



Turbo IPsec™



COTS Based vRouter IPsec VPN Solution With Scalable Performance

IPsec Performance¹

- 14 Gbps per core
- Performance scales linearly with number of cores

Scalability

- 1/10/40/100GE Support
- 50,000+ IPsec Tunnels
- 1000 Tunnels per Second

Bare Metal or Virtual Platforms

TCO Savings > 50% over Hardware

Automation: NETCONF and Telemetry APIs

6WIND Turbo IPsec is a scalable, cost-effective IPsec gateway and is part of the 6WIND vRouter family. It is a ready-to-use software network appliance that can be deployed standalone on bare metal commercial-off-the-shelf (COTS) servers or as a virtual machine. 6WIND Turbo IPsec's flexibility and rich features make it ideal for medium to very large VPN solutions for Enterprise and Network Operator/Carriers and Data Centers.

IPsec for Secure Connectivity

IPsec is a necessary VPN security technology for Enterprises and Network Operators and is used to create secure communication tunnels between trusted endpoints across the inherently insecure internet and even WAN links. Whether terminating a number of high-speed tunnels to connect data centers or enterprise campuses or connecting with remote users across hundreds or thousands of low speed tunnels, Turbo IPsec scales to meet the application/use case demand.

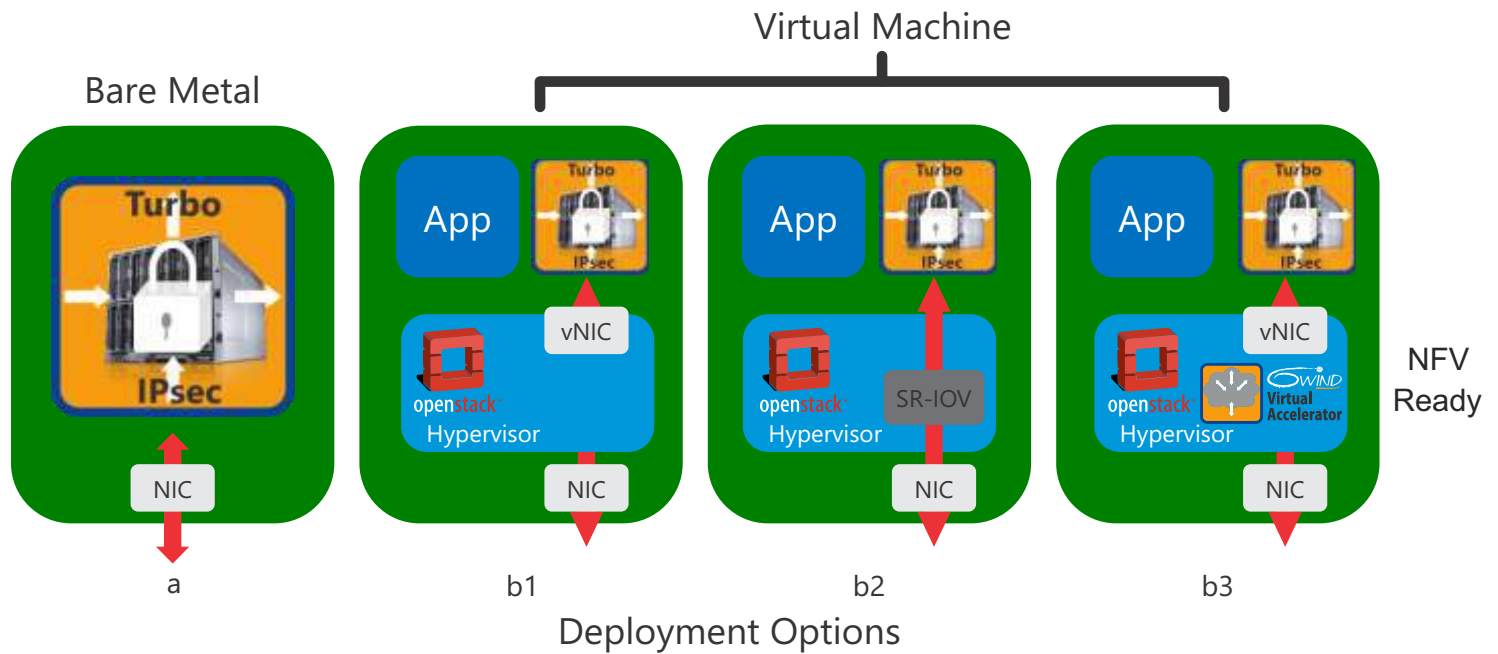
Leveraging COTS Platforms for Improved TCO

When comparing 6WIND Turbo IPsec on COTS servers versus hardware IPsec gateways, cost benefits can be realized in multiple ways. Comparing CAPEX, the cost of 6WIND Turbo IPsec on a COTS server is more than 50% less than any purpose-built hardware with similar performance characteristics. By adding virtualization, customers further reduce CAPEX since they can combine 6WIND Turbo IPsec with additional services, such as routers, load balancers, firewalls, etc. on the same COTS server, increasing productivity and generating new revenue streams.

OPEX savings are realized by minimizing installation efforts, sparing requirements and service commissioning efforts. In a virtual environment, adding additional IPsec applications is a matter of spinning up VMs. Turbo IPsec eliminates downtime needed to install, connect and cable cumbersome traditional purpose-built hardware products.



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Product Description and Architecture

The 6WIND Turbo IPsec software is divided up into a control plane and a data plane. The control plane is comprised of the Linux operating system as well as applications for routing, IKE, etc. The control plane operates independently of the data plane component and runs on at least one core.

The tremendous boost in data plane performance is accomplished by running the optimized packet processing software on dedicated cores. The data plane software comprises DPDK, a set of poll mode drivers that provide efficient data I/O processing. In addition, 6WIND technology has native multi-queue support to distribute the load across multiple CPU cores. This combination allows performance to scale linearly by 16 Gbps per core. Internal testing confirms 6WIND Turbo IPsec scales linearly from 16 Gbps to over 300 Gbps with each added core.

6WIND Turbo IPsec can be loaded directly onto bare metal servers as a pure IPsec deployment option (a). This standalone appliance is suitable as a direct replacement for traditional,

virtual machine and supports standard vNICs (Virtio, ENA) (b1). 6WIND Turbo IPsec also supports SR-IOV or PCI passthrough, a technology that bypasses the hypervisor networking stack in order to increase forwarding performance (b2). The third option (b3) combines the performance of SR-IOV and all the rich features of the hypervisor (live migration, switching, hardware independence, etc.) by installing 6WIND Virtual Accelerator™, which is hypervisor scaling software. The added advantage of using 6WIND Virtual Accelerator is that all virtual machines benefit from the increase in hypervisor networking performance.

Carrier Grade
IPsec Software

Ready To Use In Any
Network Environment

APIs For Automation

dedicated IPsec gateways small and large.

NFV Ready

In NFV or virtual environments 6WIND Turbo IPsec is instantiated as a regular

Advanced Management and Monitoring with APIs

Turbo IPsec provides both traditional, CLI-based management and management based on YANG and NETCONF APIs for integration with higher level orchestrators and management frameworks. For monitoring, the traditional SNMP and syslog mechanisms are supported, plus data plane sampling through sFlow, and streaming telemetry with time series data base and graphical analytics.

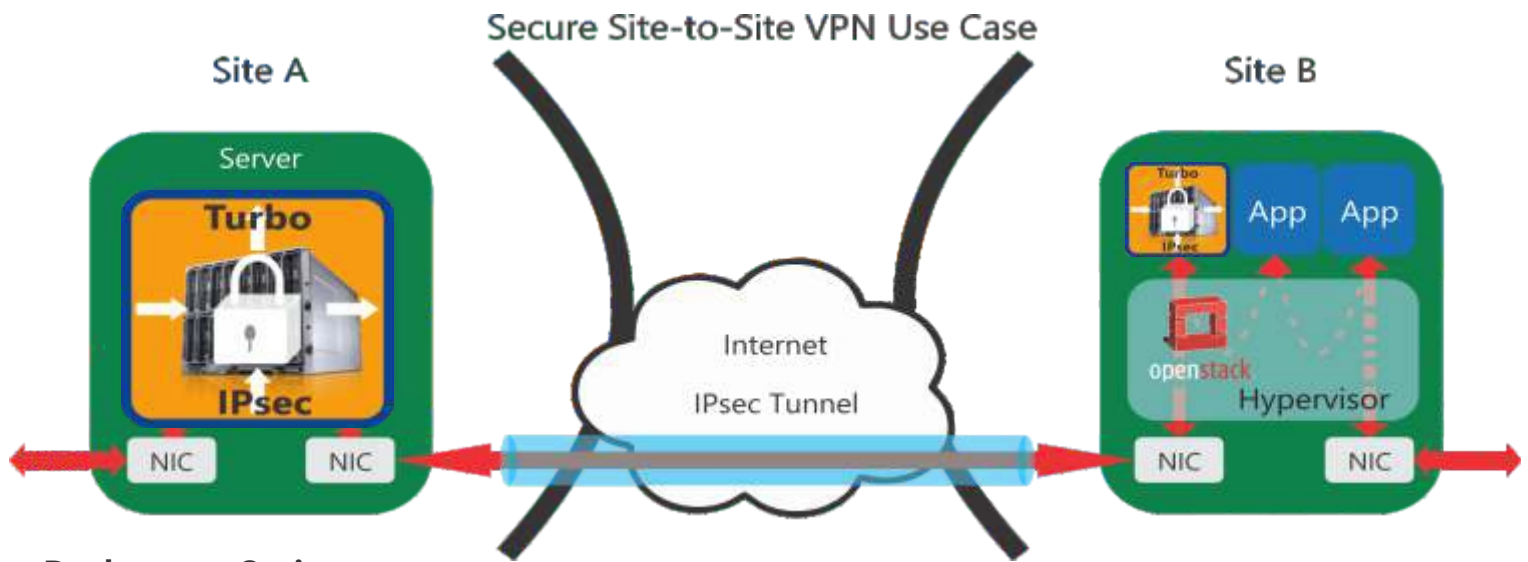
Expected Layer 3 Forwarding Performance

# of vCPUs	1	2	4	8	16	20
Throughput (Gbps) with 1420B packets	16	32	64	128	256	320



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Deployment Options:

Secure Site-to-Site VPN Use Case

For customers that need an IPsec VPN to secure point-to-point connections between multiple data centers, 6WIND Turbo IPsec can be deployed on bare metal servers (Data Center A) or as a Virtual Machine (Data Center B) to terminate one or more IPsec tunnels. The latter alternative is a flexible NFV deployment and supports service chaining.

Mobile Infrastructure Security Use Case

Operators are migrating to the Evolved Packet Core (EPC) to support 4G LTE access to networks. In the new architecture, control and data interfaces are exposed to all the threats and vulnerabilities found in trusted and untrusted IP networks. 6WIND Turbo IPsec secures these interfaces through encryption and authentication services at a fraction of the price of custom hardware.

Other Use Cases

- Wireline operators - overlaying value-added VPN and IPsec features to existing wireline services
- Enterprise VPN for telecommuters – aggregating hundreds or thousands of low speed IPsec VPN tunnels

Key Features

- High performance, full-featured data plane networking supports an extensive set of L2 to L4 networking protocols, including IP forwarding, IPsec, NAT and more
- Platform/NIC agnostic-does not lock the customer into a single vendor solution to meet small and large scale requirements
- Management options include CLI, and NETCONF/YANG management
- Bare metal or virtual machine – same software across both deployment models

Supported RFCs MIBs

Please refer to the 6WIND website for most up-to-date information. MIB information available upon request.

Ordering Information

Features subject to change. Contact your 6WIND sales team or access our website:

<http://www.6wind.com/company-profile/contact-us/>

6WIND Turbo IPsec Part Numbers

1G/1K tunnels
6SS-TI-11-Perp-Intel

2G/2K tunnels
6SS-TI-22-Perp-Intel

5G/5K tunnels
6SS-TI-55-Perp-Intel

10G/10K tunnels
6SS-TI-1010-Perp-Intel

25G/25K tunnels
6SS-TI-2525-Perp-Intel

40G/40K tunnels
6SS-TI-4040-Perp-Intel

100G/100K tunnels
6SS-TI-100100-Perp-Intel

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System Requirements

Intel x86 Xeon and Atom processor with x86 architecture with 1, 2 or 4 sockets (Advantech, Dell, HP, Lanner, Super Micro)

Core Count: Minimum one for control, one for data plane; fully customizable

2GB minimum, configurable, depends on capacity

NIC

Intel 1G 82575, 82576, 82580, I210, I211, I350, I354
Intel 10G/40G 82598, 82599, X520, X540, XL710
Mellanox 10G/25G/40G/50G/100G Cx4, Cx5
Broadcom NetExtreme E-Series
Virtio, SR-IOV, PCI passthrough, VMXNET3, ENA

Deployment / Hypervisor

Bare metal, KVM, VMware ESXi, OpenStack NFV, AWS, Containers (Kubernetes/docker)²

Performance

IPsec: 14 Gbps per core
Forwarding: 16 Mpps per core
VLAN: 13.5 Mpps per core
Filtering: 6.2 Mpps
More than 1 Million routes
50,000+ established tunnels
Up to 1,000 negotiated per second

IPsec

IKE v1/v2 pre-shared keys or X509 certificates
MOBIKE
Encryption: 3DES, AES-CBC/GCM (128, 192, 256)
Hash: MD-5, SHA-1, SHA-2 (256, 384, 512) AES-XCBC (128)
Key management: RSA, DH MODP groups 1 (768 bits), 2 (1024 bits), 5 (1536 bits) and 14 (2048 bits), DH PFS
EAP/Radius², EAP-MSCHAPv2²
Extended Sequence Numbers (ESN), Large anti-replay windows
High performance (AES-NI, QAT)
Tunnel, Transport or BEET mode
SVTI
DMVPN²
OpenVPN²

Routing

BGP4, BGP4+
OSPFv2, OSPFv3
RIPv1, RIPv2, RIPv2, RIPv2
Static Routes
Path monitoring for static routes
ECMP
PBR
MPLS
BGP L3VPN
BFD
NHRP²
VXLAN EVPN²
BGP RPKI²



²Near-term Roadmap

L2 and Encapsulations

GRE, mGRE²
VLAN (802.1Q, QinQ)
VXLAN
LAG (802.3ad, LACP)

IP Networking

IPv4 and IPv6
Segment Routing v6²
IPv6 autoconfiguration²
VRF
IPv4 and IPv6 Tunneling
NAT
Multicast²
ARP Proxy²

Management/Monitoring

SSHv2, Telnet
CLI
NETCONF/YANG
SNMP
KPIs/Telemetry (YANG-based)
RBAC with AAA
Syslog
802.1ab LLDP
sFlow

High Availability

VRRP
IKE/IPsec synchronization

Security

ACLs (stateless and stateful)
uRPF
CP Protection
BGP Flowspec

IP Services

DHCP Server/Client/Relay
DNS Client/Proxy
NTP

QoS

Rate limiting per interface
Rate limiting per VRF
Class-based QoS
Classification: ToS/IP/DSCP/CoS
Shaping and policing
Scheduling: PQ, PB-DWRR

Operations

Installation: PXE, USB, ISO, QCOW2, OVA
Update/Rollback Support
Provisioning: cloud-init, Ansible, ZTP²

Supported RFCs

Please refer to 6WIND website for the most up to date information



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