Taking Virtualization to the Next Level


At a Glance

- Intelligent, unified, open Software-defined Networking (SDN) providing best-in-class network management and control for Windows Server 2012 R2
- Secure multi-tenancy supports rapid, easy virtual machine migration and accelerated scale-out of new applications
- Advanced network automation for VM mobility decreases costs and increases network agility, resource efficiency, reliability and availability
- End-to-end visibility and control

Software-defined Networking for Windows Server 2012 R2

Accelerated Delivery of Network Services

To take full advantage of the cloud, all aspects of the infrastructure must be cloud-enabled, including servers, storage, software and the network. And while a virtual machine can be provisioned in minutes, setting up a traditional network can require the configuration of dozens or even hundreds of routers and switches.

The solution is Software-defined Networking (SDN), which radically simplifies the complex networks of today. SDN moves the intelligence of the network off proprietary routers and switches and into a centralized controller, where software enables you to design, deploy, monitor and manage the network from a single point.

Unique Integrated Server and Network Virtualization

NEC is using a new standard, an open interface protocol called OpenFlow, to deliver SDN through their OpenFlow-based ProgrammableFlow product family.

NEC is using Microsoft Hyper-V extensions to bring the substantial benefits of OpenFlow to Windows users. You get integrated server and network virtualization with a single control plane with end-to-end visibility.

The ProgrammableFlow product line consists of the ProgrammableFlow Controller (PFC) and the PF5240 and PF5820 ProgrammableFlow Switches (PFS). New with the launch of Windows Server 2012, NEC is adding a virtual switch, the PF1000 ProgrammableFlow virtual Switch (PFvS).
Secure Multi-tenancy and Automated Virtual Machine Mobility

NEC’s Virtual Tenant Network technology enables administrators to build multi-tenant networks. Once configured via a point-and-click GUI interface, the ProgrammableFlow controller will automatically discover, control and monitor networks of OpenFlow-enabled devices. The PF1000 Virtual Switch will detect VM migration and notify the controller of a change. Recognizing the VM change, the controller makes automated updates to new flows. In this way, virtual machine migration is unfettered, enabling rapid scale-out of new applications, balanced workloads, decreased costs and higher availability.

End-to-end Network Monitoring and Remediation

Providing greater control and faster response is a Windows-based GUI, integrated with the ProgrammableFlow controller. This central point of network management and monitoring enables end-to-end views of both the physical and logical networks, with the ability to take remediation action. The ProgrammableFlow controller also visualizes flows from virtual switch to physical switch as a single flow. It enables integrated traffic monitoring under the single centralized control plane.

NEC’s ProgrammableFlow network suite was the first commercially available SDN solution to leverage the OpenFlow protocol, enabling complete network virtualization, allowing customers to easily deploy, control, monitor, and manage multi-tenant network infrastructure. This architecture delivers better utilization of all IT assets, and helps provide ongoing investment protection as customers add functionality or upgrade their networks. NEC’s approach simplifies network administration and provides a programmable interface for unifying the deployment and management of network services with the rest of IT infrastructure.

ProgrammableFlow SDN for Windows Server 2012 R2 in Action

Instant, Easy Virtual Machine Migration

ProgrammableFlow Software-defined Networking separates network control from switch hardware, delivering unprecedented network automation. In particular, the ability to readily and easily move VMs on the network with no added programming—the controller immediately recognizes the migration and makes appropriate adjustments—positions the network to be significantly more responsive to business needs, and less expensive to maintain and manage.

PF1000 Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported Platform</td>
<td>Windows Server 2012 R2 Datacenter Edition</td>
</tr>
<tr>
<td>Required free HDD space</td>
<td>128 MB</td>
</tr>
<tr>
<td>OpenFlow Version</td>
<td>OpenFlow Spec 1.0</td>
</tr>
<tr>
<td>Maximum Virtual Switch</td>
<td>256 switches per server</td>
</tr>
<tr>
<td>Maximum Ports</td>
<td>1280 ports per virtual switch (total of VMNIC, VNIC, and physical NIC)</td>
</tr>
<tr>
<td>Maximum Virtual Ports</td>
<td>1280 VMNIC ports; 1 VNIC port per virtual switch</td>
</tr>
<tr>
<td>Maximum Physical Ports</td>
<td>8 ports per virtual switch</td>
</tr>
<tr>
<td>Maximum Flow Entry</td>
<td>260,000 flow (consumes approximately 0.5 MB of memory per 100 flows)</td>
</tr>
</tbody>
</table>

For more information about ProgrammableFlow, please visit: www.necam.com/pflow

About NEC Corporation of America: Headquartered in Irving, Texas, NEC Corporation of America is a leading provider of innovative IT, network and communications products and solutions for service providers, Fortune 1000 and SMB businesses across multiple vertical industries, including Healthcare, Government, Education and Hospitality. NEC Corporation of America delivers one of the industry’s broadest portfolios of technology solutions and professional services, including unified communications, wireless, voice and data, managed services, server and storage infrastructure, optical network systems, microwave radio communications and biometric security. NEC Corporation of America is a wholly-owned subsidiary of NEC Corporation, a global technology leader with operations in 30 countries and more than $38.5 billion in revenues. For more information, please visit www.necam.com.

© 2012 NEC Corporation of America. All rights reserved. NEC and NEC logo are trademarks or registered trademarks of NEC Corporation that may be registered in Japan and other jurisdictions. All trademarks identified with ® or ™ are registered trademarks or trademarks respectively. Models may vary for each country. Please refer to your local NEC representatives for further details.