Top 3 US Cable Company Deploys Avi Networks Load Balancer for OpenStack Private Cloud

100% REST API, Self-Service and Elastic Load Balancer Accelerates App Development

CUSTOMER BACKGROUND

The customer is among the top three US cable companies in the US, with annual revenues in the tens of billions of dollars. It delivers digital cable, cable Internet, digital phone, home security, and cable advertising products and services. Its OpenStack-based multi-location private cloud must satisfy the needs of a large group of application developers, spread across many teams, who are collectively responsible for hundreds of internal and external applications. To meet evolving business requirements and continually improve their applications, developers must be able to deploy applications rapidly and efficiently. Working with the internal application developers, the central IT group implemented a multi-data center private cloud using OpenStack and goaled to significantly accelerate application development and deployments.

TECHNICAL REQUIREMENTS

To boost application availability and security, as well as support its agile business, the IT team found it essential to incorporate Load-Balancing-as-a-Service (LBaaS) into its OpenStack cloud. Key requirements included:

1. Fully automated, self-service Load Balancer provisioning via the OpenStack Dashboard ("Horizon") (See Figure 1).

2. Enterprise-grade load balancing features, including support for high availability (HA), SSL offload, and multi-tenancy with centralized identity management (Keystone).

3. The ability for each tenant (one for each of the application development teams, with total apps numbering in the hundreds) to independently deploy applications (complete with Load Balancer functionality), isolated from other tenants and governed by its own per-tenant SLA.

4. Full integration with Puppet for automated solution deployment.

INDUSTRY
Media and Entertainment

ENVIRONMENT
Multi-location, OpenStack-Kilo-based private cloud

PROBLEM
- Time-consuming application development and deployment processes
- Excessive IT costs, especially infrastructure provisioning costs
- Reliance on IT for simple app development tasks
- Troublesome downtime when scaling capacity to address business needs

WHY AVI
- Elastic load balancing, security, and application analytics
- Full integration with OpenStack and automation tools like Puppet
- Enterprise-grade features not offered by open source, legacy, or virtual alternatives
- SDN design with centralized controller and distributed elastic data plane

BENEFITS:
- App deployment process dramatically reduced from days (sometimes weeks) to minutes
- Ability to identify and solve application performance issues within minutes from a single OpenStack dashboard
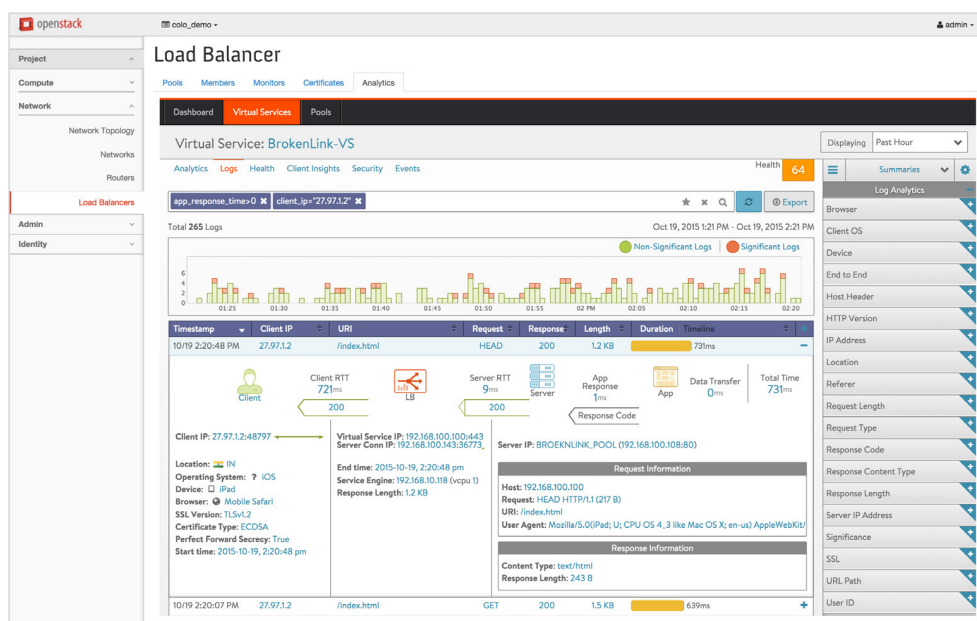- Anticipated significant OpEx savings, compared to costs from previous load balancing solutions

Figure 1: Avi Networks Integration with OpenStack Dashboard

ADC/LOAD BALANCER OPTIONS CONSIDERED

Open source LBaaS solutions such as HAProxy lacked enterprise-grade features such as high availability, tenant isolation, high performance, and advanced load balancing.

Legacy hardware Load Balancer appliances required app teams to open tickets with the IT team to set up or change a load balancing configuration, slowing down the app deployment process by days, sometimes weeks.

Virtual Load Balancer solutions were too complex for self-service. Integration with the customer's preferred automation tools would take weeks of development and, despite the effort, would not deliver the full range of desired features. Moreover, automation would require a complex orchestration layer to map tenants and applications dynamically to potentially dozens of virtual Load Balancers required to meet performance requirements.
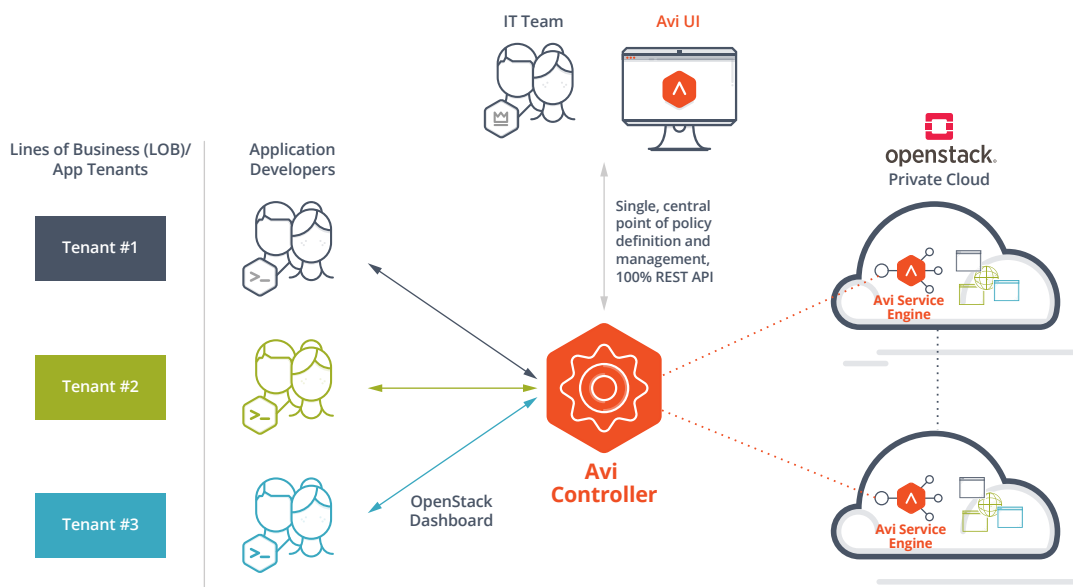

Figure 2: Schematic of OpenStack-based private cloud with Avi Networks Load Balancer

TECHNICAL REASONS FOR CHOOSING AVI NETWORKS

- Avi Networks UI and CLI are implemented atop the **native, 100% REST API**, which gives programmatic access to every object in the system.

- Unlike legacy offerings that run outside the cloud, the solution is **integrated with OpenStack services** such as Nova, Neutron, Keystone, and Glance.

- Implemented as a **one-click drop-in replacement for HAProxy in OpenStack**, the product includes enterprise-grade load balancing features. Full integration with **Puppet streamlines and completely automates Load Balancer deployment.**

- The software-controller-based architecture embraces **centralized policy definition**. IT can define policies and SLAs for each app team, which in turn can leverage self-service Load Balancer provisioning for their apps via the Dashboard, without creating a ticket.

- The distributed data plane architecture delivers **strong tenant isolation**. The Avi Service Engine (SE) is a micro-load balancer which runs in the specific tenant context. To meet **SLA guarantees**, SE instantiations are automatically created to scale the configuration either based on a tenant's policies or as new apps are added. In sharp contrast, legacy options (both physical and virtual) required multiple tenants to share Load Balancers.

- Avi Networks offers high-performance SSL offload, including the **industry's first high-performance implementation of Elliptic Curve Cryptography (ECC) and Perfect Forward Secrecy (PFS)**. App teams can manage SSL certificates directly in the Dashboard in self-service fashion.

BENEFITS FOR THE IT TEAM

With fully automated deployment and centralized policy definition and enforcement, the Avi Networks solution has:

- Eliminated IT tickets for setting up load balancing for each newly added application or configuration change

- Enabled IT to offer different Load Balancer-deployment SLAs to the various app development teams

- Introduced elastic Load Balancer scaling to gracefully cope with peak demand, while eliminating the cost of over-provisioning traditional Load Balancers

- Avoided purchase of a separate app monitoring tool

- Accelerated OpenStack adoption within app dev teams

BENEFITS FOR THE APP TEAMS

Self-service provisioning of application load balancing and performance monitoring has:

- Slashed Load Balancer deployment times from days to minutes

- Reduced troubleshooting times from hours to minutes

- Increased app performance monitoring and SLA visibility