![6WIND logo] **6WIND** — Virtualized Networking Software

Virtual CG-NAT

Key features

▶ **30M Connections**
(Concurrent connection per 32G RAM)

▶ **Linear Scalability**
(over 300Gbps throughput per single instance)

▶ **30Gbps per CPU core**
(IMIX traffic)

Benefits

▶ High Performance

▶ Support for NAT44, NAT64 and DNS64

▶ High scalability to address rapid growth in the number of subscribers and devices

▶ Native support for physical and virtual deployments (PNF, VNF)

▶ Rich features:
including Endpoint-independent Mapping (EIM), Endpoint-independent Filtering (EIF), port preservation, hair-pinning and address pooling for a seamless user experience across a NAT environment.

Virtualized Carrier Grade Network Address Translation (vCG-NAT)

The adoption of Service Defined Networks drives the need for virtualized network functions to provide flexible and scalable networking capabilities. The 6WIND vCG-NAT service along with the other 6WIND VSR services is designed to run as VNF and provide High performance and scalable networking functions delivering routing, and large-scale NAT capabilities.

6WIND vCG-NAT is a high-performance, software-based solution for a large-scale transparent network addresses and protocols translations. It is deployed in bare metal or in virtual machines on commercial-off-the-shelf (COTS) servers in private and public clouds.
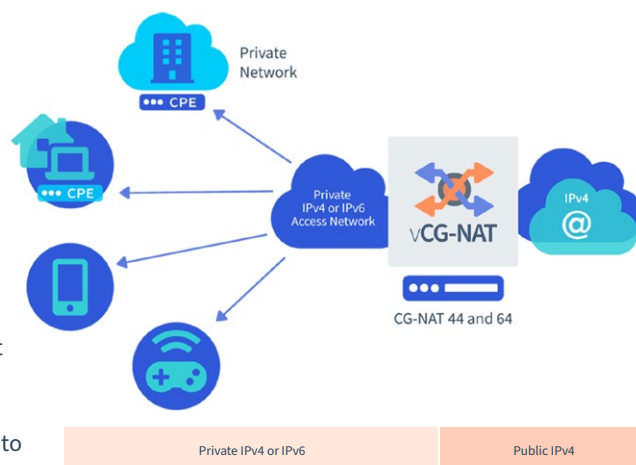
6WIND vCG-NAT enables a smooth transition to IPv6 and allows service providers to efficiently extend their IPv4 networks.

6WIND vCG-NAT aggregates multiple millions of concurrent connections and scales the bandwidth performance from 1G to over 300G.

6WIND vCG-NAT works as a Virtual Machine on top of standard x86 server to provide flexibility and cost-efficiency for small and large deployments.

The 6WIND vCG-NAT allows sharing small pools of public addresses among multiple end-sites and end-users, thus helps greatly expand the capacity of existing networks with a limited extra investment.

It enables Internet and telecom Service Providers overcome the exhaustion of public IPv4 addresses by leveraging IPv4 to IPv4 (NAT44) or IPv6 to IPv4 (NAT64) translations to optimize the private networks usage and sustain a rapid growth in the number of subscribers and devices.

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Specification

IP Networking:
- IPv4 and IPv6
- IPv6 auto-configuration
- Multi-tenancy (VRF)
- IPv4 and IPv6 tunneling
- IPv4 and IPv6 filtering
- Network address translation
- Multi-cast

Routing:
- BGP4, BGP4+
- BGP RPKI
- OSPFv2, OSPFv3
- RIPv1, RIPv2, RIPng
- Static routes & path monitoring
- BGP multi-path (ECMP)
- Policy base routing (PBR)
- MPLS
- BGP L3VPN
- BFD
- NHRP
- VXLAN EVPN

Quality of Service:
- 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:
- SSHv2
- CLI
- NETCONF / YANG
- SNMP
- KPIs / telemetry (YANG -based)
- RBAC with AAA
- Syslog
- 802.1ab LLDP
- sFlow

L2 and Encapsulations:
- GRE, mGRE
- VLAN (802.1Q, QinQ)
- VXLAN
- LAG (802.3ad, LACP)
- Ethernet bridge

IP Services:
- DHCP server / client / relay
- DNS client / proxy
- NTP

Security:
- ACLs (stateless & stateful)
- uRPF
- CP protection
- BGP FlowSpec (IPv4, IPv6)

VPN IPsec:
IKE v1/v2 pre-shared keys or X509 certificates
- MOBIKE
- Encryptions:
    – 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/Radius, EAP-MSCHAPv2
- Extended sequence numbers (ESN), large anti-replay windows
- High performance (AES-NI, QAT)
- Tunnel, transport or BEET mode
- Static and dynamic VTI
- Dynamic multi-point VPN
- OpenVPN

CG-NAT support:
- NAT44, NAT64
- Static NAT
- Port Assignment
    – Deterministic
    – Random or Parity
    – Port Block Allocation (PBA) or detailed logging per session
    – Per user/CPE session limiter
- Mapping and filtering
    – Endpoint-independent mapping and filtering
    – Address and port dependent mapping and filtering
- Hairpinning
- IP Pool Management
    – Dynamic IP pool resizing
    – Paired pooling
- Logging
    – Port batching
    – Advanced logging features
    – Syslog
- ALG Support
    – ICMP, FTP, TFTP, RTSP, PPTP, SIP, H323, DNS over UDP

High Availability:
- IKE/IPsec synchronization
- VRRPv2 (IPv4/IPv6)
- VRRPv3 (IPv6)

System Requirements

Processor:
- Single or multi-sockets Intel® Xeon® and Atom® processor

CPU/vCPU cores:
- 2 minimum (one for control, one for data plane)

Memory:
- 2GB minimum

NICs:
- Intel: 1G, 10G, 40G, 100G
- Mellanox: 10G, 25G, 40G, 50G, 100G: CX4, CX5, CX6*
- Broadcom NetExtreme E-Series

I/O virtualization:
- virtIO (Linux KVM)
- SR-IOV
- PCI passthrough
- VMXNET3 (VMware ESXi)
- ENA

Supported Hypervisors
- KVM (RH, Ubuntu, CentOS)
- VMware ESXi (6.5+),
- Microsoft Hyper-V

Public Clouds Support
- Amazon Web Services
- Microsoft Azure
- Google Cloud Platform

Deployments
- Bare metal, virtual machines, containers (Kubernetes/docker)
- Installation: PXE, USB, ISO, QCOW2, OVA
- Update / rollback support
- Provisioning: cloud-init, Ansible, ZTP
- Licensing: Online licensing system for feature and capacity enablement