**Feature-Rich, IP-Enabling Software for Faster Delivery
of Leading-Edge Networking Solutions**

eion

EION Inc.

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As an Original Equipment Manufacturer (OEM) developer or system integrator, time-to-market is a critical factor for your overall success. You also need to ensure that you have access to a complete set of networking features, including a broad array of networking protocols such as Internet Protocol (IP) and a wide range of networking infrastructure applications, such as Quality of Service (QoS), policy management,and security.

You need to be able to ensure that you can manage your solution over time as you add – or even remove – networking protocols and applications. The networking infrastructure applications need to integrate easily into your underlying network processors and operating systems. You can reduce your development cycle and accelerate the learning curve for your developers by using a common software environment for developing and evolving your networking solutions.

The race is on to swiftly deliver to market more complete networking solutions for both today and for the future. The key criteria for success are openness, modularity, and scalability. The end result is high-performance interoperability for your IP-enabled networking products.

A new economic landscape is creating opportunities to enable robust IP connectivity for diverse network equipment and appliances. Enterprise-wide applications increasingly demand connectivity to equipment, services, and applications that allow organizations to efficiently incorporate the Internet into all aspects of business. Enterprise networks today require seamless IP connectivity from anywhere – with any device – at any time.

EION IP Software Suite

EION is the leader in a new era of IP-enabled solutions. EION's IP Software Suite is a portable, real-time software suite that enables the EION vision for building the new, high-performance Internet. EION IP Software Suite includes high-performance, open, modular, scalable software components that let hardware, software, and systems vendors rapidly build high-quality, Internet-enabled devices. It can work on – and across – multiple hardware processors, platforms, and operating systems.

This open framework incorporates complete IP features and services, and it facilitates streamlined connectivity to IP infrastructure applications such as QoS, security, and network management that are offered by EION as well as third-party vendors.

The shift from standalone routers based on proprietary, monolithic architectures toward open networking infrastructure applications incorporated in diverse products and services requires a platform-independent framework that facilitates portability of the software across multiple hardware platforms and operating systems. EION's framework and applications can be implemented to construct Internet-enabled products in many market segments, including:

- Wireless devices
- Personal Digital Assistants (PDAs)
- Network appliances
- Mobile computing devices
- Consumer electronics
- Computers
- Servers
- Automobiles

With EION's IP Software Suite, you can also develop traditional network devices such as routers and switches. Standards-based routing technologies are required to capitalize on the business opportunities created by the growth of the Internet, and the IP Software Suite allows customers of EION to swiftly launch exciting and innovative solutions.

EION is the only vendor that offers a complete range of IP software technology that can be readily deployed into heterogeneous, standards-based networks. Developers and equipment vendors can dramatically accelerate time-to-market with new products and they can drive down the Total Cost of Ownership of their products by relying on proven, standards-based technologies that can be easily leveraged to create new revenue opportunities.

Ease of Integration with Network Processors

The approach to building and developing networking products and solutions is changing.

There is no better example of this than in the market for processors targeted for networking industry. EION is leading the way in adding value to network processors and helping you develop value-added networking solutions.

As networking technology becomes more of a commodity, manufacturers are faced with the new challenge of managing through market shifts. EION plays a large role in the emerging market for network processors by allowing manufacturers to pick-and-choose their required IP infrastructure applications.

You can leverage a flexible framework that easily integrates with the selected network processors and underlying operating system. EION delivers a common development environment so you can lower your learning curve in bringing products to market quickly with full-featured IP infrastructure applications.

EION's open framework approach fosters innovation and interoperability across various networking devices, including both traditional networking products such as switches as well as new networking devices such as PDAs, computers, and wireless devices. You can also IP-enable specialized network appliances, including alarm systems, thermostats, credit card readers, car information systems, and many others.

EION is a first-mover and market leader in offering an open framework for IP-enabled solutions. EION currently has partnerships with manufacturers that together represent over 80 percent of the network processors manufactured.

"Integrating Nortel Networks Open IP Environment into our processor platforms provides advanced network services that our customers require, such as security, policy management, and Quality of Service. If we didn't have Open IP Environment integrated with our network processor, we'd have to hire a hundred engineers to write the sophisticated code that provides such a complete solution".

Cindy Lindsay, Director of Strategic Alliances for Vitesse Semiconductor Corporation.

Intelligence in the air.

EION IP Software Suite

EION is the only leading global networking vendor offering a feature-rich, portable, high-performance, platform-independent IP enabled software solution. EION's latest version delivers full-featured network protocol support and robust support for IP infrastructure applications.

The routing market is quickly shifting from a model based largely on IP in routers to one based on pushing IP functionality – including routing – to the edge of the network on a variety of platforms. EION IP Software Suite is a software suite enables IP-based applications and supports them on both traditional and emerging types of network platforms. It delivers the high-performance, platform-independent routing required to support advances in the high-performance Internet.

Customers can free themselves from closed-box, proprietary approaches of the past and can now incorporate proven, Internet-hardened IP software technologies into their products. You can leverage the knowledge of thousands of highly skilled EION developers and benefit from the extensive expertise EION has developed as a leader in high-performance, high-reliability network software.

You can support enhanced network applications, such as QoS, security, and policy management. EION supports leading routing protocols, including:

• IPv4
• OSPF (Open Shortest Path First)
• RIP (Routing Information Protocol)
• BGP (Border Gateway Protocol)
• IS-IS (Intermediate System-to-Intermediate System)
• IPX (Internetwork Packet Exchange)

EION also offers additional, high-value added infra-structure specific applications, including:

• MPLS Enabled Services (MPLS, LDP, RSVP, Fast Reroute)
• DiffServ QoS (Differentiated Services Quality of Service)
• M-RTM (Multicast Routing Table Manager)
• DVMRP (Distance Vector Multicast Routing Protocol)
• VRRP (Virtual Router Redundancy Protocol)
• PPP (Point-to-Point Protocol)
• NAT/PAT (Network Address Translation/Port Address Translation)

EION also offers many more modules for enabling a whole and complete routing solution for all your networking requirements. EION's IP Software Suite incorporates the latest networking standards and provides an upgrade path to ensure long-term interoperability and increase the time-in-market for your products.

You can simplify your make/buy decisions and leverage expertise and proven interoperability from EION to further accelerate the introduction of new products. You can reduce development risks and safely benefit from a complete, off-the-shelf solution that can be easily and seamlessly customized for the unique requirements of each platform, application, or service.

For the first time, developers can take control of your own destinies and gain freedom from the limitations imposed by traditional, proprietary architectures. EION IP Software Suite delivers a common look-and-feel for the implementation, operation, management, and evolution of IP software infrastructure via standards-based interfaces and common programming languages such as C, C++, and Java. Developers can quickly incorporate high-performance IP networking across a wide range of products that are configured and managed using familiar interfaces. You can control and manage these platforms using Command Line Interface (CLI), Simple Network Management Protocol (SNMP), and/or Web Network Management.

An Open Scalable and Modular Architecture

EION is leading the re-invention of the communications industry. Developers can distribute information throughout the enterprise and throughout the Internet, and they can build high-performance links between customer touch-points, high-performance enterprise networks, and emerging applications and services.
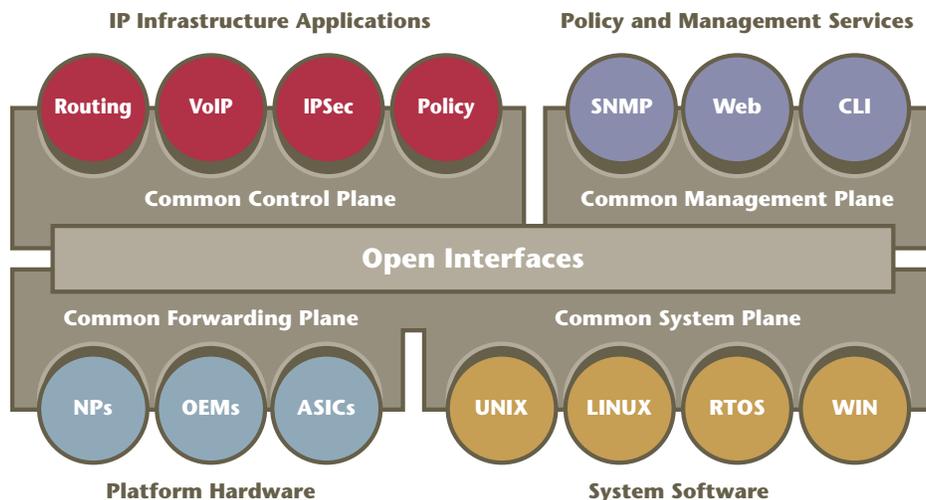
EION's IP Software Suite includes Application Programming Interfaces (APIs) to accelerate time-to-market with standards-based interfaces to the selected operating system, processors, and hardware platforms. It is independent of both platforms and operating systems, so IP functionality can be incorporated in a modular fashion into diverse platforms. This modular software can Internet-enable everything from personal appliances to high-performance carrier switches deep within the optical Internet.

The plug-and-play nature of EION IP Software Suite allows developers to use only the software modules that are required for a particular application. This reliable, open system architecture is extremely scalable, s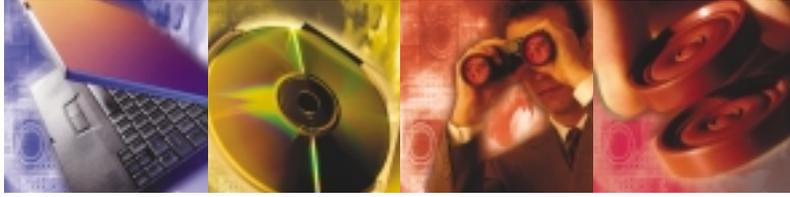ince developers can add new protocols or support for emerging industry standards in a modular fashion. You can leverage the development resources of EION to deploy standards-based technologies that accelerate the time-to-market of innovative products that meet network requirements for distributed computing.

The flexible design of EION architecture encourages innovation. Developer kits are available on multiple processors and operating systems, and support for industry standards allows developers to quickly leverage distributed IP infrastructure to extend the enterprise by adding new platforms and applications.

Next-generation IP networks will need to handle traffic volumes thousands of times greater than today's networks, and EION provides the platform-independent scalability required for long-term success. With the ability to ride atop a myriad of hardware platforms and operating systems, EION offers developers unprecedented scalability to build portable applications and services for the enterprise or carrier network.

IP Infrastructure Applications   **Policy and Management Services**

Routing   VoIP   IPSec   Policy   SNMP   Web   CLI

Common Control Plane   **Common Management Plane**

Open Interfaces

Common Forwarding Plane   **Common System Plane**

NPs   OEMs   ASICs   UNIX   LINUX   RTOS   WIN

Platform Hardware   **System Software**

EION Portfolio Summary

Routing

OSPF
EION OSPF is a high-performance portable link state routing protocol piecing together information from all routers and calculate the shortest path.

BGP
EION BGP offers tremendous network stability and high performance with scalability to over one Million routes.

RIP
EION Open IP Environment RIP module exchanges information with adjacent routers required to compute "best" routes through the network.

IS-IS
EION Open IP Environment Intermediate System to Intermediate System is an International Standards Organization (ISO) protocol that provides dynamic routing between routers.

DVMRP
EION Open IP Environment Distance Vector Multicast Routing Protocol (DVMRP) module dynamically generates IP Multicast delivery trees and enables forwarding of multicast packets along these multicast tree branches.

IPv4
EION Open IP Environment IPv4 module is used in interconnected systems of packet-switched computer communication networks.

MPLS
EION MPLS module is a high-performance fault tolerant implementation of the label switching capability mechanism based on industry standards. The flexibility of EION-MPLS allows the equipment vendors to rapidly deliver MPLS enabled solutions with carrier-class robustness.

M-RTM
M-RTM provides efficient, scalable and flexible routing table support for multicast Routing Protocols. The module enables the integration of additional multicast Routing Protocols by using queues and messages.

RPS
EION Open IP Environment RPS manages configured policy information and provides a consistent interface to all RPAs.

U-RTM
EION Open IP Environment U-RTM is a transparent and portable software module that services the routing protocols by providing a common Routing Table. A management interface is included for adding, modifying, deleting, and querying route entries.

IGMPv3
EION IGMPv3 protocol is a portable software module that implements the IP Multicasting capability as an option to TCP/IP stack. It facilitates hosts and routers to participate in multicast network groups.

PIM/SIM
EION PIM/SM provides the Multicast IP Sparse Mode protocol for routing multicast packets to multicast groups. It is designed to efficiently establish distribution trees across wide area networks where multicast groups are thinly populated across a large region.

MPLS Based Protocols

MPLS
EION MPLS module is a high-performance fault tolerant implementation of the label switching capability mechanism based on industry standards. The flexibility of EION-MPLS allows the equipment vendors to rapidly deliver MPLS enabled solutions with carrier-class robustness.

DiffServ/QoS
EION's Differentiated Services (DiffServ) for IP Quality of Service (QoS) is a set of transparent and portable software components enabling policy-based QoS control and multiple levels of QoS.

RSVP
EION Open IP Environment RSVP protocol supports RSVP signaling for admission control to RSVP-enabled DiffServ Networks.

OSPF-TE
EION OSPF-TE is a high-performance portable link state routing protocol piecing together information from all routers and calculate the shortest path.

IPv6
EION IPv6 is a portable software module that implements IP forwarding and route generation per industry standards. This module enables rapid delivery of IPv6 enabled solutions with carrier-class robustness.

Traffic Management

COPS
EION COPS suite provides total flexibility for policy management across networks.

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Security and Protection

VRRP
EION Open IP Environment Virtual Router Redundancy Protocol (VRRP) module provides fault tolerance using redundancy resulting in an overall maximum availability and performance of your device.

IPSec
EION IPSec module implements per-packet authenticity and confidentiality guarantees between peers. It provides mechanisms to protect client IP protocols and applications. This module is available for both IPv4 and IPv6.

Other Protocols

DHCP
EION Open IP Environment DHCP (Dynamic Host Configuration Protocol) is a portable implementation of the Service and Relay Agent components as per RFC 2131 and RFC 2132.

IPX
EION Open IP Environment IPX software module is a NetWare communications protocol used to route messages from one node to another. IPX packets include network addresses and can be routed from one network to another.

PPP
EION Open IP Environment PPP is a portable software module that is a full duplex, bit-oriented protocol that negotiates a wide variety of operations and options during a session between two communicating end-points.

STP
EION Open IP Environment STP module performs all functions necessary for a transparent bridge that includes spanning tree algorithm, multicast filtering, General Attributes Registration Protocol, Multicasting Registration Protocol, VLAN support and traffic class management.

LDAP
EION LDAP protocol is a portable software module that allows email programs to look up contact information from a server. LDAP also serves broader applications, such as looking up services and devices on the Internet (and intranets). This module is available for both IPv4 and IPv6.

Development Environment

CLI
EION CLI is an industry familiar command line interface delivering a command set for a common user interface for device management for the Open IP Environment Framework and across other third party products.

C/C++ Compiler
EION products are ANSI compliant thus allowing the use of industry standard compilers including GNU and DIAB.

System Services

Common System Plane
EION Common System Plane (CSP) offers a seamless high-speed interface to various RTOS. Total flexibility to port to proprietary and new Operating Systems.

Forwarding Engine
EION Open IP Environment Forwarding Engine (FE) receives and forwards Protocol Data Units (PDUs) through network interfaces based on a forwarding table that provides the best route to the packet destination.

Forwarding Plane Interface
EION Open IP Environment FPI is a module that acts as the access point for all Open IP Environment protocols and applications that interact with a forwarding engine.

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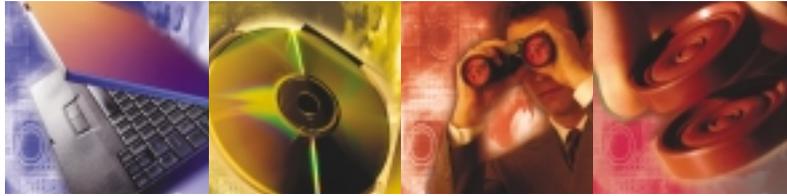
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