

OneCommand™ MANAGER

ESX 4.1 MANAGEMENT REPORT CARD

Emulex OneCommand Manager provides more than twice the management capabilities in half the time compared to QLogic SANsurfer

- Unlike QLogic, with Emulex you can do firmware and parameter updates directly from the HBA management application. No cryptic CLI commands. No root password needed.
- Unlike QLogic who has no ESXi management, with Emulex you have management support for both ESX and ESXi servers.
- Manage the same number of Emulex HBA ports in half the time
- Over twice the management functionality

Table 1: Summary of OneCommand Manager vs. SANsurfer capabilities. This table demonstrates that not only is OneCommand Manager more efficient, but it also consistently beats SANsurfer in terms of functionality. See remainder of report for backup data.

Attribute	Emulex (OneCommand Manager)	QLogic (SANsurfer)
HBA Management Efficiency**	100%	46%
Platform Support*	100%	67%
Protocol Management*	100%	12%
Installation*	100%	0%
Configuration Capabilities*	100%	7%
Automation Capabilities*	75%	25%
SAN Management Functionality*	100%	45%
Troubleshooting Capabilities*	100%	43%
Statistics and Reporting*	91%	55%
Security*	67%	33%
Usability*	100%	0%
Application Integration*	100%	100%

*Percentage is based on a quotient of the number of features available versus the number of features supported by the application. See definitions on pages 2 and 3.

**Performance benchmarks are based on the quotient of the hours required to manage 175 adapters.

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DEFINITIONS

Management Efficiency	Overall time required to perform standard deployment and device maintenance activities. Includes driver and application installation, firmware and driver upgrades, parameter updates.
Platform Support	Platform support is based on what operating systems the management application runs on. For example, SANsurfer is not available on ESXi. It also considers consistency across OS platforms. For example, SANsurfer has a large number of management features that are simply not available on Linux.
Protocol Management	The ability to manage multiple network protocols from a single management application.
Installation	Installation considers a number of features designed to speed and simplify installation. For example, pre-device installation means that you can install the drivers without an adapter present. Replicated installs allow you to take a single instance instance and replicate it across servers. One-step installation is about ease of downloading, common driver across generations and other features that make installation more straightforward.
Configuration Capabilities	Configuration is about easy enablement of advanced features such as N_Port ID Virtualization (NPIV), boot-from-SAN, Worldwide Port Names (WWPNs) and Fibre Channel over Ethernet (FCoE) parameters.
Automation Capabilities	The ability to automate standard procedures with the ultimate goal of increasing consistency while reducing the time it takes to perform an action.
SAN Management Functionality	Management functionality and features available from the management tool.
Troubleshooting Capabilities	Diagnostic capabilities designed to quickly detect problems to enable fast resolution.

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DEFINITIONS

Statistics and Reporting Leveraging the discovery capabilities of the management application to gather statistics and create reports.

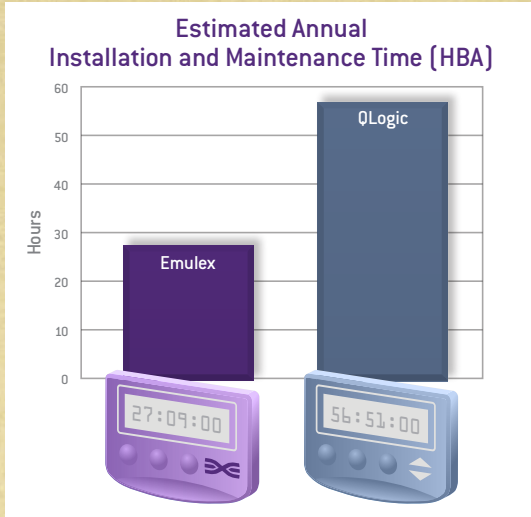
Security Ability to protect the SAN from unauthorized access.

Usability Assessment of the user interface and how it impacts overall ease-of-use.

Application Integration Ability to integrate the management tools with other SAN management applications.

MANAGEMENT EFFICIENCY COMPARISON

Chart 1: Management efficiency comparison of the time it takes annually to manage 175 HBA ports using Emulex OneCommand Manager versus QLogic SANsurfer. Per this chart, it would take 27.15 (27:09:00) hours to install and manage 175 Emulex Fibre Channel HBAs compared to 56.85 (56:51:00) hours to install and manage QLogic Fibre Channel HBAs. See Table 2 for detailed timing breakdown and links to video captures.











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MANAGEMENT EFFICIENCY DETAIL

Below is a table showing the elapsed time for performing specific management functions, as well as video links to view the actual steps required.

Table 2: The table below shows the HBA administration times for a typical midsize organization with 175 ports installed. The result is that it would take 27.15 (27:09:00) hours to manage an Emulex-based environment and over 56.85 (56:51:00) hours to manage a QLogic-based environment.

HBA Administration					
Administrative Functions	Annual Frequency	Emulex		QLogic	
		Time in Seconds	Video Links	Time in Seconds	Video Links
Parameter Updates	2	21		123	
Firmware Updates	2	70		145	
Driver Updates	2	388		474	
Agent and Application Installation (driver is inbox)	1	159		855	
Total Time		1,117		2,339	
Time/Port (Seconds)		558.5		691.25	
Time/Port * Number of Ports (Seconds)		97,737.5		204,662	
Total Maintenance Time in Hours		27.15		56.85	

Based on Quad-port HBAs, 175 Ports Calculation



FEATURE TABLES

Table 4: The table below shows a comparison of management features, comparing Emulex OneCommand Manager functionality to that of QLogic SANsurfer. Percentages are based on the number of "Yes" responses divided by the number of features per category.

Feature	Benefit	Sub-feature	Emulex	QLogic
Platform Support			100%	67%
Management Platform Consistency	Simplifies management without regard to OS platform	Management and driver features consistent across all OS platforms	Yes	No
Platforms Supported				
ESX	Easy to deploy and guaranteed support	Driver Inbox Support	Yes	Yes
ESXi		Driver Inbox Support	Yes	No
Windows (2003, 2008)		Driver Inbox Support	Yes	Yes
Linux (RHEL, SLES)		Driver In Distribution Support	Yes	Yes
Solaris (9,10)		Driver Inbox Support	Yes	Yes

Feature	Benefit	Sub-feature	Emulex	QLogic
Protocol Management			100%	12%
Centrally Discover and Manage Fibre Channel Adapters	Works with 1G, 2G, 4G and 8G adapters		Yes	Yes
Supports FCoE Configuration Requirements	Works with heterogeneous FCoE switches	Supports FCoE VSAN ID	Yes	No
		Supports FCF masking	Yes	No
	Works with heterogeneous 10G adapters	Supports "pre-FIP" CIN modes	Yes	No
Centrally Discover Network Interface Card (NIC) Entities	Improves management efficiency and helps to increase availability by enabling management of NIC adapters on local and remote servers	Supports Multivendor NIC teaming	Yes	No
			Yes	No
Centralized (Remote) Management of iSCSI Adapters	Improves management efficiency and helps to increase availability by enabling management of iSCSI adapters on local and remote servers	Update firmware	Yes	No
		Update driver	Yes	No

Feature	Benefit	Sub-feature	Emulex	QLogic
Installation			100%	0%
Pre-device Installation	Configure servers with all software and driver without HBAs; ease mass deployment	Systems can be installed without adapter and upgraded on the fly	Yes	No
One-step Installation	Single source for installation; ensures completeness and saves time	One executable file to install management application, CLI, FCoE, iSCSI, Fibre Channel and NIC drivers	Yes	No
		One Fibre Channel driver supports all generation of HBAs: 1, 2, 4 and 8Gb/s	Yes	No
		One download for complete installation package	Yes	No
Replicated Install	With replicated install, you can configure a reference installation and then replicate it across new server deployments without having to individually configure the servers.		Yes	No



FEATURE TABLES

Feature	Benefit	Sub-feature	Emulex	QLogic
Configuration Capabilities			100%	7%
Boot-from-SAN			Yes	Yes
Interrupt Coalescing	Improves host performance by grouping more data transfers in fewer interrupts	Dynamic coalescing and static configurable	Yes	No
Enabling NPIV	Ability to create, monitor and control virtual ports	Single driver with NPIV feature, where NPIV can be toggled on/off	Yes	No
		Display LUN/NPIV mapping	Yes	No
Single Driver, With Backward Compatibility With Two Older Generation Adapters	Simplifies qualification. Reduces finger pointing between support ecosystems.		Yes	No
Offline Utilities: Update, Configuration and Restoration of Adapter	Ability to configure adapter without needing server operating systems or applications	Update firmware	Yes	No
		Select boot devices	Yes	No
		Update/restore WWN	Yes	No
Supports FCoE Configuration Requirements	Works with heterogeneous FCoE switches	Supports FCoE VLAN ID	Yes	No
		Supports FCF masking	Yes	No
		Supports "pre-FIP" CIN modes	Yes	No
	Works with heterogeneous 10G adapters	Supports multivendor NIC teaming	Yes	No
Modify Worldwide Port Names	Preserve data path until servers can be brought down to install new adapters		Yes	No

Feature	Benefit	Sub-feature	Emulex	QLogic
Automation Capabilities			75%	25%
Scriptable Command Line Interface	Alternate to GUI-based management tool; useful in large and automated deployment		Yes	Yes
Batch Driver Parameter Updates	Saves times and ensures consistency		Yes	No
Batch Driver Updates	Saves times and ensures consistency		No	No
Batch Firmware Updates	Saves times and ensures consistency		Yes	No

Feature	Benefit	Sub-feature	Emulex	QLogic
SAN Management Functionality			100%	45%
Local and Remote Host Adapter Discovery	Enables management of adapters across SAN from any installed node	Inband discovery	Yes	No
		Out-of-band discovery	Yes	Yes
Persistent Binding/LUN Masking	Ensures secure target mapping across reboots	Binds WWPN to target ID	Yes	Yes
		Binds WWPN to bus ID	Yes	No
Batch Firmware Upgrade	Ease deployment of firmware upgrade in large installations	Smart one-step individual and batch upgrade across SAN of common HBAs	Yes	No
		No reboot	Yes	Yes
Multiprotocol Support	Simplify management across entire enterprise	iSCSI	Yes	No
		Fibre Channel	Yes	Yes
		FCoE	Yes	Yes
Manage NIC Teaming and VLAN (Windows Only)	Ability to use GUI to create and manage NIC teaming and VLAN configuration	Ethernet	Yes	No



FEATURE TABLES

Feature	Benefit	Sub-feature	Emulex	QLogic
Troubleshooting Capabilities			100%	43%
End-to-End SAN Echo	Important ping testing connectivity and availability of Fibre Channel ports in SAN fabric	Able to ping WWN entity supporting echo requests	Yes	No
Hardware Integrity	Diagnose and verify vital data transmission components of HBA	Post	Yes	No
		Internal/external loopback	Yes	Yes
	Pattern test	Pattern test	Yes	Yes
		PCI register	Yes	No
	Beaconing	Yes	Yes	
Diagnostic Data Log	Statistic, troubleshooting and failure analysis data in field can be sent and analyzed	Complete status and flash dump of local and remote HBAs	Yes	No

Feature	Benefit	Sub-feature	Emulex	QLogic
Statistics & Reporting			91%	55%
Adapter Statistics	Comprehensive and useful relay of HBA information and data transmission health	Data transmissions	Yes	Yes
		VPD	Yes	Yes
		Timeout	Yes	No
		Buffer statistics	Yes	No
		PRIs	Yes	No
Transceiver Statistics Display	Display of health and identification of transceiver hardware	XRIs	Yes	No
		Voltage	Yes	Yes
		Temperature	Yes	Yes
Push-Technology Alarm Emails	Alerts designated user of alarm events by e-mail	Serial number	Yes	Yes
Special CNA Diagnostics	Simplify diagnosing problems in FCoE deployments	Displays connection stats for both NIC and FCoE ports	No	Yes
			Yes	No

Feature	Benefit	Sub-feature	Emulex	QLogic
Security			67%	33%
DH-CHAP Link Authentication	Secure data transmission between HBA and configured next-link Fibre Channel switch	Link security from HBA to switch	Yes	No
Remote Host Access Permission	Enables secure management of select remote servers and groups	SSC HBAnyware Security Configuration; whole network configurable from one tool	Yes	No
		Simple password	No	Yes

Feature	Benefit	Sub-feature	Emulex	QLogic
Usability			100%	0%
Form, Function and Configurability	Good data presentation and configurable settings improve productivity and experience of users	Easy manageability; concise data presentation properly grouped in related tabs	Yes	No
		ICONS show current fabric state	Yes	No

Feature	Benefit	Sub-feature	Emulex	QLogic
Application Integration			100%	100%
Common SNIA HBA-API	Specification providing common C programming interface to manage Fibre Channel HBAs		Yes	Yes
			Yes	Yes
SNIA SMI-S	Common management interface for control of heterogeneous SAN devices	Enable access to other SMI-S devices and allow third-party tool to access us	Yes	Yes



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