



Virtual Accelerator

USPs

- ▶ **Boosts host switching performance by x5**
- ▶ **Low Latency**
- ▶ **Saves host CPUs resources for an increased VM density**
- ▶ **Integrated with OpenStack**
- ▶ **Compatible with major SDN controllers**

Benefits

- ▶ Increase VM and VNF performance without SR-IOV
- ▶ Multiply VM density on COTS servers
- ▶ 1/10/40/100GE support
- ▶ Transparent Operation: No change to existing VNFs or VMs or management tools
- ▶ Zero hardware and software dependencies

6WIND Virtual Accelerator provides packet processing acceleration for virtual network infrastructures used in Network Function Virtualization (NFV), Data Center Virtualization and Network Appliance Virtualization use cases.

6WIND Virtual Accelerator runs inside the hypervisor domain and removes performance bottlenecks by offloading virtual switching and virtual networking from the hypervisor.

Virtual Accelerator Architecture

6WIND Virtual Accelerator boosts virtual networking performance by running its data plane packet processing software on dedicated cores and using poll mode drivers for efficient data I/O processing. It has native multi-queue support to distribute the load across multiple CPU cores and scale linearly with the number of dedicated cores.

 **Virtual Accelerator**

Key Features

- ▶ Mature solution for high performance I/O leveraging DPDK, with multivendor NIC support
- ▶ Accelerated virtual switching (Open vSwitch and Linux bridge) and networking (Overlays, Filtering/NAT, IP Forwarding, IPsec) using the fastest packet processing algorithms
- ▶ Preserves standard Linux commands (tcpdump, iptables, IPsec/XFRM, etc.) for ease of deployment and operations
- ▶ Supports standard network management tools
- ▶ Supports existing workloads through standard Virtio drivers
- ▶ Scalable software-based switching enables Service Chaining
- ▶ High virtualization performance without SR-IOV
- ▶ Advanced monitoring through streaming telemetry with time series data base and graphical analytics

Specifications

Virtual Switching:

- ▶ Open vSwitch (OVS)
- ▶ Linux Bridge
- ▶ Virtio Host PMD

Offloads (for Virtio guest):

- ▶ Checksum offload (IP and TCP/UDP)
- ▶ TSO (based on GSO)
- ▶ LRO (based on GRO)

IP Networking:

- ▶ IPv4 and IPv6
- ▶ Multi-tenancy (VRF)
- ▶ IPv4 and IPv6 tunnelling
- ▶ NAT

L2 and Encapsulations:

- ▶ GRE
- ▶ VLAN (802.1Q, QinQ)
- ▶ VXLAN
- ▶ LAG (802.3ad, LACP)
- ▶ Ethernet Bridge

QoS:

- ▶ Rate Limiting per Interface
- ▶ Rate Limiting per VRF
- ▶ Class-based QoS
- ▶ Classification: ToS/IP/DSCP/CoS
- ▶ Shaping and Policing
- ▶ Scheduling: PQ, PB-DWRR

Management / Monitoring:

- ▶ Linux networking tools: ovs-*, iproute2, iptables, ping, tcpdump, traceroute.
- ▶ SSHv2
- ▶ KPIs / Telemetry (YANG -based)
- ▶ SNMP
- ▶ Syslog

IP Services:

- ▶ DHCP Server / Client / Relay
- ▶ DNS Client / Proxy
- ▶ NTP

Security:

- ▶ ACLs (stateless & stateful)
- ▶ uRPF
- ▶ CP Protection (including rte flow HW support)

System Requirements:

- ▶ Processor: single or multi-sockets Intel® Xeon® and Atom® processor
- ▶ CPU Cores: Minimum one (fully customizable)
- ▶ NICs:
 - Intel 1G, 10G, 40G, 100G
 - Mellanox 10G/25G/40G/50G/100G: CX4, CX5
 - Broadcom NetExtreme E-Series

Supported Linux Distribution

- ▶ RedHat Enterprise Linux
- ▶ Ubuntu
- ▶ CentOS

Performance

- ▶ Switching Capacity (OpenStack)
 - Compute Node: 20 Gbps per core
 - Network Node: 40 Gbps per core
- ▶ Forwarding: 12 Mpps per core
- ▶ VLAN: 10 Mpps per core
- ▶ Filtering: 6 Mpps per core



6WIND Virtual Accelerator Use Cases

NFVi Host Acceleration

6WIND Virtual Accelerator provides efficient switching to increase virtual infrastructure performance. Testing in live OpenStack environments shows most Virtual Network Functions (VNFs) can achieve performance boosts of up to 5x and 20 Gbps throughput without SR-IOV or any changes to the VNF.

By offloading network packet processing to dedicated CPU cores, 6WIND Virtual Accelerator maximizes the number of Virtual Machines (VMs) without affecting individual networking performance requirements. The increased VM density can be applied to additional VNFs such as load balancers, firewalls, etc. to generate new revenue streams on existing servers.

