

## **THE APOSTLE OF CONNECTIVITY**

Back in 1995, the computer industry was engaged in a last-man-standing shootout over which interconnect standard would replace slow and creaking old SCSI (“skuzzy”, in computer lingo) for hooking up PC and Unix computers to peripherals. A cauldron of alphabet soup was boiling over among engineering standards groups: FIDI, HIPPI, DQC, HPM, SSA, FCEL, LLD, ATM, SCON, etc.

At stake was the \$25 billion market for external PC/Unix computer storage, which is growing faster than computer sales. Half of that market is divided up in roughly \$2 billion chunks by a half dozen companies: IBM, EMC, Hewlett-Packard, Compaq, Storage Technology, and Sun Microsystems.

IBM took an early lead in the connectivity shootout with the launch of SSA, for Serial Storage Architecture. IBM tried to persuade other companies to join in making SSA the industry standard, but in vain. Anything Blue was bad, in the view of the rest of the industry. Instead, the others, led by Hewlett-Packard, formed a consortium to promote Fibre Channel as the connectivity standard. And Adaptec, the world leader in manufacturing SCSI boards, no company to be left holding a leaky \$500 million bag, quickly developed UltraSCSI to present a moving target to all those trying to shoot SCSI down.

IBM quickly converted its \$2 billion share of the market for external storage to SSA, and began to make inroads on Hewlett-Packard, Sun, and EMC. But, despite IBM’s fast start, by late 1997 it looked like Fibre Channel was going to win in the long run, and become the market leader. EDS led a parade of users in adopting Fibre Channel as the network architecture for all of its managed installations, and required all vendors, even SSA-pioneer IBM, to make available a native Fibre Channel interface. H-P announced that its newest powerhouse, the 9000 V-series high-end server, would be available only with Fibre Channel.

But the real world is never as clean and simple as many technologists wish it were. Few large computer users are willing to throw out proven standards and well-running machines in favor of SSA, Fibre Channel, or any other single solution. By mid 1998 H-P announced that the 9000 V-series would be available with UltraSCSI as well as Fibre Channel.

### **ENTER VICOM SYSTEMS**

While the connectivity shootout was raging in 1995, Samuel Tam, a veteran computer engineer whose company, Vicom Systems, made high-end graphic imaging computers, thought he had a better idea. Instead of trying to promote a single interface, he thought, why not develop a combination router and switch which would interface any PC or Unix

server or workstation with any storage device? In his view, any CPU or peripheral should be able to connect to any storage device, and new and old equipment – servers or storage devices—should be able to plug and run together.

The best way to accomplish that connectivity ideal, Sam reasoned, was to use SCSI as the standard interface, because of the preponderance of devices using it, and to make SCSI compatible with SSA and Fibre Channel, while, at the same time, eliminating the slow speed, distance restriction, device limits, and bus arbitration problems inherent in SCSI.

By the end of 1996 Vicom had its solution running. Sam called it SLIC, an acronym for Serial Loop Interface Controller. Vicom's first customer for SLIC was IBM. Despite its mighty marketing muscle, IBM found that many of its Unix and PC customers with huge external storage facilities, such as Blue Cross/Blue Shield and Hoffmann-LaRoche, although they liked the performance of the new SSA drives, wanted to run their old SCSI drives on the same network, and to use their legacy SCSI servers with the new SSA drives.

SLIC made that possible, and IBM began marketing Vicom's SLIC under its own label. Now Fibre Channel vendors are finding the same customer resistance to scrapping legacy equipment that IBM had found, and are asking Vicom to hurry up with its development of the version of SLIC compatible with native Fibre Channel. Vicom says that the native Fibre Channel version will be out before the end of 1998.

“SCSI is not going to go away,” Sam says. “Nor will SSA go away as the Fibre Channel advocates hope. And Fibre Channel is here to stay, too. You also can bet that in the new millennium a new connectivity technology will be developed better than Fibre Channel or SSA. When it shows up, we will be here to make it work with SCSI, SSA, and Fibre Channel.”

“The point is, none of the connectivity standards have to go away,” Sam says. “Each of them have advantages, and each of them come with some undesirable characteristics, besides incompatibility. With SLIC Net, customers of any vendor can have their cake and eat it, too. SLIC Net will run as fast as Fibre Channel in most installations. It has the network reliability of SSA, and the connectivity of SCSI. But it is less expensive and more reliable than Fibre Channel, and has none of the old SCSI bottlenecks.”

Once he started down this path to connectivity, Sam saw a wide vista of new opportunities to facilitate and manage connectivity, particularly for storage systems. By adding functions to the SLIC Net routers, Vicom Systems offloads some of the storage management and administrative tasks from the host Unix/PC platforms, and provides RAID Level 1 capability. Vicom's storage manager helps servers share disk storage space by allocating space to each server on the network, and re-allocates the space as one server uses more storage than another.

“Standardized benchmarking has a role,” says Sam “But what the customer really wants to compare is SLIC Net vs SCSI or vs SSA or vs Fibre Channel or vs whatever running

against each other on his storage devices with his servers in his shop. We give them that opportunity.”