



Reducing VM TCO For Cloud Providers

6WIND Virtual Accelerator™

Data center operators have now completed virtualizing their servers and provide very flexible private and public cloud services.

At the same time, server performance keeps increasing (more embedded processors, more cores per processor, 40G Ethernet) and it's expected the average number of VMs per server will dramatically grow to reach dozens to soon one hundred, and more.

Beyond traditional workloads, Cloud Providers want to differentiate in a very competitive environment by providing customers with new innovative services (video-based services, DDoS protection, and more). These services all rely on higher network bandwidth.

Virtualized architectures add many software processing layers between the network interface and the application workloads running in a VM that cause significant networking performance penalties. It will be an increasing challenge to manage the aggregated bandwidth required by many VMs within a single server.

Cloud Providers have specific functional and performance networking requirements to increase the

number of VMs per server and deploy new bandwidth-intensive services:

- High performance switching aggregated bandwidth for workloads using the least processing cores possible.
- Hardware independent network attachments for seamless network hardware upgrades and workload migration; this is very important to benefit from the lower cost per Gbps enabled by 40G Ethernet.
- Extension of network infrastructure protocols (routing, firewalls and more) beyond pure switching features to deploy more services at a lower cost.
- No impact on server management.

6WIND Virtual Accelerator Solution For Cloud Providers

To meet all these requirements, 6WIND Virtual Accelerator is designed around an open, high performance software switch to provide a high performance and full-featured networking platform for

Test Configuration: 16 Cores / 4 VMs per core



3X More VMs, 3X More Performance

increasing performance at the hypervisor level.

Based on a fast path architecture, 6WIND Virtual Accelerator transparently accelerates the Linux selected software switch to provide extreme bandwidth and low-latency to VMs. As an example, 6WIND's Open vSwitch (OVS) acceleration provides 20 Gbps of switching capacity per core that scales linearly with the number of cores without any modification to OVS or its management.

Using DPDK to interface with Ethernet Network Interface Cards (NIC), 6WIND Virtual Accelerator isolates VMs from real hardware, thus eliminating driver dependency in VM operating systems. This isolation also allows network hardware changes in either connection speed, supplier or function (for example a smart NIC performing DDoS mitigation) without VM changes. It also allows for live and scheduled migration of VMs from one platform to the other without any hardware NIC adaptations.

On the application side, 6WIND Virtual Accelerator interfaces with the VMs using standard Virtio. The VM can run any application and any operating system without any changes. It allows Cloud Providers to easily integrate VMs from different vendors with various guest operating systems.

Beyond accelerating Linux Bridge and Open vSwitch, 6WIND Virtual Accelerator also provides enhanced networking services such as overlay, L3 forwarding, virtual routing, multi-tenancy, IPsec and more.

6WIND Virtual Accelerator software deploys

transparently into the hypervisor domain based either on open source or commercial distributions. It supports OpenStack and SDN Controllers without any changes to the existing management and orchestration environment.

6WIND Virtual Accelerator is installed using standard Linux package managers, rpm or deb. In OpenStack environments, 6WIND Virtual Accelerator can be also installed using platforms such as Fuel (plug-in) or Juju (Charms).

6WIND Virtual Accelerator includes a ready-to-use "zero conf" default configuration option. Optimizations can be done using configuration tools. Once configured, 6WIND Virtual Accelerator is started as a service of the Linux distribution.

6WIND Virtual Accelerator ROI Example For Cloud Providers

A Cloud Provider deploying four application VMs per core, with each one requiring 500 Mbps of traffic, will deploy 3x more VMs on a single server using 6WIND Virtual Accelerator's virtual switch acceleration solution.

As a result, a Cloud Provider can deploy 70% less servers and save 70% of CAPEX and OPEX with a Return on Investment in less than 3 months.



Virtual Software Solutions For COTS Servers



6WIND Virtual Accelerator Feature Set and Performance

- 6WIND Virtual Accelerator runs a standard Linux distribution and DPDK (Data Plane Development Kit)
- 20 Gbps of switching capacity per core on Intel platforms
- High capacity for encapsulation protocols such as VLAN, VXLAN and more
- High performance and scalable IPv4 and IPv6 forwarding supporting 10 Mpps per core on Intel platforms independent of packet size
- Virtual routing support for a large number of instances
- High performance and high capacity firewall
- High performance IPsec stack to sustain more than 12 Gbps of encrypted traffic per core on Intel platforms