VyOS Networks

The Universal Networking Platform

PRODUCT DATA SHEET

VyOS 1.5

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Universal Networking Platform

VyOS is a powerful, open-source network operating system built on GNU/Linux, designed to unify routing, firewalling, and network services under a single, user-friendly configuration interface. It delivers high-performance, enterprise-grade networking with a fully featured platform that runs reliably across physical, virtual, cloud, and edge environments, providing unmatched transparency, flexibility, and zero vendor lock-in.

Platform-driven: Built for Every Edge and Cloud

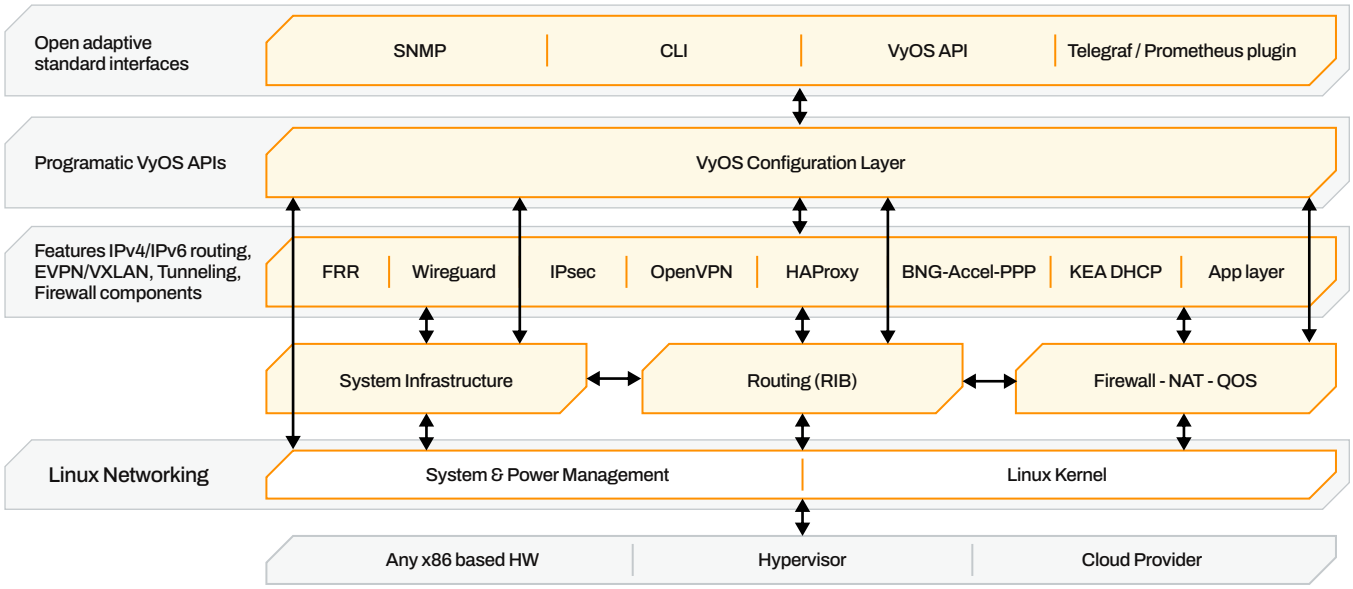
- **Flexible Deployment Options**
  Supports a broad range of COTS (Commercial Off-The-Shelf) hardware for bare-metal deployments, giving users maximum flexibility to select the hardware that best fits their needs.
- **Cloud-Ready**
  Fully supported by major public cloud providers: Amazon Web Services (AWS), Microsoft Azure, Google Cloud (GCP), Oracle Cloud Infrastructure (OCI), Equinix Network Edge, OpenStack, and Exoscale.
- **Single NOS for Bare Metal, Virtual, and Cloud**
  Simplify operations with a single network operating system across all environments—bare metal, virtual, and cloud. Consolidate multiple network functions into one powerful platform, including Edge Router, Firewall, VPN Gateway, Edge IoT Gateway, BNG, and Cloud Gateway.

Automation-Ready for NetDevOps

- **Integration with Automation Tools**
  VyOS integrates smoothly with popular automation frameworks such as Terraform, Ansible, cloud-init, SaltStack, Custom Scripting, Netmiko, Napalm, and APIs (HTTP API and internal APIs available).
- **New data-plane architecture**
  Modern high-performance environments demand more from their workloads. VyOS-VPP delivers next-generation data-plane technology designed to meet these evolving requirements.
- **Configuration-Driven, Transactional CLI Framework**
  The VyOS CLI is purpose-built for stateful network systems. It provides a robust commit/rollback mechanism, strict user session separation, and built-in configuration versioning with support for remote backups. With VyOS, you get audit-ready change control and vendor-independent operations, designed to support secure, scalable networks without proprietary constraints or opaque dependencies.

What Sets VyOS Apart

VyOS runs on bare-metal hardware, hypervisors, and cloud platforms with the same operational model across environments.



Automation Native Networking

VyOS integrates directly with Terraform, Ansible, cloud init, and modern APIs, so networking becomes part of your deployment pipeline, not a manual bottleneck. This reduces deployment friction and helps teams standardize network changes through repeatable automation workflows.

Transactional Operations, Built for Change

Commit/rollback, configuration versioning, and session separation make VyOS safer to operate at scale. Teams can implement changes with clearer accountability and faster recovery when adjustments are needed.

One Network OS Everywhere

Bare metal, hypervisors, public cloud. Same NOS, same feature set, same workflows. This consistency simplifies day-to-day operations and reduces the overhead of maintaining different platforms across environments.

Next Generation Performance with VyOS VPP

Optional VPP dataplane delivers predictable latency and massive throughput for demanding environments. It is well-suited for high-traffic paths where performance and latency stability are primary requirements.

VyOS | VPP Dataplane

Introduction to the new architecture:

The evolution of network virtualization and cloud-native infrastructures is driving the need for routing platforms that deliver high throughput, predictable latency, and programmability. VyOS integrates Vector Packet Processing (VPP) as an optional high-speed dataplane to accelerate packet forwarding.

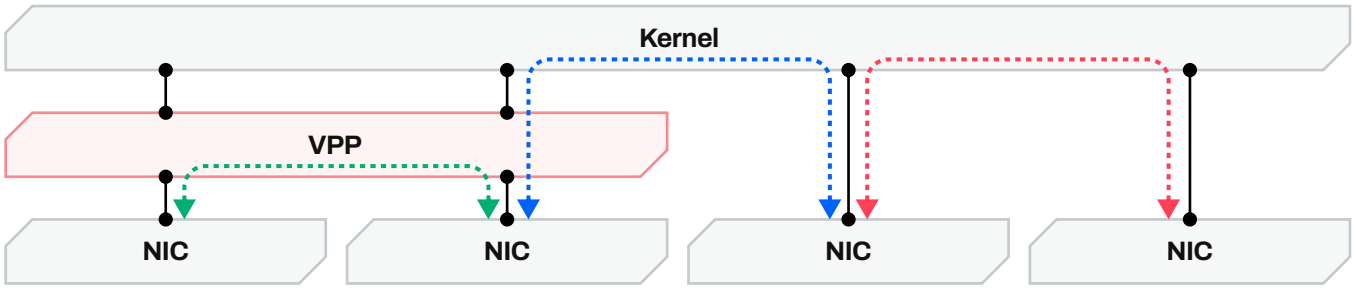
VyOS offers two forwarding architectures: the traditional Linux kernel dataplane and the VPP userspace dataplane. VPP is a high-performance, multi-core-optimized packet processing engine capable of delivering significantly higher throughput and lower latency for demanding network scenarios.

By leveraging VPP, VyOS becomes an even more powerful platform for next-generation routing, advanced firewalling, and service-chaining use cases, where performance, scalability, and deterministic behavior are critical.

Packets Processing Integration

Details

VPP Dataplane integration is designed to minimize configuration changes. Features that exist in the kernel dataplane remain available and continue to operate in the kernel dataplane. VPP Dataplane only takes over packet forwarding for interfaces explicitly assigned to it. Examples of traffic flow between interfaces connected to VPP and kernel dataplanes:



Green path

Traffic between two VPP interfaces is processed entirely within VPP for maximum performance. Packets that follow this path can use only features available inside the VPP dataplane.

Blue path

Traffic between a VPP interface and a kernel interface is processed by both dataplanes, with VPP handling the VPP side and the kernel handling the kernel side. Packets that follow this path can use features available in both VPP and kernel dataplanes at the same time.

Note: Because packets must follow both dataplanes, performance will be slower than with pure VPP or pure kernel forwarding.

Red path

Traffic between two kernel interfaces is processed entirely within the kernel dataplane. Packets that follow this path can use only features available inside the kernel dataplane and lack VPP acceleration.

This is the traditional VyOS dataplane operation.

Key Benefits

High-Performance Packet Processing

VPP accelerates packet forwarding by processing traffic in vectors rather than individual packets, delivering:

- **Higher throughput compared to traditional kernel-based forwarding**
- **Lower and more predictable latency for time-sensitive workloads**
- **Near-linear performance scaling as additional CPU cores are added**

VyOS Hybrid Dataplane Flexibility

VyOS uniquely supports simultaneous operation of both VPP and kernel dataplanes, enabling:

- **Seamless cross-dataplane forwarding:** Traffic can move transparently between VPP and kernel interfaces
- **Unified configuration model:** The same CLI and most services operate consistently across dataplanes
- **Incremental adoption:** Deploy VPP on high-traffic interfaces while retaining kernel dataplane elsewhere

When to Use VPP

VPP is an ideal choice for environments with:

- **High throughput demands**
- **Latency-sensitive applications requiring consistent performance**

When to Use the Kernel Dataplane

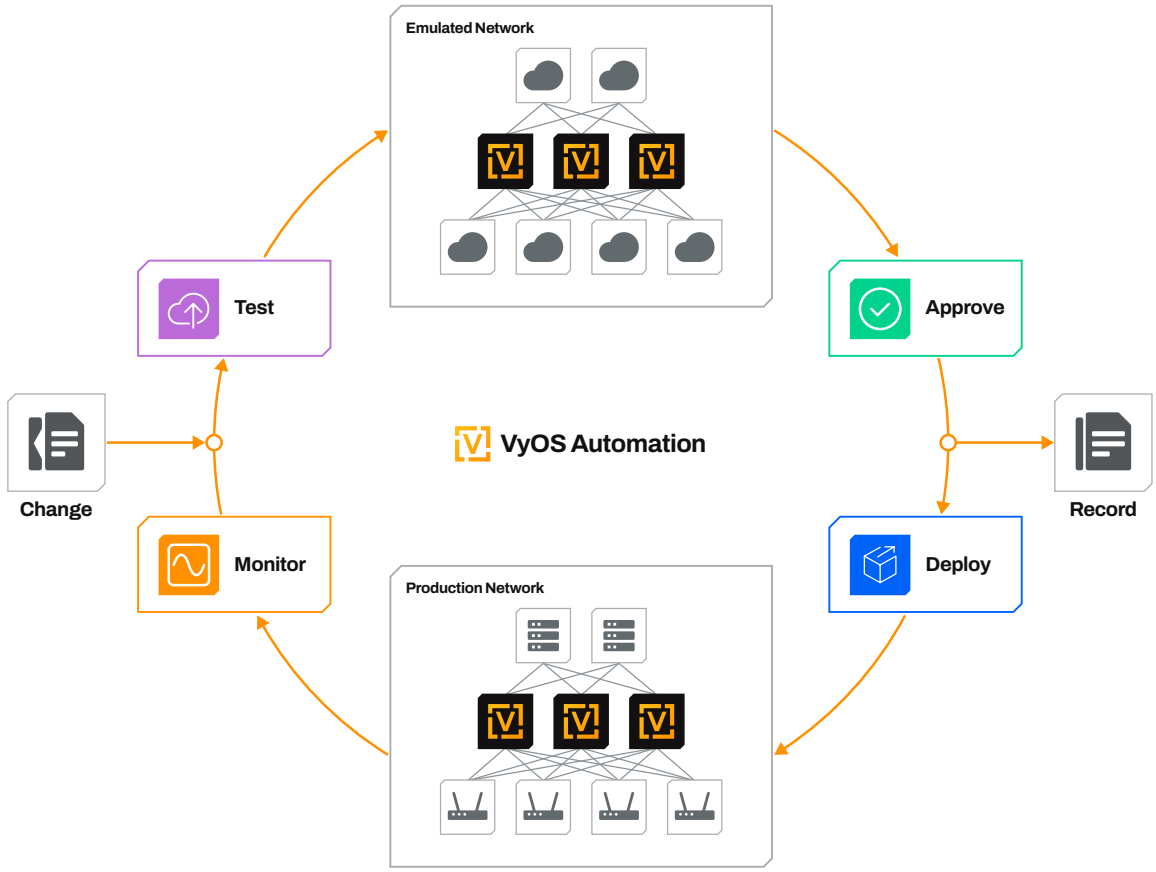
The kernel dataplane remains well-suited for scenarios involving:

- **Low to moderate traffic volumes**
- **Workloads without strict latency requirements**
- **Applications that depend on features not currently supported by the VPP dataplane**

VyOS Automation

VyOS supports a wide range of automation frameworks and tools, ensuring compatibility with modern DevOps and NetOps workflows. This flexibility allows network administrators to configure, deploy, and manage network infrastructure and integrate networking into CI/CD pipelines. Key automation capabilities include: Terraform, Ansible, Cloud-init, SaltStack, Custom Scripting, Netmiko, Napalm, and HTTP API.

Deployment Network Services



VyOS Monitoring

Effective monitoring is crucial for maintaining network performance and security. VyOS integrates with various monitoring solutions, providing visibility into network health, traffic patterns, and performance metrics. Key monitoring capabilities include:

- **NetFlow / sFlow:** Scalable network traffic sampling and analysis for real-time traffic visibility
- **Telegraf / Prometheus Client:** Exposes Prometheus-compatible metrics for monitoring and alerting, including FRR exporter for routing visibility
- **Zabbix Agent2 / Syslog:** Native integration with Zabbix for comprehensive network event logging and monitoring
- **SNMP (v2 and v3):** Supports SNMP v2/v3 for device monitoring, data collection, and secure network communication

Deployment Options

VyOS runs equally well on bare-metal hardware, hypervisors, and cloud platforms. Using the same network OS on all platforms frees administrators from the need to manage multiple products and allows them to have the same feature set everywhere. It also lowers operational overhead for training and change management. VyOS system requirements and deployment options:

System requirements and deployment options:

Requirements	Specification
CPU	Any 64-bit x86 Intel or AMD
RAM	1024 MB (4 GB recommended)
Distributions	VyOS is Available as: ISO, OVA, RAW, QCOW2, VHD, XVA

Deployment Option	Supported
Bare Metal	Dell EMC, EdgeCore, Lanner, Supermicro, Equinix Metal (Formerly known as Packet) Generic Images for x86 Compatible Servers
HyperVisor	Optimized Images for: XCP-ng, Citrix HyperVisor, Xen HVM, VMware vSphere, OpenStack, Proxmox, Nutanix, Zededa EVE-OS, Hyper-V, Oracle (OVM v3.x | Oracle Linux KVM v7.6, v7.7, v7.8, v8.x | VirtualBox, DellNativeEDGE, Openshift (REDHAT).

Deployment Option	Supported
Cloud Provider	Amazon Web Services (AWS), AWS Outposts, Microsoft Azure, Azure Stack Hub, Google Cloud Platform, Oracle Cloud Infrastructure, Equinix Metal, Equinix Network-Edge, Exoscale

Being a Universal Networking Platform not only means being deployable across environments, but also serving as multiple network roles and solution patterns.

Below you will find the different features and protocols that VyOS supports:

⚠ **Note:** If you don't find a specific feature or protocol below, it does not mean it cannot be supported. VyOS is a highly customizable platform and can be adapted to support a specific feature if needed.

Features

Feature	Supported
Supported Interfaces	Up to 100 Gbps interfaces, 802.1q VLAN, 802.1ad QinQ, 802.3ad and other bonding protocols, Software Bridging, Paravirtualized NICs (vmxnet3 & virtio), Virtual Ethernet(veth), Wireless (WiFi & Cellular Networks).
Routing Protocols	BGP IPv4/IPv6, BGP Unnumbered, EVPN-VXLAN, EVPN-MH, RPKI, OSPF (V2 & V3), ISIS, Babel, RIP, RIPng, BFD, BFD Monitoring, Policy Based Routing (PBR), Multicast IPv4/IPv6 (MLD, IGMP proxy v2 & v3, PIM-SM), ECMP, Static routes, Failover routes, OpenFabric.
MPLS - Segment Routing	MPLS, LDP, LDP IPv6, LDP label allocation range, LDP sync, Static labels, MP-BGP Labeled Unicast (BGP-LU), MPLS over GRE, SR-MPLS, SRv6, L3VPNv4/v6, ISIS LFA, OSPF opaque, SR-TE.
Firewalling	Stateful Connection Tracking, Zone Based Firewall, GeoIP matching, address/ports/network groups, interfaces / mac-address groups, Domains groups, Dynamic address group, Synproxy, Firewall bridge and Flowtables.
NAT	Source and Destination NAT (One-to-One, Many-to-Many, One to many), Balancing, Masquerade, Network prefix Translation, NAT Load Balance, NAT44 , NAT66(NPTv6), NAT64,CGNAT, NAT444.
Tunnels	WireGuard (P2P, RoadWarrior), OpenConnect (Client & Server), OpenVPN (P2P, Client & Server), OpenVPN DCO, GRE, IPIP, SIT, IP6IP6, L2TPv3, IPsec Route-based/Policy-based, VXLAN, SSTP (Client & Server), PPTP Server, GENEVE, DMVPN, Erspan, IP6erspa, Gretap, IP6gretap.
BNG	PPPoE (Client & Server), IPoE Server, L2TPv2,DM/CoA extension, Scripting, QOS, Automatic Vlans, Shaping, IP pool, Implemented Radius policy, Chap-secrets and Static pools.

Feature	Supported
Services	DNS Forwarding, Dynamic DNS, mDNS Repeater, DHCP Server and Relay, IPv6 Router Advertisements, NTP (Client & Server), LLDP (Client & Server), TFTP Server, Web Proxy Server), Event Handler, UDP broadcast relay, Task-scheduler, Virtual-server load-balancing/reverse-proxy, RSA-Keys.
QoS	Traffic Shaping and Matching, Rate Limiting, Rate Control (TBF), Traffic Queues (Drop-Tail FIFO, Fair Queue (SFQ), FQ CoDel, Round Robin (DRR), Random Early Detection (RED/WRED), CAKE (Common Applications Kept Enhanced).
Management & Monitoring	SSH, HTTP API, SNMP (V2 & V3), NetFlow, sFlow, Telegraf, Prometheus-client, Zabbix-agent, BGP BMP, Splunk plug-in, Azure data exporter, Syslog, PKI keys, OTP-based MFA, Config-sync, Rollback-soft, Commit-confirm / commit-archive, network-event, prometheus: blackbox-exporter / frr-exporter / node-exporter.
High Availability	VRRP, VRRP Health check scripts, VRRP transition scripts, WAN Load Balancing, Connection State Synchronization, Conntrack Synchronization, Virtual-server load-balancing.
Supported Automation Tools	Ansible, Cloud-init, Terraform, Scripting, VyOS API, Netmiko.
Additional Features	Intel QuickAssist Cryptographic Hardware Acceleration (QAT), TACACS+, RADIUS, AWS GLB Tunnels, Console Server, Login banners, LCD display, Third-Party containers services.