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With ProgrammableFlow Network Suite V5, NEC Reinforces Commitment to OpenFlow-Based SDN

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By: Brad Casemore

Seeing an opportunity to benefit from new customer needs and potential disruption in the marketplace, NEC was an early proponent of OpenFlow-based software defined networking (SDN).

Not only was NEC, like HP, early to market in providing OpenFlow switches, but NEC also was involved in the earliest deployments of experimental OpenFlow-based SDN networks at Stanford University in late 2008, subsequently supplying the first hardware-accelerated OpenFlow switch. A few years later, in May 2011, NEC's ProgrammableFlow PF6800 OpenFlow controller became the first generally available commercial-grade OpenFlow controller on the market. NEC's ProgrammableFlow Network Suite was also positioned as the first commercially available SDN solution to leverage the OpenFlow protocol for network virtualization, encompassing physical and virtual switches as well as an SDN controller and applications.

NEC was first in a few other areas, too. Early this year, NEC announced the ProgrammableFlow PF1000, a virtual switch (vswitch) for Microsoft's Windows Server 2012 Hyper-V hypervisor, developed to bring network virtualization to then-underserved Microsoft datacenter customers.

New Features, Functionality, Support for OpenStack Grizzly

NEC continues to advance its OpenFlow-based SDN strategy. On September 26, NEC announced ProgrammableFlow Version 5, which provides support for OpenFlow 1.3 and provides functionality that enhances network scalability, performance, availability, and management visibility.

NEC claims to be the first vendor to provide commercial-controller support for OpenFlow 1.3, and that's true. As noted above, the company invariably has been early in its adoption of all meaningful iterations of OpenFlow. The 1.3 release is important not only because it adds incremental features and functionality that make OpenFlow more robust and useful in a wide range of application environments but also because it gives the OpenFlow community, including vendors such as NEC, a base of stable, strong code on which to release commercial products and build a vibrant ecosystem.

Like other vendors, NEC makes the case that performance and scaling requirements of applications have outpaced traditional networking's capacity to keep up, especially in the datacenter, where VM mobility, VLAN management, and support for multitenancy have exposed traditional networking's inherent limitations. What's more, traditional networks were built to serve the needs of the client/server architectural model, under which the vast majority of network traffic flowed from north to south. Today, by contrast, with the increased virtualization of applications in the datacenter, east-west server-to-server traffic patterns are predominating. Accordingly, NEC posits that the traditional network has become not only a technological hindrance but also a business inhibitor.

NEC is positioning its ProgrammableFlow Network Suite V5 as a next-generation networking solution to those problems. The latest iteration of the ProgrammableFlow Networking Suite comprises an OpenFlow controller (PF6800), a line of physical switches (PF5240, PF5248, and PF5820), and a HyperV virtual switch (the PF1000). Two of the NEC physical switches, PF5240 and 10-GbE PF5248, work in both OpenFlow and legacy environments, whereas the 10-GbE PF5820 supports OpenFlow exclusively.

In addition to the aforementioned support for OpenFlow 1.3, NEC points to V5's enhanced scalability — with support for 10,000 ports per controller, ability to recognize and support switch traffic as high as one

terabyte, and support for IP multicast. Building on the previously announced OpenStack integration, available for more than a year on the controller, Version 5 offers integration with OpenStack Grizzly. Indeed, Johns Hopkins Applied Physics Lab already has implemented ProgrammableFlow Version 5 and integrated it with OpenStack Grizzly, resulting in a cloud infrastructure that enables clients to work within an isolated and secure virtual network.

Additionally, this release of ProgrammableFlow sees NEC adding Ether OAM to the mix for higher availability — what NEC terms “carrier-class SDN” — and granular, network-wide visualization for the support of multi-domain functionality.

Recognizing the critical importance of partnerships to success in SDN, NEC spotlights an ecosystem that includes IBM, Brocade, Arista, Citrix, Red Hat, Extreme Networks, Intel, and Centec.

IDC View

NEC deserves credit for being an early vendor advocate and ardent champion of OpenFlow-based SDN. There’s no question that the release of the ProgrammableFlow Networking Suite V5 signals that NEC’s commitment to OpenFlow-based SDN remains strong and undiminished.

What’s more, NEC has added some solid features and functionality to its ProgrammableFlow Networking Suite that further differentiates it from a number of other OpenFlow-based offerings. Of notable mention in the V5 release are not so much the support for OpenFlow 1.3, which is likely to be matched by other vendors, but some of the other new capabilities that have been introduced.

On the scalability front, for instance, NEC has significantly raised V5’s ceiling above that of its predecessor. Also added in V5 of ProgrammableFlow is enhanced policy-driven networking, whereby the controller recognizes the connection, calculates bandwidth across the fabric, and then distributes the traffic across equal-cost paths, making better use of available bandwidth while prioritizing traffic delivery according to business policies. Other new capabilities that come in the V5 release include data-flow migration (for use during maintenance and in load-balancing scenarios, or for prompt failure recovery), higher levels of resiliency and availability (via Ether OAM), and more granular network visualization and monitoring.

All told, NEC’s ProgrammableFlow Networking Suite continues to grow in maturity as well as in its range of features and functionality. NEC is pushing the OpenFlow envelope as far and as fast as it will go, but it’s also constrained by the OpenFlow value chain. That is not to suggest that NEC isn’t finding takers for ProgrammableFlow — many of the enhancements in V5 have arisen to support and extend existing customer environments — but OpenFlow’s progress depends on a value chain that extends from merchant-silicon purveyors to OEM switch vendors, then to OpenFlow controller vendors and to the range of other players that provide network and security services as well as other OpenFlow applications. It’s an ecosystem that will take time to develop, which is one of the reasons OpenFlow networking has been overshadowed in the past year by overlay-based network virtualization from VMware and others.

Nonetheless, NEC is staying the OpenFlow course in its journey toward SDN, contending that OpenFlow fabrics are capable of supporting various use cases — traffic steering, network visibility, equal-cost multipath (ECMP) routing, flow migration, and traffic engineering — that are not supported by software overlays alone. As a result, NEC continues to back up its commitment to the OpenFlow user community and to the technology itself with a steady stream of increasingly mature and robust releases of ProgrammableFlow.

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