Automated L2-L7 Network and Application Services with Juniper and Avi Networks

Integrated solution for network automation, application load balancing, security, and analytics

Challenge

Traditional, appliance-centric solutions do not support web-scale and cloud-native application architectures and cannot provide automation and agility that enterprises need for a next-generation, software-defined data center.

Solution

Avi Networks and Juniper have partnered to deliver on the promise of automating network and application services such as load balancing, security, and analytics. This integrated L2-L7 software-definedsolution is designed for next-generation cloud-native and web-scale architectures.

Benefits

- Fully automated, policy-driven L2–L7 services
- Full-featured network and application services such as load balancing, security, application monitoring, analytics, and autoscaling
- Software-only solution for lower total cost of ownership

Organizations understand the benefits of web-scale and cloud-native architectures such as flexibility, agility, speed, automation, elastic scale, and cost effectiveness. While they can achieve these benefits for application deployments, legacy networking and application services solutions prevent them from realizing end-to-end benefits for the infrastructure stack. Furthermore, the emergence of private, public, and hybrid cloud deployments and heterogeneous environments (bare-metal servers, virtual machines, containers) requires a next-generation solution architected for software-defined environments.

Juniper and Avi Networks, with their software-defined networking and software-defined load-balancing solutions, enable enterprises to extend the SDN benefits from network layers (L2-L3) to application layers (L4-L7). This integrated solution enables networks and application services to be provisioned and scaled quickly and automatically, to match application and infrastructure automation that is possible with public cloud and private cloud frameworks.

The Challenge

Enterprises and service providers deploy their applications in a heterogeneous environment (bare-metal servers, VMs, containers) in on-premises data centers and private clouds as well as in public clouds. They use automation tools such as Ansible, Chef, and Puppet as well as custom scripting to deploy and scale out/in these applications quickly and automatically. However, traditional networking and load-balancing solutions do not support this level of automation:

- The lack of native REST API requires manual operations.
- An appliance-centric architecture requires static capacity management.
- The lack of built-in telemetry results in costly overprovisioning.

The Juniper Networks-Avi Networks Automated L2-L7 Network Application Services Solution

This joint solution integrates Juniper Networks® Contrail Networking with Avi Networks' distributed, elastic, and software-defined application services solution.

Solution Components

Juniper Networks Contrail Networking: Contrail Networking, based on the open-source OpenContrail project, is a software-defined networking cloud automation solution comprised of a highly available controller and a kernel-embedded virtual router (see Figure 1). As leading cloud networking and service orchestration powered by open technology, Juniper's open solution for cloud and Network Functions Virtualization (NFV) improves business agility with security, availability, performance, automation, and elasticity. More information is available in the Contrail Networking datasheet.

AVI
Networks®

The Avi Vantage Platform

The Avi Vantage Platform is an elastic, software-defined solution that delivers application services beyond load balancing. Built on software-defined architectural principles, Avi Vantage aligns perfectly with Juniper's SDN solution, Contrail Networking. With this joint solution, enterprises and service providers can extend the benefits of a software-defined architecture to the entire networking stack.

The Avi Vantage Platform consists of a centralized Avi Controller cluster and distributed Avi Service Engines (distributed load balancers) running as bare-metal servers, VMs, or containers (see Figure 2). The Avi Controller provides centralized control and management across Service Engines (SEs) deployed across private and public cloud environments. Avi Controller is a single REST API endpoint for all configurations. Based on the policies, it dynamically creates, provisions, and scales out Avi Service Engines. Avi Controller integrates with other solutions such as OpenStack, Contrail Networking, and more for end-to-end automation. Avi Service Engines, in addition to providing load balancing, SSL offload, and distributed denial of service (DDoS) mitigation capabilities, also collect logs and metrics and send them to the centralized Avi Controller. Avi Controller then uses these real-time analytics to make intelligent autoscaling decisions on the application fabric.

How the Contrail and Avi Vantage Joint Solution Works

The Avi Controller is the single point of integration with Contrail using REST APIs. During initial installation of the Avi Controller, the admin needs to provide a URL and admin credentials for the Contrail Networking system. From there on, the Avi Controller completely automates the deployment. As application or network admins configure application load-balancing instances, the Avi Controller automatically creates SEs, places the virtual IPs on the SEs, and invokes Contrail APIs to place the network interfaces in the right overlay network without any manual intervention. As application traffic increases, the Avi Controller scales out by creating new or additional service engines and placing them in the right network through the integration with Contrail.

Figure 3 illustrates a sample use case of Juniper Contrail Networking and Avi Vantage in an OpenStack environment.
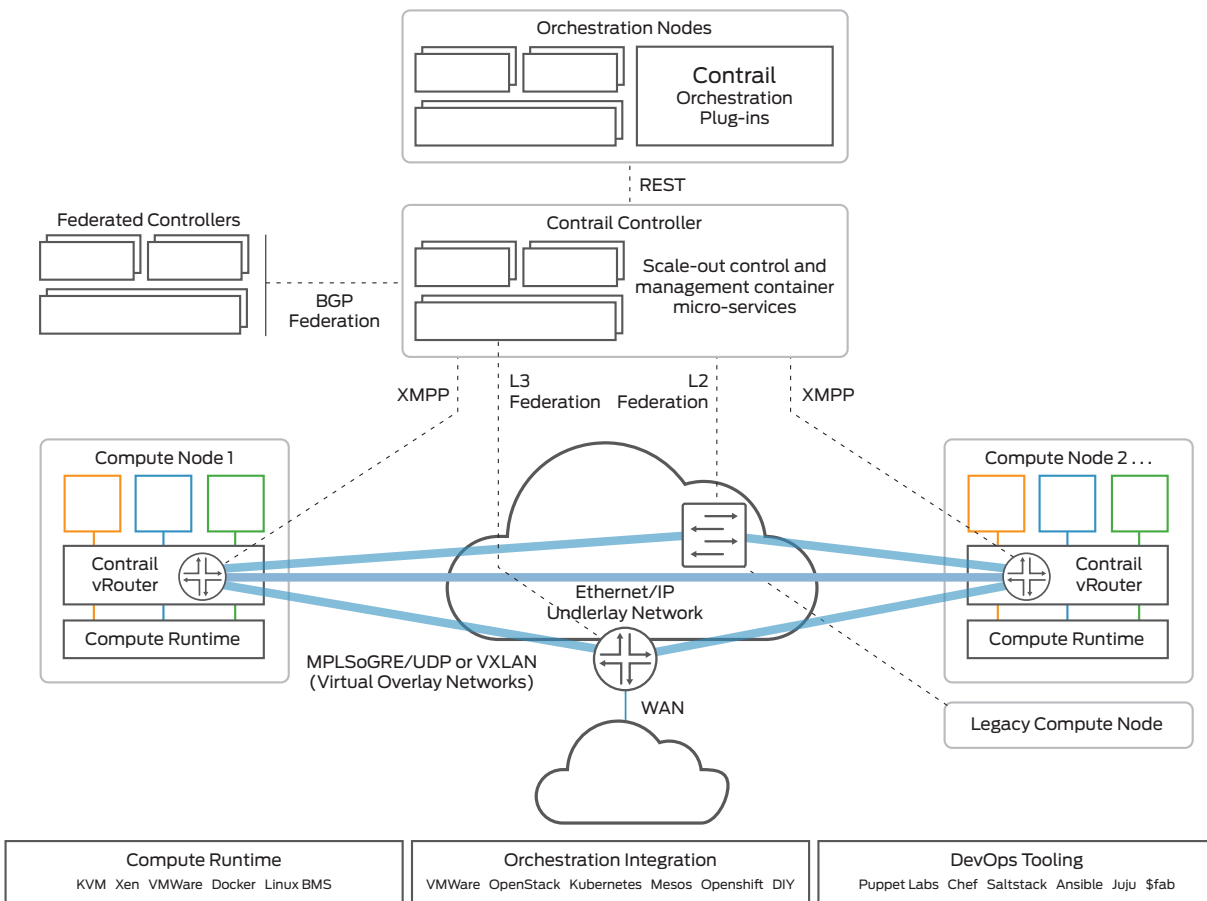

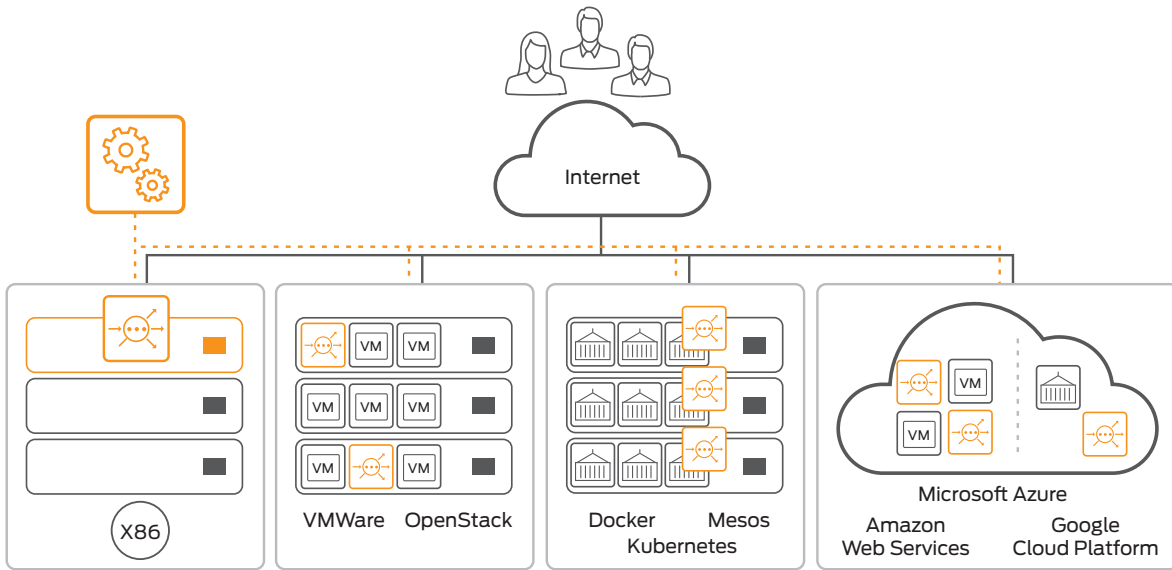Figure 1. Juniper Networks Contrail Networking

Figure 2. Avi Vantage

Features and Benefits

- Architectural alignment enables seamless integration of Juniper and Avi solutions, delivering intelligent automation.

- Complete automation from L2-L7 enables enterprises to automate their infrastructure. They can respond quickly and cost-effectively to surging demand, without downtime, enabling applications to be deployed and scaled rapidly.

- Granular visibility into application performance and end-user experience, along with access to both historical and real-time application analytics, enables admins to troubleshoot network incidents within minutes.

Summary—Juniper and Avi Networks Deliver a Software-Defined Networking Stack

As mutual technology alliances integrate solutions, Juniper Networks and Avi Networks deliver on the promise of SDN: agility, automation, cost effectiveness, and scale, from the network layers (L2-3) all the way up to the application layers (L4-7), for enterprises and service providers alike. Networks and services can be provisioned and scaled quickly and automatically, to match application and infrastructure automation that is possible with OpenStack and other orchestration frameworks. This high-performance networking solution enables a full-featured, software-defined data center, while reducing TCO by up to 70%.
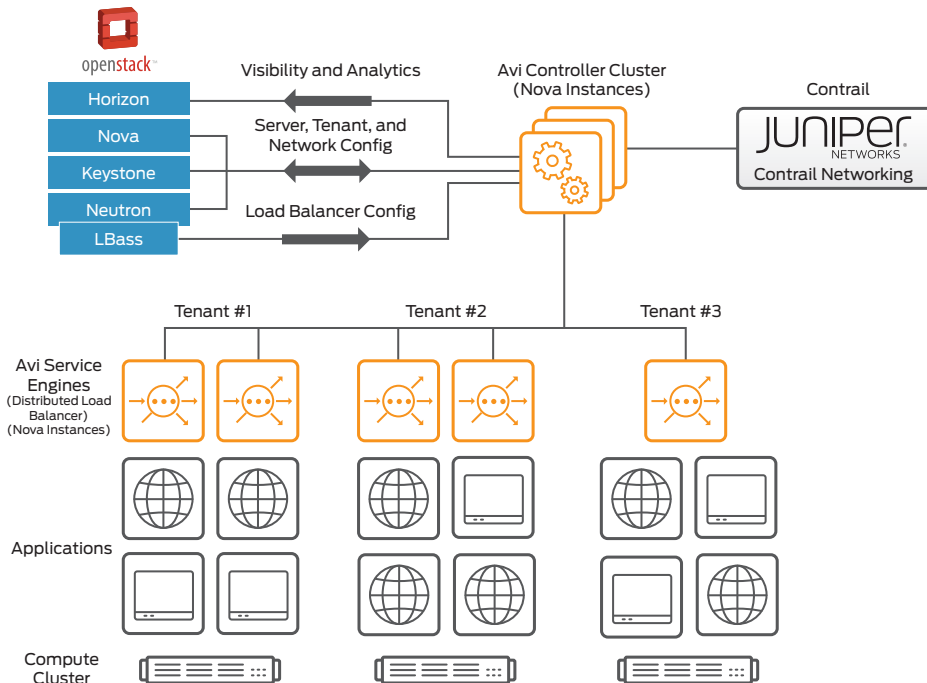

Figure 3. Juniper Networks-Avi Networks joint solution

Next Steps:

If you would like to learn more about this joint solution, please contact your Juniper Networks or Avi Networks representative for more information.

About Avi Networks

analytics, predictive autoscaling, and security in the data center or public cloud. The Avi Vantage Platform delivers elastic, software-defined application services on commodity x86 servers, VMs, or containers. Avi Vantage provides application services as a dynamic pool of resources that matches the automation needs of private or public cloud initiatives. Fortune 500 technology, media, and financial services companies use Avi Networks to accelerate application delivery, enable self-service for application owners, and lower their TCO. Learn more at www.avinetworks. com or @avinetworks.

About Juniper Networks

Juniper Networks challenges the status quo with products, solutions and services that transform the economics of networking. Our team co-innovates with customers and partners to deliver automated, scalable and secure networks with agility, performance and value. Additional information can be found at Juniper Networks or connect with Juniper on Twitter and Facebook.

Corporate and Sales Headquarters

Juniper Networks, Inc.

1133 Innovation Way

Sunnyvale, CA 94089 USA

Phone: 888.JUNIPER (888.586.4737)

or +1.408.745.2000

Fax: +1.408.745.2100

www.juniper.net

APAC and EMEA Headquarters

Juniper Networks International B.V.

Boeing Avenue 240

1119 PZ Schiphol-Rijk

Amsterdam, The Netherlands

Phone: +31.0.207.125.700

Fax: +31.0.207.125.701

EXPLORE JUNIPER
Get the App.

JUNIPER
1ON1

Download on the App Store

ANDROID APP ON Google Play

3510604-001-EN Jan 2017

JUNIPER
NETWORKS