Overview

Overlay networking is fast emerging as a network paradigm that allows dynamic provisioning and efficient utilization while providing isolation for multi-tenancy in the datacenter. Here, Network Virtualization is achieved using Layer-2 over Layer-3 tunneling for connecting Open vSwitches.

One Convergence intelligent in-line acceleration technology allows for complete virtual switching / Open vSwitch and flow off-load to a multi-core processor like Cavium Octeon to achieve wire speed networking while freeing the host processors like x86 for applications processing. Virtual switching in the adapter can be combined with in-line acceleration for other functions like flow processing, DPI, SSL, IPSec, custom processing etc. with hardware assist to achieve scalability for flows and throughput while providing low latency.

The One Convergence Edge Acceleration Platform can be enabled on a Cavium Octeon based NICs PCIe adapter platform and is targeted for data center applications like virtualized servers, virtual appliances, edge switches, L2oL3 gateways and other networking appliances. The solution will have support for Layer-2 over Layer-3 tunneling like VXLAN, NVGRE and other protocols along with full offload of Open vSwitch and other datapath functions for enabling OpenFlow based SDN.

A virtual appliance like a Load Balancer running on a server or proprietary hardware equipped with an intelligent NIC running One Convergence Edge Acceleration Platform can benefit from programming the flows directly into the Open vSwitch running on the NIC with minimal involvement of the host processor in the data path to achieve performance and scalability for data center applications.

Deployment Scenario
Edge Acceleration Platform Features
- Open vSwitch / Edge Switching Acceleration and Offload
  - OpenFlow Compliant SDN
- Flow based Acceleration for Appliances
  - Large Flow Table Support
- Hardware Assist for IPsec, DPI
- Custom Inline Application Processing
- Network Virtualization Enablement
- L2oL3 Tunneling - VXLAN, NVGRE ...

Edge Switching Features
- A Subset of 802.1ag CCM Link Monitoring
- STP (IEEE 802.1D-1998)
- Fine-grained Min/Max Rate QoS
- Per VM Interface Traffic Policing
- NIC Bonding with Source-MAC Load Balancing, Active Backup, and L4 Hashing
- OpenFlow Protocol Support (including many extensions for virtualization)
- IPv6 Support
- Multiple Tunneling Protocols
  - Ethernet over GRE, CAPWAP, IPsec, GRE over IPsec
  - VXLAN, NVGRE
- Remote Configuration Protocol with Local Python Bindings
- Compatibility Layer for the Linux Bridging Code

Virtual Appliance Acceleration
- Load Balancer / ADC
  - Splice Acceleration
- Firewall
  - Flow based NAT Acceleration
  - Custom Firewall Actions
- Network Virtualization Enablement
  - Interoverlay Translation
  - VXLAN, NVGRE, VLAN
  - Legacy Network Connect

Target Applications
- Virtualized Appliances
- Virtualized Servers
- Edge Switches
- L2oL3 Gateways
- Firewalls
- ADC / Load Balancers

Load Balancer Use Case

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