



Emulex LightPulse HBAs Provide Maximum VPort Scalability

Create More Virtual Ports with Emulex 8Gb/s LPe12000 HBAs

At a Glance

New server platforms and more efficient hypervisor technologies are driving higher server virtualization ratios resulting in greater cost savings. For most data centers, a Fibre Channel SAN provides the scalable, high-performance storage that's needed to fully optimize server virtualization. NPIV allows each virtual machine to have its own SAN identity based on a virtual port, enabling unique isolation and management of storage connections.

With higher virtualization ratios, there is a requirement to create an increased number of VPorts, which can become a limiting factor in the number of VMs on a host server. As detailed in this Tech Brief, more VPorts can be created with Emulex® LightPulse® 8Gb/s Fibre Channel HBAs than with the competition. Using Emulex HBAs, storage and server administrators can fully leverage server virtualization for maximum cost savings.

VPort Technology and NPIV

With improvements in scalability and performance, server virtualization has moved into the heart of the data center. This trend has placed added emphasis on high-performance storage which is typically provided with a storage area network (SAN) based on the Fibre Channel protocol.

One of the challenges for storage administrators is maintaining the traditional Fibre Channel best practice to isolate storage using fabric zoning with the switch and LUN masking with the storage array. Both are configured using the Worldwide Node Name (WWNN) and Worldwide Port Name (WWPN) of host bus adapters (HBAs) or converged network adapters (CNAs) that connect host servers to the SAN. When virtual machines (VMs) share the WWPN identity of a physical HBA or CNA port, there is no option to uniquely isolate and manage storage for an individual VM.

The solution is N_Port ID Virtualization (NPIV), which allows a single physical HBA or CNA port to function as multiple virtual ports (VPorts), with each VPort having a unique SAN identity based on a virtual WWNN or WWPN. In addition to isolating storage, NPIV enables storage functions such as chargeback, backup and quality of service (QoS) to be uniquely managed for individual VMs.

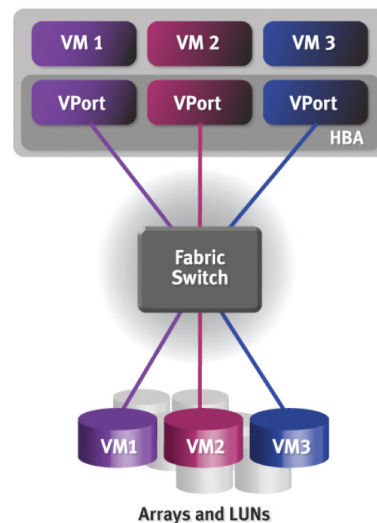


Figure 1 VMs and VPorts with unique access to LUNs.

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More VPorts Created with Emulex HBAs

New generations of servers and hypervisors have dramatically increased the number of VMs that can be deployed on a host. This allows data centers to fully leverage the savings in equipment, energy, data center footprint and administration costs that result from server virtualization. With higher virtualization ratios, there is a requirement to create an increased number of VPorts, which can become a limiting factor in the number of VMs on a host server.

As a pioneer in the development of the ANSI T11 standard for NPIV, Emulex has taken the lead in promoting and implementing VPort technology. As part of that effort, Emulex conducted an analysis of VPort scalability with current generation 8Gb/s HBAs from Emulex, QLogic® and Brocade®. The tests were done by adding VMs with VPorts until errors were encountered with VPort creation or limits were reached with server or switch resources.

Server:

- HP ProLiant DL160 G5
- Two quad-core processors
- 4GB RAM

VMware ESX Drivers:

- Emulex ESX 3.5 Update 2 in-box
- QLogic ESX 3.5 Update 2 in-box
- Brocade 1.1.0

Windows Server 2008 Hyper-V Drivers:

- Emulex Storport Miniport 2.20.06
- QLogic Storport Miniport 9.1.7.18
- Brocade Storport Miniport 1.1.0.1

As summarized in Figure 2, tests results showed that QLogic and Brocade HBAs were both limited in the number of VPorts that could be created. The limits were well within the number of VPorts that could be required with the increased scalability of new servers and hypervisors.

HBA	VMware® ESX 3.5 Update 2	Windows Server 2008 Hyper-V
Emulex LightPulse LPe12000	64 (server resource limit)	127 (switch limit)
QLogic QLE2560	15	15
Brocade 815	20	127 (switch limit)

Figure 2 Maximum VPort creation with Emulex, QLogic and Brocade HBAs.

Conclusion

VPort and NPIV technology allows storage administrators to maintain SAN best practices as applications are moved to VMs running on virtualized servers. Emulex Fibre Channel LightPulse 8Gb/s HBAs can be used to create more VPorts per server than the competition, maximizing the benefits and costs savings that can be achieved with server virtualization.



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