Ixia® Vision Edge® OS Adds Visibility to Hyperscale Data Centers

Vision Edge OS software running on Intel® processor-powered Edgecore® open switches creates a network packet broker (NPB) supporting up to 100 Gbps throughput. This cost-effective solution can be deployed throughout a data center for widespread visibility into security and network monitoring issues.

Introduction

Data center architectures are evolving to support increasing growth in applications, cloud services, and data. Innovations in rack-scale design, software defined networking (SDN), virtualization, open networking, and infrastructure orchestration are enabling accelerated and elastic provisioning of capacity. At the same time, these networks are facing increased cybersecurity risks that threaten to compromise the data center resulting in data theft.

These data centers need deep insights into application performance and network security that are provided by a new class of network packet broker (NPB) that collects network packets to be analyzed by specialized security and management tools. Ixia's® Vision Edge® OS, a network visibility operating system, together with Edgecore Networks'® open networking switches powered by Intel® processors, are enabling pervasive and cost-effective visibility in hyperscale data centers and disaggregated networks.

The Challenge

Data centers are adopting virtualization technologies to efficiently support the ever-increasing volumes of data for processing. Innovations in rack-scale design, software defined networking (SDN), and infrastructure orchestration are defining the new software defined data center (SDDC). Companies are using SDDC architectures to create web scale or "hyperscale" data centers powering massive public and private cloud services. Additionally, new forms of data centers such as multi-access edge computing (MEC) systems are emerging to help satisfy this data growth at the network edge.

As data center architects and operators adopt these technologies, entirely new applications in areas such as artificial reality (AR), virtual reality (VR), internet of things (IoT), and smart cites will be able to utilize these compute, storage, and networking resources to fuel new applications and services.

All of these data centers, software defined or not, need to provide visibility into network traffic by utilizing NPBs to aggregate, filter, and load-balance network packet data to deliver packet metadata and contents to security, forensics, and performance management tools.

By disaggregating the NPB into software running on an open switch, these tools can scale more readily—from being deployed on a single top-of-rack (TOR) switch to covering traffic from thousands of racks. This visibility ensures that security, forensics, and monitoring tools have access to the full breadth of network traffic.

The Solution

Ixia's Vision Edge OS is a network visibility software solution that transforms selected Edgecore Networks open networking switches into NPBs, providing pervasive rack and data center level visibility. NPBs aggregate, filter, and load-balance network packet data to seamlessly and efficiently deliver packet data to security, forensics, and performance management tools.

The Vision Edge OS and Edgecore solution offers complete access to network packets for real-time visibility, insight, and security capabilities into high-density hyperscale, microscale, and SDDC networks, even as they expand. Some of the benefits of this combination include:

- Scalable and always-on network visibility in fast-growing and evolving data centers with more flexible architecture delivered via open networking components.

- Automated network provisioning that can streamline operations by accelerating provisioning of network visibility services and connecting packet feeds to network tools.

- Enhanced security capabilities for crucial networking, data center, and cloud business assets through an extended visibility architecture with intelligence features.

Solution Architecture
As seen in Figure 1, an enterprise solution includes switches in racks in data centers throughout the enterprise that tap the networks for data packet collection, then filter those data packets. This data is then sent to aggregation switches that then switch the packets to the right set of security or network management tools. These aggregation switches leverage load-balancing technology to direct packets to multiple tool instances and not overwhelm a single tool with too much data.
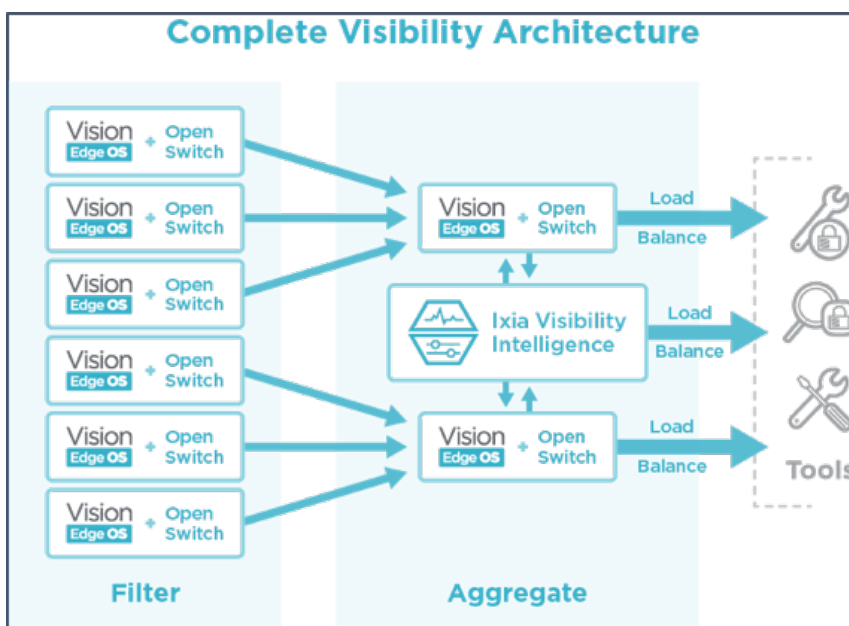

Figure 1. Vision Edge OS enterprise architecture.[1]

Ixia Vision Edge OS

Ixia Vision Edge OS delivers control, coverage, and performance to protect and improve crucial networking, data center, and cloud business assets on open networking switches, delivering a powerful solution for enterprises as well as cloud and telecom service providers that are leveraging SDDC technologies.

The Vision Edge OS NPB solution comes with Ixia's NetStack,* which includes:

- Setup, configure, and re-configure visibility with a drag-and-drop interface that can easily link network traffic flows to specific security and monitoring tools.

- Three-stages of filtering—ingress, dynamic, and egress—naturally providing a built-in capability for AND/OR logic and simplifying configuration of complex Boolean filtering rules.

- Patented dynamic filter compiler technology automatically resolves rules when configuring and re-configuring. This filter compiler eliminates the possibility of inadvertently dropping packets.

- Source port labeling (VLAN tagging) that is used to track network traffic.

Additional capabilities can be added to Vision Edge OS to further enhance the Ixia and Edgecore visibility solution. Edgecore open network switches running Vision Edge OS can seamlessly integrate with Ixia's turnkey Vision ONE* and Vision 7300* network packet brokers, each of which features a visibility engine that adds deduplication, packet trimming, application filtering, SSL decryption and encryption, and other features to the baseline NPB features.

Edgecore Open Switches

Edgecore Networks delivers open network solutions for cloud data center, telecommunications, and enterprise customers. Edgecore, as a participant in the Open Compute Networking Project,* offers a full set of open switches based on its approved design contributions.

Figure 2. Edgecore AS5900 Open Switch.[2]

Edgecore offers several open switches that are compatible with Ixia's Vision Edge OS, including the AS7712 100 GbE data center switch and AS5812 from the family of 10 GbE top-of-rack (TOR) switches, which includes the first switch ever approved by the Open Compute Project (OCP).[3] The company also offers the cost-optimized AS6800 family of 40 GbE switches and AS7700 family of 100 GbE switches.

Edgecore switches support a broad set of commercial and open source software choices in the industry, providing customers with alternatives to meet their specific requirements.

Edgecore Switches Utilize Intel® Xeon® D Processors

Edgecore switches utilize the Intel® Xeon® processor D-1518 to provide the processing power for the diagnostics software and the Open Network Install Environment (ONIE),* which provides the automated loading of compatible open source and commercial network operating system (NOS) offerings.

The Intel Xeon processor D-1518 is part of the Intel Xeon processor D family, which delivers the performance and advanced intelligence of Intel Xeon processors in a dense, low-power system on a chip. The Intel Xeon processor D family is Intel's third-generation, 64-bit system on chip and the first SoC based on Intel Xeon processor technology.

The Intel Xeon processor D family can be deployed for a variety of workloads, including network routing, wireless base stations, warm storage, industrial IoT, dynamic web serving, dense/rugged environments outside the data center, and more.

The Intel Xeon processor D-1518 is a four-core device operating at 2.20 GHz with up to 128 GB of memory and two 10 GbE ports. It consumes 35 W with a design that provides excellent performance per watt. Edgecore makes use of

the built-in baseboard management controller (BMC) to monitor the state of the switch, communicating any issues or alarms to the system administrator through an out-of-band connection.

Conclusion

NPBs are important systems for providing data centers with the data needed for advanced security and visibility tools. And they continue to evolve to keep pace with an ever-changing data center. The Ixia Vision Edge OS running on Intel processor-powered Edgecore open switches shows how to build an NPB infrastructure that can maximize network visibility in scaled out data centers. By leveraging low-cost hardware with powerful software, Ixia has created a powerful, scalable NPB that can be installed anywhere it is needed in the data center.

About Ixia

Ixia, a Keysight Business (NYSE:KEYS), provides testing, visibility, and security solutions to strengthen networks and cloud environments for enterprises, service providers, and network equipment manufacturers. Ixia offers organizations trusted environments in which to develop, deploy, and operate. Customers worldwide rely on Ixia to verify their designs, optimize their performance, and ensure protection of their networks and cloud environments. Learn more at www.ixiacom.com.

About Keysight Technologies

Keysight Technologies, Inc. (NYSE:KEYS) helps its engineering, enterprise, and service provider customers optimize networks and bring electronic products to market fast and at a low cost. Keysight's solutions go where the electronic signal goes, from design simulation, to prototype validation, to manufacturing test, to optimization in networks

and cloud environments. Customers span the worldwide communications ecosystem, aerospace and defense, automotive, energy, semiconductor, and general electronics end markets. Keysight generated revenues of $2.9B in fiscal year 2016. In April 2017, Keysight acquired Ixia, a provider of network test, visibility, and security solutions. More information is available at www.keysight.com.

About Edgecore Networks

Edgecore Networks Corporation is a wholly owned subsidiary of Accton Technology Corporation. Edgecore Networks delivers wired and wireless networking products and solutions through channel partners and system integrators worldwide for the data center, service provider, enterprise, and small and medium business customers. Edgecore Networks provides a full line of open Wi-Fi access points and 1 GbE, 10 GbE, 25 GbE, 40 GbE, 50 GbE, and 100 GbE OCP-ACCEPTED switches that offer choice of NOS and SDN software for data center, telecommunications, and enterprise networks. For more information, visit www.Edge-Core.com.

About Intel® Network Builders

Intel® Network Builders is an ecosystem of infrastructure, software, and technology vendors coming together with communications service providers and end users to accelerate the adoption of solutions based on network functions virtualization (NFV) and software defined networking (SDN) in telecommunications and data center networks. The program offers technical support, matchmaking, and co-marketing opportunities to help facilitate joint collaboration through to the trial and deployment of NFV and SDN solutions. Learn more at http://networkbuilders.intel.com.