment

With an increasing dependence on cloud-hosted SaaS applications, it is critical for the business to ensure no Wide Area Network (WAN) down-time to maximize productivity and end-user experience.

The traditional approach to achieve high WAN availability has been to purchase the most reliable transport service available, usually dual Multiprotocol Label Switching (MPLS) connections from service providers and redundant routers. Obviously, this approach is not cheap! It uses the most expensive circuits and hardware to ensure high availability (HA). Two possible physical connections for each WAN service are provisioned using two distinct IP addresses per WAN service. Traditional router HA architectures rely on the BGP or OSPF protocol for failovers, and re-convergence times for these protocols measure in the tens of seconds if not minutes, usually resulting in failed applications. In short, the HA architecture using traditional routers is complex, expensive – since one router operates actively while the other sits as a passive standby – and it is prone to manual configuration errors.

A new solution is needed that can simplify the HA architecture for the cloud-first enterprise to streamline configuration and management while delivering the utmost application availability. An advanced SD-WAN is the solution to address these challenges while maintaining cost efficiency.

SILVER PEAK SOLUTION

The Silver Peak Unity EdgeConnect HA cluster approach relies on its intelligent software stack to provide the highest resiliency while ensuring simplicity over any WAN transport including consumer broadband. The EdgeConnect HA cluster operates as a single logical system and provides both WAN transport and hardware resiliency to maintain application availability.

Let's look closer at how this works.

Failures may occur in one or more of these three areas:

> WAN link

> LAN link

> Device

Two EdgeConnect devices or VMs can be configured as an HA cluster that appears to the network as a single logical device and shares a single connection and IP address across the cluster (Figure 1). With the EdgeConnect HA cluster approach, virtual WAN overlays are extended over any transport and device maintaining simplicity as well as resiliency with packet-based multi-pathing.

The HA link between the devices enables local and WAN traffic to move between them without complexity or additional management. It employs VRRP (Virtual Router Redundancy Protocol) and appears as a single VIP (Virtual IP Address) as shown in the figure to ensure redundant LAN paths. In the case of LAN/

WAN link or device failure, EdgeConnect software automatically detects and routes traffic around the failure.

In the EdgeConnect HA cluster architecture, one appliance serves as the master to direct the steering of all traffic and to manage packet-based load sharing of traffic across bonded tunnels, even when the tunnel comprises links on both active EdgeConnect appliances. If one of the EdgeConnect appliances fails, the surviving appliance serves as the master, steering traffic across all links connected to it, providing a highly resilient solution.

The configuration steps in the Unity Orchestrator are very simple. As shown in the Deployment Profile template (Figure 2), it abstracts the configuration of individual chassis connections. Once the HA mode is enabled, the HA interconnect link and peer device are then selected.

KEY BENEFITS AND ADVANTAGES

Simplicity and Operational Efficiency

> All transports and devices are active and fully utilized based on business policies defined in the Orchestrator

> Bonded tunnels, business intent policies, analytics, metrics and WAN optimization are extended seamlessly over WAN links connected across the two EdgeConnect devices

> Hardware replacement or upgrades can be done at any time even during business hours
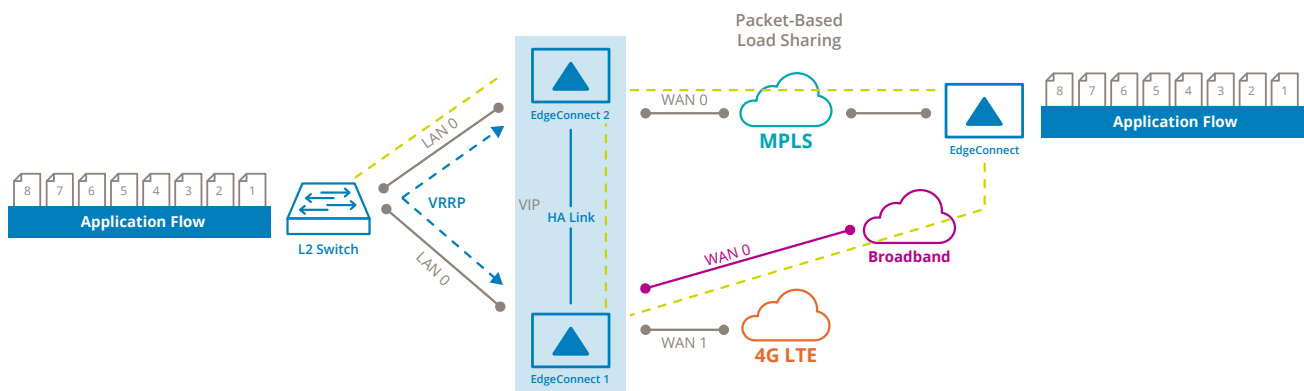

Figure 1: Simplified EdgeConnect HA cluster resulting in utmost application availability
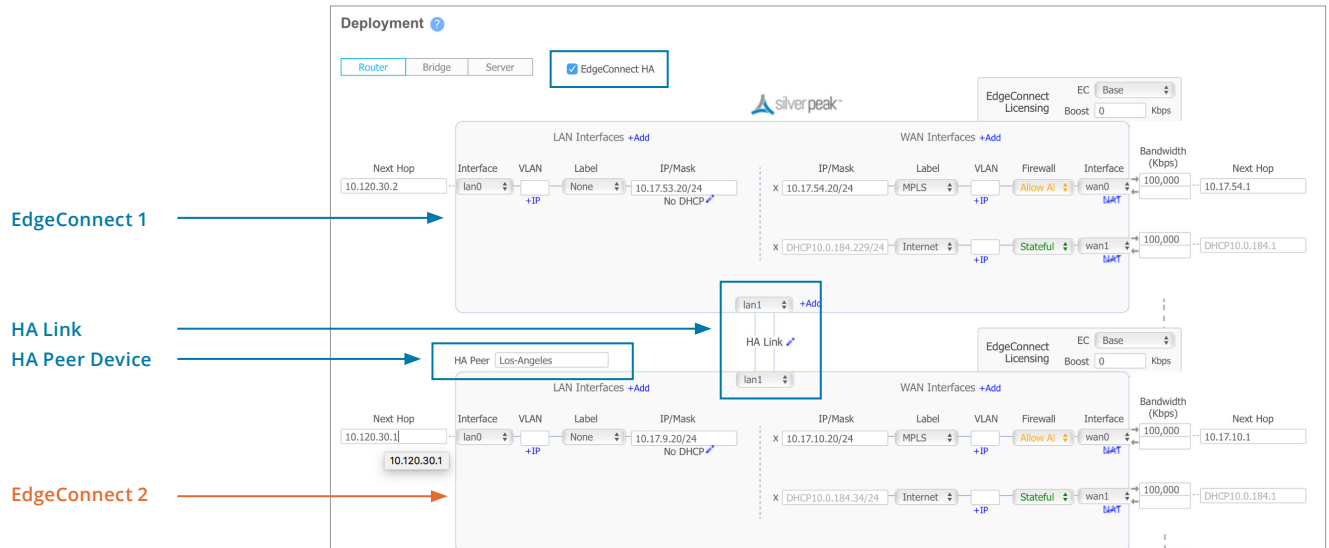
Figure 2: Unity Orchestrator Deployment Profile template for configuring EdgeConnect HA cluster

> There is no single point of failure

> Additional WAN capacity can be easily added via extra WAN ports provided on two appliances

Cost Efficiency

> Eliminates the added cost and complexity of provisioning and managing multiple IP addresses for each appliance and WAN service in the cluster

> Through automated configuration, errors are avoided resulting in less downtime and lower cost

> No upstream L2 switch required between WAN services and the EdgeConnect appliances

IN CONCLUSION

The Silver Peak EdgeConnect HA cluster solution uniquely provides a different approach to building a resilient branch. The active-active HA cluster maintains all of the advanced features and the management simplicity of the EdgeConnect SD-WAN solution. Eliminating single points of failure, the EdgeConnect HA solution provides the highest levels of application availability to enable businesses to build cloud-first branch offices.

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