Emulex® HBAnyware® Software Evaluation

Evaluation report prepared under contract with Emulex Corporation

Introduction

Emulex Corporation commissioned Demartek to evaluate the ease of installation and use of its HBAnyware software, and to compare its ease of installation and use against the equivalent software from QLogic® Corporation. HBAnyware software manages host bus adapters (HBAs) manufactured by Emulex.

This report shows the actual steps taken to install and use the HBAs and the management software associated with those HBAs. Screen shots are included.

Evaluation Summary

Our general findings were that for equivalent functions, Emulex HBAnyware required fewer mouse clicks to accomplish tasks and was easier to use than QLogic SANsurfer® FC HBA Manager. The design of the Emulex software appears to be geared for efficient deployment and use in large environments, more so than the QLogic software. The Emulex software had a more complete set of features, especially for setting detailed control and diagnosis of the HBAs.

In our opinion, the Emulex software was easier to use and its functions seemed to be more intuitive than the QLogic software.

◇◇ *Demartek*

1 – Installation of HBA Drivers and Management Software

Emulex and QLogic have apparently taken two somewhat different philosophies for the installation of HBA drivers and HBA management software. Emulex provides a single package, AutoPilot Installer®, that installs the HBA drivers and the HBA management software, known as HBAnyware. QLogic supplies the HBA drivers separately from their HBA management software, known as SANsurfer FC HBA Manager, and they are installed as two separate procedures.

In the test cases performed in our labs, the installation of the Emulex and QLogic HBA drivers and HBA management software was accomplished in under two minutes and no reboots were required, however the QLogic HBA management software installation required noticeably more interaction with the administrator. In a large environment with many servers and HBAs, administrators may become frustrated at the number of clicks required to install the software with the QLogic approach.

Emulex HBAnyware and QLogic SANsurfer FC HBA Manager can be installed on hosts without HBAs. This allows the management software to be installed before installing HBAs or allows for remote management of the HBAs from a system that will not have HBAs installed in it. In addition, Emulex allows the HBA drivers to also be pre-loaded. The Emulex technique of preloading of the entire HBA software stack allows system images to be taken in preparation for batch deployment to large numbers of servers.

Emulex HBAnyware arrives prepackaged and is transparently deployed with the driver, in the span of a few mouse clicks. In contrast, the installation of QLogic SANsurfer FC HBA Manager required ten steps. This installation process included two separate information and summary screens requiring a "next" click, and other options on separate screens that could have been condensed into fewer screens.

Emulex AutoPilot Installer
Steps: 2

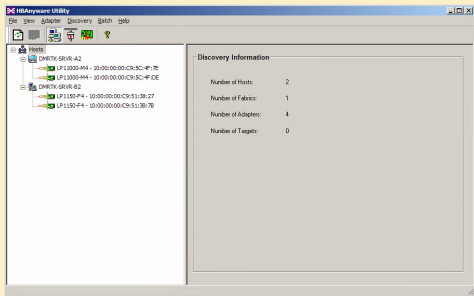**QLogic SANsurfer Pro Installer**
Steps: 10

2 – HBA Management Software Configuration

Discovery of the HBAs and the SAN fabric is another area where Emulex and QLogic differ in basic philosophy. Emulex HBAnyware performs discovery in-band by default and can also perform discovery out-of-band. QLogic SANsurfer FC HBA Manager only performs discovery out-of-band.
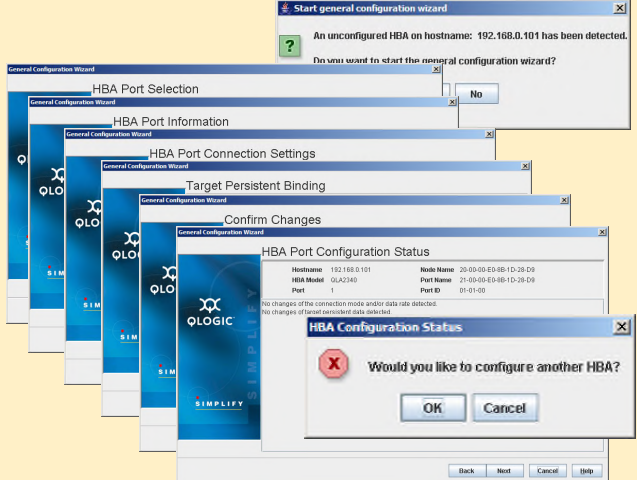
At first initialization, the Emulex HBAnyware software automatically and immediately discovered all the Emulex HBAs in the local server and those visible in the fibre channel SAN from that host, without any manual intervention or mouse clicks. This was a simple, one-step process.

At first initialization, the QLogic SANsurfer FC HBA Manager requests that the user select a host to inquire for HBAs. If the host has QLogic HBAs, a general configuration wizard is started that begins the discovery process for each HBA on the specified host. This is a six-step process for each HBA for each host with HBAs. In an environment with 50 servers and 2 HBAs each, this would have been 600 steps. We felt that this was much more cumbersome and not efficient for large environments. The screen shots below provide a visual comparison of the HBA discovery process.
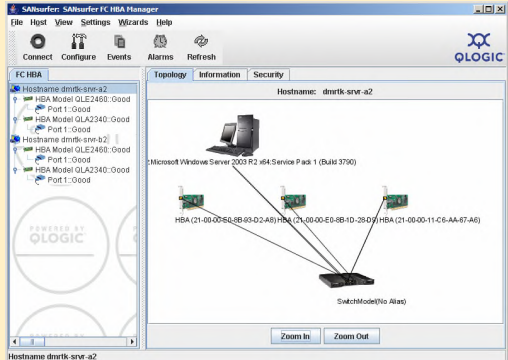
Emulex Initial HBA Discovery

QLogic Initial HBA Discovery

The six-step process above was repeated three times to discover all four HBAs in two servers, leading to the following completed discovery screen.

QLogic provides a sort of topology view in its discovery screen. However, other than the HBAs in the local host, it cannot identify which HBAs are in which host in the topology diagram.

Emulex HBAnyware provides a Host View and a Fabric View, showing all Emulex HBAs visible in the SAN fabric. The Fabric View shows the host name associated with each HBA. A single click can switch between Host View and Fabric View as shown below.
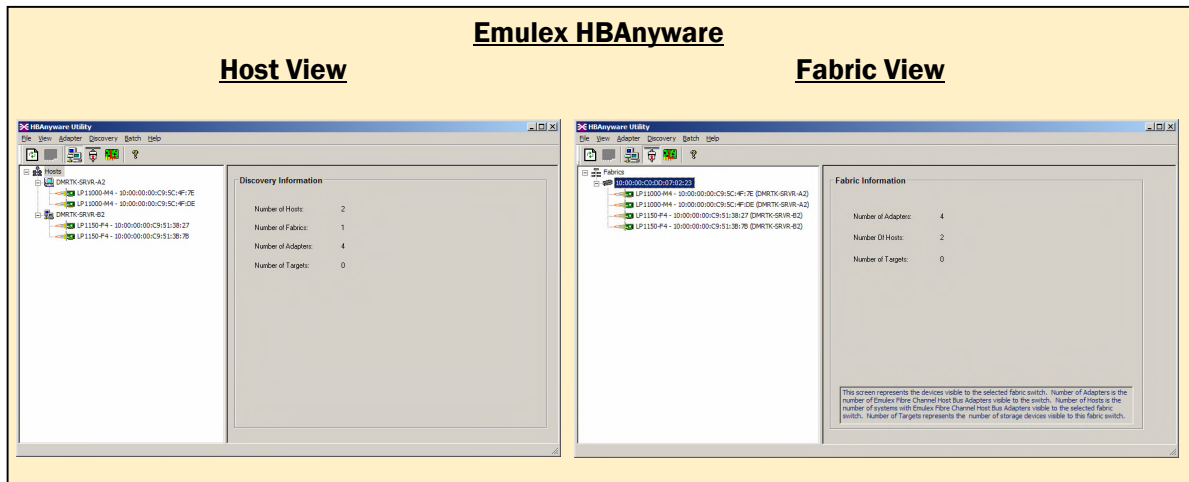
To discover and manage Emulex HBAs from a host that does not have Emulex HBAs installed, the out-of-band discovery option allows a range of IP addresses to be scanned for Emulex HBAs. Once discovered, the results are identical to the initial host view screen shown above.

3 – Typical HBA Management Tasks and Troubleshooting

When clicking on an HBA on the left side of the menu structure, each product shows several tabs with various functions for daily or periodic management of HBA functions and parameters. Each product takes a different approach to many of the day-to-day HBA administrative tasks.


Detail HBA Functions and Parameters
Emulex HBAnyware   **QLogic SANsurfer FC HBA Manager**
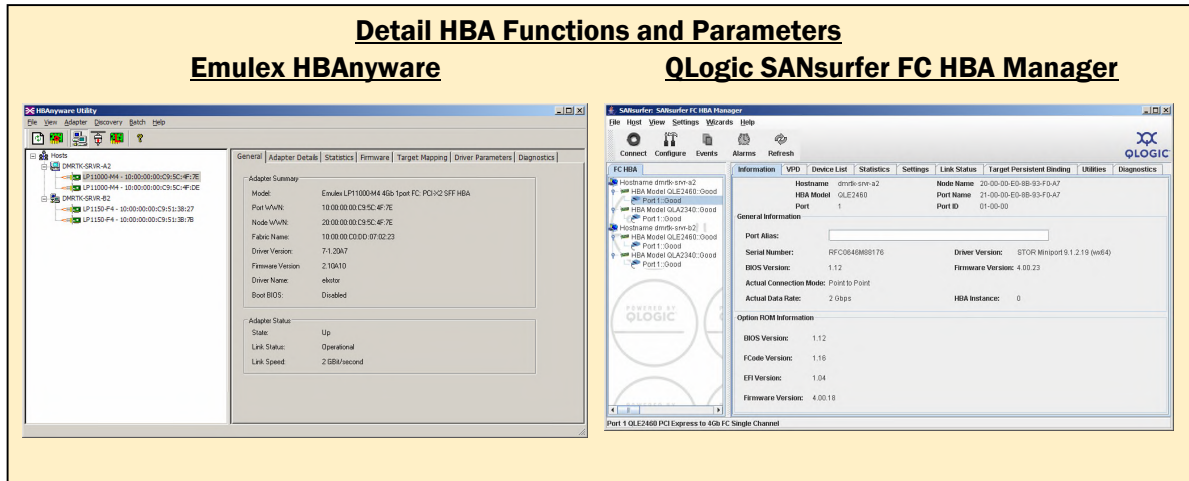
HBAnyware allows firmware updates to occur together for all similar HBA models in any or all hosts. The firmware is selected, and then HBAnyware provides a list of those HBAs anywhere in the visible fabric that can use that firmware. The screenshots below show the start and finish of this process, including an event log. This process can be initiated from the local host or remote hosts.

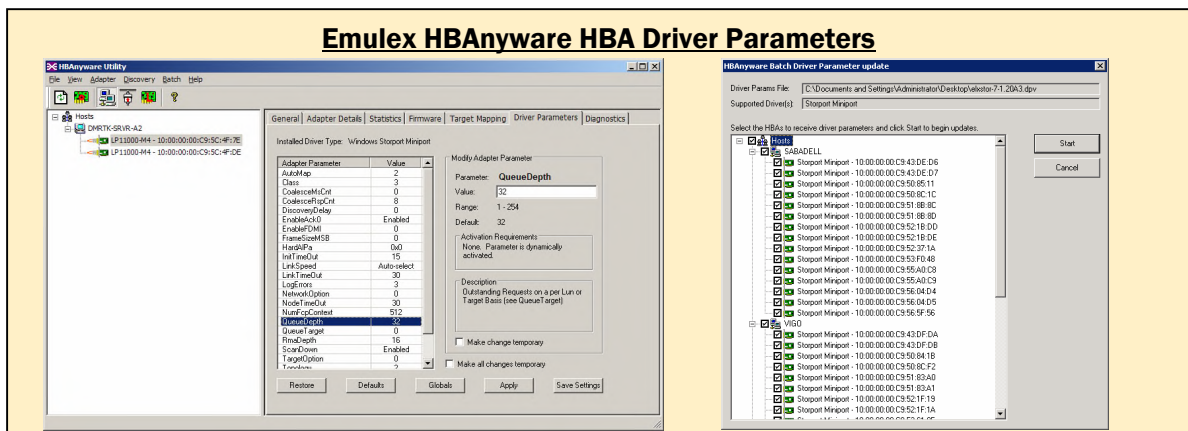**Emulex HBA Firmware Update Process**
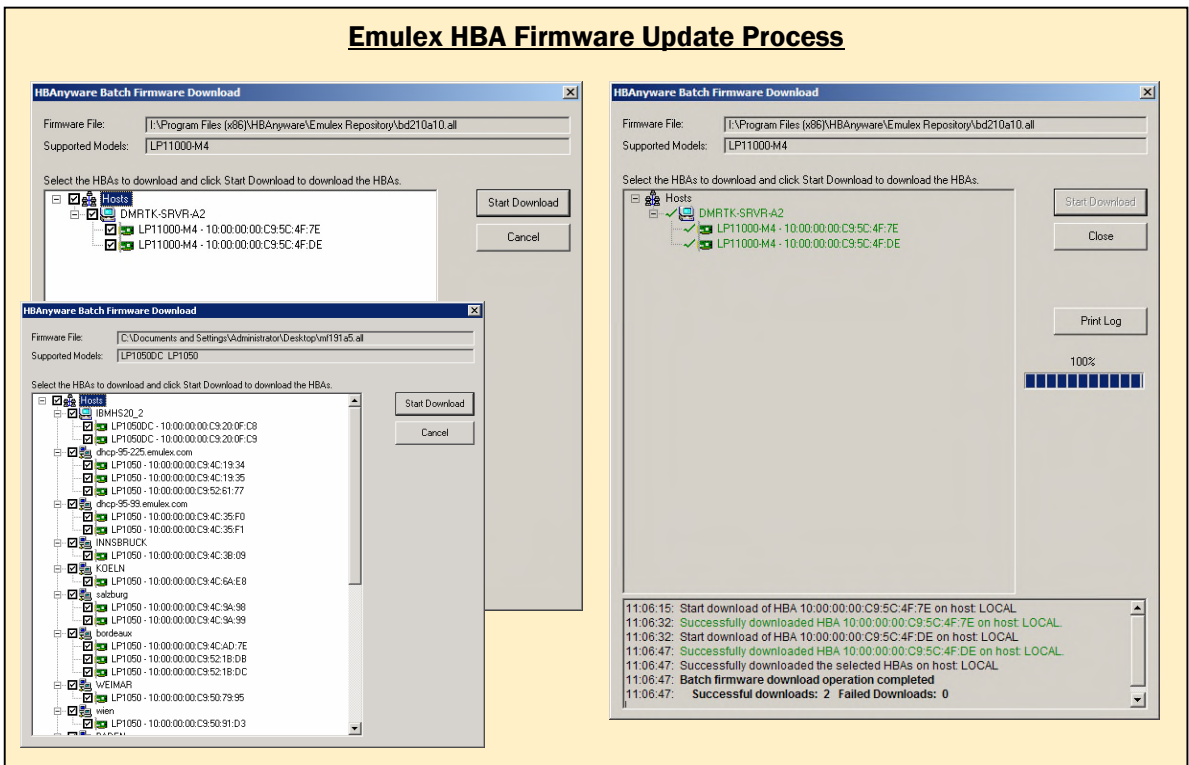
No reboots were required for Emulex HBA firmware updates. We found the event log to be quite useful, and would find it to be very valuable in managing large environments.

Updates to the QLogic HBAs are performed through the utilities tab. If more than one HBA port is selected, Flash BIOS and NVRAM updates can be made to each selected item. BIOS updates require a server reboot. No event log entries were noted when either the BIOS or NVRAM were updated. This process was a bit confusing for the QLogic HBAs, as these features are called different things with different QLogic HBAs, and it was not entirely clear which function updated which HBA features.

QLogic HBA Firmware Update Process
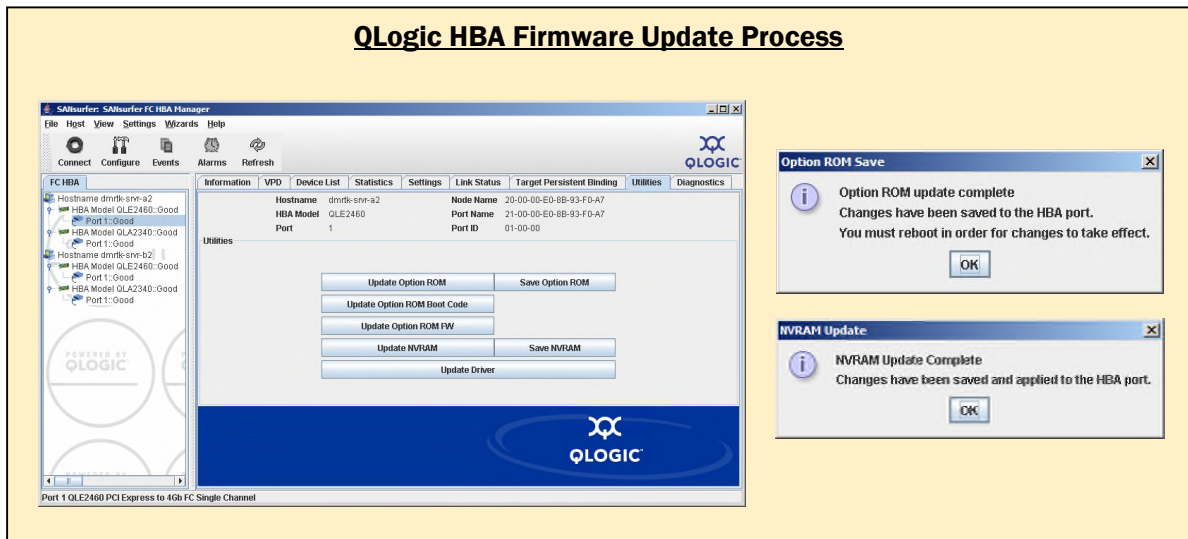
Both products have a "beacon" function. HBAnyware has a "Beacon On" and "Beacon Off" radio button on the diagnostics tab. SANsurfer FC HBA Manager uses the right-click on the HBA port for the beacon function. The beacon function was visible on the diagnostics tab in HBAnyware, but the QLogic software required a Help lookup to find the beacon function.

Emulex HBAnyware HBA Driver Parameters

For many of the advanced functions, HBAnyware has a number of settings that can be changed under the "Driver Parameters" tab including queue depth, coalesce response count, and many others. HBAnyware provides a handy description of the feature and the range of allowable values,

which is a benefit to administrators who might need a reminder for the many parameters that can be adjusted. A screen shot of these parameters can be seen on the lower left side of page 7. In addition to the batch mode firmware updates, Emulex also provides a batch mode distribution of HBA parameter settings by distributing a parameter file for the HBAs to any or all of the servers with those HBAs, which can be seen in the screen shot on the lower right side of page 7. This file remains on the server and in the event of a change of HBA, the parameter settings remain, so that the HBA automatically uses them and the administrator does not have to individually reset the HBA parameter settings. This is especially useful in large environments where the detailed settings need to be consistent across a large number of servers and HBAs.

We did not find any equivalent function to the parameter settings for things such as queue depth in the QLogic product.

Both products provide a diagnostics tab that allows the administrator to diagnose possible problems with the HBAs, but HBAnyware provides more diagnostic functions including a quick test and non-disruptive Power-on Self Test (POST) and logs the various diagnostic tests, which can be seen in the screen shots below. The POST function allows the administrator to quickly test the HBA without rebooting the server. This is critical in large environments where server reboots are not tolerated in certain circumstances. HBAnyware also provides an HBA driver/firmware diagnostic dump feature, not found in the QLogic product. This is an extremely useful capability to expedite root cause analysis by Tech Support.

HBA Diagnostics

Emulex HBAnyware   **QLogic SANsurfer FC HBA Manager**

Summary and Conclusion

Although both Emulex HBAnyware and QLogic SANsurfer FC HBA Manager provide a full set of management functions for their respective HBAs, we found the HBAnyware interface to be easier to use, more intuitive, and required fewer steps to perform some functions. We liked the logging of firmware updates and diagnostic tests, and organizing firmware updates by host. We found toggling between the host and fabric views of HBAnyware very handy when taking a larger look at the SAN fabric.

We found that the Emulex HBAnyware design lends itself to scaling out to large environments well, and that many of the functions were designed with installation and management of large numbers of HBAs in mind, so that some tasks would not have to manually repeated for each HBA. For example, all appropriate HBAs can be selected automatically for a given firmware update.

We have summarized a few of our findings in the table below.

	Emulex HBAnyware	QLogic SANsurfer FC HBA Manager
Combined driver and management software installation	Yes	No
Total number of steps to install	2	10
Total number of steps to discover HBAs	1	6x number of HBAs
In-band discovery	Yes	No
Out-of-band discovery	Yes	Yes
Host view of HBAs	Yes	Yes
Fabric view of HBAs	Yes	No
Firmware update without server reboot	Yes	No, for some functions
Batch mode selection of all HBAs for firmware update	Yes	No
Batch mode selection of all HBAs for driver parameter update	Yes	No
Description and value range of HBA driver parameters	Yes	No
HBA beaconing	Yes	Yes
Online, HBA POST	Yes	No
HBA driver/firmware diagnostic dump	Yes	No

Appendix A – Evaluation Environment

This evaluation was conducted at the Demartek facilities, using two identical servers running Windows 2003 Server R2 Enterprise Edition, each with Intel Pentium D 950 processors (dual-core, 3.4 GHz) and 4 GB RAM. The tests were run with the 64-bit version (x64) of Windows Server on both servers and repeated with the 32-bit version of Windows Server on both servers. There were no differences in the look or feel of the HBA management software between the 64-bit and 32-bit versions of Windows Server. All the screen shots in this report were taken on 64-bit systems.

Four HBAs were provided by Emulex, two LP11000 and two LP1150 HBAs. These HBAs are single-port, 4-gigabit fibre channel using PCI-X slots in the servers. They were connected into an existing fibre channel storage infrastructure at the Demartek facilities. Emulex HBAnyware version 3.0a16 was used for these tests.

The QLogic HBAs included a QLE2460 HBA in each server and a QLA2340 HBA in each server. The QLE2460 HBAs are single-port, 4-gigabit fibre channel using PCI-e slots in the servers. The QLA2340 HBAs are single-port, 2-gigabit fibre channel using PCI-X slots in the servers. QLogic SANsurfer FC HBA Manager version 2.0.30 Build 89 was used for these tests.