

## Canadian startups offer complementary technologies for data storage and transport

### NETWORKS

By ROBERT PEASE

New optical technologies and applications are springing up all over North America-particularly in telecommunications hotbed states like California, Texas, North Carolina, and most recently, Massachusetts. But in seeking out hot startups with innovative new concepts in fiber-optic communications, U.S. fiber enthusiasts cannot afford to ignore their neighbors to the north.

Canadian startups are popping up in provinces east to west with some novel ideas-not to mention some unique names. Two such entrants into the competitive arena are BigBangwidth and Yotta Yotta, both headquartered in Edmonton, Alberta. These two newcomers, bursting on the scene last year, garnered first-round financing from the same investor. TechnoCap Inc., a Montreal-based private venture company has invested some \$70 million in more than 20 technology companies, including optical offerings like Hyperchip, a pet abit router manufacturer that recently won an "Investor's Choice" award and was one of five finalists for the Massachusetts Institute of Technology's Disruptive Technology Award.

#### **Innovative technologies**

BigBangwidth is an emerging player in the nano-machining of all-optical grids for fiber-optic networks, including dark fiber. Using nano-electrical mechanical systems technology, the company develops products intended to eliminate network bottlenecks and generate increased bandwidth capacity.

"We're providing a dramatically new all-optical connection technology," says Brian Moore, president and chief technology officer for BigBangwidth. "Our product uses a patented optical chip with a thin layer of administrative software to connect, manage, and provision dark fiber in wide-area, metropolitan-area, storage-area, and enterprise networks."

BigBangwidth's optical chip is based on massively parallel, fully redundant optical cores that are embedded in single crystal silicon. These optical cores,

which include a highly reflective, actuator-controlled surface, redirect light waves in two dimensions, says Moore.

Meanwhile, Yotta Yotta proclaims itself to be the first and only "yottabyte (a trillion terabytes of data) net storage company." The company is building products to converge voice, data, and storage traffic on a single, high-bandwidth, fiber-optic infrastructure.

"The last decade has witnessed explosive growth in the creation of fiber-optic networks and the technologies and standards to allow greater data throughput across the network," says Stuart Lisk, group manager of product management and marketing at Yotta Yotta. "As these technologies have matured, network bandwidth has increased while prices have fallen. This powerful combination of increased speed and lower cost has 'incented' users to move data and applications to the network."

Yotta Yotta's solution to this phenomenon is to converge the traffic by providing a protocol-agnostic network-storage environment. The solution encompasses traditional network protocols, such as Internet protocol (IP), SCSI, Fibre Channel, and Gigabit Ethernet, as well as providing support for evolving standards and additional new protocols.

The technology uses intelligent input/ output, fully hot-swappable blades with auto-discovery that can tolerate failure in any part of the network without losing data. Through a seamless uplink to a DWDM platform, customers can network multiple array clusters of data. An intelligent caching technology solves the critical issue of cache coherency across geographically disparate storage infrastructures.

"This functionality ensures that multiple copies of data remain online and synchronized across the network," says Lisk. "Customers gain the ability to store remote copies of data and provide a true disaster recover system without compromising system downtime."

Increases in network bandwidth coupled with decreased costs have created an ideal environment for a geographically distributed networked storage, Lisk believes. "Enterprises find themselves at a unique juncture where the intelligent integration of storage into the optical-network core promises revolutionary benefits to users and powerful new business opportunities," he says.

### **Combining talents**

BigBangwidth and Yotta Yotta find themselves in the position of offering complementary technologies to optical customers. Although no agreements or partnerships currently exist, both companies say their products could go hand-in-hand to provide solutions where bandwidth capacity and network storage are critical issues to any business.

For example, if a customer's storage devices are being hosted offsite, the

requirement is for large bandwidth capacity to transfer information from the office to the storage site and back. The information would not be transferred directly via the Internet, but rather along fiber-optic cables that potentially pass through a crossconnect, switch, or router.

"Companies with data centers, or call centers, often need to back up and synchronize databases on a daily basis," says BigBangwidth's Moore.

"Information on these databases can be stored using Yotta Yotta's products, and companies can transfer these large amounts of data quickly through a fiber cable using our bandwidth grid capabilities. Transferring information directly via dark fiber and the grid will allow companies to avoid using third-party lines and eliminate issues such as converting packets and latency that are common with traditional transfer methods."

Yotta Yotta's Lisk agrees that companies like BigBangwidth are creating tools to rapidly connect, manage, and provision dark fiber across networks. These tools, he says, eliminate performance and connectivity bottlenecks and make it more cost-effective for companies to implement networked storage infrastructure.

"By easing economic barriers and time-to-market for new services, the full power of networked storage through the optical network can be exploited, delivering orders of magnitude improvements in performance, cost, and scalability," says Lisk.

Indeed, the combination of a networked storage solution within an all-optical network introduces new levels of network performance. These two Canadian startups are wading into uncharted waters in pursuit of unique opportunities for converging the latest in data storage technologies with today's cutting-edge optical transport capability.

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