



Scalability: Achieving scalability by improving efficiency through state-of-the-art manageability

Emulex solutions improve IT administrator productivity and reduce total cost of ownership

At a Glance

Efficiency in management and configuration can have a large impact on the productivity of IT administrators and the resulting total cost of ownership (TCO). The design of the Emulex drivers, firmware and management software greatly improves overall productivity of the IT administrator and thereby reduces TCO, in both the physical and virtual server environments.

Technology

- Emulex LightPulse® Fibre Channel Host Bus Adapters (HBAs)
- Emulex OneConnect™ Universal Converged Network Adapters (UCNAs)
- Emulex OneCommand™ Manager application

Applications

- Storage Area Networks (SANs)

With at least one Fibre Channel HBA or UCNA in every server connected to the SAN, efficiency in HBA and UCNA management and configuration can have a large impact on the productivity of IT administrators. Efficiency translates into operational cost and TCO savings. Whether it's configuration changes or day-to-day management tasks, scalability of the HBA and UCNA monitoring and management is primarily a function of how easily and efficiently such tasks can be performed on multiple adapters at one time, and how well their administration integrates into a data center's overall management regimen. Emulex HBAs and UCNAs are supported by state-of-the-art management capabilities, introducing greater administration efficiencies that improve overall productivity and reduce TCO.

Key features:

- Centralized management support (in-band and out-of-band)
- Virtual port (vPort) management
- Global parameter setting
- Scriptable management interfaces
- Open reporting
- Integration with storage or systems management tools
- Boot-from-SAN
- High availability



OneConnect™



OneCommand™

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- Centralized management**—The ability to discover, monitor and manage all HBAs and UCNAs across the SAN in a unified manner is a big step forward in terms of management efficiency. Emulex pioneered centralized, cross platform administration of adapters from anywhere in the SAN with the launch of the HBAnyware® management application back in 2002. OneCommand™ Manager—the evolution of HBAnyware®—provides powerful, state-of-the-art management capabilities, no matter where the Emulex HBAs or UCNAs are located within the SAN, what platform they are running on, or how they can be accessed, whether in-band (over Fibre Channel) or out-of-band (over TCP/IP). Emulex also extends management to environments leveraging the Common Information Model (CIM) interface standard. Currently, Emulex is the only enterprise-class adapter vendor to offer comprehensive CIM-based management capabilities. This is of significant value, as it enables online adapter management within VMware ESXi environments.
- vPort management**—Data centers are moving to server virtualization to consolidate servers, reduce costs associated with power, cooling and management of server sprawl. To enable better integration of virtual servers in a SAN, data centers are also choosing to virtualize their HBAs and UCNAs using implementation of the N_Port ID Virtualization (NPIV) standard, thereby allowing SAN management and security best practices to be applied at the VM level. OneCommand Manager supports the discovery and management of vPorts on Emulex adapters (see Figure 1). With the Emulex vPort mapping capability, server and storage administrators can quickly identify vPort-to-VM associations in VMware ESX environments from a single management window, helping to increase SAN availability, management efficiency and business agility for better business productivity.

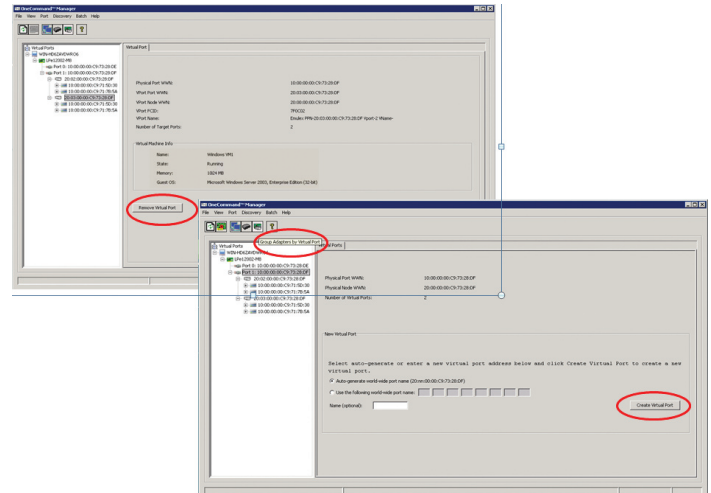
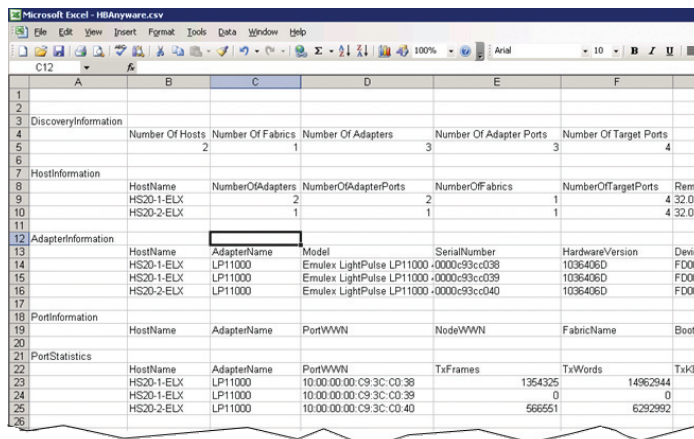


Figure 1 Discover and manage vPorts.

- Global parameter setting**—Emulex is the only vendor to allow driver parameters within the same system to be set either globally (for all Emulex HBAs and UCNAs) or locally (for a given HBA or UCNA). This not only makes configuration easy, but it prevents errors by consolidating all common settings and only requiring changes (exceptions) to be itemized. Furthermore, it reinforces commonality across HBAs and UCNAs.

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- Scriptable management interface**—Some homegrown IT policies and processes require complex and specific administration tasks that do not fit the mold of predefined capabilities of some management utilities, no matter how powerful. The Emulex scriptable command-line interface (CLI) is the perfect solution for such scenarios, providing IT administrators with the flexibility to tailor their HBA and UCNA management activities using customized scripts. The advanced scriptable management interface is yet another method of introducing a greater level of management automation in the SAN.
- Open reporting**—Inventory and change management are important concerns to IT departments that need the ability to easily capture configuration information about their SAN components. Emulex OneCommand Manager enables all HBA- and UCNA-collected data to be exported into an open, flexible XML format, which IT administrators can in turn import into off-the-shelf data analysis tools such as Excel in order to create custom reports (see Figure 2).



DiscoveryInformation	Number Of Hosts	Number Of Fabrics	Number Of Adapters	Number Of Adapter Ports	Number Of Target Ports	
	2	1	3	3	4	
HostInformation	HostName	NumberOfAdapters	NumberOfAdapterPorts	NumberOfFabrics	NumberOfTargetPorts	Rem
	HS20-1-ELX	2	2	1	4	32.0i
	HS20-2-ELX	1	1	1	4	32.0i
AdapterInformation	HostName	AdapterName	Model	SerialNumber	HardwareVersion	Device
	HS20-1-ELX	LP11000	Emulex LightPulse LP11000	-0000:93cc038	1036406D	FD00
	HS20-1-ELX	LP11000	Emulex LightPulse LP11000	-0000:e93cc039	1036406D	FD00
	HS20-2-ELX	LP11000	Emulex LightPulse LP11000	-0000:e93cc040	1036406D	FD00
PortInformation	HostName	AdapterName	PortWWN	NodeWWN	FabricName	Boot
PortStatistics	HostName	AdapterName	PortWWN	TxFrames	TxWords	TxE
	HS20-1-ELX	LP11000	10.00.00.00:C9:3C:C0:38	1364325	14962944	
	HS20-1-ELX	LP11000	10.00.00.00:C9:3C:C0:39	0	0	
	HS20-2-ELX	LP11000	10.00.00.00:C9:3C:C0:40	566551	6292992	

Figure 2 Use open reporting to capture configuration information.

- Integration with storage or systems management tools**—Emulex management instrumentation is based on open, standards-based interfaces and components, with the design goal of enabling integration into enterprise storage or server management solutions. This can be accomplished either at an application level or through the native application programming interface (API). The result is a single pane of management for all Emulex HBAs and UCNAs within the end-users' favorite storage or server management applications (see Figure 3).

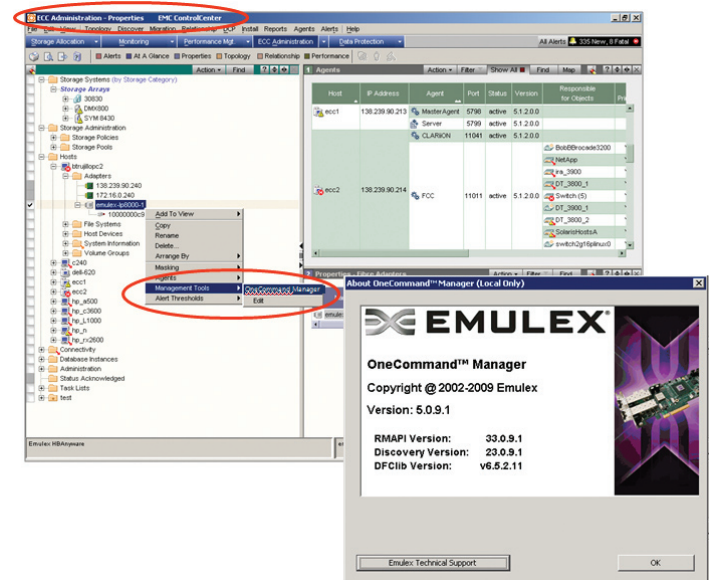


Figure 3 Single-pane integration with EMC ControlCenter.

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- Boot-from-SAN**—Many large-scale data centers have centralized storage not only for applications and data but also for operating system images. IT departments deploy boot-from-SAN as a way of standardizing and provisioning larger server pools. Emulex adapters not only support boot-from-SAN but can accommodate multiple boot paths to provide a high-availability solution. In addition, to streamline and expedite server provisioning, OneCommand Manager allows IT administrators to fully configure boot-from-SAN settings while the server is online, thereby pre-staging required changes ahead of the server's next maintenance window. Emulex's online boot-from-SAN configuration capability introduces greater speed and flexibility in server deployments, which helps to reduce deployment costs and improve SAN availability (see Figure 4).
- High availability**—High availability is certainly another critical consideration for IT administrators. A fairly common way to achieve this is using a standby server that could quickly replace a failed server. One of the challenges in such a scheme is to have the new server assume the identity of the old server as quickly as possible. OneCommand Manager allows the adapter Worldwide Name (WWN) to be changed online to match the one from the failed server. This goes a long way in making the failover as smooth, non-disruptive and efficient as possible.

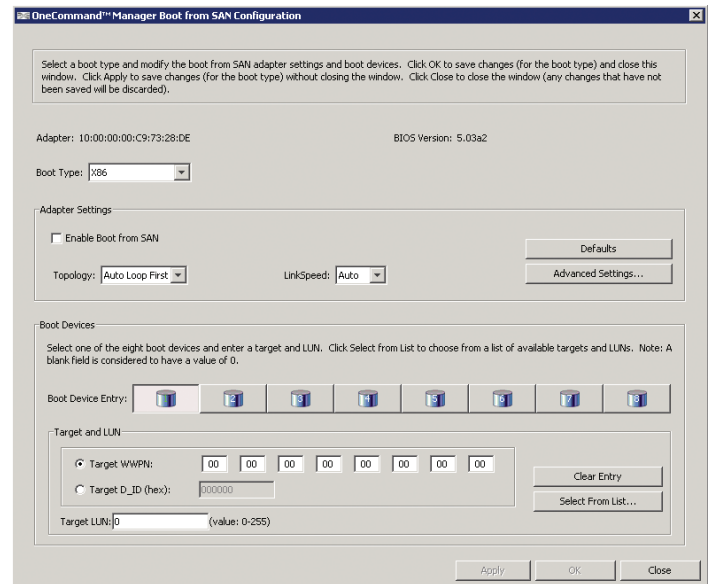


Figure 4 Online “Boot-from-SAN” configuration.

Conclusion

Emulex management capabilities are geared toward increasing overall productivity and efficiency, helping IT administrators to cope with increasing pressure for managing an ever-expanding SAN infrastructure. This directly translates into reduced operating costs and improved TCO.

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