EXECUTIVE SUMMARY

Challenges
• Automate the deployment of network services at scale in a private cloud with optimum administrative control using the OpenStack framework
• Maintain dynamic control of network operations for a large-scale private cloud
• Enable administrators to manage load balancing resources while abstracting the operational requirements for users

Solution
• OpenStack Grizzly release
• OpenStack LBaaS framework for vendor driver integration, device inventory functionality, data model extensions, and support for extended components
• OpenStack Dashboard for supporting the Horizon User Interface (UI)
• Brocade ADX Series for application delivery and load balancing platforms
• Brocade ADX driver for expanding LBaaS functionality in the OpenStack framework

Results
• Reduced time to provision load balancing resources from days to minutes with the Brocade ADX driver for LBaaS
• Enabled faster service rollout by abstracting administrative networking tasks from users and automating the creation of load balancers

In 2013, Yahoo! JAPAN adopted OpenStack cloud infrastructure software to standardize the administration of data center resources and streamline IT operations. As an open source framework, OpenStack is an ideal model for automating the orchestration of the company’s private cloud environment, allowing Yahoo! JAPAN to design the desired control into its cloud management platform. By building an OpenStack-based private cloud, Yahoo! JAPAN created an environment that allows administrators to manage operations from the OpenStack Dashboard, while allowing application developers to more effectively utilize system resources using the Web-based interface on their own.

As part of the OpenStack initiative, Yahoo! JAPAN needed to enable the deployment of load balancing services within its private cloud in order to provide a simple and dynamic application development environment. To enable Load Balancing as a Service (LBaaS), Yahoo! JAPAN deployed the OpenStack-enabled Brocade® ADX® Plugin, with an extension for Layer 3 Direct Server Return (L3 DSR) to automate the deployment of load balancing services at scale within multitenant environments. As a result, Yahoo! JAPAN was able to deliver a seamless experience for application developers in creating the needed services and streamline the administration of the private cloud environment.

ENABLING LBaaS WITH BROCADE ADX
Prior to the Brocade solutions, the existing LBaaS functionality in OpenStack was limited to host-based load balancing via HAProxy and did not support third-party vendor plugins. As a result, the base implementation of OpenStack was not able to satisfy Yahoo! JAPAN’s immediate requirement to support a large-scale multitenant environment. “Using the standard extension mechanism of the OpenStack load balancing framework, Brocade has expanded the functionality of load balancing within OpenStack for our private cloud,” says Norifumi Matsuya, Technical Director at Yahoo! JAPAN Corporation.
The current solution provides a simple administrator and (developer) tenant portal through the OpenStack Dashboard User Interface (UI) to manage application delivery resources. It allows for specific role-based views to provision and create load balancing services based on relevant parameters such as Virtual IPs (VIPs), real servers, subnets, health monitoring options, high-availability options, and network deployment types (see Figure 1).

To help ensure a dynamic and resilient LBaaS deployment, the Brocade ADX driver implements device management components, complete with device inventory and high-availability functionality, for Yahoo! JAPAN’s OpenStack cloud. When the load balancing service is requested by a tenant, these extended components select the load balancer that best satisfies the service type and parameters, and further allows for the creation, updating, and removal of those services as required via REST APIs.

**WHY BROCADE**

“Since its establishment in 1996, Yahoo! JAPAN has actively adopted open source software. We recently adopted OpenStack and Brocade ADX to enable Load Balancing as a Service [LBaaS] for our private cloud and to improve ease of use for our application developers.”

— Norifumi Matsuya, Technical Director at Yahoo! JAPAN Corporation
OPTIMIZING DATA CENTER SCALABILITY

By nature, content providers tend to have approximately 20 percent of their traffic flowing from clients to servers, and the remaining 80 percent flowing from servers to clients. To more effectively process the outbound traffic, Yahoo! JAPAN has adopted Brocade ADX L3 DSR functionality to reduce latency and speed application response times (see Figure 2).

Brocade ADX L3 DSR functionality allows outbound traffic to flow directly to clients instead of back through the network, thus increasing the overall service delivery. Moreover, Brocade ADX L3 DSR provides the flexibility to scale out the network across the Layer 3 perimeter, independent of the server configuration, without constantly having to manually examine the configuration and design of the load balancers. These benefits make Brocade ADX L3 DSR an ideal solution for a large-scale content provider such as Yahoo! JAPAN, enabling the company to maintain high-speed connections from servers to clients without additional operational complexity.

For more information, visit the Brocade OpenStack solution page at www.brocade.com/openstack and the Brocade ADX Series product page at www.brocade.com/adx.

CONTINUED INNOVATION AND THOUGHT LEADERSHIP

"Together, Brocade and Yahoo! JAPAN Corporation collaborated on integrating OpenStack cloud infrastructure technology to streamline IT operations for the private cloud environment and enable a simple, dynamic application development environment," says Masakazu Aoba, Vice President, Japan Sales at Brocade.

Yahoo! JAPAN selected Brocade over other vendors largely for Brocade’s commitment to OpenStack. Brocade joined the OpenStack initiative in May 2011 and became a corporate sponsor in September 2012, driving networking architecture (frameworks, services, and Application Programming Interfaces [APIs]) in the OpenStack community. Along with its OEM partners, Brocade spearheaded the group focused on Fibre Channel Storage Area Network (SAN) extensions to OpenStack. Brocade is also working toward enhancing the networking subsystem of OpenStack to support Network Functions Virtualization (NFV) and multivendor environments. Moreover, Brocade continues to drive networking innovation with OpenStack across its entire data center product portfolio, as demonstrated by the development of the Brocade VCS® Fabric Plugin and Fibre Channel SAN extensions.

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**Figure 2.**
OpenStack-enabled Brocade ADX Plugin, with Layer 3 Direct Server Return (L3 DSR).