Windows Server 2012 Hyper-V Virtual Switch Extension Software

UNIVERGE PF1000
Overview

IT Network Global Solutions Division
UNIVERGE Support Center
ProgrammableFlow API architecture

- **PFC API**
- **OpenStack API**
- **Virtual Tenant Network**
- **Logical/Physical Mapping**
- **OpenFlow Driver**

**Components:**
- **Microsoft System Center 2012**
- **Third Party Orchestration System**
- **Application Partners**
- **Quantum Plug-in**
- **PF1000 Hyper-V vSwitch**
- **OpenFlow Switches**
- **Open vSwitch**
- **Legacy WAN/LAN**
What is Hyper-V?

HYPER-V is a standard feature included in Windows 2012 to provide server virtualization as a Hypervisor.

- High Performance (Guest OS not introduced between the system)
- Low Cost (Part of Windows Server)
- Compatible with Various Guest OS (Windows, SUSE Linux, Xen, etc)
What is UNIVERGE PF1000?

Extensible Switch is a layer 2 virtual network switch to connect virtual machine to physical network. This switch has an EXTENSION feature which includes Capturing, Filtering, and Forwarding. NEC has utilized the Forwarding feature to develop the ProgrammableFlow Virtual Switch Extension Software PF1000 to provide OpenFlow compatibility.

Just simply install this software to have the Hyper-V to be OpenFlow compatible.
Issue of Virtual Server and Network

The Overlapped Boundary for Server/Network Management

Past

Overlapped boundary to be managed for both Server and Network

Current, Future

Border of Server and Network

Server Management

Network Management

Server

Server

L2 Switch

L2 Switch

AP

AP

VM

VM

VM

vSwitch

vSwitch

L2 Switch

L2 Switch
The Benefit Provided by PF1000

Single Control Management

Centralized single control and management for both virtual and physical switches for virtual server network.
PF1000 Release Schedule

PF1000 is compatible with the UNIVERGE PF Series as shown below.

- ProgrammableFlow Controller  PF6800  (Ver4.0 to be released on xxxx xx, 2012 )
  Notice: To control the PF1000 from the ProgrammableFlow Controller, management license must be purchased separately.
- ProgrammableFlow Switch  PF5240/PF5820
## Specification of PF1000

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported Platform</td>
<td>Windows Server 2012 Datacenter Edition</td>
</tr>
<tr>
<td>Required free HDD space</td>
<td>128MB</td>
</tr>
<tr>
<td>OpenFlow Version</td>
<td>OpenFlow Spec 1.0</td>
</tr>
<tr>
<td>Max Virtual Switch</td>
<td>256 Switches per Server</td>
</tr>
<tr>
<td>Max Port</td>
<td>1280 Ports per Virtual Switch (Total of VMNIC, VNIC, Physical NIC)</td>
</tr>
<tr>
<td>Max Virtual Port</td>
<td>VMNIC 1280 Ports/VNIC 1 port per Virtual Switch</td>
</tr>
<tr>
<td>Max Physical Port</td>
<td>8 Ports per Virtual Switch</td>
</tr>
<tr>
<td>Max Flow Entry</td>
<td>260,000 Flow (Consumes approx. 0.5MB of memory per 100 flows)</td>
</tr>
</tbody>
</table>
**PF1000 Use Case**

**Security Policy 1**

Allow traffic from VM1 to VM2 but do NOT allow from VM1 to VM3

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### Without Extension

- VM3
- VM1
- VM2
- Hyper-V Switch
- PFC
- Hyper-V Switch
- WS2012 Server #1
- Port1
- PFS

Cannot control NW communication between Virtual Machines located within the same virtual switch.

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### By applying PF1000

- VM3
- VM1
- VM2
- Hyper-V Switch
- PFC
- Hyper-V Switch
- PF1000
- WS2012 Server #2
- Port1
- Port4
- PFS

Can control the flow of NW communication between Virtual Machines located within the same virtual switch.

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**Can control the flow of NW communication between Virtual Machines located within the same virtual switch.**
PF1000 Use Case

Security Policy 1
Allow traffic from VM1 to VM2 but do NOT allow from VM1 to VM3

Even after the VM migrates...

During VM migration, there is no need for re-configuration. The configuration will be performed automatically by synchronization.

Also, the security policy will be persistent.
PF1000 Use Case

Security Policy 2

All traffic from VM1 to VM2 must go through Firewall

Without Extension

Migration

If each VM's are located in a different virtual switch, NW communication can be routed to a certain appliance such as the firewall. But if both VM's will be located within the same virtual switch after migration, there is no way to control the flow of NW communication.
PF1000 Use Case

Security Policy 2

All traffic from VM1 to VM2 must go through Firewall

By applying PF1000, the virtual switch will be OpenFlow compatible.

As a result, the flow of NW communication for VM's located within the same virtual switch can be controlled.