6WIND
Virtualized Networking Software

vHNA

Virtual Host Network Accelerator (vHNA)

Cloud platforms are crucial for modern communication service providers, offering the flexibility, scalability, and efficiency needed to meet the rapidly evolving demands of the digital era. These platforms enable service providers to dynamically allocate resources, improve network resilience, and support advanced technologies such as 5G, IoT, and edge computing.

Host based routing offers significant advantages in cloud platforms by providing granular control and flexibility over network traffic management. By decoupling routing decisions from physical network infrastructure, host-based routing supports scalability and agility in cloud environments, where workloads and demands can widely vary.

The 6WIND Virtual Host Network Accelerator (vHNA) is designed to facilitate the cloud-native transformation of service providers' networks. It provides routing capabilities at the host level of Kubernetes nodes, enhancing network security through finer-grained access controls and network segment isolation. This is essential for protecting sensitive data and ensuring compliance with regulatory requirements.

Key features

▶ **Complete integration into Kubernetes workflow**

▶ **Enhanced routing capabilities**

▶ **IP/MPLS/SR support**

▶ **VLAN/VxLAN support**

▶ **High Performance**

Benefits

▶ Simplifies network and connectivity in CaaS dynamic environment

▶ Enhances operational efficiency by bringing routing capabilities into Kubernetes Nodes

▶ Decouples clusters' network configuration from network fabric configuration

▶ Enhanced security with traffic segmentation

▶ Agility and flexibility in defining telco cloud networking
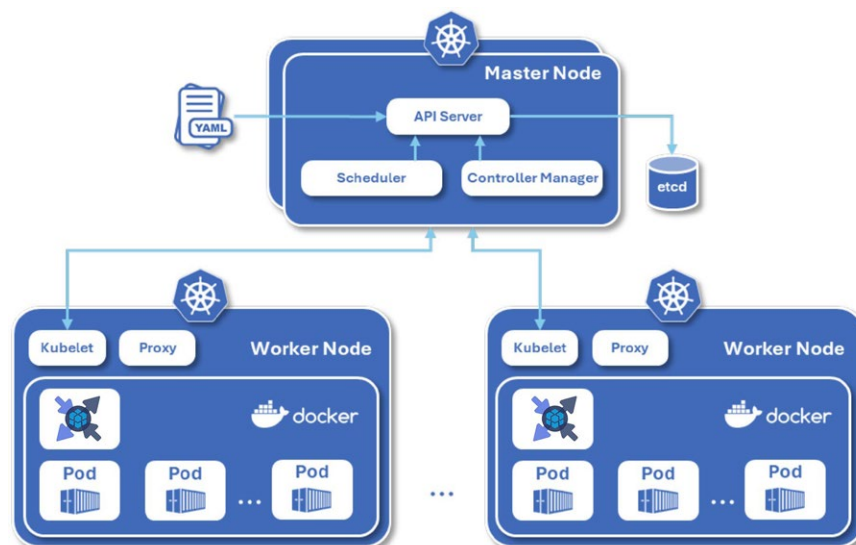
Kubernetes-based Cloud Platforms

The 6WIND vHNA seamlessly integrates with Kubernetes-based cloud platforms and is natively managed by Kubernetes. This transparent integration allows K8S clusters and their nodes to be created with the desired connectivity and dynamically managed without requiring any network modifications. As a result, Kubernetes Pods are directly routed to the fabric, reducing host network address translations and lowering processing overhead.
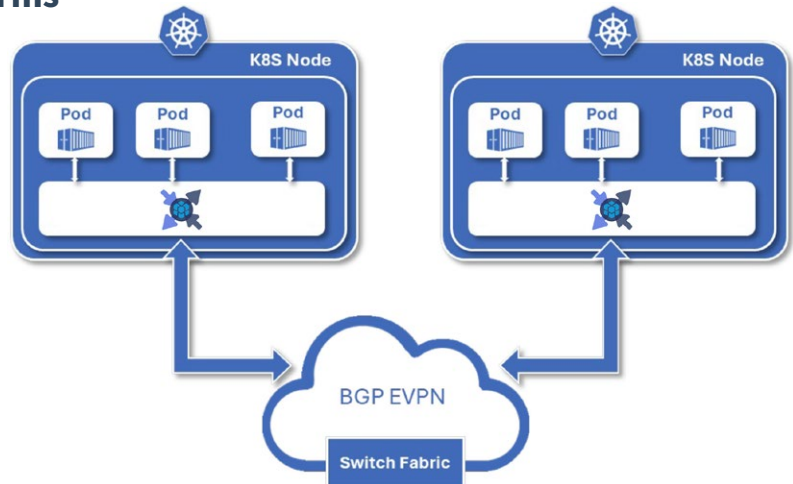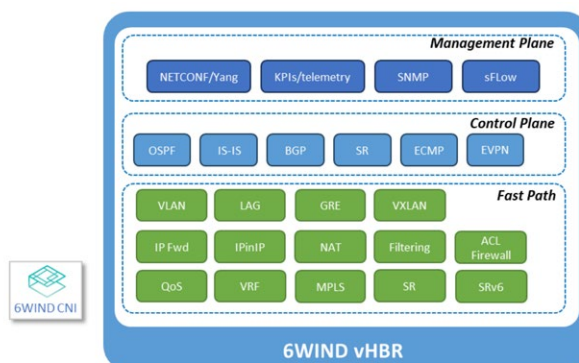
Data Center Network Fabric

Besides the routing capabilities brought at the K8S nodes, the 6WIND vHNA brings a high performance routing data plane to enable the node PODs and containers to deploy high performance East-West and North-South connectivity without specifically recurring to SR-IOV.

Illustration of E/W and N/S paths connectivity
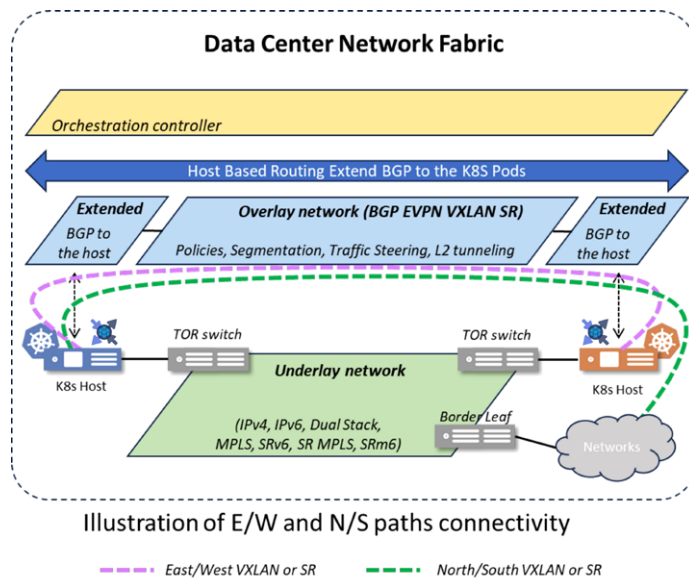
Carrier-grade implementation of Host Based Routing

► Hardened Routing Capabilities
► Fast Path Forwarding Plane
► Network Management & Monitoring
► Full Automation
► Productized Capabilities
► SLA Support

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Host Based Routing - Data Plane Acceleration Benefits

In Kubernetes nodes, networking connectivity is established using a combination of container network interfaces (CNIs), virtual Ethernet pairs, and various advanced networking techniques.

The 6WIND vHNA plays a crucial role in enhancing this connectivity by offering an accelerated data plane that bypasses the host kernel performance limitations to connect the PODs and Containers directly to the switch fabric. This approach not only streamlines the data flow but also reduces latency and improves throughput.

The 6WIND vHNA comes with a 6WIND CNI to sets up standard veth pairs and vhost interfaces to connect the node PODs with the vHNA accelerated data plane.
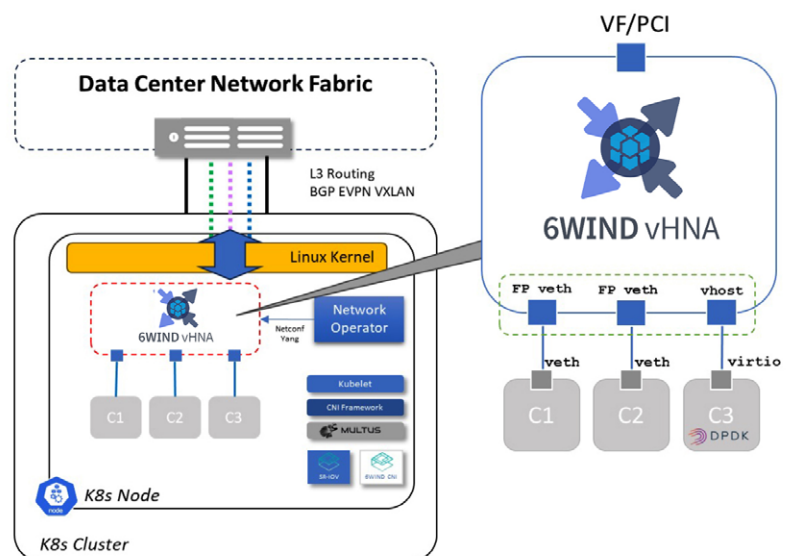
Specification

IP Networking:
- Dual Stack IPv4/v6
- Multitenancy (VRF/L3VRF)
- IPv4/IPv6 tunneling
- IPv4/IPv6 filtering
- Network address translation

Routing:
- Static routes
- Dynamic Routing (BGP, OSPF, ISIS)
- Policy base routing (PBR)
- MPLS, SR, SRv6

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

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

Management / Monitoring:
- SSH
- CLI, NETCONF/YANG
- SNMP
- KPIs/telemetry (YANG-based)
- RBAC (Tacacs+)
- Syslog 802.1ab
- IPFIX, Netflow v9

System Requirements

Processor:
- Single or multi-sockets
- Intel® Xeon® and Atom® processors
- AMD based servers
- ARM based servers

CPU/vCPU cores:
- 2 minimum (1 CP, 1 DP)

Memory:
- 2GB Minimum

NICs:
- Intel:
  1, 10, 40, 100G (E810)
- Nvidia (CX4, CX5, CX6, Cx7):
  10, 25, 40, 50, 100G, 200G
- Broadcom: NetExtreme E-Series

Environments:
- Kubernetes / Docker
- VMWare Tanzu
- RH OpenShift

Deployment models:
- Containers (Kubernetes/Docker)

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