

## Key features

- ▶ **High Performance**
- ▶ **Advanced networking & security features**
- ▶ **High Scalability**
- ▶ **Multi-service offering**
- ▶ **Increased deployment agility**
- ▶ **Optimal resource usage**

## Benefits

- ▶ End-to-End Security
- ▶ Reliability & Flexibility
- ▶ Increased deployment agility
- ▶ Optimized use of resources
- ▶ Highly Cost Effective
- ▶ Low TCO

## Virtual Service Router (VSR)

6WIND VSR is a product line comprising of various high-performance and scalable virtualized software routers optimized for CSP's, MNO's and Enterprises.

6WIND VSR solutions leverage 6WIND's core technology, to benefit from a high-performance data plane that helps addressing, quickly and efficiently, CSP's requirements.

Per design, the 6WIND VSR solutions provide scalable performance at both control plane and data plane allowing customers to build flexible network architectures that deliver high-end routing and security features with scaling performance.

6WIND VSR solutions come with a complete and rich management plane that enables customers besides configuring, managing and monitoring the vRouter locally through a CLI or remotely through a Netconf based client, to automate operational workloads.

6WIND VSR solutions address different use cases including border routers, Provider Edge, VPN concentrators, large scale NAT, end-to-end security, security gateways, SD-WAN, etc., and comes with a pay-as-you-grow model that helps customers scale their business appropriately.

## Highlights

### High Performance and Scalability

The main concept to reach deterministic high performance is to fully isolate the data plane, where network data packets are processed, from the control and management planes. 6WIND maximizes performance of its control plane and data plane by optimizing its VSR solutions for deployments in scalable and virtualized computing environments.

The 6WIND VSR solutions rely on a software design optimized to drive the best performance from a multi-processors CPU architecture. With an optimized networking stack relying on a lockless design and on poll mode network drivers, the 6WIND VSR solutions deliver high-speed and ultra-low latency packet processing and forwarding.

Furthermore, the 6WIND VSR architecture uses a run to completion model that allows the VSR to deliver linear scalable performance with deterministic low latency.

The separation between the control plane and data plane enables the 6WIND VSR to support compute-intensive control plane tasks and to minimize routing table convergence times.

### Resiliency and Robustness

The 6WIND VSR software solutions are designed and optimized for deployment on generic x86 server platforms (COTS servers) to meet extreme reliability demands for the virtualized environment.

Based a proven stable network stack, widely deployed by major Tier-1 OEMs and Service Providers, the 6WIND VSR software solutions enable creation of highly robust network architectures with advanced resiliency capabilities.

### Ease of Deployment

6WIND VSR software solutions come in different deployment options. Whether bare metal as Platform Network Functions (PNFs), or virtualized as Virtual Network Functions (VNFs), or containerized as Container Network Functions (CNFs), the VSR is designed to vertically scale with available hardware resources and deliver the highest performance from the selected deployment environment.

6WIND VSR software solutions come in different binary formats including qcow2, ova and iso. Furthermore, the deployment and orchestration can be seamlessly handled by Openstack and Kubernetes. Automation through Ansible is used for ease of deployment and provisioning.

### Ease of Management and Operations

6WIND VSR software solutions rely on a Netconf/Yang management. It onboards a Netconf server that allows managing the VSR locally with a CLI and remotely with any generic Netconf client.

Furthermore, the VSR provides support for different other standard management and monitoring tools including Cloud-init, snmp, and sflow that ease management and operations.

### High Efficiency

The 6WIND VSR software solutions rely on an efficient and highly optimized network stack that enables driving the highest performance from a multi-processors based platform.

The VSR implements a separation between the control plane and the data plane that allows a linear scalability of the VSR performance. This design enables an optimized use of system resources and increases the VSR efficiency.

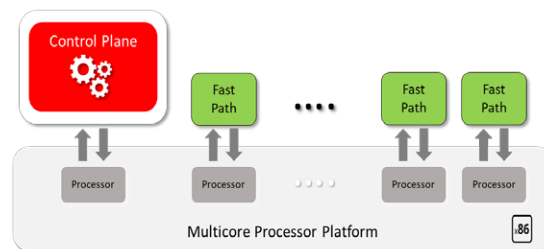
The 6WIND VSR software solutions deliver multiple Gigabits of forwarding capabilities with a single CPU core (virtual or physical). Combined with a linear scalability of its data plane, the VSR performance can scale to multiple hundreds of Gigabits on a single instance.

### VSR Architecture

The 6WIND VSR relies on 6WIND’s expertise in high performance service routing software solutions to deliver optimized architectures and designs for x86 multi-processor platforms.

To deliver the required high performance, the 6WIND VSR adopts advanced implementation and design concepts including the following:

- ▶ Separation of control plane and data plane to enable independent scaling of both planes within the VSR instance.
- ▶ Lockless data plane network stack for a consistent minimized latency.
- ▶ Optimized data plane, named Fast Path (FP), that benefits from a multi-processor environment to deliver high scalability. The FP represents an optimized data path that supports the different data plane functions, including forwarding, routing, filtering, QoS classification, policing, etc.
- ▶ Leverage HW acceleration when available to deliver the highest possible data plane performance and drive the best from the available HW resources.



Thanks to these advanced implementation and design concepts, the 6WIND VSR solution allows:

- ▶ Separation of control plane and data plane CPU cores
- ▶ Optimized usage of deployment environment’s resources
- ▶ High performance for both control and data planes
- ▶ Advanced redundancy features
- ▶ Resilient cloud scaling
- ▶ Consistent operations across physical and virtualized network elements.

## 6WIND VSR Product Suite



### Virtual Provider Edge Router (vPE)

6WIND vPE Router provides an IP/MPLS network edge service for CSPs and Enterprises delivering highly available internet services over IP/MPLS infrastructure. It is deployed as an alternative to using a physical router and can deliver the required functions and performance to enable fast service innovation and extend service reach.



### Virtual Cell Site Router (vCSR)

The 6WIND vCSR is a virtualized solution that runs on x86 COTS servers and delivers the features and performance needed to aggregate traffic in a radio access network from baseband units and backhaul it over an aggregation network to the operator's core network.



### Virtual Security Gateway (vSecGW)

6WIND vSecGW Router provides security capabilities along with performance and scalability to address end-to-end security challenges for CSPs, MNOs and Enterprises.



### Virtual CGNAT Router (vCGNAT)

6WIND Virtual CGNAT (Carrier Grade NAT) provides network address translation capabilities at high scale to enable service providers handle internet IPv4 address exhaustion.



### Virtual Firewall (vFW)

6WIND Virtual Firewall meets the unique security needs of modern virtualized infrastructures. As a L3/L4 firewall solution, the 6WIND vFW brings the performance, scalability and capabilities needed to offer a comprehensive and efficient defense for virtualized and cloud environments.



### Virtual Broadband Network Gateway (vBNG)

6WIND Virtual Broadband Network Gateway is a subscriber aware operating system that provides highly scalable subscriber management, multi-million session management and cutting-edge network services features and functionalities.



### Virtual Border Router (vBR)

6WIND Virtual Border Router is a high performance, ready-to-use virtual router, part of the 6WIND VSR software solutions. It is deployed bare-metal, virtualized, or containerized on COTS servers in private and public clouds.



### Virtual CPE Router (vCPE)

The 6WIND vCPE Router is a virtualized routing solution adapted for **Universal Customer Premises Equipment**. It runs as a virtualized network function (VNF) to deliver cost effective and highly efficient routing, security and VPN connectivity services on simple, inexpensive, on-site x86 devices.