



IP Infusion Product Brief

ZebOS[®] 7.8 Network Platform

Overview

ZebOS[®] 7.8, the latest ZebOS Network Platform version from IP Infusion, offers a scalable, robust and standards-based Layer 2 and Layer 3 carrier-class routing and switching software solution with additional supported features for GMPLS, Data Center Bridging and MEF implementations of Carrier Ethernet stacks. A complete software solution, ZebOS 7.8 allows OEMs to rapidly add state-of-the-art networking capabilities to their new and existing lines of communication products. Its modular, platform-independent architecture enables OEMs to pick from among an impressive array of protocols and solutions to add to their equipment.

ZebOS Network Platform supports industry-standard and best-of-breed operating systems, control plane and data plane processors. ZebOS has been architected to take advantage of separate data plane processors (NPUs and ASICs) to support highly modular and scalable communications equipment. ZebOS is targeted at vendors building or enhancing access, enterprise, edge, core and enhanced IP services products.

ZebOS Network Platform Architecture

ZebOS 7.8 builds on and enhances the capabilities of ZebOS 7.7.

Key Features

- GMPLS
- Data Center Bridging
- Enhanced Resiliency for MPLS with BFD and VCCV
- MEF specifications compliance (MEF-2, 9, 11, 16, 13, 17, 19, 20)
- BGP Multipath Routing
- Policy Based Routing

- Support for Provider Backbone Bridge-Traffic Engineering (PBB-TE)
- Enhanced resiliency for IP routing and MPLS signaling with support for Bidirectional Forwarding Detection (BFD)
- Complete non-stop forwarding (NSF) functionality for IP and MPLS
- Hardened implementation of BGP Route Server for deployment in carrier networks utilizing commercial off-the-shelf (COTS) hardware
- Support for OpenSAF, the industry's leading high-availability (HA) middleware
- Ability of MPLS solution to support pseudo-wires across multiple Packet Switched Networks (PSNs)
- Linear and Ring Protection for Ethernet networks
- IPv4 and IPv6 switching and routing protocols
- Advanced L2 and VLAN switching
- MPLS Traffic Engineering and VPN support
- Multicast
- High Availability
- Management and Logging Plus Basic Access and Tunneling Protocols
- Virtual Routing

Benefits of ZebOS 7.8

- Highly scalable architecture evolved from seven generations of ZebOS software provides rich features, performance, scalability and future-proofed solutions.
- Mature and robust IPv4, IPv6 and L2 software offerings based on ten years of product advancement.
- State-of-the-art protocol software based on current standardizations at IETF, IEEE, and MEF, now offering GMPLS, Carrier Ethernet and Data Center Bridging stacks.

- Extensive offering that will enable system designers to develop products in telecom, data, video and voice applications.
- Architecture optimized for performance that enables system developers to implement stacks without any performance penalties.
- Architecture designed for modularity, thus enabling systems designer to develop and validate systems in minimum time.
- Architecture optimized for portability, which enables customers to target operating systems and chip-sets quickly.
- System vendors can build scalable and extensible future-proofed networking equipment.
- Providing VPN services adds significant value to provider edge equipment. These solutions enable the security needed by VPN service providers, while at the same time building a scalable infrastructure that can take advantage of IP routing, traffic engineering (TE) and MPLS switching features.
- Multicast, PIM-DM functionality greatly optimizes the delivery of video conferencing, streaming music and movies, voice over IP (VoIP) services, distributed downloads, Internet TV and more into Local Area Networks.
- Virtual Routing capabilities. Virtual routers can be utilized as routers within virtual private networks.

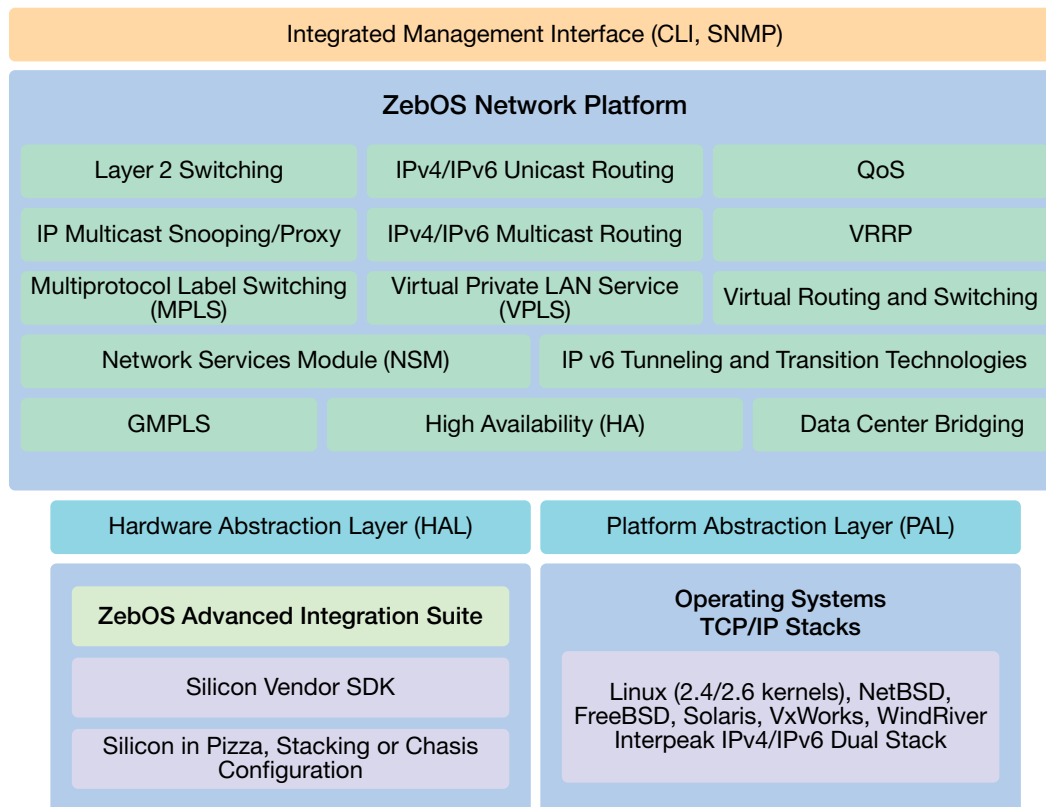
Modularity and Portability

Protocol modules can be independently licensed, installed and upgraded. This allows ZebOS to be deployed in smaller and lower-priced access equipment as well as highly-scalable core networking equipment. Each protocol module is built on the ZebOS Network Services module (NSM), the base module that simultaneously and independently communicates with every ZebOS routing and switching process. The ZebOS NSM communicates through the Hardware Abstraction Layer (HAL) and Platform Abstraction Layer (PAL) to the underlying operating system or network processor for forwarding table updates.

Routing Protocols

IPv4 and IPv6

IP Infusion is the leading provider of integrated IPv4 and IPv6 routing protocols. ZebOS Network Platform supports the most recent IETF and IEEE drafts and specifications for both IPv4 and IPv6 versions of OSPF, BGP, IS-IS and RIP. In addition to standard routing protocols, ZebOS offers Virtual Routing (VR) support, Traffic Engineering (TE) extensions and Constrained Shortest Path First (CSPF) topology support for OSPFv2, OSPFv3, IS-IS protocol modules and TCP-IP modules.



ZebOS 7.8 Network Platform Architecture Diagram

Advanced Layer 2 and VLAN Switching

The ZebOS Layer 2 and VLAN switching modules are a family of Carrier Ethernet, Ethernet bridging, spanning tree, multicast and VLAN software packages that provide advanced Layer 2 functionality for vendors building routing or switching equipment. Each Layer 2 protocol module leverages the CLI and kernel management of the ZebOS NSM. ZebOS Layer 2 modules are complementary to our Layer 3 routing protocol software solutions and are built on a common architecture. The Layer 2 family includes a full set of solutions for Carrier Ethernet, Ethernet OAM, and Linear and Ring Protection.

MPLS, Traffic Engineering and VPN Support

The ZebOS Multiprotocol Label Switching (MPLS) modules are a complete solution for the rapid integration of MPLS functionality into the enterprise for provider access, edge and core communications equipment. ZebOS supports both MPLS Traffic Engineering (TE) and MPLS VPN (Virtual Private Network) capabilities, and extensions to support DiffServ and DiffServ-TE. The ZebOS MPLS switching modules which support Traffic engineering extensions use RSVP-TE and DiffServ dynamic signaling protocols to communicate with the ZebOS MPLS forwarder or a third-party MPLS forwarder.

Multicast

ZebOS Network Platform includes support for both IPv4 and IPv6 multicast protocol modules. This includes support for Protocol Independent Multicast-Sparse Mode (PIM-SM and PIM-SMv6) Protocol Independent Multicast-Dense Mode (PIM-DM) and Distance Vector Multicast Routing Protocol (DVMRP) modules.

Virtual Routing

Virtual Routing (VR) logically subdivides a physical router into multiple virtual routers and allows each virtual router to execute separate instances of the routing protocol software and network management software (for example, SNMP or the CLI). Each virtual router can be independently monitored and managed by the user. ZebOS Network Platform offers optional VR for both IPv4 and IPv6 routing protocol modules.

Integration Platforms

ZebOS Network Platform contains an advanced Hardware Abstraction Layer (HAL) and Platform Abstraction Layer (PAL) interfaces which isolate all of the hardware platform-specific interaction into a compact set of well-defined function calls for NSM. This allows ZebOS protocol modules and control plane applications to be totally independent of the hardware platform and the OS while supporting easy and rapid integration with any data plane solution. These include popular network processors like the Intel® IXP425 and IXP2400, and silicon switching solutions like the Broadcom StrataSwitch and StrataXGS and Marvell Prestera series. IP Infusion's ZebOS Advanced Integration Suite (AIS) Hardware Integration Platform

(HIP) provides integration and optimization of ZebOS software for both switching/routing hardware and an OS of choice.

Management and Logging Plus Basic Access and Tunneling Protocols

In order to provide its customers with ease of management, configuration, and operation, IP Infusion has developed various management interfaces.

The ZebOS Integrated Management Interface (IMI) and IMI Shell (IMISH) modules provide complete, unified management for the ZebOS NSM and the individual ZebOS routing protocols.

Development, Documentation and Support

All ZebOS Network Platform modules are written in the portable ANSI C programming language. ZebOS Network Platform software is delivered with extensive documentation including: CommandReferences, Developer, Installation and Configuration Guides. IP Infusion provides comprehensive technical support to customers who have purchased support and maintenance contracts for IP Infusion products, including the customers-only online support website, product updates and email support. The technical support staff is comprised of highly-skilled network engineers developing, supporting and operating advanced IP networks.

Additional Information

Individual protocol module data sheets are available that contain more details on features, benefits and requirements. For these or any other additional information, please contact us at sales@ipinfusion.com or 1-866-MY-ZEBOS (1-866-699-3267), or visit our website at www.ipinfusion.com.



IP Infusion delivers advanced software solutions that power communications equipment for packet-based Next Generation Networks (NGN). With a unique modular architecture and the industry's broadest suite of communication protocols, IP Infusion enhances product differentiation and market agility for many of the world's leading network equipment vendors. Incorporated in Delaware in October 1999, IP Infusion is headquartered in Sunnyvale, California, and is a wholly owned and independently-operated subsidiary of ACCESS Systems Americas, Inc., a wholly owned U.S. subsidiary of ACCESS CO., LTD., of Tokyo, Japan. For more information about IP Infusion, please visit www.ipinfusion.com.

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