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Next-Gen Storage

Enterprise Storage/Networking Weekly

- Traditional Versus Next-Gen Storage Workloads--Interview With Scott Genereux, Exec. Vice President Of Worldwide Sales At DataDirect Networks--
  In this note we highlight our updated thoughts on what could be increasing bifurcation in the enterprise storage market involving traditional enterprise workloads and those environments requiring highly scalable next-generation storage systems. We believe it is becoming increasingly apparent that there is a evolving storage market around new classes of workloads--driven by Web 2.0, digital video surveillance, video production/delivery (e.g. VoD), etc. With this in mind, we also thought it would be interesting to highlight a recent interview with Scott Genereux, EVP of Worldwide Sales at DataDirect Networks--a relatively unknown, but established ($100+MM in annualized revenue and profitable) player in this next-gen storage market. This was the first public interview Mr. Genereux has done since leaving Hitachi Data Systems in February 2008.

Enterprise Hardware

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Please see page 33 for rating definitions, import ant disclosures and required analyst certifications.

Enterprise Storage: Bifurcating Storage Market; Interview with Scott Genereux, SVP of DataDirect Networks Worldwide Sales, IT Spending Thoughts, & More

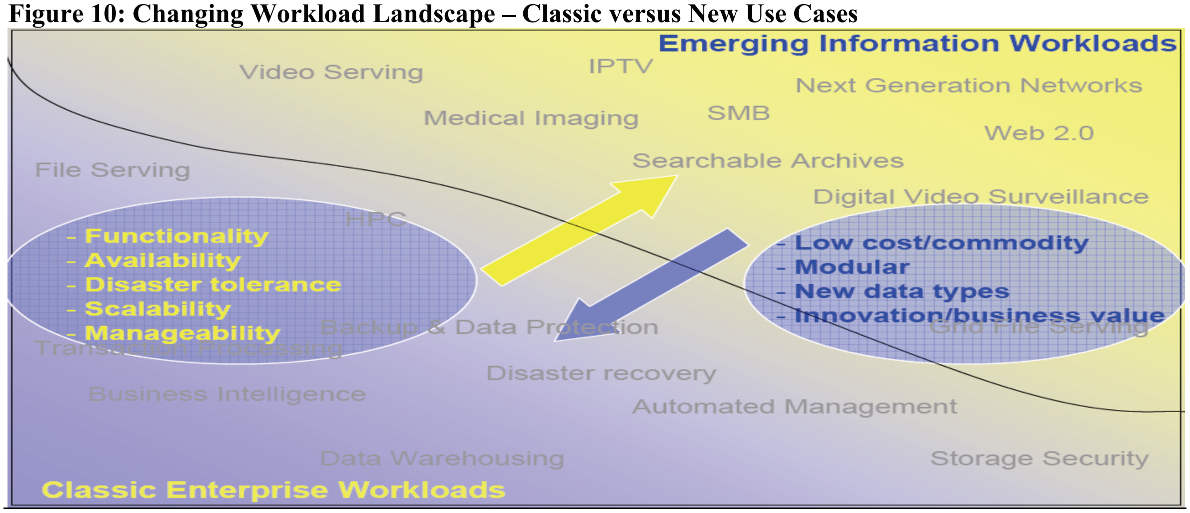
Next-Gen. Storage Market Continues to Evolve – DataDirect Networks a Strong Emerging Competitor; Interview with Scott Generuex, Executive VP of Worldwide Sales.

We continue to receive ongoing validation in our thesis that the storage market is seeing a bifurcation between two distinct market segments:

(1) **Traditional Enterprise Environments** – We consider traditional enterprise environments to have been typically addressed by what could become characterized as legacy monolithic and modular dual-controller architected solutions (e.g. EMC's Symmetrix, Hitachi's USP-V, NetApp's FAS-series solutions, IBM DS8000, etc.). The requirements have primarily been driven by database applications, transactional processing, data warehousing, Exchange file serving, SQL Server, and other traditional enterprise-class applications. These environments range from the highest end architectures requiring the utmost degree of resiliency to environments utilizing less resilient modular (dual-controller) based storage systems. More importantly, we believe this class of storage has typically been satisfied with systems performing well in typical sequential read/write performance patterns, but often see performance degradation as system loads increase under atypical performance workloads.

(2) **Next-Generation Storage Environments** – The next-generation storage market is quickly evolving across many different industries. From the growth in Video-on-Demand (VoD), HDTV, and digital video surveillance, to the explosion of content across the Web 2.0 market and large content files such as medical images, this market looks to be evolving into a burgeoning storage growth opportunity. We believe there have been many recent announcements/events validating the notion that this market is in fact a fundamentally different market than the traditional enterprise market – often driven by dramatically different performance requirements. This has vendors focusing on the development of highly scalable systems (often times implementing a form of clustering or highly scalable next-generation operating systems, as well as the adoption of new next-generation interface technologies such as InfiniBand). Some of the more notable developments supporting the fact that this market is evolving include: (1) IBM acquiring XIV, (2) EMC's plans on soon announcing its Maui clustered NAS solution focused on these markets, (3) Rapid growth in emerging players such as 3Par, DataDirect Networks (highlighted below), and others, and (4) NetApp's focus on providing an integrated next-generating Data ONTAOP operating system (Data ONTAP 8) that supports clustered NAS (Global Namespace). We believe Figure 10 below, from a presentation on IBM's recent XIV acquisition, provides a good high level summary of the changing dynamics, or rather bifurcation, we are seeing take shape within the storage market.

Figure 10: Changing Workload Landscape – Classic versus New Use Cases



Source: IBM

Interview with Scott Genereux, Senior VP, Worldwide Sales at DataDirect Networks

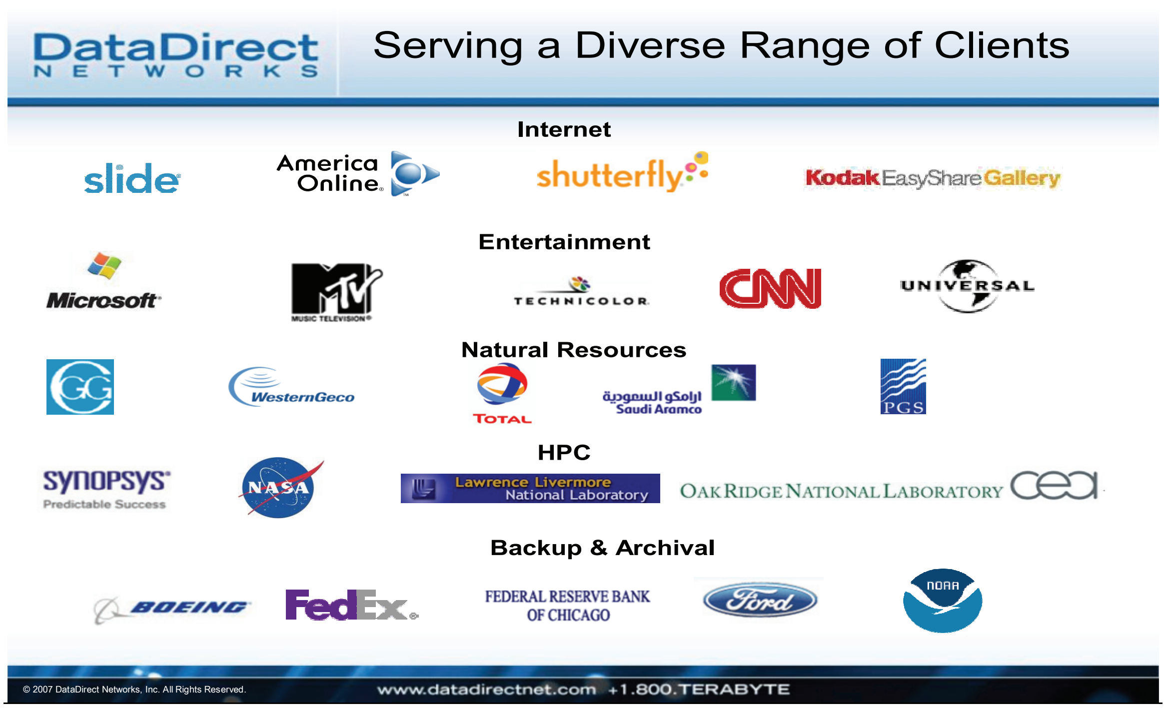
With the abovementioned thoughts in mind, we thought it would be helpful to highlight a recent interview we had with Scott Genereux, Senior Vice President of Worldwide Sales for DataDirect Networks, an emerging player in the next-generation storage array market. As a way of background, Mr. Genereux very recently (February 2008) joined DataDirect after spending 18 years at Hitachi Data Systems where he most recently served as HDS' Executive Vice President, Worldwide Sales, Marketing and Support. Our interview with Mr. Genereux was his first public interview since joining DataDirect, a company that has thus far kept a fairly low profile in the overall storage market. Our key takeaways from our conversation with Mr. Genereux include:

- **DataDirect Networks Quick Description** – Founded in 1988 and headquartered in Chatsworth, CA, DataDirect Networks focus on providing high-end storage solutions specifically for large capacity and high-bandwidth applications (i.e. non-traditional enterprise applications). The company's products had initially focused on High-Performance Computing environments, in which it established a footprint in more than 40 of the world's top-100 supercomputing environments (many of which utilize InfiniBand interfaces in high-end clustered configurations). The company's S2A Storage Systems currently focus on the following verticals:
    - **Media & Entertainment** – According to our conversation, this market is likely the largest vertical for DataDirect, encompassing applications such as Video-on-Demand (e.g. TimeWarner Cable), animation rendering, Gaming (digital content distribution; e.g. Microsoft Xbox Live), and audio applications. <u>We believe this is a market where DataDirect has faced Isilon in competitive engagements (e.g. ComCast has historically been a large Isilon customer for VOD).</u> DataDirect has <u>more than 400 broadcast and post production customers</u>.
    - **Internet Media –** This segment includes digital image storage/archival (e.g. Kodak EasyShare Gallery, Shutterfly, etc.), as well as applications for on-line video streaming, and web-based e-mail. <u>We believe Isilon is a key competitor in this segment as well, possibly being displaced by DataDirect within Kodak.</u>
    - **Oil & Gas –** This includes applications such as model rendering, high-end simulations, and seismic processing.
    - **Engineering** – CAD applications, Aero, Automotive, and Semiconductor engineering.
    - **Government-** The company highlights applications such as Geospatial imaging and digital surveillance.
    - **Life Sciences** – Drug discovery, mass spectrometer, and proteomic applications.
    - **Deep Archival** – This is not a specific vertical, but a market in which DataDirect believe it is differentiated with its ability to spin-down drives (specific drives or all at once; versus some others in the market only able to spin down/up all drives at once), as well as provided integrated Virtual Tape Library (VTL) and data de-duplication functionality in a single solution (note: we have not seen DataDirect in competitive environments against Data Domain).

  From a competitive landscape, we believe DataDirect does face competition from the likes of EMC, Hitachi, NetApp, Isilon, and others, but really appears to be focused on next-generation high-performance applications with a surging amount of next-generation digital content. Our conversations suggest that the company could look to build-out its product portfolio and possibly move down market over time.

- **Financial Thought –** While DataDirect is not providing specific details on its financials, in early January the company did report that its revenue now exceeded $100 million annualized. The company has also been operating at profitability. The company has more than 150 petabytes of capacity installed worldwide (though we would note that some deals could be as large as 5PB to up as much as 10PB or more). The company also has <u>reseller arrangements with IBM and Dell in HPC environments, as well as partnerships with SeaChange (post production), Raytheon, Sony, and Cray.</u> IBM is the most notable partner, a relationship DataDirect could be expanding going forward. The company currently has approximately 200 employees, of which approximately 35-40 are quota carrying sales persons. Mr. Genereux noted that he is very focused on expanding the company's current sales organization, though partnerships remain an important focus. He believes the channel will be an important piece of DataDirect's long-term go-to-market strategy. As a reference, Figure 11 provides a truncated summary of some of DataDirect's current customers across key verticals.

Figure 11: DataDirect Networks – Customer Summary



Source: DataDirect Networks

- **Next-Generation Storage Architecture –** DataDirect currently offers two storage configurations – (1) S2A 9900 – flagship high-end system scalable to up to 1,200 drives for a total of 1.2PB of capacity in an 84U rack (2-bay) configuration under only two performance controllers ("couplets"), and (2) S2A 9550 – lower-end system scalable up to 960 drives for 960TB of total capacity. The company uses high-capacity 1TB drives. The company's systems, like many of the emerging companies in the storage market, utilize a proprietary operating system – the DirectOS Virtualization Layer. However, the company does not currently offer thin-provisioning capabilities. One of the most impressive characteristics of the company's S2A 9900 system is its support for very dense 60 drives per 4U disk array enclosure (DAE), which compares to traditional modular arrays supporting only 14-16 drives per DAE. Mr. Genereux highlighted this drive density characteristic by comparing its system relative to NetApp's FAS6000, EMC's high-end CLARiiON CX3-80, and Isilon's systems (details shown below). As we can see, the company's density, as measured by TB/square-feet, is nearly 2x better than Isilon's IQ systems.

Systems Comparison	NetApp FAS6000	EMC CX3-80	Isilon IQ Systems	DataDirect S2A 9900
Capacity	1,172TB	480TB	1,152TB	1,200TB
Footprint	42.9 sq-ft	16 sq-ft	30.64 sq-ft	16.33 sq-ft
Density	**27.4 TB/sq-ft**	**30 TB/sq-ft**	**37.6 TB/sq-ft**	**73.5 TB/sq-ft**

Source: Company data

In addition to capacity density, Mr. Genereux provided an interesting summary of the performance characteristics of the company's systems, which do utilize InfiniBand interface technology and specialized FPGAs with proprietary firmware. The company's systems enable 6GB/s of both read and write throughout (consistently upon scaling the system), which compares to 100 MB/s read and 50 MB/s write performance in Isilon's IQ-series systems. The company also has a maximum internal bandwidth of 24GB/s, which compares to only 1GB/s at Isilon. Isilon systems also offer scalability via the clustering of up to 94 nodes, which we have heard to present issues with regard to performance scalability and operating system upgrades. This compares to DataDirect's systems only employing two clustered controllers.

- **Our Conclusion** – With our initial thoughts on the growth opportunities in the emerging next-generation class of storage environments in mind, we thought we would highlight DataDirect as one of the lesser known, but quite interesting, stories to monitor in this market. We believe investors should watch DataDirect as a company seemingly well positioned for the proliferation of next-generation storage requirements with a surprisingly long operating history, revenue exceeding $100 million and, most notably, profitability. Our conversations with DataDirect's Scott Genereux provided an interesting run down of what should be viewed as a potential competitor or partner in the enterprise disk storage market.