

OpenFlow-based Network Virtualization PF6800 ProgrammableFlow SDN® Controller



Pr@grammableFlow

NEC Corporation of America necam.com NEC ProgrammableFlow Networking Suite, the first commercially available Software-Defined Network solution to leverage the OpenFlow protocol, enables full network virtualization and allows enterprises, data centers and service providers to easily and cost-effectively deploy, control, monitor and manage secure multi-tenant networks.



At a Glance

- Network-wide virtualization, featuring a high performance, resilient network fabric offering high availability and management of network flows up to 1 Terabyte
- Best-in-Class interoperability and investment protection, including support of the 1.3 OpenFlow1 standard, and demonstrated operations with multiple switch vendors
- Granular, end-to-end network visibility and control from a central point for dynamic, policy-based network management featuring advanced automation
- Multi-tenant capabilities enable isolated, secure networking to meet stringent compliance and regulatory requirements
- Integrated network and compute orchestration with OpenStack and Microsoft System Center Virtual Machine Manager for greater agility and streamlined operations

ProgrammableFlow integrated with Microsoft System Center Virtual Machine Manager provides integrated compute and network orchestration



Key features and benefits

Network programmability for accelerated delivery of services

OpenFlow and ProgrammableFlow technology decouple the data path from the control path, so organizations can now easily introduce changes into the network and customize it to suit their business needs. A programmable network in the future will be essential to position enterprises and solution providers for significant competitive advantage. Programmable interfaces, available both Northbound and Southbound from the ProgrammableFlow controller, will allow customers to take advantage of rich development and network services that are now becoming available.

NEC has established the first OpenFlow-based SDN ecosystem, featuring both northbound and southbound partners to add value to your NEC network investment, providing both interoperable OpenFlow-based switching and L4-L7 services. Today this includes three key IT segments: increased network optimization, manageability and availability. Already these areas are populated with NEC and third party solutions, supporting greater business agility, streamlining and accelerating delivery of services and beginning to show the promise of an open, standards-based ecosystem.

Integrated network and server orchestration for streamlined operations

ProgrammableFlow Controller integrates with Microsoft System Center Virtual Machine Manager (SCVMM) for streamlined compute and network orchestration. This solution extends the full benefits of ProgrammableFlow SDN to Microsoft Hyper-V environments, including providing virtual L2 and L3 networks with Quality of Service (QoS) end to end, and IPv6 support across an OpenFlow enabled switch fabric.

ProgrammableFlow Networking also integrates with OpenStack, leveraging the Grizzly plug-in. This will provide both open compute and network platforms, and with Grizzly, gives larger enterprises new levels of stability.

End-to-end network visualization

Integrated into the NEC SDN controller software is a network monitoring function, now providing customers with end-toend network visualization. Depicting both physical and virtual networks from a single pane, traffic and bottlenecks can be visualized in real time. Now, the complete end-to-end flow is depicted graphically, and control and corresponding action can be taken as needed.



Virtual/Logical Topology

Physical Topology

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Integrated Visualization with the PF6800 provides both physical and virtual network views, and depicts end-to-end network flows

Network automation delivers OpEx savings

The ProgrammableFlow Fabric leverages OpenFlow to move the complex and error-prone CLI interfaces into an open and standardized interface. This network automation and configuration works with switches from multiple vendors to provide point-and-click virtual network design and automated topology discovery.

Discovery operates automatically for all devices on the network. Flows can be moved off of devices without interrupting network sessions and when an end point, such as a VM, moves physical locations, the policy automatically moves with it. A design for automation extends to third-party systems that can make on-demand calls to the API to create, edit and delete virtual networks, as well as to add and remove policies.

This significant benefit has resulted in production customers reducing ongoing network administration expenses as much as 80%, in combination with the resource efficiency (power and footprint) provided by ProgrammableFlow.

Policy-based routing enables business agility

The ProgrammableFlow Fabric enables the network to be fully responsive to the needs of the business—network traffic can be customized dynamically based on traffic type or application. Legacy networks do not control network traffic based on business policy, and cannot make changes as rapidly as the business moves. The closest solution is the policy-based routing capability in high-end routers. However, policy-based routing is limited to simple header field matches and can only map the packet to a specific router interface as opposed to an end-system.

ProgrammableFlow Fabric allows complex conditions to be defined over a combination of multiple packet header fields such as MAC addresses, IP address, port number, and protocol type, enabling intelligent routing decisions. The final destination of a packet could be an address, or an intermediate appliance or service module such as a firewall or load balancer. Such functionality is not available in traditional networks. With ProgrammableFlow, network restrictions do not curtail business performance and priorities.

Secure, multi-tenant networking provides needed isolation

ProgrammableFlow provides greater flexibility and new business models for private and public cloud deployments. The fabric allows multiple virtual networks to securely share a common physical infrastructure. Because they are completely isolated and operate with different policies, each network fabric can be customized without impacting other services.

NEC's Virtual Tenant Network (VTN) allows each tenant to define their own customized layer-2 or layer-3 network and leverage inter-tenant isolation to effectively create a secured slice of the underlying physical network. VTN features:

- Network isolation—Network segments can be configured centrally and enforced throughout the network without switch configuration. This critical feature directly addresses many companies and enterprise needs to segment or isolate parts of the business securely.
- Virtual network—Virtual bridge and router functions provide L2/L3 network services.
- VFilter—The virtual filters in ProgrammableFlow can be leveraged to define Access Control Lists (ACLs) of various degrees of complexity.

For More Information

Visit NEC Corporation of America at www.necam.com/sdn to learn more about Software-defined Networking solutions, ProgrammableFlow, or download the free 90-day trial copy.

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