

# OcNOS™: High Performance Network Operating System for Next Generation Networks

IP Infusion's Open Compute Operating System (OcNOS) targeted for Next Generation Data Center and Enterprise Network environments.

OcNOS is the industry's most advanced network operating system for Open Compute platforms-based networking devices.

It has been created to address the networking needs of public/private/hybrid cloud networks. OcNOS enables new applications of Software Defined Networks (SDN) and NFV services from the network.

OcNOS is built around a proven set of modular framework components for control plane with data plane integration. A transactional management plane, plus middleware to support high availability, helps for nonstop operations in mission critical networks.

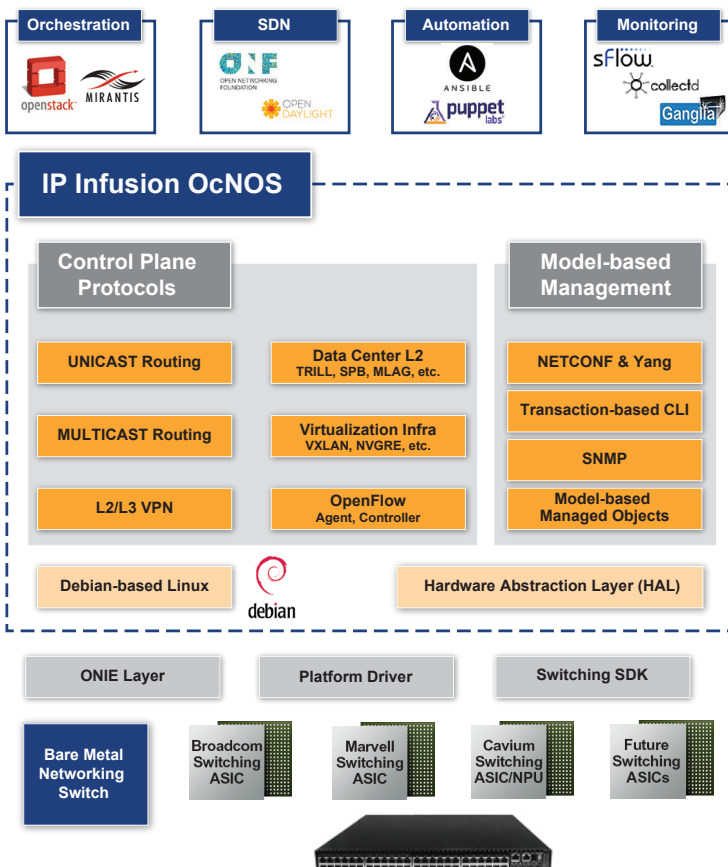
Built over a multi-tasking Linux-based network operating system, OcNOS has tight integration capabilities on commodity open compute network hardware, which allows for use in a variety of networking and open networking applications.

One key value proposition of OcNOS is reduced Capex and Opex for service providers while maintaining services and a rich feature set.

OcNOS has an integrated centralized management and provisioning layer, which allows for transaction-based configuration. This provides the key services required for Model-based device configuration and orchestration. This layer exposes NETCONF, REST APIs besides custom CLI generation capability. Combination of these services allows an OcNOS system to be configured, managed, and controlled in several ways by network management systems. OcNOS presents a YANG model of its protocols and system services. This allows for it to sit transparently in a mixed networking environment and participate in network wide transactions. This significantly reduces OPEX for the device.

OcNOS borrows heavily from the popular ZebOS line of products, therefore has carrier grade, rich feature density and robustness build up over 15+ years of development, and is deployed with over 250+ OEMs.

## OcNOS- SDN/NFV Ready Network Operating System



- Best of Linux, Networking and Model-based Management
- Feature-rich Data Center Networking Services
- Model-driven Automation and Orchestration
- Virtualization Enabled (NFV ready)
- OpenFlow and Overlay Network (SDN Ready)
- Any Hardware based on Any Switching Silicon
- Open Compute Forum Ready



OcNOS provides industry standard CLI, NETCONF, support all standard MIBs and other standard operation & management tools.

## Key Features and Capabilities

- **Common software for multiple deployments and hardware:** OcNOS abstraction layers, allow the software to seamlessly run over commodity hardware.
  - SDN enablement by providing support for OpenFlow 1.3 with Hybrid mode support. The OpenFlow component can be managed by Open Daylight and other standard SDN controllers.
  - Interoperation and ease of use
  - Modular software design
  - OcNOS supports technologies required for bandwidth scaling at data centers and interconnects.
  - **Management and Orchestration:** OcNOS has a centralized transaction based modeling layer, which allows for multiple management interfaces, this in-turn allows for a central service level provisioning and chaining across multiple devices. It can be managed by a NETCONF enabled NMS/OSS or by automation systems like Ansible.
  - Comprehensive Troubleshooting and diagnostics
  - **Traffic Monitoring based on sFlow.** Can be easily integrated with Monitoring systems such as Ganglia, Collectd etc.
  - Configuration verification and rollback
  - Role-based access control (RBAC)
  - Traffic Routing, Forwarding, and Management
  - **Rich Ethernet switching services:** The solution supports the complete feature set required to run it as a pure Layer2 or Layer2-3 switch. Key features are support for Rapid Spanning Tree Protocol(RSTP), Multiple Spanning Tree Protocol(MSTP) IEEE 802.1w & 802.1s, RPVST, QinQ, IEEE 802.3ad Link Aggregation, Multi-Chassis Link Aggregation, EVB and DCB support.
  - **Key data center features:** OcNOS supports multiple standards based multi-path Ethernet technologies for the datacenter. These are TRILL, SPB, and Multi-chassis Link Aggregation Group. Apart from them, it also supports Data Center Bridging (DCB), QCN, ETS, and PFC for true unified Ethernet backplane.
- **Best of breed IP routing:** OcNOS supports a wide range of IPv4 & IPv6 services and routing protocols. Open Shortest Path First (OSPF) Protocol v4/v6 Support, IS-IS v4/v6, BGP v4/v6 with Virtual routing and VRF support.
  - **Comprehensive IP Multicast:** OcNOS includes state-of-the-art implementations of the following multicast protocols and functions: IGMP/MLD, PIM-SSMv4/v6, PIM-SSM IPv4/v6, Bidir PIM IPv4/v6
  - **Quality of service (QoS):** OcNOS supports numerous QoS mechanisms, including classification, marking, queuing, policing, and scheduling. Both Hierarchical and Modular QoS CLI (MQC) are supported.
  - **L2/L3 VPN Services:** OcNOS supports a comprehensive set of MPLS features including Label Switching, Layer 3 VPNs, MPLS Traffic Engineering with Fast Reroute (FRR), Multicast VPNs for IPv4, and IPv6 provider edge (6PE) and IPv6 VPN provider edge (6VPE).
  - **Network Security:** Authentication, authorization, and accounting (AAA) and TACACS+ , Secure Shell (SSH) Protocol, etc
  - Partial Hardware Platform Compatibility List
    - Dell – S600-ON, S4048-ON, S3048-ON, Z9100-ON (100G)\*
    - Agema AG8032, AG7348, AG9032v1(100G)\*
    - Interface Masters: 2924-6XL/12XL, 2960
    - Accton AAS5812-54X(10G)\*, AS7712-32X(100G)\*
    - WNC LN10040\*

\* Available June 2016

## Solution Ready

OcNOS is deployment ready for modern designs based on based on:

- **Hybrid L2/L3 designs:** Utilizing VxLAN with EVPN, OcNOS based 10G/40G/100G commodity switches can be readily deployed.
- **Layer3 designs:** With multiple programmatic APIs and a robust layer3 services it is useful for large scale DC designs.
- **MPLS DCI Services:** OcNOS deploys a multitude of MPLS services useful for data center interconnects.

## About IP Infusion

IP Infusion is a leading provider of intelligent network software for enhanced Ethernet and IP services. Tier one and two OEMs rely on IP Infusion's ZebOS software and global professional services to bring products to market faster, and to differentiate them from competitors with less cost. Products built on IP Infusion technology are deployed in networks with five-9s reliability across five continents—as well as a growing number of enterprises—to improve network performance, decrease network infrastructure costs, and grow revenue. IP Infusion is headquartered in Santa Clara, Calif., and is a wholly owned and independently operated subsidiary of ACCESS CO., LTD., of Tokyo, Japan.

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