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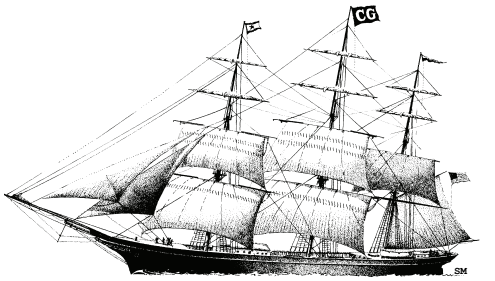

Navigating Information Technology Horizons℠

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Finisar Identifies SAN Problems

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Management Summary

In my college days, I was the proud owner of a 1959 *Triumph* sports car. The heater did not work very well, the roof leaked when it rained, the engine leaked oil all of time, and it steered like a truck; but I loved that car. It was a simple car with four cylinders, a four speed manual transmission, and a manual choke to get the car started on cold winter days. It did not have power steering, or power brakes. It was a simple car and it was simple to fix.

Now I drive a turbo-charged car that has "power everything" – windows, steering, brakes, sunroof, side mirrors, heating, and air conditioning controls. There are no dials in the car just a few buttons. There are no oil pressure gauges, just idiot lights. It is a complicated car and now I can't fix anything when it breaks. After driving this new car for three months, the engine decided to die when cruising on a major Boston highway. I was in the middle lane with no power steering, no power brakes, and a really bad feeling about my luck that day. I wrestled the car to the side of road. After 15 minutes, the car started up again as if nothing had gone wrong. I brought it to the car dealer to determine the cause of this dangerous behavior. They returned the car telling me that they could not find anything wrong. The car worked fine for about three months, then decided to shut down again when I was, again, in the middle lane on a major highway. Again, the car dealer told me they could not find anything wrong. The third time the car decided to shut down on its own, I was short on patience. I told the car dealer to keep the car (and the car payments) until they could figure out the cause of this intermittent problem. The service manager drove the car for several days and he had the pleasure of having the car shut down on him. However, he had installed a monitor under the hood that collected all sorts of computer codes. We now had a reason why the car periodically decided to stop running. The fuel ignition card was, in non-technical terms, "flaky". It took many months and several tense moments to diagnose the problem.

Storage is a lot like cars. Years ago, connections were simple. Storage was directly connected to servers through SCSI or bus and tag cables. Intermittent problems accessing storage were caused, many times, by an improperly seated cable or a bent pin. Resolving connection problems were simple. Unfortunately, today, storage is connected to many different servers, running different operating systems, with different failover software communicating with different applications. Connections are routed through one or more switches. Now, when Microsoft Exchange has an intermittent problem that only occurs once every few days, resolving the problem can be difficult, if not impossible.

Where do you start? Diagnosing today's infrastructure problems are like diagnosing modern car problems - without sophisticated tools, your chances of resolving these types of problems is not very good at all. **Finisar has developed sophisticated tools used by many hardware vendors to diagnose problems during product development. These same tools are now available to enterprise customers to diagnose and prevent complex problems within storage area networks (SANs).**

IN THIS ISSUE

About Finisar

Finisar may not be a household name, but they have been incorporated since 1999 and have been in business since the late 1980's. For many years, they have produced optical modules and components that have been used by networking vendors. They have also developed several tools to aid designers and engineers to design, test, and verify hardware equipment. Some of the tools generate network traffic or inject errors into network streams to allow engineers to test error recovery code. The *Xgig Analyzer* captures information about high-speed traffic over gigabit Ethernet, Fibre Channel, and SAS/SATA links. Xgig Analyzer is used by most of the storage, switch, and HBA vendors in their labs today. Finisar has taken their knowledge and experience of SANs and developed products targeted for enterprises that have the responsibility for managing and maintaining SANs. This family of products is called *NetWisdom*.

Gathering the Information

When the Microsoft Exchange system experiences performance problems, the first question is – where is the problem? Is it in the host bus adapter, the operating system, SAN switch, the storage device or the application? In complex SANs, determining where the problem resides requires detailed information about the operations of physical infrastructure.

Finisar uses a *Traffic Analysis Point (TAP)* that is installed on a link. The TAP is a non-powered device. It requires no electricity and has no moving parts. Once installed, TAPs provide non-disruptive, secure access to data flowing over the links. Data is never modified; it is only accessed at each TAP. The TAPs are connected to the *NetWisdom ProbeFCX*; each NetWisdom Probe FCX can monitor up to eight links in a dedicated mode or can sample the traffic on different links in a rotating mode. Many metrics are collected. Some of the metrics collected include:

- SCSI operation errors
- Link errors
- Device faults
- Number of active and pending SCSI exchanges to a port
- Elapsed time from SCSI read to first data
- Elapsed time for each complete read or write operation

Each second, these metrics are reported to the *NetWisdom Portal* software that is connected to the NetWisdom ProbeFCX by an Ethernet connection.

Reporting on the Information

Gathering information is the first step, but displaying the information in an easy to use format is important for fast problem resolution. The NetWisdom Portal software resides on a *Windows* platform. It collects the information from the ProbeFCX every second and creates summary metrics once a minute. Events that violate pre-defined thresholds can generate email alerts or SNMP traps.

NetWisdom Views software provides numerous graphs and reports that can identify the source of the problem. Historical information can be retained and reports can be generated that compare, say, this month's data to last month's data allowing SAN managers to identify trends and areas of congestion that can be resolved before the problem becomes critical.

The *NetWisdom Dashboard* is a graphical real-time display that quickly allows SAN and network administrators to view the health of their environment by viewing the status, performance, and alerts for the various components in the SAN.

These components comprise the *Finisar NetWisdom Enterprise Suite* of products.

Need Even More Help?

Enterprise with very large complex SANs and very difficult problems to solve can get even more help from Finisar. The *Finisar NetWisdom Enterprise Expert* suite adds the Xgig protocol analyzer to the SAN. The Xgig protocol analyzer can record very detailed information about the packets on the network. The information from these traces and the data collected by the ProbeFCX can be forwarded to the SAN vendor for problem resolution.

NetWisdom Express

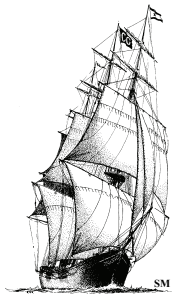
Enterprises that want to monitor the health of their SAN and have alerts generated when thresholds are exceeded have an entry-level option. This option, called *NetWisdom Express*, does not require TAPs. ProbeV software retrieves SNMP data from switches and uses NetWisdom software to display the general health of the SAN.

Conclusion

SANs are like modern cars. When they run well, everything is perfect. But when they don't run well, things can be very difficult to diagnosis. SAN problems, like my car problems, can drag on for months. Patience can be very limited for administrators, managers and people trying to access their applications.

Do you need NetWisdom? You don't, if your SAN continues to run well without any problems. However, if you are like many enterprises, you probably experience intermittent or persistent problems that degrade performance and impact reliability. NetWisdom can resolve problems quickly when they occur. NetWisdom also continually monitors the traffic across the SANs, allowing SAN managers to detect trends that may affect performance in the future, taking steps to prevent future problems.

If your enterprise has large, complex SANs, then evaluate NetWisdom. Plan ahead. The next time you add more links to your SAN, consider adding TAPs to those links before you put them into production. Then, when problems occur, NetWisdom can make problem resolution easy.



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- ***The Clipper Group can be reached at 781-235-0085 and found on the web at www.clipper.com.***

About the Author

Dianne McAdam **is Director of Enterprise Information Assurance for the Clipper Group**. She brings over three decades of experience as a data center director, educator, technical programmer, systems engineer, and manager for industry-leading vendors. Dianne has held the position of senior analyst at Data Mobility Group and at Illuminata. Before that, she was a technical presentation specialist at EMC's Executive Briefing Center. At Hitachi Data Systems, she served as performance and capacity planning systems engineer and as a systems engineering manager. She also worked at StorageTek as a virtual tape and disk specialist; at Sun Microsystems, as an enterprise storage specialist; and at several large corporations as technical services directors. Dianne earned a Bachelor's and Master's degree in mathematics from Hofstra University in New York.

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