



Virtual Border Router

Key features

- ▶ **Linear Scalability**
(over 300Gbps throughput per single instance)
- ▶ **40Gbps per CPU core**
(IMIX traffic)
- ▶ **Multiple Full Route**
(Multiple millions BGP routes)
- ▶ **Fast Route Lookup**
- ▶ **Fast BGP Convergence**

Benefits

- ▶ Multiple full route support
- ▶ High Performance and Scalability
- ▶ Low convergence time
- ▶ Fast route lookups
- ▶ Multi-tenancy support
- ▶ Support for physical and virtual deployments (PNF and VNF)
- ▶ Efficiency with reduced operational costs and complexity

Virtual Border Router (Peering Router)

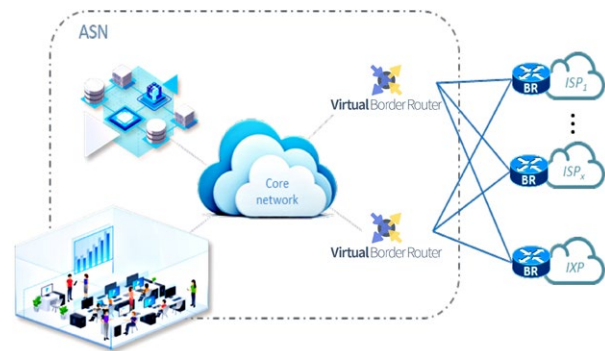
A Peering Router allows two Internet networks to connect and exchange traffic.

Network operators, ISPs and large Enterprises use peering for greater control over their traffic flows in order to allow optimizing routing decisions and increase performance.

The 6WIND VSR software includes all the features and capabilities needed to deliver a Border Router (Peering Router) service.

For instance, the VSR supports multiple full internet routing table and provides the following capabilities:

- ▶ Rich routing protocols (BGP, OSPF v2, OSPF v3, RIP and RIPng)
- ▶ Support for access control lists
- ▶ Internet peering scale
- ▶ Device management
- ▶ DDoS protection through BGP flowspec.



Thanks to its optimized design and to its fast route lookup implementation, the 6WIND VSR achieves high scalability, high performance and low convergence time allowing optimal routing decisions.

The 6WIND VSR implements traffic splitting and balancing between multiple links to optimize packet flow, reduce latency and enhance connectivity.

“ 6WIND’s vRouters have the **best virtual packet processing engine we’ve seen on any virtual routing platform.** No other products we’ve looked at perform anywhere close to 6WIND. ”

*Rick Jenssen, Senior Director of Consulting
Systems Engineering at Arbor Networks*

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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