6WINDGate™

Packet Processing Software For COTS Servers
Scalable Data Plane Performance For Multicore Platforms

Source Code For Network Builders: Cloud, Enterprise and Service Providers

Save Years To Build Your Network Product

Seamless Integration With Linux

IP Forwarding	• 16 Mpps per core <100ns latency • 200+Gbps
IPsec	• 14 Gbps per core • 1420B packets
Routes	• 1 Million
IKE	• 50,000+ tunnels • 1,000 tunnels per second
4in4	• 9.9 Mpps
Filtering	• 6.2 Mpps per core
GRE	• 8.7 Mpps per core
OVS	• 22.6 Mpps per core
VLAN	• 13.5 Mpps per core

Network builders of all sizes looking for a shortcut in development are discovering the value of 6WINDGate Packet Processing Software by 6WIND. Changing demands for compute power in Linux networks, combined with the availability of commercial-off-the-shelf servers, is creating an opportunity for developers to create custom network applications with little overhead.

Fast Path Data Plane Scales Linux Networking Performance
6WINDGate's accelerated data plane, known as the fast path, provides a turbo boost for Linux networking performance. A common problem with Linux is performance bottlenecks in the kernel that cripple scalability and stability. 6WINDGate overcomes this challenge by offloading data plane functions from Linux with a dedicated and isolated fast path networking stack to increase predictable performance. Its lockless design enables scalability per core on multicore platforms. With 6WINDGate, performance scales linearly with the number of cores.

6WINDGate Deployment Options
6WINDGate can be deployed in bare metal environments to help customers build high performance applications and services directly on top of COTS servers. It can also be deployed in virtualized environments within a virtual machine to build high performance applications and services within VMs, or within the hypervisor domain to build high performance virtual infrastructure for 6WIND or third-party VMs. We also provide a migration path from bare metal to virtual with the same code base.

Available For Industry Leading Processor Platforms
6WINDGate fast path modules are architecture and processor independent. We focus on efficiency and performance by optimizing the number of cycles it takes to perform packet processing functions, resulting in increased throughput and reduced latency. This architecture also makes it easy to switch from one architecture to another.

In addition, architecture specific Fast Path Networking SDKs are available that leverage processor suppliers' SDKs, which are particular to specific architectures.

We leverage processor supplier SDKs such as DPDK for Intel and ARM and Simple Exec for Cavium, with additional support for programmable processors and smart NICs.

High Performance, Scalable Networking Protocols
All of our fast path networking protocols are designed for the highest throughput with low latency and linear scalability with the number of cores. Our performance is independent of packet size, with the exception of IPsec.

6WINDGate Accelerated Layer 2-4 Networking Stacks
6WINDGate networking stacks are based on a fast path architecture with an accelerated data plane that resides in the Linux userspace, offloading these functions from the kernel. These include modules for Layer 2, Layer 3 and Layer 4.

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Because there is no kernel modification, we provide a Fast Path Synchronization module to keep our fast path continuously in synch with all Linux distributions.

We also include modules for control plane, distributed architecture, management and high availability.

Seamless Integration with Linux
6WINDGate's unique value proposition is seamless integration with Linux. It starts with support for all major Linux distributions, where existing Linux management tools can be reused with no changes. We support third-party open source control plane applications such as **FR Routing** and **strongSwan.** We also work with third party management tools, both commercial and open source.

Advanced Management and Monitoring with APIs
6WINDGate 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.

System Requirements
CPU: Intel x86 Xeon and Atom, ARM

NICs
- Intel 1G 82575, 82576, 82580, I210, I211, I350, I354
- Intel 10G/40G 82598, 82599, X520, X540, XL710
- Mellanox 10G/25G/40G/50G/100G CX3, CX4, CX5
- Broadcom NetExtreme E-Series
- Virtio, SR-IOV, PCI passthrough, VMXNET3, AWS ENA, Azure NetVSC

Deployment / Hypervisor: Bare metal, KVM, VMWare ESXI, OpenStack NFV, AWS, Azure, Containers (Kubernetes/docker)

Features
Routing
- BGP4, BGP4+
- BGP RPKI[1]
- OSPFv2, OSPFv3
- RIPv1, RIPv2, RIPng
- Static Routes
- Path monitoring for static routes
- ECMP
- PBR
- MPLS
- BGP L3VPN
- BFD
- NHRP[1]
- VXLAN EVPN

L2 and Encapsulations
- GRE, mGRE[1]
- VLAN (802.1Q, QinQ)
- VXLAN
- LAG (802.3ad, LACP)
- Ethernet Bridge

IP Networking
- IPv4 and IPv6
- IPv6 autoconfiguration
- Segment Routing v6[1]
- VRF
- IPv4 and IPv6 Tunneling
- NAT, CG-NAT
- TCP IPv4/IPv6
- TLS/DTLS
- PPPoE client/server
- L2TP server
- Multicast[1]

IPsec
- IKE v1/v2
- MOBIKE
- Encryption: 3DES, AES-CBC/GCM (128, 192, 256)
- Hash: MD-5, SHA-1, SHA-2 (256, 384, 512), AES-XCBC (128)
- RSA, DH Key Management
- EAP/Radius, EAP-MSCHAPv2
- High performance (AES-NI, QAT)
- Tunnel, Transport or BEET mode
- SVTI, DVTI
- DMVPN[1]
- OpenVPN[1]

Virtual Switching
- Ethernet Bridge
- OVS

Offloads (for Virtio guests)
- Checksum offload (IP and TCP/UDP)
- LRO (based on GRO)
- TSO (based on GSO)

These offloads work on inner headers within tunnels (VLAN, VXLAN, GRE, IPinIP). 6WINDGate leverages hardware offloads when supported by the NICs.

Management / Monitoring
- SSHv2, Telnet
- CLI
- NETCONF/YANG
- SNMP
- KPIs/Telemetry (YANG-based)
- Standard Linux networking tools: iproute2, iptables, ping, tcpdump, traceroute, telnet
- RBAC with AAA
- Syslog
- 802.1ab LLDP
- sFlow

High Availability
- VRRP
- IKE/IPsec synchronization
- ARP/NDP synchronization
- Firewall/NAT synchronization
- Daemon Monitoring System

Security
- ACLs (stateless & stateful)
- uRPF
- CP Protection (including rte flow HW support[1])
- BGP Flowspec

IP Services
- DHCP Server / Client / Relay
- DNS Client / Proxy
- NTP

QoS
- Rate limiting per interface and flow
- Rate limiting per VRF
- Class-based QoS
  - Classification: ToS/IP/DSCP/CoS
  - Shaping And Policing
  - Scheduling: PQ, PV-DWRRR

Linux Transparency
- 6WINDGate does not require any modification to the existing Linux environment (kernel, control plane or management applications). Example functions and tools that work seamlessly in Linux and with 6WINDGate technology: netdevices, iproute/iptables/iprules, third-party routing/security control planes, networking statistics, etc.

Build Framework
- Automatic build of 6WINDGate source packages into read-to-install binaries for RHEL, CentOS or Ubuntu. With 6WINDGate distribution, an all-in-one bootable system is built.

Linux Distribution Support
RHEL 7, CentOS 7, Ubuntu 16, Ubuntu 18
[1]Near-term roadmap