

White Paper

Why Shared Ethernet Adapters (SEAs) Are an Important Component to Your IT Datacenter

Building virtual SEAs can decrease a datacenter's hardware footprint, reduce costs, and increase overall performance.



About the Author

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Chris Churchey brings more than 35 years of IT experience in enterprise open systems and storage products, with an emphasis on operating systems, virtualization, large scale systems architecting, design and integration, and performance optimization of computer resources.



A Shared Ethernet Adapter (SEA) is a Power Virtual Machine (PowerVM) feature that provides a virtual connection between a physical Ethernet adapter to a single or several virtual Ethernet adapters in local client logical partitions (LPARs). Therefore, with an SEA operating on a virtual I/O server (VIOS), virtual Ethernet adapters running in an LPAR can still transmit network data traffic beyond the immediate virtual local area network (VLAN).

This whitepaper discusses the complexities of why SEAs can benefit your company's IT infrastructure to boost performance and reduce costs and overall hardware footprint.

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SEAs Reduce Hardware Footprint

By bridging physical and virtual adapters, an SEA can facilitate data exchanges between LPARs on the internal virtual network and outside physical and virtual networks. An SEA works by connecting internal VLANs with VLANs located on external switches, which is a complex way of saying an SEA allows virtual partitions to communicate with other virtual partitions and stand-alone servers outside of the internal network. One or more LPARs on a virtual network can accordingly communicate with stand-alone servers and LPARs on other systems, thereby eliminating the need for a dedicated physical adapter for each client LPAR.

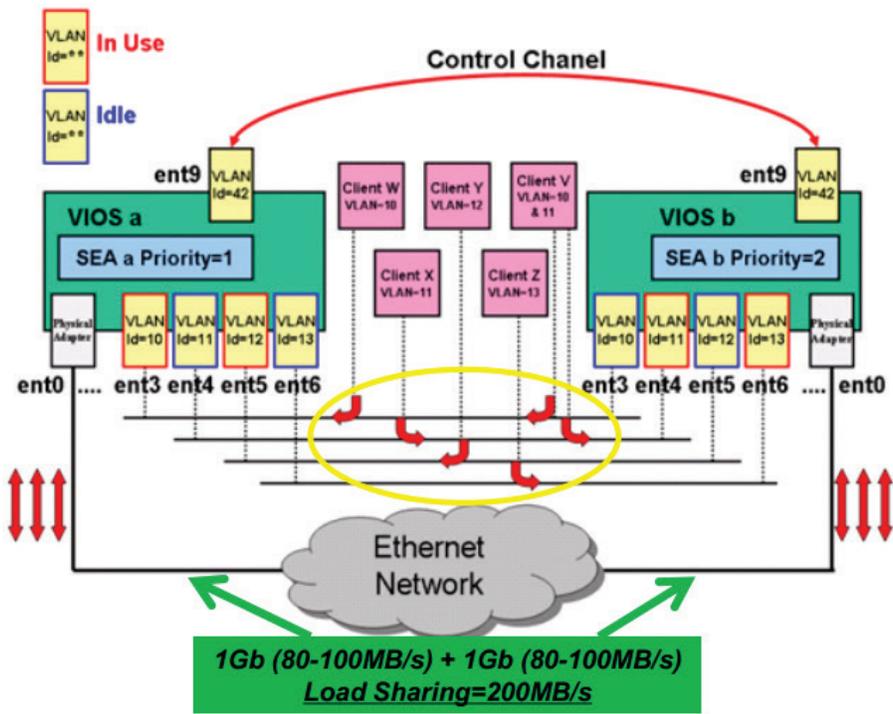
To put it more simply, an SEA reduces the need for more physical IT hardware. Instead, an SEA creates a virtual software layer that performs the function of a physical adapter device without actually being a physical device. Reducing physical adapter devices requires less of a valuable IT datacenter footprint, frees up slots, I/O drawers, and reduces the need for complex wires and cabling.

Additionally, by utilizing SEAs, businesses reduce the burden on existing necessary dedicated hardware adapters, maximize network throughput using all adapters, and increase bandwidth sharing across LPARs. Using SEAs also allows an IT datacenter to balance central processing unit (CPU) loads across VIOS environments.

SEAs provide such necessary redundancy and failover configurations as SEA-HA Load Sharing (or load balancing), SEA High Availability (SEA-HA), and SEA Network Interface Backup (SEA-NIB).

SEA-HA Load Sharing Architecture

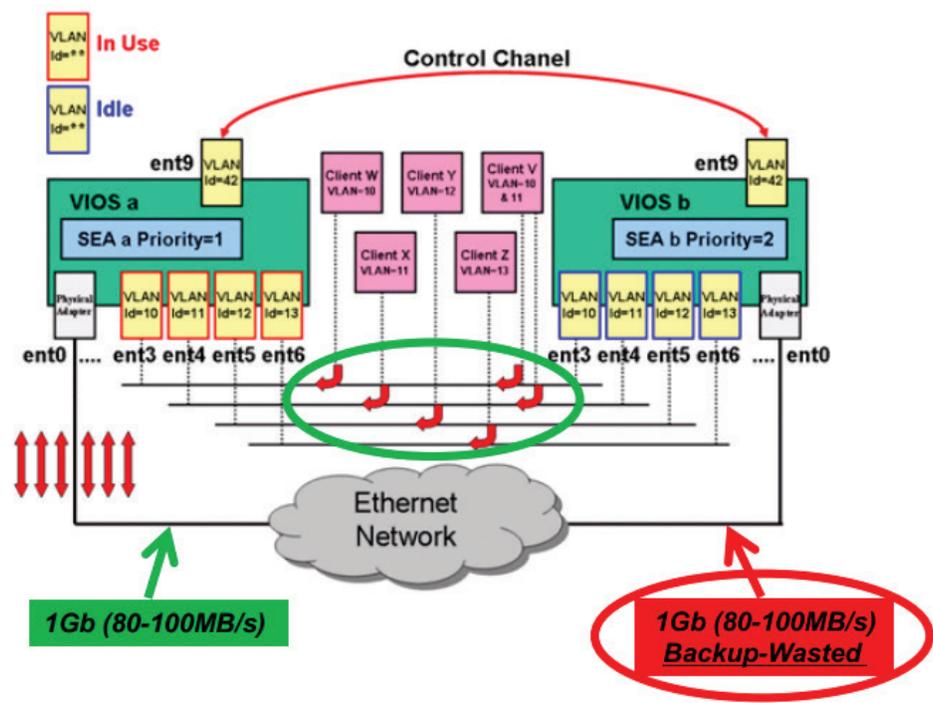
As the term implies, SEA-HA Load Sharing involves *automatic* sharing and balancing the traffic of multiple client LPARs across dual VIOS LPARs, and utilizing the full bandwidth of both VIOS LPARs as illustrated in the next figure. It should be noted this requires multiple VLANs.



SEA-HA Load Sharing Architecture utilizes the full bandwidth of both VIOS LPARs

SEA-HA Architecture

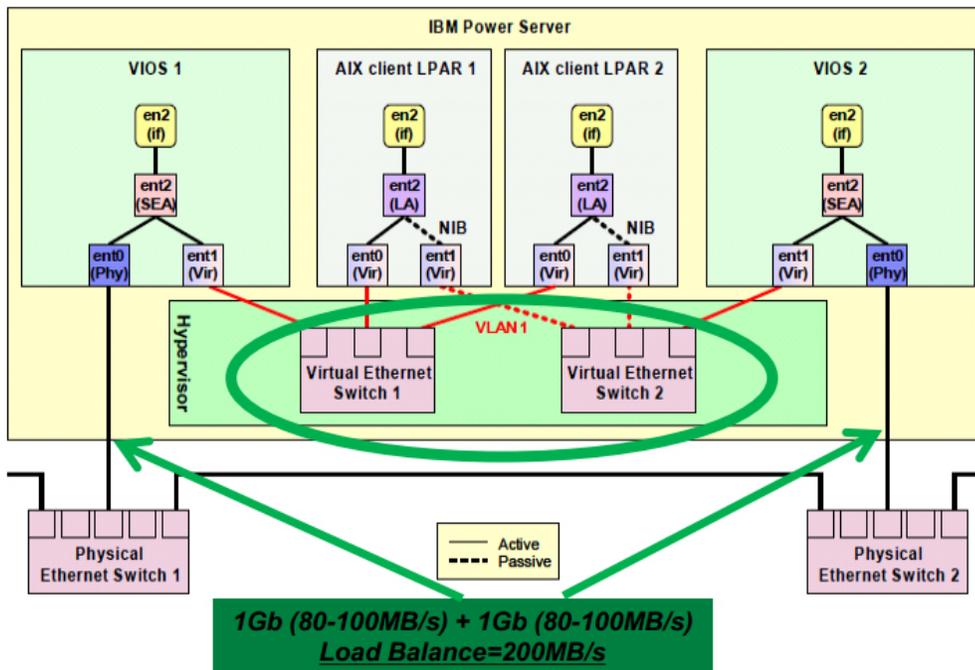
In much the same vein, SEA-HA acts as a redundancy solution. However, whereas SEA-NIB utilizes two virtual Ethernet adapters and EtherChannels per LPAR, SEA-HA only requires one virtual Ethernet adapter per LPAR. With SEA-HA, LPAR network traffic is routed through one VIO with failover routed through a second VIO.



SEA-HA Architecture not only reduces administration complexity but also reduces the bandwidth to only the adapters of the primary VIOS LPAR

SEA-NIB Architecture

SEA-NIB acts as a front line redundancy or failover solution, providing somewhat primitive yet effective load balancing over a system's network I/O adapters. This level of redundancy offers quick recovery in the event of a network card failure. Should such a failure occur, network traffic is quickly re-directed to an alternative VIOS. The system administrator must create two virtual Ethernet adapters, assigned to an EtherChannel in each LPAR, and manually designate the primary virtual adapter to VIO, attempting to load balance LPAR network traffic across dual VIOS LPARs. Scripts have been written to assign odd numbered LPARs to VIO-1 and even numbered LPARs to VIO-2 in an attempt to automate this poor-man's balancing at LPAR startup.

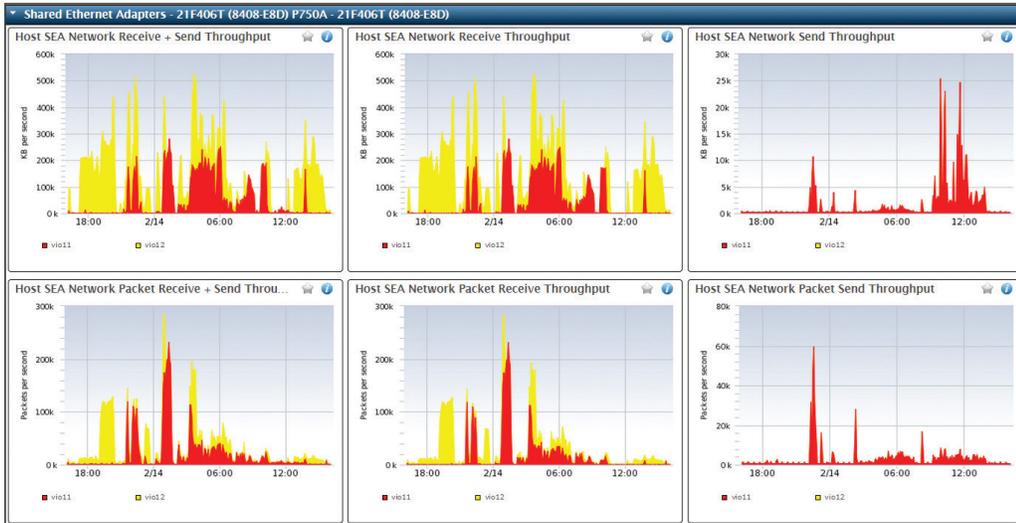


◀ The SEA-NIB Architecture allows the full bandwidth of the adapters across dual VIOS, although manually designated.

SEA Traffic Monitoring

As useful and performance efficient as utilizing SEAs can be, monitoring SEA traffic throughput performance and identifying potential failure or slowdown risks is essential for maximizing overall IT performance.

The Galileo Performance Explorer™ solution provides exactly the type of SEA monitoring necessary to maximize data efficiency by presenting IT administrators with an intuitive graphical user interface that quickly and easily displays all the necessary information to ensure seamless operation of your data storage network.



Dashboard showing Galileo's extensive host and storage reporting and metrics that deliver the depth of detail needed to analyze performance and capacity planning for optimum efficiency.

Solution Opportunity

The ATS Group, a premier IBM® business partner, provides performance, optimization and capacity insight to help your business best utilize IT technology. In particular, our Galileo Performance Explorer™ solution provides server and storage operational intelligence which helps you make informed and accurate decisions. Galileo monitors and analyzes many of the operations necessary for servers and storage efficiencies. For ways to improve performance, capacity and configuration management across your servers and storage systems, contact us:

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