BROCADE

WHITE PAPER

The Business Case for Software-Defined Networking

Brocade enables customers a means of reducing costs of service delivery through Software-Defined Networking (SDN) technologies. In addition, SDN will provide customers the ability to increase service velocity.

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Software-Defined Networking (SDN) is a new technology that provides the potential to change the game, since it enables direct programmatic control of the network, coupled with end-user-driven applications and needs, enabling operators to efficiently use their network and operational resources to increase revenue from highly customized and "sticky" services. Infonetics has just released a report—SDNs, 40G/100G, and MPLS Control Plane Strategies: Global Service Provider Survey—surveying top service providers worldwide on their plans for SDN. The top reason to move to SDN, given by 52 percent of respondents, was to simplify the way they provision and create network services and virtual networks—and to do so in ways that are not always possible with existing technologies.

In order for service providers to change their current model, they will need a sound business model that highlights a savings in TCO (Total Cost of Ownership) and promotes key innovative service opportunities.

This paper will highlight the cost savings that can be obtained utilizing SDN over the Present Mode of Operation (PMO).

Introduction

In an effort to reduce CapEx (capital expenditure) and OpEx (operating expenditure) and increase service velocity, service providers are looking for technology alternatives that will streamline service creation and foster innovative applications and services.

With increased competition and pressure to increase revenue, service providers are taking a hard look at their current infrastructure and operations environment and finding that their existing networks lack the flexibility and agility needed to support today's customers and the unprecedented demands they put on the network for ubiquitous service delivery.

The current operations model and network architectures inhibit this ability for these reasons:

- There is no real-time visibility into the network to accurately gauge bandwidth utilization and no real-time traffic tools that allow the user to dynamically change services.
- There is no standard way to change traffic flows to handle user mobility and flip the switch applications.
- There are no software tools available that enable them to "dry run" new service options without impacting the production network.
- The current backoffice model does not provide the flexibility needed to make dynamic network changes and create new service offerings.
- Any changes to the production network are difficult, slow, and risky.

Overview

In order for service providers to change their current model, they will need a sound business model that highlights a savings in TCO (Total Cost of Ownership) and promotes key innovative service opportunities.

This paper will highlight the cost savings that can be obtained utilizing SDN over the Present Mode of Operation (PMO).

Software-Defined Networking offers a means of reducing costs of service delivery and as a vehicle for increasing service velocity. SDN links networks and applications, enabling direct programmatic control of the network in line with end-user application needs, rather than programming around the network, as is done today. By having access to network topology information, applications can optimize decisions related to service fulfillment, service placement, and service removal. The network has the intelligence to provide guidance to a key set of applications through abstraction, including peer-to-peer, content distribution, and data center applications. In all these cases, aligning the applications with the resources is important, as peers need to sync up with the best cloud application or best Content Delivery Network (CDN) server.

Cost Benefits/Value Proposition

There are key cost benefits you can realize with SDN deployments through efficient use of the network and operational resources within the following areas.

Automation—SDN will enable operations automation by linking OpenFlow to Operational Support Systems (OSSs) through protocols such as RESTful, where triggers will enable rapid service changes and service creation.

Efficiency of assets—Network operators will now have an accurate depiction of network topology and usage, which will alleviate unnecessary upgrades, thus resulting in CapEx savings.

Incremental revenue streams—Service providers will have the ability to offer self-service portals, enabling customers to tailor the network to accommodate their application or service need. Both the ability to be innovative in applications and the service offerings will enable the service profitability that service providers are looking for.

Business intelligence—Data held in the network is the current untapped goldmine that has the ability to improve many things: from real-time information and location-based offerings to new service insertion points, as well as intelligent applications that can re-route themselves based on network data. The result will be better customer quality systems and a better user experience.

Service Creation—PMO

If you look at one of the cost benefits of automation within the service creation area and compare the PMO with SDN, the net result is a significant savings. The PMO model shown below is one that is typical of most service provider models.

As you can see from Figure 1, there are many groups that are involved in the creation and assignment of a service to ensure that the service is configured and deployed for billing. These high-level areas are just a few of the groups that are involved in service order creation. Under the present method, there are a number of devices that make up a common solution, all of which require different skill sets, including different technicians, programmers, and customer care personnel.

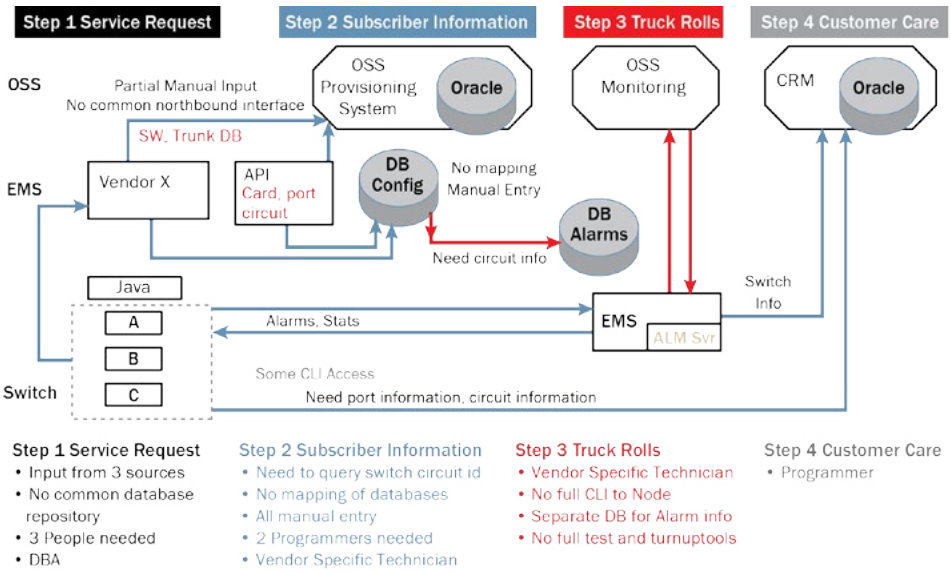

Figure 1: PMO New Service Creation.

Step 1: Service Request

As a service is requested, a table lookup is required across the product sets to be able to stitch a service for end-to-end deployment. The current model requires input from three databases, since some of the information is resident in a database, while other information may be resident in the switch or router only. As such, three people may be required to provide input, as well as a database administrator who can build code to map the switches to the service offering. This is an expensive as well as time-consuming process.

Step 2: Subscriber Information

A critical aspect of service creation is to properly assign the subscriber to the application for troubleshooting and service usage tracking. In order to properly assign the subscriber to the application, a query must go to the devices, since there is no ability to join tables automatically and learn the information. Today this is a manual process that may involve technicians from different vendors. Often this process requires a manual entry to repopulate the database with the subscriber information and add fields within the database.

Step 3: Truck Rolls

One of the most costly aspects of operations is truck rolls. If you can avoid having to dispatch a technician, it can mean the difference between a service being profitable versus breaking even. If there is no vehicle a technician can use to remotely test and turn up a switch, prior to its service date, through a set of commands and tools, then the technician must physically go out to the location to directly access the device and perform that test. The technician must either be familiar with the specific product used or must engage a technican who is. This process is also costly.

Step 4: Customer Care

The customer relationship management system must hold all the key customer information and circuit information, so that calls can be fielded properly if a service change is required or any service-related issues arise. If that information cannot be obtained from the database, a programmer is needed to input that information and develop a program to ensure all databases are consistent. This step also requires a programmer that has the right specific skill set.

Thus, using the current model, it can sometimes take months for a service to be deployed.

Service Creation—SDN

The Brocade® solution streamlines these processes using SDN, OpenFlow, and RESTful protocols and processes.

As you can see in Figure 2 on the next page, with the implementation of RESTful and Openflow, many service creation processes can be merged into one. This implementation provides ubiquitous integration across networks and multiple devices.

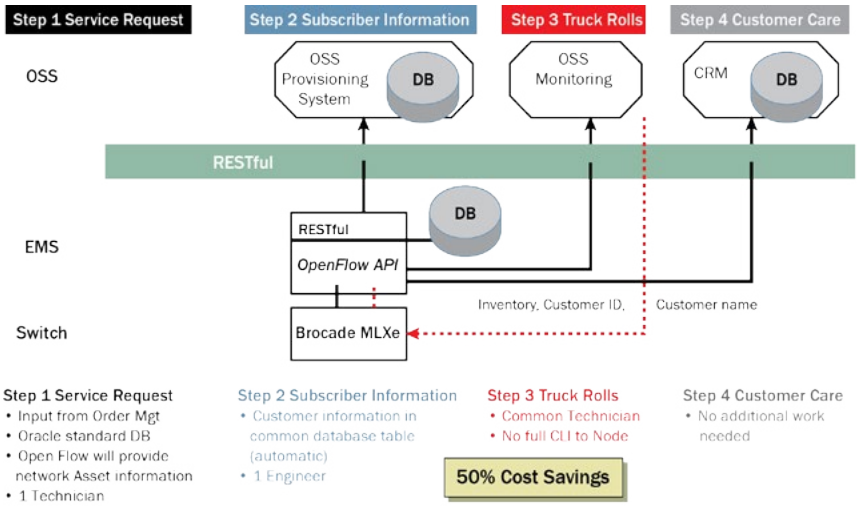

Figure 2: SDN New Service Creation.

Step 1: Service Request

The Brocade product solution performs all of the functions that were displayed under PMO through one product set. It uses a standard Oracle database that contains all of the circuit and customer information. The use of an OpenFlow controller provides network asset information that allows the service provider to better gauge the available facilities for proper assignment and reduced service delivery time. Through RESTful, this information gets automatically populated into the OSS systems that require it.

Step 2: Subscriber Information

The use of a RESTful interface with a more dynamic functionality provides northbound mapping to the network and subscriber detail. The service provider receives the network information, which automatically maps the subscriber to populate the common database. Through the use of simple commands, a developer can seamlessly map the network interface information with the network configuration information.

Step 3: Truck Rolls

In many cases, the need to dispatch on test and turn up is eliminated. The customer service team has remote access to the network to pretest the applications using CLI access, as well as the ability to run traffic loads on the production network via OpenFlow. This proactively redistributes traffic to support new users.

Step 4: Customer Care

There is no additional programming needed, since all customer details can be obtained from the common database and the RESTful API to populate key customer systems.

The ability to streamline these processes in some cases represents almost a 50 percent savings by eliminating developers, technicians, and programmers. In addition, services can be deployed more quickly

TCO Model

In order to validate TCO savings, Brocade has enlisted ACG Research (www.acgresearch.net), a leading industry consultancy, to conduct an independent study. ACG will analyze three SDN use cases:

- Service creation and insertion—Intrusion Detection System (IDS) and firewall services are provided by an OpenFlow router that steers traffic to achieve the desired pipeline of services.
- Wide-Area Network (WAN) network virtualization—OpenFlow is provided as an overlay to an existing L2/L3 Virtual Private Network (VPN)-IP network. The OpenFlow overlay allows for new revenue generating features on top of the existing production network.
- Network analytics—The telemetry-enabled Brocade MLX® Series performs aggregation, filtering, and replication of traffic to support an analytics tool farm, including tools such as HTTP and Voice over IP (VoIP) analyzers, intrusion detection, and billing applications.

Michael Kennedy, a principal at ACG, projects a a 50 percent reduction in TCO. He states, "Most of the cost reduction is derived from the automation of operations and the centralization of network control. In addition, further savings are realized from much faster service delivery and maintenance processes that reduce service intervals from weeks to minutes. Short service intervals and directly programmable network control also enable subscriber self-service portals that produce incremental revenue streams. Finally, CapEx is reduced through the centralization of the network control function and the use of the OpenFlow protocol." The full results of this study will be available in October 2012 from Brocade.

Summary

Software-Defined Networking provides the ability to reduce the cost of IP service delivery as well as providing the vehicle for increased service velocity. Brocade SDN solutions provide service providers with the business model justification for new service deployment and technical innovation that result in service profitability.

About Brocade

Brocade (Nasdaq: BRCD) networking solutions help the world's leading organizations transition smoothly to a world where applications and information reside anywhere. This vision is realized through the Brocade One™ strategy, which is designed to deliver key business benefits such as unmatched simplicity, non-stop networking, application optimization, and investment protection.

Innovative Ethernet and storage networking solutions for data center, campus, and service provider networks help reduce complexity and cost while enabling virtualization and cloud computing to increase business agility.

To help ensure a complete solution, Brocade partners with world-class IT companies and provides comprehensive education, support, and professional services offerings. (www.brocade.com)

Corporate Headquarters
San Jose, CA USA
T: +1-408-333-8000
info@brocade.com

European Headquarters
Geneva, Switzerland
T: +41-22-799-56-40
emea-info@brocade.com

Asia Pacific Headquarters
Singapore
T: +65-6538-4700
apac-info@brocade.com

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