

White Paper

Managing Application Delivery Controllers in an OpenStack LBaaS Environment

Supporting Multiple ADCs and High Availability

APV Series Application Delivery Controllers



White Paper

APV Series I Managing ADCs in an OpenStack LBaaS Environment



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Introduction

OpenStack has come to the forefront as the open-source cloud computing software platform of choice. Begun in 2010 as a joint project of Rackspace and NASA, the effort has drawn support from a wide spectrum of networking vendors, Infrastructure-as-a-Service (IaaS) providers, enterprises and others implementing large private, public or hybrid clouds.

OpenStack includes a variety of components that serve as building blocks that allow open-source and proprietary solutions to be deployed in the cloud environment. In particular, the networking component, called Neutron, is responsible for managing networks and IP addresses. The dashboard component, dubbed Horizon, is responsible for accessing, provisioning and automating third-party products and services, such as application delivery controllers and load-balancing-as-a-service (LBaaS). A native OpenStack API is available to allow developers to build tools and automate access to resources.

In its current form, OpenStack does not provide a flexible framework to deploy, manage and configure multiple load balancers in the environment. This is highly problematic in at least two use cases: When multiple application delivery controllers are deployed to support multiple tenants in an LBaaS deployment, and/or when high availability is required.

The LBaaS Environment

OpenStack originally provided one LBaaS reference implementation – HAProxy, an open source solution. While widely used by Web sites such as Reddit, Twitter and others, HAProxy is lacking in many of the key features used in enterprise and IaaS environments. (For example, it is limited to TCP and HTTP-based applications, whereas enterprise environments may require UDP, FTP, SIP and other protocols.)

With the release of the LBaaS API in the Havana release, OpenStack allows for either proprietary or open-source load balancing products to manage load balancing requests, allowing network operators greater choice in their application delivery controller technology. It also provides much more substantial capabilities that are more in tune with the requirements of service providers and large enterprises.

However, in an OpenStack environment where LBaaS is being used, system administrators need the ability to identify individual load balancers as well as to administer and manage them without requiring additional systems. Since LBaaS does not define the mapping between the services and the load balancers providing the services, it cannot be used to manage multiple load balancers directly. While some vendors have developed additional centralized management appliances to overcome this obstacle, this approach adds cost and overhead to the equation – which runs directly counter to the overall goals of OpenStack.

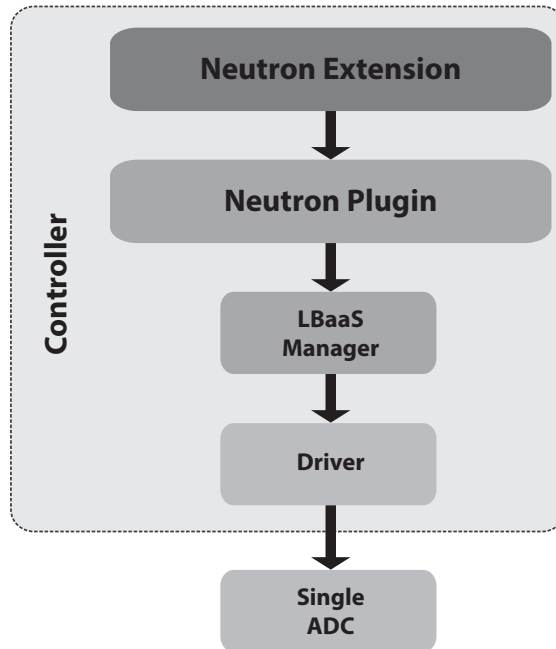


Figure 1: OpenStack's Native ADC Driver Method Manages a Single ADC Instance

An LBaaS Solution for IaaS Providers, Large Enterprises and Others

Array leveraged its long experience with Infrastructure-as-a-Service providers, enterprises and others running very large networks to design its OpenStack LBaaS solution with their needs in mind. The Array LBaaS driver for OpenStack's networking service (Neutron) includes a mechanism to create a communications client for each ADC device. In addition, for virtual appliances, an Array agent is deployed on the hypervisor to allow communication to the vAPV virtual application delivery controller instances. Dedicated APV Series ADC appliances and AVX Series virtualized appliances do not require an agent.

Array's OpenStack LBaaS driver includes a policy file, which contains device information as well as pool policies for groups of virtual or dedicated ADCs, virtual IP (VIP) policies, and clustering information. Once this information is configured by the OpenStack administrator through the Dashboard (Horizon), a communications client is created for each ADC.

The clients then communicate with the Array application delivery controllers, which allows OpenStack or tenant administrators to configure virtual and real services and manage the overall operation of the virtual, dedicated or virtualized ADCs at any time. Configuration and mapping are automatically done for each device, and devices can be added or removed on-the-fly by modifying the policy file.

Key Benefits of Array's LBaaS Implementation

Array's OpenStack LBaaS implementation offers several key benefits for IaaS providers, enterprises and others deploying large-scale networks or public/private clouds, including:

- Easily leverage existing Array APV Series dedicated ADC appliances or vAPV virtual ADCs through policy management
- No additional central management appliance to deploy, manage and maintain
- A cloud-portable architecture that allows easy integration with OpenStack and other cloud platforms
- Easily set up clustering for high availability through simple policy definition
- On-demand scaling of vAPV instances through out-of-band communication that is not dependent on the networking component of OpenStack
- Seamlessly integrated with the OpenStack Dashboard (Horizon)

Summary

Through Array's OpenStack LBaaS implementation, IaaS providers, enterprises and other organizations overcome one of the key limitations of OpenStack, and gain the ability to support multiple physical or virtual application delivery controllers to support multiple customers, applications, user communities, or other divisions. The implementation also supports high availability for users that require non-stop, assured uptime of applications, tenant instances, and other uses. In addition, the Array implementation does not require an additional centralized management appliance, reducing costs and management overhead as well.

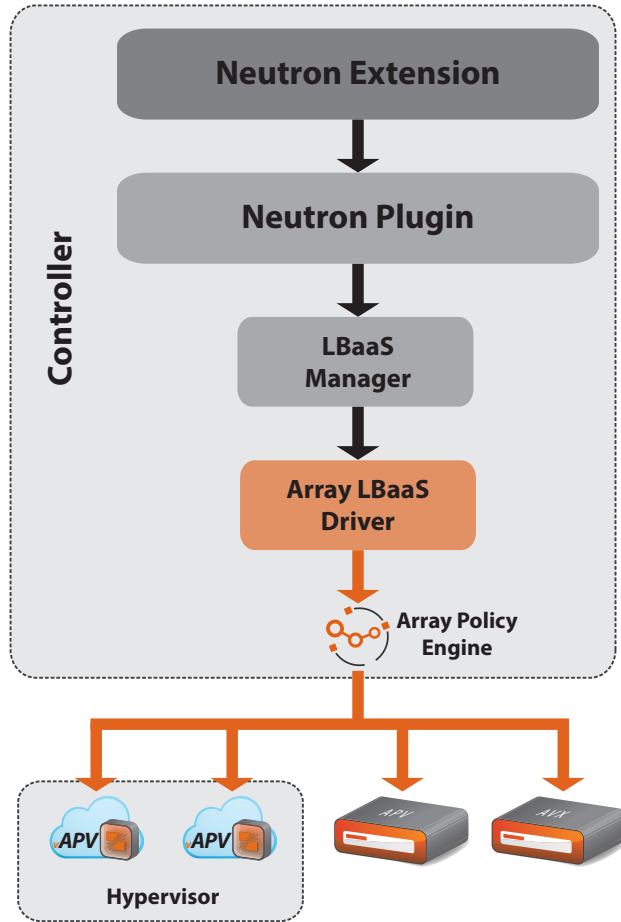


Figure 2: Multiple ADCs Deployed using Array's LBaaS Driver and Policy Engine

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About Array Networks

Array Networks is a global leader in application delivery networking with over 5000 worldwide customer deployments. Powered by award-winning SpeedCore® software, Array application delivery, WAN optimization and secure access solutions are recognized by leading enterprise, service provider and public sector organizations for unmatched performance and total value of ownership. Array is headquartered in Silicon Valley, is backed by over 250 employees worldwide and is a profitable company with strong investors, management and revenue growth. Poised to capitalize on explosive growth in the areas of mobile and cloud computing, analysts and thought leaders including Deloitte, IDC and Frost & Sullivan have recognized Array Networks for its technical innovation, operational excellence and market opportunity.



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