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**NEC**

Network Virtualization and Automation

# ProgrammableFlow Network Suite v 6.3 and UNIVERGE PF5300 series 10 & 40 Gigabit switches

**PF6800**

OPEN Compute Project

INTEROP BEST OF SHOW AWARD 2015 Grand Prize

**PF5340-48XP-6Q**

**PF5340-32QP**

## Overview

NEC's ProgrammableFlow Network Suite version 6.3 advances scalability of SDN support for OCP approved 10 and 40 gigabit switching.

NEC's ProgrammableFlow Network Suite version 6.3 delivers packet processing pipeline capability designed to work with low cost OCP (Open Compute Project) approved network equipment, ensuring an efficient, high-performance and flexible network architecture.

> **Key Benefits of NEC's ProgrammableFlow Network Suite version 6.3**

- Improvements in network security, operational cost savings, and optimizes the ability to manage and control networks

- Non-blocking spine leaf network designed specifically for data center networks provides high performance network built on a low cost, power efficient, open platform.

- Secure network isolation of data traffic with up to 64,000 virtual networks, supporting fine grained network segmentation and multi tenancy.

- Support for massive scalability - up to 10,000 switches - in a federated controller network, an increase of 2,000 switches from the previous release.

- Zero touch network policy provisioning from the NEC ProgrammableFlow Controller increases service agility and reduces the network administrative burden.

- High Availability – up to 16 way path redundancy network control provides high levels of reliability for mission critical applications.

- Packet processing pipeline capability designed to work with low cost OCP (Open Compute Project) approved network equipment.

## PF5340 Specifications

| Model number (*1) | | PF5340-48-6Q | PF5340-32QP |
|---|---|---|---|
| Switching capacity | | 1,440 Gbps | 2,560 Gbps |
| Packet processing performance | | 1,071 Mpps | 1,428 Mpps(*2) |
| 1000BASE-X (SFP) | SX, LX, 1G-T | 48 (*3) | - |
| 10GBASE-R (SFP+) | SR, LR, DAC | 48 (*3) | - |
| 40GBASE-R (QSFP+) | SR4, DAC, Breakout DAC (QSFP+ ~ SFP+ x4) | 6 | 32 |
| Management ports | | 1 RS-232C(RJ45), 1 10/100/1000BASE-T, 1 USB2.0 (for flash memory) | |
| OpenFlow functions | Version | OpenFlow Version 1.3.4 | |
| | OpenFlow Channel | TCP connection | |
| | Number of flow entries — Bridging Flow Table | Max 294,912 (*4) | |
| | Number of flow entries — ACL Policy Flow Table | 1,792 | |
| Jumbo Frame | | Max 9,216 byte (data part) frames | |
| Network functions | | Link Aggregation, Storm Control | |
| Operation management functions | | SNMPv2c, syslog, ping, traceroute, SSHv2, telnet, ftp, tftp, scp, NTP, Port Mirroring | |
| Operation/setting interface | | JSON/Linux configuration files, REST API, CLI commands | |
| Redundancy | | 2 Internal power modules (hot swappable), 5 FAN modules (hot swappable) | |
| Power Ranges (*1) | AC/DC input voltages (*5) | 100 - 240 VAC or -48VDC (*5) | |
| | AC frequency | 50/60 +- 3 Hz | |
| | Maximum input current | 3.3 A @100 VAC - 1.4A @240 VAC, 5.9 A @ -48 VDC (*5) | 4.1 A @100 VAC - 1.7A @240 VAC, 7.4 A @ -48 VDC (*5) |
| | Power consumption | Max 282 W | Max 355 W |
| Heat generation | | Max 1015.2 kJ/h | Max 1278.0 kJ/h |
| Ambient temperature | Operation | 0 to 40 degrees C | |
| | Storage and transportation | -40 to 70 degrees C | |
| Ambient humidity | Operation, storage and transportation | 5 to 95% (noncondensing) | |
| Acoustic Noise (ISO 7779/3744) | | Max 60 dB | |
| Dimensions (W x D x H) | | 442.5 x 473 x 43.95 mm (1U) | 438.4 x 515 x 43.5 mm (1U) |
| Weight | | Max 8.5 kg | Max 9.1 kg |
| Air flow (*1) | | Front to rear or Rear to front | |

## VTN-OEF Scalability

| | Performance (Unit) |
|---|---|
| Number of PFCs | 40 (PFCs/system) |
| Number of VTN-OEFs | 4,000 (VTN-OEFs/PFC) 64,000 (VTN-OEFs/system) |
| Number of vBridges | 40,000 (vBridges/PFC) 640,000 [vBridges/system] |
| Number of PFSs that can be controlled | 250 (PFSs/PFC) 10,000 (PFSs/system) |
| Number of OEF-Spine domains | 16 (OEF-Spine domains/ system) |
| Number of OEF-Leaf domains | 96 (OEF-Leaf domains/system) |
| Number of OEF domains (Total of OEF-Spine domains and OEF-Leaf domains) | 16 (OEF domains/PFC) |
| Number of multiple flooding paths (MFPs) | 16 (MFPs/OEF domain) |

## PF9800 Operating Environment (Same for UNC)

| | | Specifications |
|---|---|---|
| Recommended hardware | Model name | NEC Express5800/R120f-1M |
| | Memory | 64 GB |
| | CPU | Xeon E5-2660 v3 |
| | Network interfaces | 1GbE, 6 ports |
| | HDD | 300 GB (RAID1) |
| OS | | Red Hat Enterprise Linux 6.5 (x86_64) Kernel version: kernel-2.6.32-431.20.3.el6.x86_64 |

(*1) There are eight PF5340 model numbers depending on the network interfaces, air flow directions and power (AD or DC).
(*2) The maximum packet processing capacity is equally distributed to every 8 QSFP+ slots (1-8, 9-16, 17-24, 25-32). Specifically, QSFP+ 1-8slot:357Mpps, 9-16slot:357Mpps, 17-24slot:357Mpps, 25-32slot:357Mpps.
(*3) SFP modules or SFP+ modules can be used.
(*4) Hash collision may limit the maximum number of entries.
(*5) DC power version is a future option.

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