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Startup takes parallel approach to access network bottlenecks

CommunicationsWeek International , March 1, 1999 by Phil Jones

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Traffic congestion problems between the IP backbone and local networks could be solved with the aid of supercomputer technology

As switch makers struggle to build Internet Protocol routers able to keep pace with the bandwidth promised by modem wave division multiplexing, one U.S. startup claims to have solved the problem with technology normally used to simulate nuclear explosions.

Star Bridge Systems Inc. (SBS), of Salt Lake city. Utah, believes it has developed a way to deal with the performance bottleneck that sits between today's ultra high-capacity backbone networks and the local access environment.

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Using conventional processing technology, IP switches and routers struggle to find enough power to deal with signals that arrive at the speed of light and then send them on their way to the correct destinations before the next bulk delivery comes pouring off the backbone. SBS claims it has the answer-replace conventional IP switches and routers with a supercomputer.

SBS last month unveiled its technology, HAL-4rWI, and immediately ruffled the feathers of the supercomputer world by claiming that its massively parallel machine is about 10 times faster than Blue Pacific, IBM's \$94-million behemoth that is used to simulate the detonation of atomic bombs, and which is probably the world's most powerful computer.

However, Kent Gilson, SBS's chief technology officer, believes his company's product, 15 years in development, may have an even bigger impact later this year, as it is used to develop a new class of platform for processing multimedia transmissions and other classes of high-bandwidth communications services.

He said development platforms have gone to 50:50 joint-venture companies set up by SBS and two small application developers: Such development licenses start at \$2 million, said SBS. One of these ventures, Viva Telesystems Inc., is using HAL to build an off-premises switch to deliver multimedia services to multiple dwelling units, such as apartment buildings.

High speeds

In tests so far, said Gilson, SBS's technology has been able to drive a single external I/O interface at 20 gigabits per second with internal transport speeds approaching 2 terabits per second-significantly faster than today's fastest commercially available routers, the Gigabit range from Cisco Systems Inc., which have an I/O ceiling of 2.5 Gbps, and internal transport speeds measured in hundreds of gigabits per second.

HAL computers can do this, Gilson claims, because their massively parallel configurations of Field Programmable Gate Arrays-a kind of dynamically reprogrammable computer chip-are ideal for executing the intense levels of scalar processing needed to produce the very low latency and very high bandwidth performance needed by modern IP switches. The combination of parallelism with FPGAs is SBS's big innovation.

"We're talking of latency measured in nanoseconds, rather than in the hundreds of

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microsecond common today," claimed Gilson.

Traffic processing

Also, the reconfigurable HAL machine can be used as a general-purpose computer, as well as a data switch, allowing it to simultaneously perform operations on the traffic it is switching, such as firewall security or encryption.

So far response to SBS claims has ranged from polite skepticism to outright scorn. Barry Flanigan, a principal consultant with Ovum Ltd., of London, said there is certainly a need for the high-capacity switches SBS claims to offer, but doubted whether the company has the market credibility to win the support from major manufacturers and carriers. "SBS's demonstration is certainly impressive and is along the lines of what the industry is looking to develop," he said. "However, the key thing to remember is, this was a demonstration. How easy will it be to scale this up to a commercially available, robust, reliable solution that carriers will go for?"

Others, including IBM, are also concerned that SBS's performance claims for HAL may not be all they appear to be. "Anyone can do that [build a parallel computer from FPGAs]," said Tony Befi, IBM vice president of server technology in Austin, Texas. "But can they make it scale?" he asked.

Establishing market credibility, both for its technology and for itself, could yet prove to be SBS's biggest challenge. company president, Alfred DiMora, is better known as the founder of U.S. luxury car maker Clenet, while Larry Wilcox, founder of SBS development partner Media corps, is most famous as

a star of the 1980s U.S. TV series chips.

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