



VirNOS: Feature-rich, High-performance Network OS for Virtual Network Functions

VNF Solutions for vCPE, vPE, Security, WAN Optimization and More

VirNOS provides a virtual networking solution for Network Functions Virtualization to help network operators reduce their CapEx and OpEx costs, accelerate time-to-market for new services, increase agility, and deploy new network services faster.

VirNOS supports many use cases such as distributed or cloud based vCPE, vPE for carriers' network, vRouter for data center network, and OpenFlow support for SDN deployments, etc.

Based on the widely-deployed and time-tested ZebOS® network platform, VirNOS is designed to meet the requirements for today's networks by supporting many networking functionalities such as MPLS L3VPN, MPLS L2VPN, IPv4, IPv6, OSPF, ISIS, BGP, LDP, RSVP-TE, QoS, OpenFlow and network security.

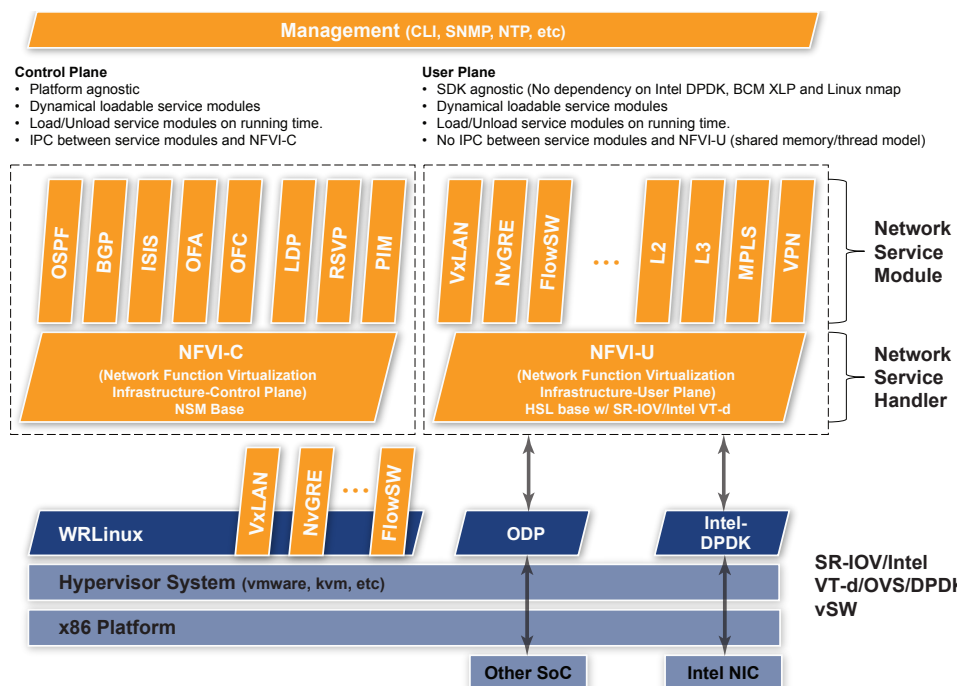
With VirNOS, customers have a high performance software solution to leverage standard COTS servers with generic CPUs. Network operators can build and deploy diverse services at less cost by using standards-based hardware and achieve the disaggregated networking model. They can integrate VirNOS into their software offering to add services and features more quickly. VirNOS gives carriers, service providers, enterprises and network equipment manufacturers a complete NFV-based software package which customers can

run, as-is, on top of the standard server platform. IP Infusion customers can integrate VirNOS into their software offering and thereby be able to add services and features more quickly.

VirNOS addresses today's networking challenges with:

- **CAPEX reduction:** Allows for the purchase of commodity servers (standard Intel) instead of purpose-built hardware and supporting pay-as-you grow models.
- **OPEX reduction:** Requires less space, power and cooling requirements and simplifies the launch and management of new network services.
- **Single platform:** Can use a variety of multi-version and multi-tenancy network appliances, allowing use of a single platform for different applications, users and tenants. Resources can be shared across services and different customer bases.
- **Industry proved ZebOS-XP platform:** Leverage matures code base, assuring interoperability with many different existing pieces of network equipment. ZebOS is used by more than 250+ vendors around the world.

System Architecture



Features and Benefits

Supports Network Functions Virtualization

Virtualization: VirNOS replaces dedicated network hardware with virtualization software running on commodity servers. VirNOS consolidates and delivers the networking components needed to support a virtualized network infrastructure. With VirNOS, network operators can select equipment options from multiple vendors instead of buying expensive and restrictive solutions, reducing their CapEx and OpEx costs.

Supports OpenFlow: VirNOS supports Flow Switching via the OpenFlow Agent which can allow customers to program the Data Plane with flexibility by using a general OpenFlow controller.

VirNOS supports the OpenFlow Controller function and can work along with the existing routing/signaling protocols. Based on the results of the routing/signaling protocols, the OpenFlow controller can convert the routing/signaling information into the flow messages and then program the devices for IPv4, IPv6 and MPLS via OpenFlow protocol.

Supports multiple data path pipelines:

VirNOS supports several interface configuration to achieve the performance and flexible service chaining with PCI Passthrough, SR-IOV, OpenVswitch Bridging, Intel DPDK & ODP compliance vSW.

Supports MPLS, MPLS L3VPN, and MPLS L2VPN: VirNOS supports LDP, RSVP-TE and BGP labeled unicast and segment routing. VirNOS provides support for MPLS based L3 service for both IPv4 and IPv6 applications for both control plane and data plane. VirNOS also provides support MPLS based L2 service with LDP signaling with and without the control word.

Provides network connectivity support:

VirNOS provides full network connectivity support of IPv4 and IPv6 dynamic routing protocols (BGP, OSPF, ISIS, Static). VirNOS allows a migration path to IPv6, due to IPv4 and IPv6 compatibility.

Leverages ZebOS-XP platform: VirNOS leverages the mature code base of IP Infusion's industry proven ZebOS-XP platform which is used by more than 300 vendors around the world. This assures interoperability with many different existing pieces of network equipment and takes advantage of IP Infusion's industry experience and expertise in routing and switching.



About IP Infusion

IP Infusion, the leader in disaggregated networking solutions, delivers the best network OS for white box and network virtualization. IP Infusion offers network operating systems for both physical and virtual networks to carriers, service providers and enterprises to achieve the disaggregated networking model. With the OcNOS™ and VirNOS™ network operating systems, IP Infusion offers a single, unified physical and virtual software solution to deploy new services quickly at reduced cost and with greater flexibility. Over 300 customers worldwide, including major networking equipment manufacturers, use IP Infusion's respected ZebOS platform to build networks to address the evolving needs of cloud, carrier and mobile networking. IP Infusion is headquartered in Santa Clara, Calif., and is a wholly owned and independently operated subsidiary of ACCESS CO., LTD. Additional information can be found at <http://www.ipinfusion.com>.

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