Orchestrating a brighter world NEC

SDN Compliant Products

PF Series SDN Controller + PF5340 Switch

Virtual Tenant Network - OpenFlow Ethernet Fabric (VTN-OEF)

- **Enable networks for large datacenters with thousands of racks**
- **Quick and flexible service provision and changes by SDN technology**

PF6800

PF5340

PF5340-48XP-6Q

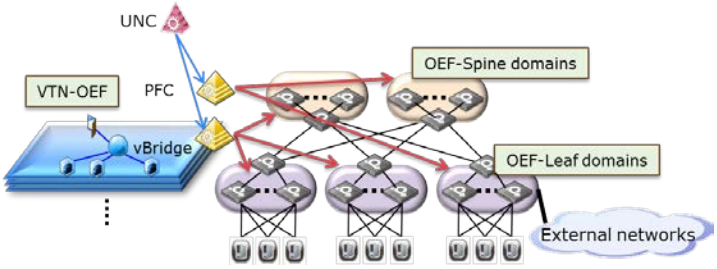
PF5340-32QP

The PF series VTN-OEF provides large scale datacenters with virtual networks. This is realized by the PF series SDN controllers' (UNC and PFC) unifies control over PF5340 switches (PFS's) using OpenFlow protocol.

Virtual Network (VTN-OEF)

The virtual network (VTN-OEF) is a virtualized network method specialized in scalability, fault tolerance and virtualization of L2 networks for large datacenters.

- Virtual network (VTN-OEF) communications are set up as mutually independent networks by the controller.
- Virtual networks are designed, added or changed through a GUI of the controller without regard to the physical network configurations.
- Virtual L2 networks are configured using virtual L2 switches (vBridges) .
- High speed switching in case of a failure in large networks is achieved by a combination of OpenFlow protocol and PF5340's automatic terminal address learning function.
- UNIVERGE PF6800 Controller (PFC) controls multiple PF5340's in each domain (OEF-Spine domain or OEF-Leaf domain) on a per domain basis.
- Up to 16 domains can be managed per PFC cluster.
- One UNIVERGE PF6800 Network Coordinator (UNC) can control up to 40 PFC clusters.
- OEF-Spine domains are used to connect OEF-Leaf domains to expand networks. Up to 16 OEF-Spine domains and 96 OEF-Leaf domains can be configured.



VTN is the name of the "Virtual Tenant Network" which is the feature of ProgrammableFlow.

VTN is being separated from the physical network configurations and VTN are designed, added or changed through a GUI of UNC freely.

More than one VTN is configured on one physical network.

Communications between each VTN is independent without being intermingled.

ProgrammableFlow

Specifications

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)	8 (MFPs/OEF domain)
Number of MCLAGs	6,250 (Trunk ports/PFC)

PF6800 Operating Environment (Same for UNC)

		Specifications
Recommended hardware	Model name	NEC Express5800/R120g-1M
	Memory	64 GB
	CPU	Xeon E5-2680 v4
	Network interfaces	1GbE, 6 ports
	HDD	300 GB (RAID1)
OS		Red Hat Enterprise Linux 6.7 (x86_64) Kernel version: kernel-2.6.32-573.12.1.el6.x86_64

PF5340 Specifications

Model number (*1)			PF5340-48XP-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			
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)	
		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		3.3A @100 VAC - 1.4A @240 VAC, 5.9 A @ -48 VDC	4.1A @100 VAC - 1.7A @240 VAC, 7.4 A @ -48 VDC
	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	

*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. You can install 1G-T (SFP) to up to 6 ports.
*4: Hash collision may limit the maximum number of entries.

For inquiries, contact:
NEC Corporation
URL http://www.nec.com/

Rev.E-20160906 Ver.7.1.0.0