Seven Key Considerations Before Your Upcoming F5 Load Balancer Refresh

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ABOUT THIS DOCUMENT

This whitepaper details how ADCs and virtual appliances are inflexible, expensive, and lacking in visibility in contrast to the central management, autoscaling features, intelligent analytics, and flexibility offered by the NSX Advanced Load Balancer. This document also outlines 7 key considerations that you should evaluate before you refresh your current load balancers:

1. Automation and Self-Service
2. Elasticity
3. Application Analytics and Troubleshooting
4. Performance
5. Hybrid Cloud
6. Ecosystem Integrations
7. Total Cost of Ownership

EXECUTIVE SUMMARY

Modern data centers run a combination of cloud-native applications and microservices architectures alongside traditional applications. Networking teams are under pressure to deliver services and resolve application issues quickly while lowering costs for application services. Your IT operations demand agile, cost-effective load balancing solutions.

Traditional application delivery controller (ADC) vendors such as F5 Networks barely address the needs of modern applications and cloud-native use cases. Instead, they force you down the path of expensive and inflexible hardware refreshes without addressing the fundamental challenges of elasticity, automation, multi-cloud use, and cost. Until now, enterprises had little choice but to depreciate their previous ADC appliance over just a few years and purchase more appliances when the time comes to refresh their load balancer.

In a recent blog post, Andrew Lerner, Vice President of Research at Gartner advises enterprises to avoid network incrementalism[1]. Before you commit to a multi-year license and maintenance contract with your appliance-based load balancing vendor, review these key considerations and their implications for the future of application services in your enterprise.

Avi Networks (a Gartner Cool Vendor in Enterprise Networking 2016) provides a next generation ADC that delivers a flexible, analytics-driven, application services fabric with a centrally managed, software-defined architecture. NSX Advanced Load Balancer provides complete automation for L4-L7 services with an elastic, multi-cloud approach that provides TCO savings of over 70% compared to traditional load balancing solutions.

APPLICATION DELIVERY CHALLENGES IN MODERN DATA CENTERS

Modern data centers use webscale technologies to optimize and automate compute and networking infrastructure. These environments use standard x86 servers for compute, centrally manage infrastructure as a fluid collection of resources, and enable seamless scaling by adding compute resources dynamically. However, load balancing and application services have been a different story. Enterprises have had little choice but to use inflexible hardware ADCs (application delivery controller) or low performance, clumsy virtual appliances. These appliances are often overprovisioned and cause businesses to overspend to gain the necessary performance and availability. They present several challenges:

- No central management - inefficient operations with each device managed separately
- Not architected for cloud-native applications with lots of east-west traffic
- Proprietary hardware leads to expensive overprovisioning without elastic scalability
- Unable to address per-application or per-service load balancing needs.
- Do not offer any visibility to the application or network to help resolve issues
- Cannot scale up or down in response to traffic and without manual intervention
- Lack of consistent architecture for multi-cloud and hybrid-cloud use cases

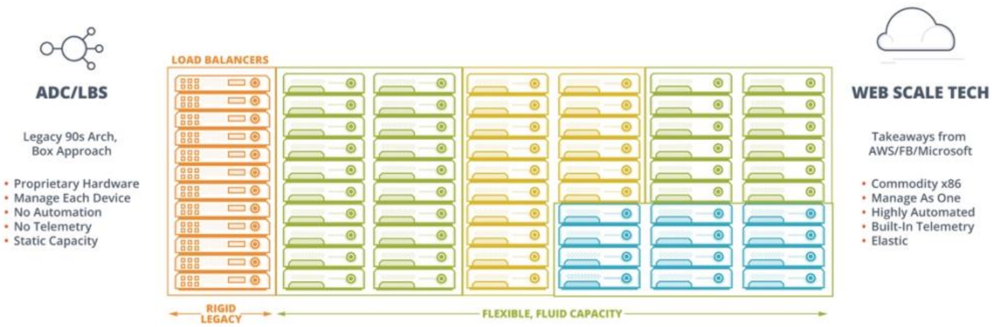

Figure 1: Legacy load balancers vs. programmable infrastructure in modern data centers

VMWARE NSX® ADVANCED LOAD BALANCER™

Next Generation Application Services with a Software-defined Architecture

Avi Networks delivers flexible application services beyond load balancing, including application analytics, predictive autoscaling, and automation in private data centers or the public cloud. NSX Advanced Load Balancer is built on software-defined principles and is architected to mirror the agility of next generation data centers and DevOps practices. NSX Advanced Load Balancer uses a distributed architecture with a centralized Avi Controller and distributed Avi Service Engines (load balancers) that are deployed on Intel x86 servers, virtual machines, containers, or the public cloud. Avi Service Engines communicate real-time application telemetry to the Avi Controller, which analyzes the data to provide visibility to applications along with actionable insights on performance, security, and end user experience to administrators. The Avi Controller also provides central management of a distributed pool of load balancing resources and predictively autoscales load balancers, as well as applications (through out-of-the box integrations with infrastructure orchestration platforms).

With the NSX Advanced Load Balancer, enterprises can replace their hardware appliances with a high-performance software load balancing solution that eliminates the need for expensive, proprietary hardware.

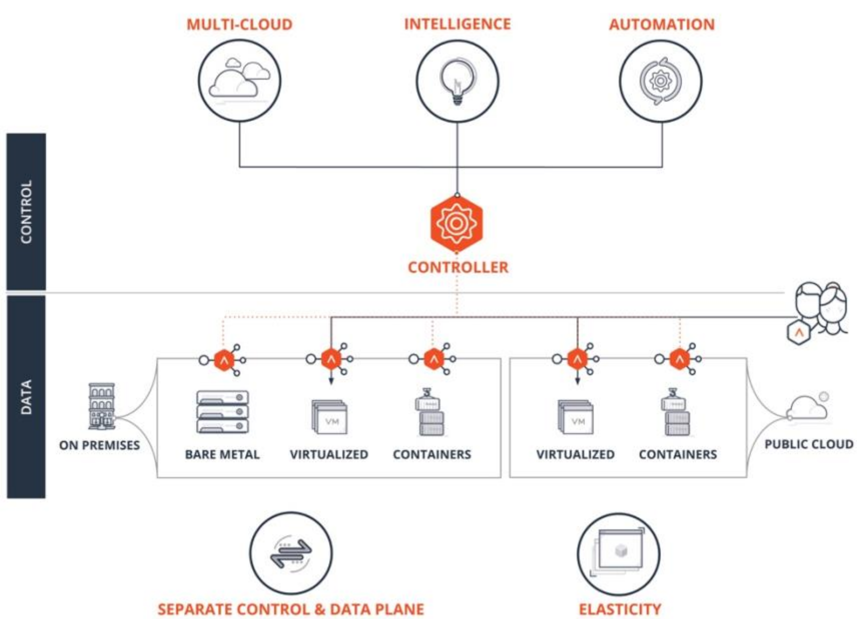

Figure 2: NSX Advanced Load Balancer – high-level architecture

CONSIDERATION #1: AUTOMATION AND SELF-SERVICE

The Traditional Approach

For many enterprises, traditional load balancing architectures represent a last-mile problem. Although they already optimize for DevOps principles and continuous delivery goals, development teams are still waiting weeks or months for resolution of IT tickets, waiting for IT teams to provision additional VIPs or rollout applications and updates. Administrators lack basic visibility of virtual services. Even today, several networking teams maintain lists of VIPs and pool members in spreadsheets! Network administrators need to consider application dependencies, perform manual capacity and tenancy assessments to decide where to place new VIPs, and if necessary order additional hardware to manually provision application services. Once load balancers are picked or purchased, they need to manually configure the network parameters, including physical connections, VLANs, and IP configurations before they can provision the VIP. The process often takes several weeks.

How Avi Networks Enables Automation, Self-Service, and Visibility

The Avi Controller is a single point of management and automation for administrators to quickly provision the capacity required by their applications. With the NSX Advanced Load Balancer, administrators can setup developers and application owners to automate capacity provisioning by building in services through a 100% REST API-driven model. All APIs are designed, built, and documented in the platform with the Swagger framework. Administrators can eliminate tedious manual tasks and provision new VIPs in a matter of seconds. NSX Advanced Load Balancer enables administrators to provide policy-based access to the console for application owners for troubleshooting and monitoring, and to integrate the platform with orchestration services.

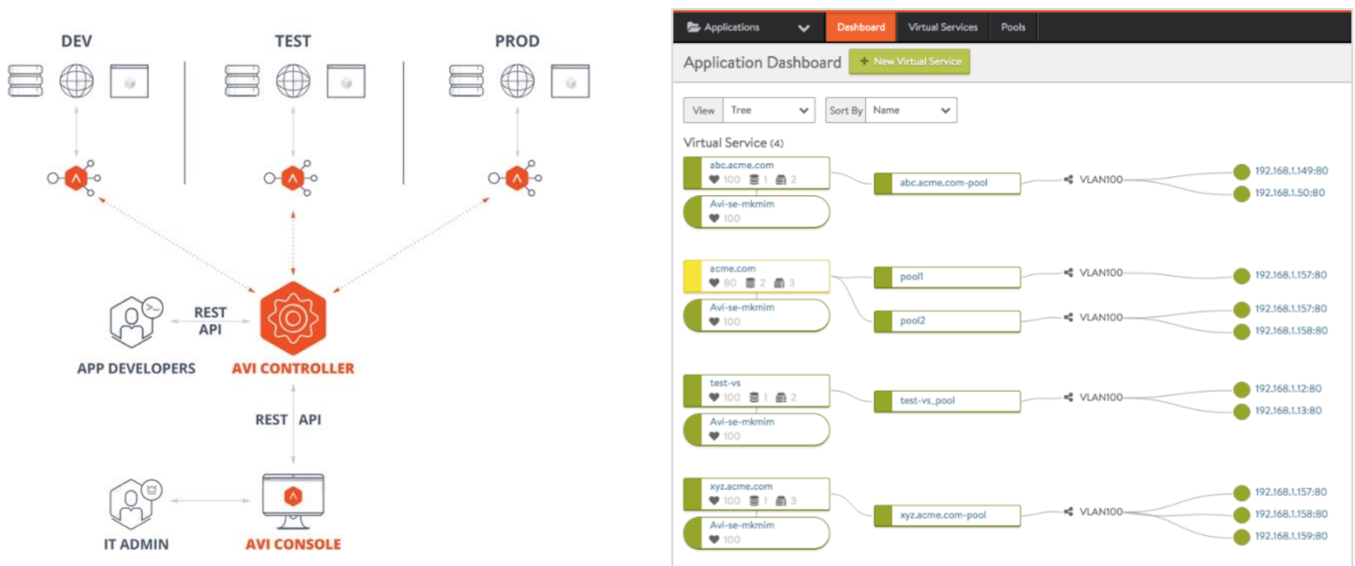

Figure 3: NSX Advanced Load Balancer automation and visibility (showing tree view of virtual services)

CONSIDERATION #2: ELASTICITY

The Traditional Approach

Enterprises are challenged with understanding and planning for peak usage, with the ability to scale up dynamically and scale down when demand recedes. With traditional load balancers, enterprises are forced to overprovision application services upfront or scramble to deploy additional appliances when they need to scale. With no visibility into application usage patterns or performance analytics, the tendency to overcompensate for performance and scale is a common challenge. Enterprises end up paying a huge premium for scalability. Appliance-based solutions do not offer the elasticity needed to support dynamic scale up or scale down of load balancing services.

How Avi Networks Delivers Elastic Load Balancing Services

NSX Advanced Load Balancer uses a software-defined architecture to centrally orchestrate a distributed fabric of load balancers. The distributed data plane components (Avi Service Engines) collect real-time telemetry from application traffic flows across the entire deployment. The Avi Controller analyzes the information to generate intuitive application performance and security dashboards for administrators. The data enables administrators to define preset thresholds to trigger autoscaling of load balancers and/or application servers. The Avi Controller automatically spins up software load balancers on demand in response to growing traffic needs and then spins them down when demand recedes. The ability to deploy load balancers dynamically on commodity x86 servers, VMs, or containers enables the use of webscale principles for elasticity of application services. NSX Advanced Load Balancer is also able to trigger the autoscaling of backend applications through integrations with orchestration platforms and scripting tools.

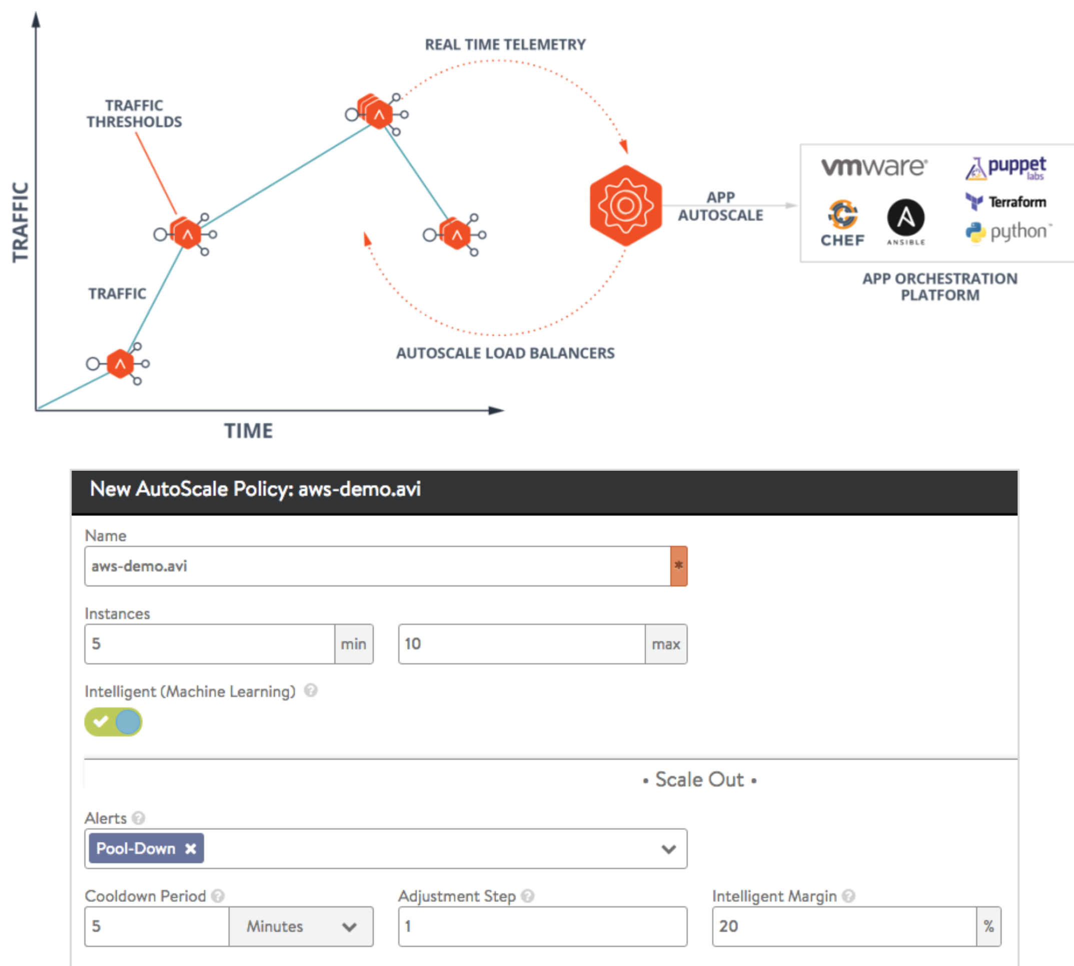

Figure 4: NSX Advanced Load Balancer predictive autoscaling and screenshot showing traffic thresholds for autoscaling

CONSIDERATION #3: APPLICATION ANALYTICS AND TROUBLESHOOTING

The Traditional Approach

Load balancers occupy a strategic location in the enterprise data center – in the path of application traffic. However, architectural limitations of traditional ADCs appliances have prevented them from taking advantage of this location privilege to provide meaningful application insights. Traditional architectures cannot provide application and end user insights or visibility to all virtual services. Network engineers have very few options to troubleshoot application issues or identify network bottlenecks. Often, they need to troubleshoot network issues with span ports, TCP dumps, and log traces in a process that might take several days. This often leads to finger-pointing between teams, putting the onus on network engineers to perform root-cause analysis and fix transient issues that may not reproducible.

How Avi Networks Provides Analytics and Troubleshooting

NSX Advanced Load Balancer is built on software-defined principles with a central controller (Avi Controller) and a distributed fabric of software load balancers (Avi Service Engines). In addition to providing enterprise-grade application delivery services, the Avi Service Engines send real-time telemetry about the application to the Avi Controller, which analyzes the data and provides pinpoint analytics and visibility into application performance, transaction round trip times, and end user and security insights. The platform acts as a “Network DVR”, enabling administrators to record and view traffic events and application information, from the past 15 mins, 6 hours, day, week, month, or year. Network administrators can zero-in on application issues and resolve problems in a matter of minutes.

AVI APP INSIGHTS

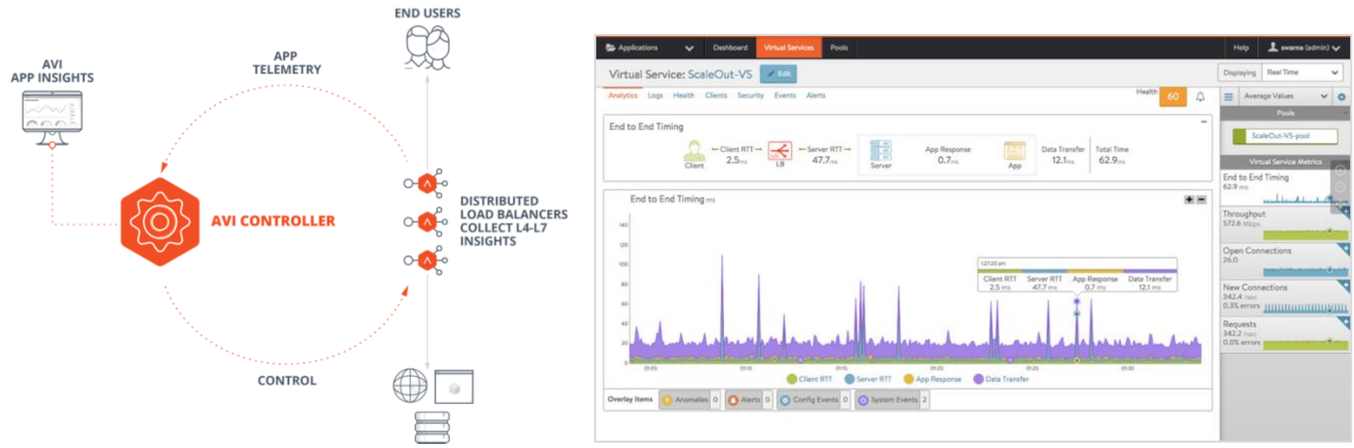

Figure 5: Real-time telemetry from load balancers used for NSX Advanced Load Balancer analytics and health-score dashboard

CONSIDERATION #4: PERFORMANCE

The Traditional Approach

Ever since load balancers were first introduced, ADC vendors have made the case for proprietary hardware to meet performance requirements. The argument for custom hardware was that purpose-built hardware can outperform generic Intel architecture servers when it comes to load balancing services. It is no wonder that each new revision of hardware ADCs is more expensive than the previous version forcing customers to increase spending in a continuous cycle of hardware refreshes. However, improvements in the speeds of Intel x86 architecture processors, memory performance, and network interface cards have made performance concerns of Intel servers a thing of the past.

How Avi Networks Delivers Superior Performance

NSX Advanced Load Balancer can deliver a terabit class load balancer with its software-defined approach to application services. In a single Intel server (two sockets with 12 cores each), which costs less than $8000, NSX Advanced Load Balancer can deliver over 60,000 SSL TPS (ECC with Perfect Forward Secrecy). Used by large multi-national corporations, the platform provides a software-only approach, and can be deployed on bare metal servers, VMs, or containers in private data centers or public clouds and is used by large, multi-national corporations. NSX Advanced Load Balancer spins up new load balancers and VIPs in a matter of seconds and eliminating cumbersome manual processes to provision new applications. With policy-based triggers for predictive autoscaling of load balancers, the platform scales in and out elastically on commodity x86 hardware. The platform enables the deployment of scalable application services down to individual applications (per app load balancers), and supports multitenancy natively.

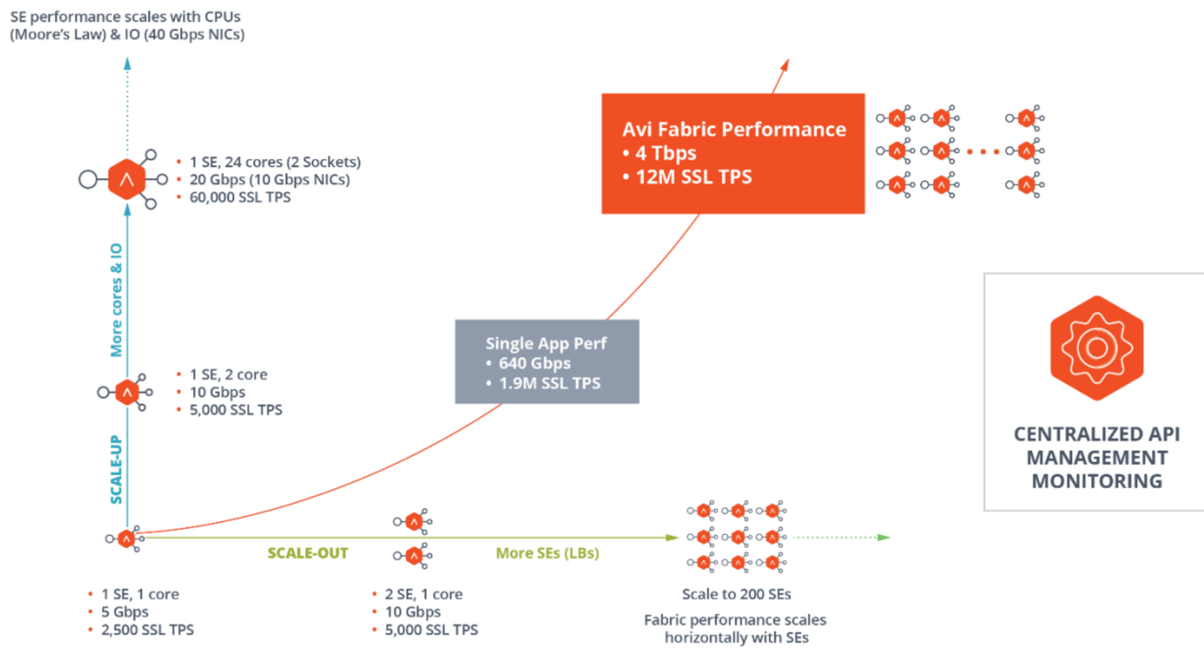

Figure 6: Vertical (scale up) and horizontal (scale out) scaling and performance with NSX Advanced Load Balancer

CONSIDERATION #5: HYBRID CLOUD

The Traditional Approach

Load balancers were built for use in data centers prior to the public clouds, and private clouds. As virtualization, public and private clouds emerged, load balancer vendors began to force fit their solutions for these environments with virtual editions of their appliances. While these virtual versions are offered as software that can run on VMs, they inherit the same disadvantages of the hardware appliances with disparate management, lack of automation, and elasticity. Virtual load balancers offer poorer performance and are not recommended by appliance vendors, except when customers need a solution for the cloud. Unfortunately, these solutions are cost prohibitive to run the public cloud and do not offer centralized management or enable hybrid cloud operations. Enterprises often end up with completely different application delivery solutions for their data center and cloud applications.

How Avi Networks Supports Hybrid and Multi-Cloud Use Cases

With its infrastructure-agnostic architecture, the NSX Advanced Load Balancer natively supports hybrid and multi-cloud environments. Avi Networks delivers a consistent software-defined architecture for application services with central management, visibility, security, and unique application analytics that are common across these environments. The performance and elasticity of the platform is also consistent across different data center and cloud environments. With the NSX Advanced Load Balancer, enterprises can use intelligent hybrid cloud traffic management and application scaling across their data centers and the public cloud with central management. Enterprises developing container-based microservices applications get full stack L4-L7 services, including service discovery, service proxy, interactive application maps (showing traffic between each microservice), and micro-segmentation capabilities.

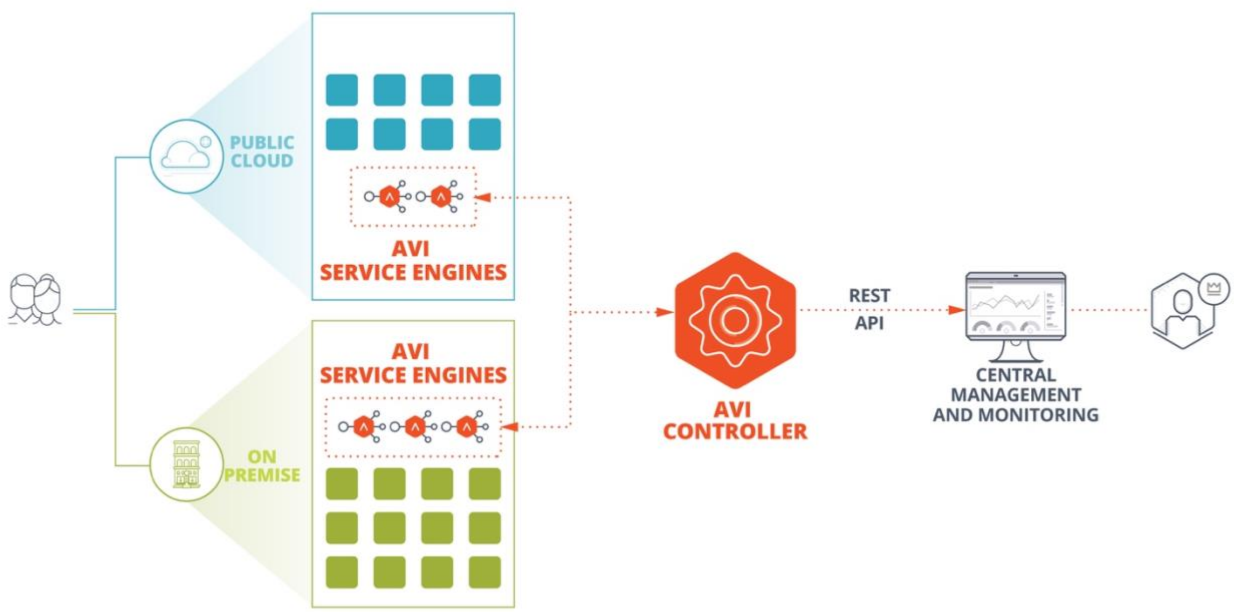

Figure 7: Hybrid cloud intelligent traffic management and scaling with NSX Advanced Load Balancer

CONSIDERATION #6: ECOSYSTEM INTEGRATIONS

The Traditional Approach

In traditional ADC architectures, each load balancer is a distinct appliance (whether hardware or virtual) that needs to be configured and managed individually. They do not offer native integration with infrastructure and private cloud orchestration platforms and require manual configurations and provisioning. As enterprises seek to automate IT operations and enable internal self-service to achieve cloud-like flexibility, ADCs must operate in a way that matches the automation initiatives used by infrastructure teams.

How NSX Advanced Load Balancer Simplifies Application Services with Ecosystem Integrations

The NSX Advanced Load Balancer is built with 100% REST APIs for all capabilities offered by the platform. The Avi Controller is a single point of control and automation and provides out-of-the-box integrations with popular infrastructure orchestration, SDN, or PaaS solutions such as VMware vCenter and NSX, OpenStack, Cisco ACI/APIC, Cisco CSP (NFV), Juniper Contrail, Nuage VSP, Amazon AWS, Google Cloud Platform, Microsoft Azure, RedHat OpenShift, Kubernetes, Mesos/Marathon, and Docker UCP. The platform also enables administrators and DevOps teams to use configuration management and orchestration tools such as Ansible, Chef, and Puppet to automate common server and network management tasks. The ecosystem integrations enable network administrators to deploy load balancing services in minutes instead of weeks and provide self-service capabilities to their internal customers. Application provisioning, troubleshooting, and configuration management tasks that would normally take weeks with traditional hardware or software appliances takes just a few hours with the NSX Advanced Load Balancer.

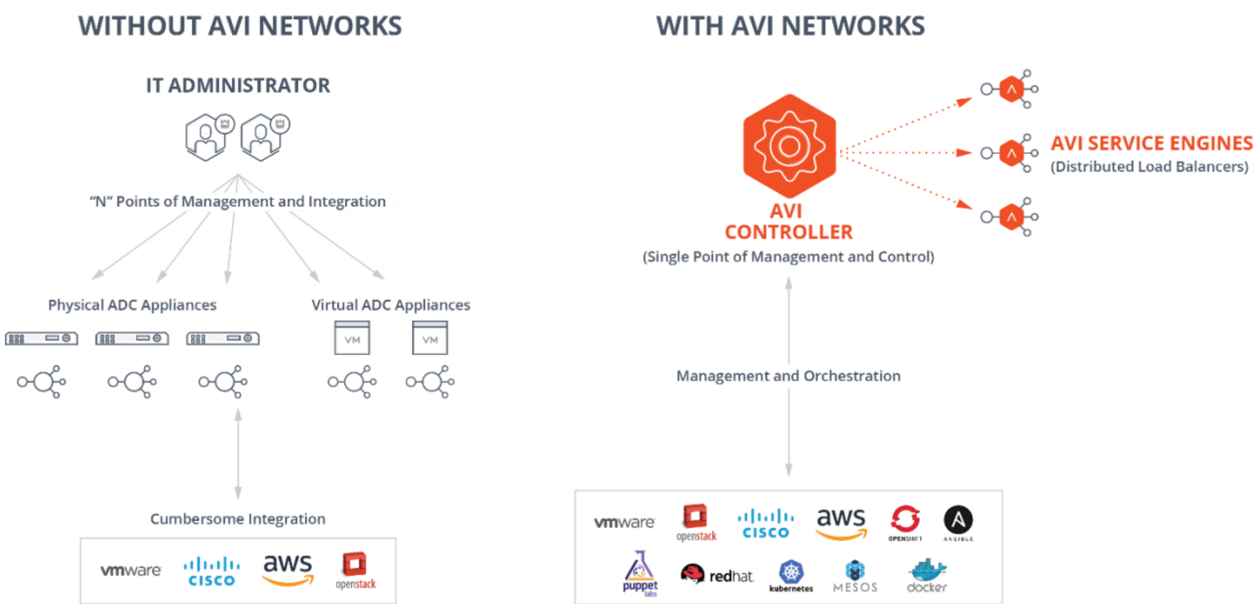

Figure 8: Ease of integration and management without and with NSX Advanced Load Balancer

CONSIDERATION #7: TOTAL COST OF OWNERSHIP

The Traditional Approach

As new cloud-native applications and data center automation initiatives have emerged, many leading appliance-based load balancers have become cost prohibitive for enterprises. While the price/performance ratio of Intel x86 servers continues to decrease in accordance with Moore's law, these costs savings are never available to enterprises choosing appliance-based ADCs. Each hardware refresh from ADC vendors, such as F5 Networks, cost more than the previous version, and businesses still must choose different point solutions to address different use cases. In addition, new appliances or virtual editions need to be purchased to scale applications.

How NSX Advanced Load Balancer Lowers TCO

NSX Advanced Load Balancer is an enterprise-grade ADC which runs on standard x86 servers, VMs, containers, and the public cloud. Subscription is based on the number of vCPUs on which the distributed load balancers run. The solution enables enterprises to size their load balancers based on application needs (instead of overprovisioning upfront) and scale horizontally, on demand as the application need grows. The platform eliminates the need for custom hardware and reduces operational challenges by providing application/network performance management (APM/NPM) capabilities. Customers save greater than 60% to 70% over the cost of the leading appliance-based ADCs.

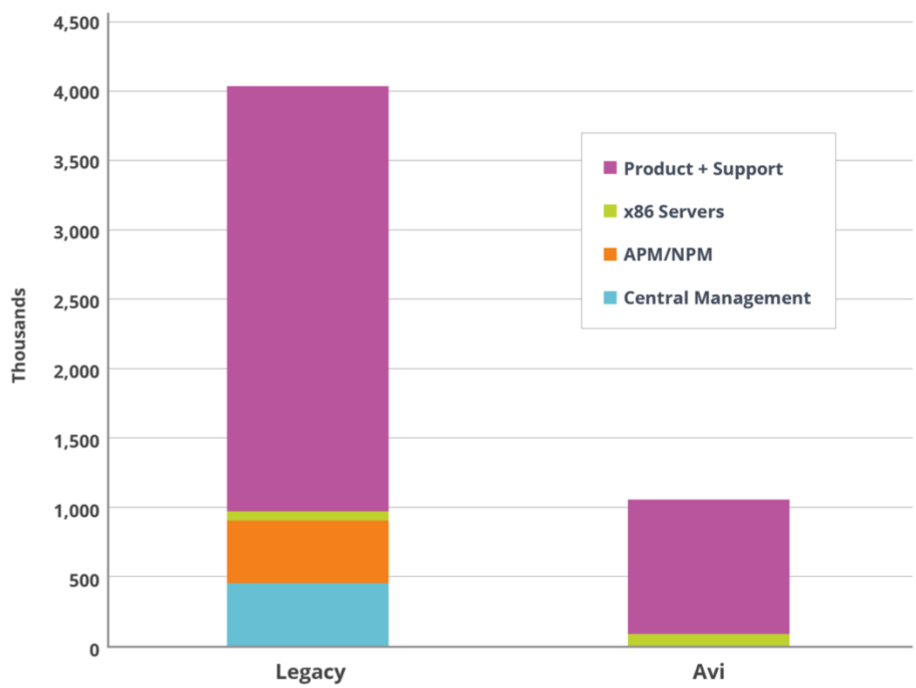

Figure 9: Sample comparison showing TCO savings of 65% to 75% with Avi Networks over F5 Networks

CONCLUSION

Enterprises looking to refresh their F5 load balancing appliances now have an opportunity to get an enterprise-grade load balancer with better capabilities at significant cost savings. Avi Networks has already enabled Global 2000 financial services firms, retailers, technology companies, and service providers to solve advanced application services use cases and accelerate the rollout of applications. Contact Avi Networks (*sales@avinetworks.com*) for a custom demo and more information about the product.

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