Solution Overview

Migrate from Cisco ACE to a Next-Generation Load Balancing Solution from Avi Networks and Cisco

Applications in your data center and your IT operations demand agile, cost-effective load-balancing solutions. The Avi Vantage Platform and the Cisco® Cloud Services Platform (CSP) 2100, Cisco's network functions virtualization (NFV) platform, offer a software-based approach to help you migrate from the Cisco Application Control Engine (ACE) with flexible and elastic application delivery services. This integrated solution enables faster application rollouts, simpler troubleshooting, and automation at significant savings in operational and licensing costs.

Overview

Customers using Cisco ACE for load balancing need to migrate to another solution soon because Cisco has exited the application delivery market and announced the end-of-life for Cisco ACE. Cisco ACE software releases are no longer supported and Cisco recommends that its customers running Cisco ACE make the transition as soon as possible.

Until now, enterprises had little choice but to swap out Cisco ACE for an appliance-based load balancer from another vendor. However, modern data centers need to run a combination of cloud-native applications built on microservices architectures alongside traditional applications. Traditional architectures and hardware-centric load balancers are proving to be too inflexible to provide cost-effective scaling and to handle modern application architectures driven by automation, multi-cloud requirements, and programmable self-service.

Avi Networks and Cisco have partnered to provide a Cisco ACE replacement solution. This solution combines flexible, analytics-driven load-balancing software (Avi Vantage Platform) deployed on high-performance NFV Platform called the Cisco CSP 2100. The combined solution provides a highly automated, elastic, software-based approach to load balancing with savings of more than 50 percent in total cost of ownership (TCO) compared to traditional load-balancing solutions.

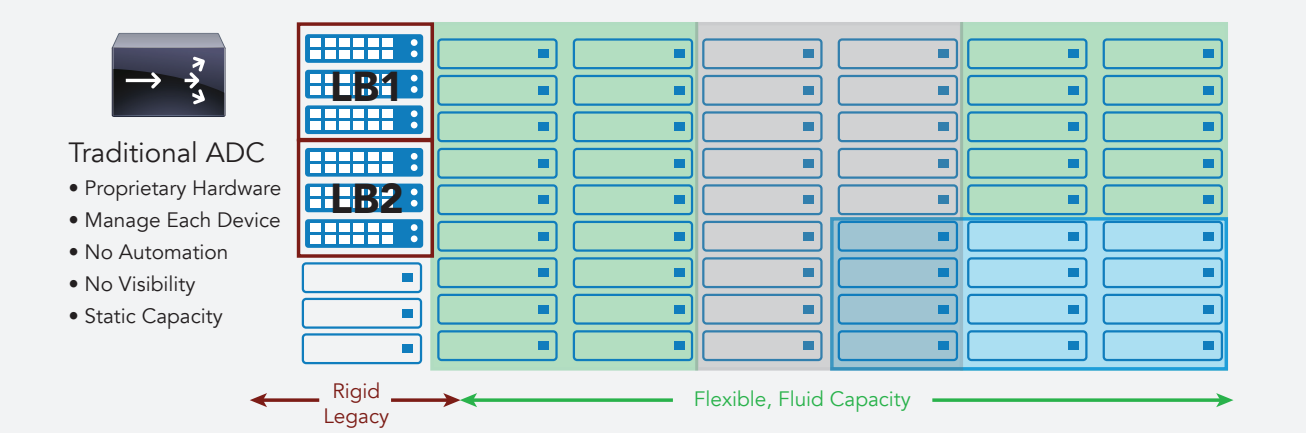
Application Delivery Challenges in Modern Data Centers

Modern data centers use webscale technologies to optimize and automate computing and networking infrastructure. These environments use standard x86 servers for computing and can centrally manage infrastructure as a fluid collection of resources and provide transparent scaling through dynamic addition of computing resources. However, load balancing and delivery of application services have proved to be more difficult. Enterprises have had little choice but to use inflexible hardware application delivery controllers (ADCs) 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:

- They have no central management, leading to inefficient operations because each device must be managed separately.
- They are not designed for cloud-native applications with lots of east-west traffic.
- The use of proprietary hardware leads to expensive overprovisioning without elastic scalability.
- They cannot address per-application or per-service load-balancing needs.
- They do not offer any visibility into the application or network to help resolve problems.
- They cannot scale up or down in response to traffic and without manual intervention.
- They lack the consistent architecture needed for multi-cloud and hybrid-cloud use cases.

Figure 1 shows the differences between traditional designs and modern programmable infrastructure.

Figure 1. Traditional Load Balancers Versus Programmable Infrastructure in Modern Data Centers



Cisco Cloud Services Platform 2100 and Avi Vantage Platform

With the Cisco CSP 2100 and Avi Vantage Platform, enterprises and service providers can replace their Cisco ACE appliances with a flexible turn-key load-balancing solution on an industry-standard NFV platform that scales elastically without breaking their budgets.

Cisco Cloud Services Platform 2100

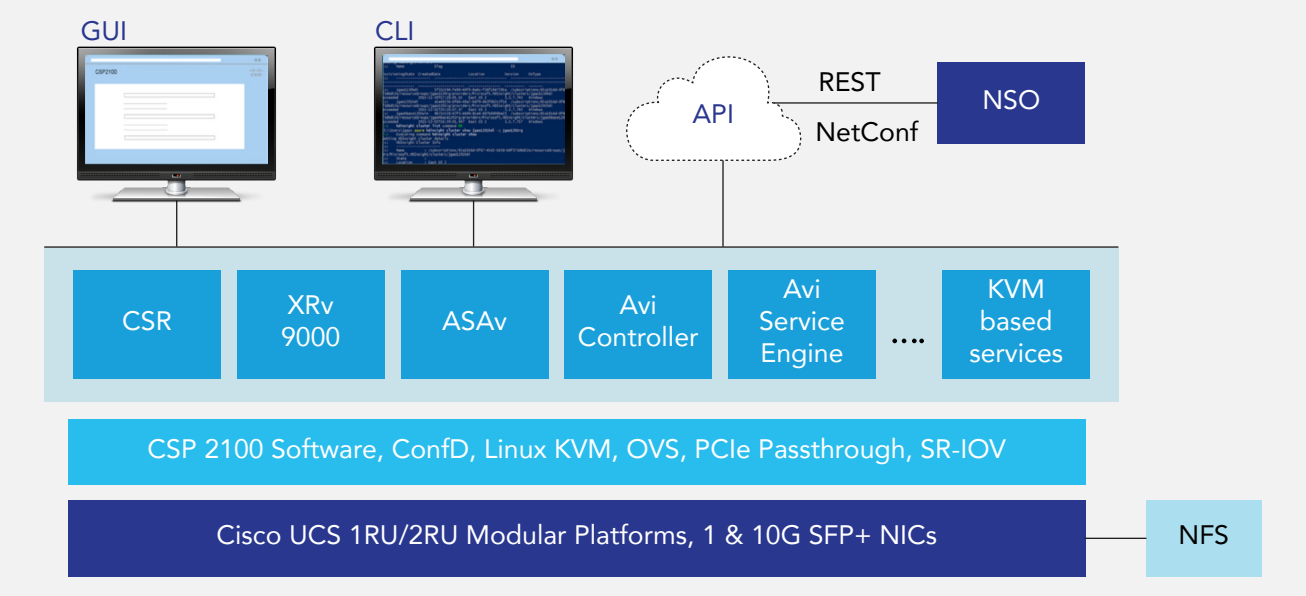
The Cisco CSP 2100 is a turn-key and open data center NFV platform for Cisco and third-party virtual network functions (VNFs). NFV virtualizes networking functions and runs them as software in cloud-like infrastructure. NFV represents a fundamental architectural shift for network engineers and network administrators who are concerned about patch management and updates for standard x86 servers and virtual machines in their critical network infrastructure. Delivering network functions on an appliance form factor using standard hardware simplifies server management and provides a scalable approach to network functions.

The Cisco CSP 2100 is an NFV platform that supports fully virtualized networking components and automation of network services. It uses:

- Standard x86 servers
- Virtualized and software-based functions
- API-based approach (representational state transfer [REST] API and NetConf/Yang)
- Elastic scale-out architecture

The Cisco CSP 2100 is built on the Linux Operating System. Its convenient appliance form factor provides the agility of software with the performance benefits of hardware. Customers can now run an assortment of virtualized network functions on a single standard platform (Figure 2).

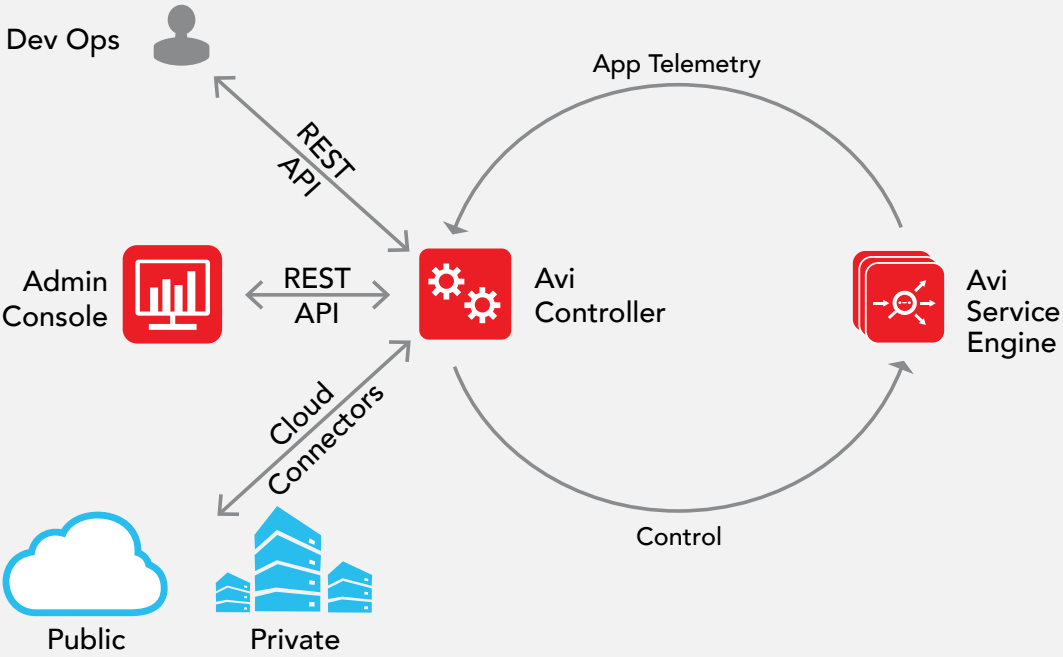
Figure 2. Cisco Cloud Services Platform 2100 High-Level Architecture



Avi Vantage Platform

The Avi Vantage Platform delivers application services that go beyond load balancing to include precise application analytics, security, application visibility, and predictive, on-demand autoscaling. The platform is designed on software-defined principles with separate control (Avi Controller) and data planes (Avi Service Engine distributed load balancers). It delivers the capabilities of an enterprise-class ADC in an elastic, software-only solution. The platform provides central management over a distributed load-balancing fabric deployed close to individual applications (Figure 3).

Figure 3. Avi Vantage Platform High-Level Architecture



Avi Networks and Cisco Cloud Services Platform 2100 Joint Cisco ACE Replacement Solution

The Cisco CSP 2100 and the Avi Vantage Platform together provide a turn-key load-balancing solution with expanded Layer 4 through Layer 7 (L4-L7) services on an elastic NFV platform without requiring any additional technical expertise. The centralized management - critical to both the Avi Vantage Platform and the Cisco CSP 2100 - helps ensure that administrators can efficiently roll out elastic load-balancing and application-monitoring capabilities with industry-leading performance. With a single Cisco CSP 2100 appliance supporting tens of Gbps of throughput, tens of thousands of SSL transactions per second (TPS), and several million concurrent connections, performance is not a concern for network functions. In addition, the system can transparently scale to several terabits per second (Tbps) of throughput and millions of SSL TPS as a single load-balancing fabric.

Cisco CSP 2100 and Avi Vantage offer these benefits:

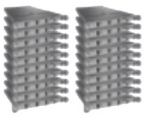
- Convenience of an NFV appliance with the flexibility of software
- Elimination of server and patch management concerns
- High-performance load balancing with elastic, on-demand scaling
- Greater than 50 percent TCO savings with lower acquisition and operating costs
- Powerful application, security, and end-user insights and analytics

Table 1 presents the mapping between Cisco ACE appliances, their respective performance capabilities, and the corresponding Cisco CSP 2100 and Avi Service Engine sizing. Compute the total number of Avi Service Engine cores needed from this table and identify the Cisco CSP 2100 bundle that you need from Table 2.

Table 1. Cisco ACE to Avi Networks + Cisco CSP 2100

Existing Cisco Model		Migration to Cisco CSP + Avi Vantage	
Ace 4710 	• Throughput: 0.5, 1, 2, 4 Gbps • SSL Throughput: 1 Gbps • SSL TPS: 7,500	Cisco CSP + 4-core Avi SE 	• Throughput: 20 Gbps • SSL Throughput: 4 Gbps • SSL TPS: 8,000
Ace 30 Service Module 	• Throughput: 4, 8, 16 Gbps • SSL Throughput: 6 Gbps • SSL TPS: 30,000	Cisco CSP + 15-core Avi SE 	• Throughput: 75 Gbps • SSL Throughput: 15 Gbps • SSL TPS: 30,000
GSS 4429R 	• ACE Global Site Selector	Cisco CSP + 1-core Avi SE 	• Built-in functionality in Avi
CSM Module 	• Throughput: 4Gbps • SSL Throughput: 0 • SSL TPS: N/A	Cisco CSP + 1-core Avi SE 	• Throughput: 5 Gbps • SSL Throughput: 1 Gbps • SSL TPS: 2,000
CSS 11501S-C 	• Throughput: 1.8 Gbps • SSL Throughput: 0.5 Gbps • SSL TPS: 1,400	Cisco CSP + 1-core Avi SE 	• Throughput: 5 Gbps • SSL Throughput: 1 Gbps • SSL TPS: 2,000
CSS 11503 	• Throughput: 6 Gbps • SSL Throughput: 1 Gbps • SSL TPS: 2,800	Cisco CSP + 2-core Avi SE 	• Throughput: 10 Gbps • SSL Throughput: 2 Gbps • SSL TPS: 4,000
CSS 11506 	• Throughput: 12 Gbps • SSL Throughput: 2 Gbps • SSL TPS: 5,600	Cisco CSP + 3-core Avi SE 	• Throughput: 15 Gbps • SSL Throughput: 3 Gbps • SSL TPS: 6,000

Table 2. Cisco CSP 2100 Bundles and Maximum Number of Avi Service Engine Cores

Bundle	# Cisco CSPs (16 cores and 2x 10G ports each)	Max Avi SE cores	Performance	
			SSL Throughput	SSL TPS
Starter	2 	20	1G - 20G	2K - 40K
Small	3 	30	5G - 30G	10K - 60K
Medium	5 	60	10G - 60G	20K - 120K
Large	8 	100	25G - 100G	50K - 200K
Extra Large	20 	275	75G - 275G	150K - 550K

For More Information

http://www.cisco.com/go/csp

https://avinetworks.com

For questions and comments, please contact CSP-2100@cisco.com

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