GEORGE TEIXEIRA, DATACORE's CEO : *"WE WILL PROVIDE A FRAMEWORK TO INTEGRATE SAN AND NAS"*

StorageNewsletter: Why did you choose Florida, a tourist state with very few storage and IT companies, rather than California, Colorado or Massachusetts?

Teixeira*: It turns out that Florida was actually the home to a lot of the space program. And the original founders of Datacore were from the space program and the aerospace industry. We used to work for a company called Systems Engineering Labs, which became Encore. And we were the group that did nuclear power plant control, we did telemetry for the NASA space shuttle, so what we learned was if you're doing nuclear power control, you learn how to do fail-over. If you know how to do telemetry, you know how to do high-speed I/O. So what we though, as a bunch of scientists who wanted to use high-speed I/O and fault tolerance, where do you apply it? Storage was a natural, that's how we got into it. Now it also turned out that we were, our office in Fort Lauderdale is right next to Citrix. And the reason Citrix and Datacore are there is because IBM, in Boca Raton, was the founding of the PC, so many of our engineers also come from the same world there.*

What was wrong with your company that led you to downsized and undertake an MBO?

What was wrong? It's very easy, we were a small company, and after the dot.com crisis, every small company suffered, everybody in the business world wanted to buy from IBM, HP, they wanted to go safe. So the
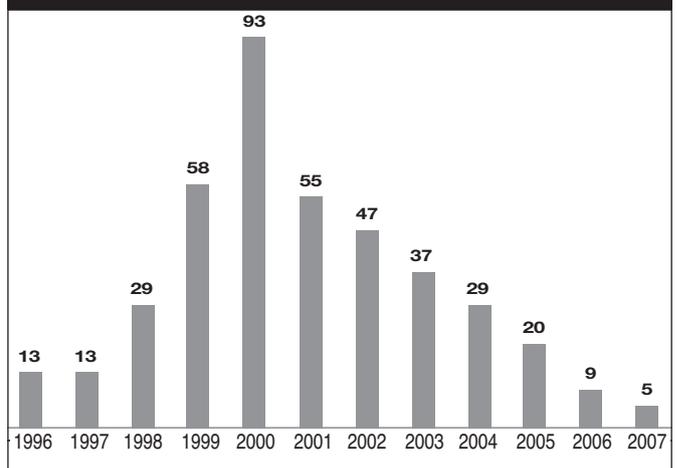
STORAGE START-UPs: INVESTORS TIGHT-FISTED IN 2007

From 2006 to 2007, the total number of financial rounds for storage start-ups fell from 62 to 52, for a total amount of $477 million.

This figure is down 29%, since just as significantly, the average investment per round also dipped from $10.8 million to $9.2 million, the lowest figure since 2003, the year we began undertaking this yearly survey.
VCs are still interested in storage technology, but they are looking more closely before they take out their checkbooks. On the other hand, there have never been as many IPOs (6) as there were this year. ➡️

NUMBER OF STORAGE START-UPs LAUNCHED EACH YEAR SINCE 1996

Year	Value
1996	13
1997	13
1998	29
1999	58
2000	93
2001	55
2002	47
2003	37
2004	29
2005	20
2006	9
2007	5

(Source: StorageNewsletter)

2007 Start-ups

THE FIVE START-UPS FOUNDED IN 2007 (KNOWN THUS FAR)...	
NAME (LOCATION)	**ACTIVITY AND COMMENTS**
Drop.io (New York, NY)	Web site to store and share files online
OnPATH (Marlton, NJ)	switch technology purchased from Brocade created by former employees of McData
Nirvanix (San Diego, CA)	online storage services optimized for media affiliated with MediaMax
Seval Systems (Palo Alto, CA)	IBM's spinoff; new RAID architecture with two or three dimen- sional array or "cube" for video and streaming; in stealth mode
Storspeed (Austin, TX)	products that the increase network storage performance in stealth mode
... AND THE EIGHT FROM 2006	
Adesto Technologies (Sunnyvale,CA)	venture-backed fabless semiconductor company working on a new type of computer memory; in stealth mode
Anobit Technologies (Herzelia, Israel)	fabless semiconductor company developing novel solutions for the flash market; in stealth mode
Blade Network Technologies (Santa Clara, CA)	spun-out of Nortel 10Gb Ethernet switchesin blade form factor
Cofio Software (San Diego, CA)	VTL software for an iSCSI server
Fusion-io (Salt Lake City, UT)	SAN on PCI with flash memory
Matrix Appliances (Marseille, France)	D2D backup appliance
StorMagic (Bristol, UK)	backup iSCSI software and solution; also in Bloomington, MN
UbiStorage (Boves, France)	Ethernet backup appliance

(Source: StorageNewsletter)

We tallied only five new start-ups founded in 2007, but the figure must be taken with a grain of salt, and could easily increase, given the possibility of companies still in stealth mode, which do not wish to appear in our study - fear not, we will find them eventually, and add them to our database.

So it was this time last year, when we had only smoked out two, merely to find another six come crawling out of the woodwork later in the year. Nevertheless, the number of storage start-ups founded each year has been in steady decline. We will probably never see the likes of 2000, a banner year with a record 93.

276 start-ups alive, 75% in U.S.
According to our figures, there are currently 276 storage start-ups in operation throughout the world, and their geographic spread gives an indication of the various levels of R&D underway in the different regions. 75% are based in the U.S., hardly a surprise. Next comes France (with 18), Canada (12), Israel (11), the U.K. (9) and Australia (4). Europe accounts for 14% of the total, but curiously enough, Asia is almost entirely absent, with only 1%, although it could change with the emerging economies of countries such as China and India. France's strong performance may have something to do with the fact that this newsletter is published in Paris, and our start-up detecting skills are particularly attuned to this market. Note, however, that apart from Atempo (whether it's French is debatable), Arkeia and to a lesser extent Seanodes, and only recently, these firms have hardly any international profile.

More Wall Street than VCs
2007 was thus a mixed bag for storage start-ups: there was less investment from VCs, but more IPOs. Seen in a different light, Wall Street has a better feeling about the storage industry than private investors, something that is slightly odd, since at the end of the day, much of the money comes from the same pockets, only via different structures.

Lower VC investments
We counted 52 financial rounds for storage start-ups over the past year (see table, p. 4-6) for a total of $477 million raised and an average of $9.2 million per financial round, with all these figures at their lowest levels since 2003. Why? Well for one thing, it strikes us that in recent months, there have been fewer "hot" or "hyped" technologies in which to invest.

As usual, storage software is the winner with 43% of the rounds for the storage sector in 2007 (58% in 2006), ahead of subsystems with 34% (48% in 2006).

The largest amount received by a single start-up was $40 million for a group headed by Seagate's chairman Steve Luczo, Xiotech, a former ... Seagate (big surprise!) subsidiary that acquired certain pieces of Seagate technology just before the deal. In 2006, the winner was Pillar with the same amount. In second place, MAID company COPAN drummed up $32.4 million last year. 18 start-ups received $15 million and more, compared to 14 in 2006. The all-time record, not about to be broken any time soon, is still held by Cornice, a one-inch HDD manufacturer that got individuals rounds of $54 million in 2004 and an enormous $97 million in 2005, which sadly did not prevent it from throwing in towel early last year. As for those still operating, and only those for which we know total invest-

INVESTMENTS IN STORAGE START-UPs OVER THE LAST FIVE YEARS
(in US$ millions)

Year	No. of startups	Total invested during the year	Average investment per firm during the year
2003	53	593	11.2
2004	76	820	10.8
2005	73	738	10.1
2006	62	671	10.8
2007	52	477	9.2
TOTAL	**316**	**3,299**	**10.4**

(Source: StorageNewsletter)

SECTOR BREAKDOWN FOR THE 52 STORAGE START-UPS GETTING FUNDS IN 2007

Software	43%
Subsystems	34%
Connectivity	13%
SSP	11%
Storage and security	6%
Fundamental technology	4%
Infiniband	2%

Note: Total exceeds 100% due to certain start-ups' classification in more than one sector

(Source: StorageNewsletter)

ment, we get 153 companies in all, for $3.207 billion, or a total averaging $21 million received.

Among those start-ups still running, those that received the greatest amount of financing since their inception continue to include Pillar ($250 million) and BlueArc ($204 million). If once again, we take into account all the start-ups counted and for which we know total investment since the dawn of time, we get an aggregate total of $7.94 billion for 288 firms, or an average $26.6 million for each.

Six IPOs in 2007
Of course, the main event in 2007 was the long-awaited return after many years' absence of the U.S. stock market's interest in storage start-ups. There were six IPOs in 2007 - compared to four in 2006 - an enormous increase, given that

THE GREATEST FINANCIAL ROUNDS IN 2007: $15 MILLION AND MORE (in US$ millions)

Xiotech	40
Copan Systems	32.4
ONStor	27
Fabrik	24.9
GlassHouse Technologies	23.5
Atempo	22
Sepaton	22
Expand Networks	21
3Leaf Systems	20
ExaGrid Systems	20
Verari Systems	20
Woven Systems	20
Exanet	18
Anobit Technologies	17
Mimosa Systems	17
Blackwave	16
Akorri	25
Omneon Video Networks	15

(Source: StorageNewsletter)

there have only been 16 since 2000, and merely one for each of

START-UPs ACQUIRED IN 2007

Company	Total funding	Buyer	Price in US$ millions
Archivas	28	HDS	100-120
Acopia	85	F5	210
Arsenal Digital	101	IBM	NA
Berkeley Data Systems	1.9	EMC	76
EqualLogic	52	Dell	1,400
Evault	24	Seagate	NA
FileKeeper	NA	Yosemite	NA
Illuminator	5	EMC	10
Neopath	29	Cisco	NA
NeoScale	51	nCipher	1.95
PolyServe	73	HP	NA
Siafu	NA	Hifn	NA
SiliconStor	12	LSI	55
Silverback	51	Brocade	NA
Zantaz	125	Autonomy	375

(Source: StorageNewsletter)

SUCCESSFUL IPOs

Company	Amount raised*	IPO year
StorageNetworks	2000	260
BakBone	2000	NA
McData	2000	350
FalconStor**	2001	-
Xyratex	2004	48
Rackable	2005	75
CommVault	2006	161
Double-Take	2006	50
Isilon	2006	108
Riverbed	2006	86
3PARdata	2007	95
Compellent	2007	144
Data Domain	2007	111
Mellanox	2007	102
Netezza	2007	124
Voltaire	2007	47

* in US$ millions
** became public via a merger with Network Peripherals

(Source: StorageNewsletter)

2001, 2004 and 2005, with none at all in 2002 and 2003.

It was Compellent that raised the largest sum last year, $144 million, ahead of Netezza ($124 million), then Data Domain ($111 million), Mellanox ($102 million), 3PAR ($95 million), and Voltaire (only $47 million).

And of course, this new trend towards IPOs may not end with the two firms currently set to go at the starting line: Omneon seeking $115 million and GlassHouse $100 million. There are other potential IPO candidates (or for an acquisition such as EqualLogic's by Dell): BlueArc, which has been mulling over the idea for the past few years (and even filed in September for $103 million, although the transaction was ultimately postponed, perhaps until this year?), as well as DataDirect, Diligent, ONstor, Lefthand, SEPATON or Xiotech.

Recall too that one year ago, our

2007 Start-ups

COMPANY (LOCATION)	WEB SITE	Founded in	2007 funding	Total funding	ACTIVITY AND COMMENTS
3Leaf Systems (Santa Clara, CA)	3leafsystems.com	2004	20	32.5	I/O virtualization
Adesto Technologies (Sunnyvale, CA)	adestotech.com	2006	6	NA	in stealth mode; venture-backed fabless semiconductor company working a new type of computer memory
Agami Systems (Sunnyvale, CA)	agami.com	2003	13	51	NAS; founded by former Zambeel employees; formerly StorAD
Agematis (Mérignac, France)	agematis.fr	2002	0.5	3.3	software platform for storage service provider
Akorri (Littleton, CO)	akorri.com	2005	15	38.5	software monitoring storage and server resources; founder Rich Corley started Pirus Networks acquired by Sun
Anobit Technologies (Herzelia, Israel)	anobit.com	2006	17	NA	fabless semiconductor company developing novel solutions for the flash market; in stealth mode
Archive Systems (Fairfield, NJ)	archivesystems.com	1991	11.5	20	outsourced service that captures, stores, routes, and archives documents online
Arkeia Software (Pantin, France)	arkeia.com	1996	3	7	Linux backup and recovery software; formerly Knox Software
Atempo (Courtaboeuf, France)	atempo.com	1992	22	38.2	Time Navigator, a backup and restore software; formerly Quadratec; also in Palo Alto, CA
Berkeley Data Systems (American Fork, UT)	mozy.com	2005	1.9	1.9	backup on the Web; acquired by EMC in 2007 for $76 million
BiTMICRO Networks (Fremont, CA)	bitmicro.com	1995	9.3	31.4	Flash disk solutions; incorporated in California as ASIC Design Consulting in 1995
Blackwave (Acton, MA)	blackwave.tv	2005	16	21	storage and delivery infrastructure solutions for Internet video; formerly Acinion; in stealth mode
CipherMax (San Jose, CA)	ciphermax.com	2000	10	123	intelligent switches, and then encryption solutions; formerly MaXXan Systems
Cleversafe (Chicago, IL)	cleversafe.com	2005	5	NA	storage grid
COPAN Systems (Longmont, CO)	copansys.com	2002	32.4	88.4	D2D backup using MAID technology; formerly Flow Engines
CYA (Trumbull, CT)	cya.com	1998	3	9.8	data management software for disaster recovery
Diligent Technologies (Framingham, MA)	diligent.com	2002	10.5	46.5	enterprise D2D backup and restore; formerly a part of EMC software division; also in Israel
Dmailer (Marseille, France)	dmailer.com	2001	3	NA	portable backup and synchronization software
Drop.io (New York, NY)	drop.io	2007	1.2	1.2	Web site to store and share files online
ExaGrid Systems (Westborough, MA)	exagrid.com	2002	20	65	formerly Inspection Systems; formed by employees of HighGround Systems; grid technology to take the complexity out of storing and protecting data; de-dup

COMPANY (LOCATION)	WEB SITE	Foun-ded in	2007 funding	Total funding	ACTIVITY AND COMMENTS
Exanet (Ra'anana, Israel)	exanet.com	2000	18	55	virtualization software for NAS; also in New York City, NY
Expand Networks (New Jersey, NJ)	expand.com	1998	21	74	WAFS acceleration appliance
Fabrik (San Mateo, CA)	fabrikinc.com	2005	24.9	49	home storage server and Web storage provider; founded by former executives of Maxtor; acquired the consumer business of SimpleTech in 2007 for $43 million
GlassHouse Technologies (Framingham, MA)	glasshousetech.com	2001	23.5	58.5	proposes to maximize the features in storage and backup technologies through architecture and design to implementation; proposed IPO in 12/2007
GuardianEdge Technolo. (San Francisco, CA)	guardianedge.com	1994	13.5	19.5	encryption software; spin-off from Micro Security Devices; formerly PC Guardian Technologies
Hi-Stor Technologies (Colomiers, France)	hi-stor.com	1997	2	3.6	fixed data archiving software; tape technology
InMage Systems (Santa Clara, CA)	inmage.net	2001	10	17.3	appliance-enabled enterprise-class combination of block and file-level replication (CDP); formerly Abhai Systems; also in India
Intransa (San Jose, CA)	intransa.com	2000	2.7	88.7	IP SAN; probably 3Com's partner
Intronis Technologies (Englewood Cliffs, NJ)	intronis.com	2003	5	5	online backup provider
Mimosa Systems (Santa Clara, CA)	mimosasystems.com	2003	17	34.1	CDP for Microsoft Exchange
NeoScale Systems (Milpitas, CA)	neoscale.com	2000	8	51	storage security appliance providing encryption; acquired by nCipher for $1.95 million 2007
NetEffect (Austin, TX)	neteffect.com	1999	8	77	10Gb Ethernet channel adapter; formerly Banderacom
Nexsan Technologies (Thousand Oaks, CA)	nexsan.com	1999	11	40	SATA RAID, MAID and ILM storage systems
Nirvanix (San Diego, CA)	nirvanix.com	2007	12	14.5	online storage services optimized for media; affiliated with MediaMax
Ocarina Networks (San Jose, CA)	ocarinanetworks.com	2005?	10	10.5	data de-duplication appliance
Omneon Video Networks (Sunnyvale, CA)	omneon.com	1998	15	57.2?	video networking and storage systems
OnPATH (Marlton, NJ)	onpathtech.com	2006 or 2007	8.5	8.5	purchased in March 2007 the UCS connectivity product line from Brocade/McDATA; created by former employees of McData; formerly Intellipath
ONStor (Los Gatos, CA)	onstor.com	2000	27	106	clustered NAS; formerly Agile Storage and then ClariStor
Oodrive (Paris, France)	oodrive.com	2000	5.9	NA	storage provider with a SaaS platform
Scentric (Alpharetta, GA)	scentric.com	2004	7.0	17.4	data classification software; also in India; shut down in 2007?

2007 Start-ups

COMPANY (LOCATION)	WEB SITE	Founded in	2007 funding	Total funding	ACTIVITY AND COMMENTS
Seanodes (Colomiers, France)	seanodes.com	2002	6.5	11.5	storage grid under Linux; formerly Storagency
SEPATON (Marlborough, MA)	sepaton.com	2000	22	90.6	virtual tape appliance; formerly SANgate Systems
SmApper Technologies (Kufstein, Austria)	smapper.com	2005	10	10	FAN (File Area network) software; in stealth mode
Storewize (San Jose, CA)	storewize.com	2004	9	NA	SATA data compression appliance
Storspeed (Austin, TX)	storspeed.com	2007	13	13	products that increase network storage performance; in stealth mode
Storwize (San Jose, CA)	storwize.com	2004	9	15	online data compression appliance; R&D in Israel
Terascala (Avon, MA)	terascala.com	NA	3	3	founded by former execs Larry Genovesi and Bill Elliot of Network Engines; in computer and storage blades for Unix clusters
Verari Systems (San Diego, CA)	verari.com	1996	20	NA	platform-independent blade-based computing and storage solutions
Voltaire (Billerica, MA)	voltaire.com	1997	10	75	TCP/IP to InfiniBand routers; R&D center in Herzeliya, Israel; IPO in 2007; raised only $47 million
Woven Systems (Santa Clara, CA)	wovensystems.com	2003	20	35	10Gb Ethernet switch to interconnect servers and storage systems
Xiotech (Eden Prairie, MN)	xiotech.com	1995	40	77.5	SAN and virtualization in the box; former Seagate Technology's subsidiary; a group led by Steve Luczo invested $40 million in 2007.
Zmanda (Sunnyvale, CA)	zmanda.com	2005	8	13	Linux backup software for MySQL

(Source: StorageNewsletter)

predictions for stock offerings were 3PAR, Acronis, Compellent, Data Domain, Diligent, EqualLogic and Lefthand. Our success rate? Four out of seven, which isn't too shabby.

Acquired start-ups

For the young sprouts, the other means to profit for founders and investors is to find a wealthy buyer, preferably a computer giant. There was no question for the past year, it was iSCSI EqualLogic, acquired by Dell for the now well-known sum of $1.4 billion. Thirteen other start-ups fell into the hands of more or less large companies. As usual, EMC stuck out as the only company to buy two of them during the year, Illuminator and Berkeley Data Systems (Mozy).

Analyzing the track records of all the start-ups in our database, we conclude that a storage start-up has a 3% chance of going public, 18% chance of folding, 21% of being sold and 58% chance of continuing on its current path for another year, which isn't all that bad, even if they don't strike gold. It's a tough job trying to come up with the next killer idea in the storage industry. Many are tempted, quite a few have tried but only a few make it in the end.

J.-J. M.

(continued from page 1)

investment… Now what's very different about us is that almost all of the dot.com companies died. Datacore, instead, because we were founded by a group of people that went for a year without salaries, when the market went bad, even though we downsized, our people decided that we believed and had enough passion in our company, in our products, that we bought our company back, so I think that we are an exciting and wonderful story.

Why did Hitachi Ltd, along with HDS (already in virtualization) and Intel Communications, invest in Datacore?

I think for obviously their own reasons, but I think in Hitachi's case, Hitachi realized that virtualization was very strategic. And frankly by working with us, they recognized that we were one of the top innovators of all the technologies, because we were doing thin-provisioning, storage domains, hot-swap, storage pools, fault tolerance in software, and frankly by working together, they learned a lot.

And Intel?

Intel, I think, was a more obvious thing. Intel recognized that, just like with VMware, this virtualization was going to sit on top of Intel platforms. So I think they wanted to learn about it. I also believe that they saw that every time we sold a Datacore, we were selling another Intel platform, so it was a good thing.

Ultimately, were you saved by VMware, which made virtualization popular?

It's interesting. I hate to say saved. But VMware has made a huge difference. What actually occurred: prior to the VMware, we had actually found that the resellers we were working were storage resellers. And those storage resellers don't understand software. All they know is how to move a box. What we started working actually was not VMware, but with Citrix resellers, so CEMA in Germany was a good example, and those resellers understood the software model. When VMware came along, what we recognized very quickly, and this is three years ago, that if people could do virtual terminals, like they did with Citrix, or understood virtual servers, like they
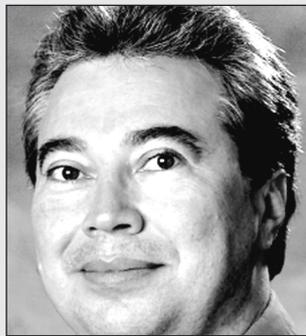
did with VMware, they already understood working in a virtual world. And if you think about it, Citrix makes terminals that float, they're kind of virtual, and you can apply them where you need to. What VMware does is it

George S. Teixeira, 51, president and CEO of Datacore Software, co-founded the company after ten years of senior management experience at Encore Computer Corporation, where he played a major role as a team leader of OEM marketing and sales to Amdahl, IBM, and DEC. His work culminated in the $185 million sale of Encore's storage control business to Sun Microsystems. He also held a number of senior management positions at the Computer Systems Division of Gould Electronics. Teixeira is a native of Madeira, a Portuguese island off the coast of Africa. He earned his MBA at Florida Atlantic University, after joint B.S. degrees in Chemistry and Biology. His hobbies include cycling, eating good French food, and most of all playing racquetball, sometimes with his grown twin sons, both of whom are opera singers. Although proud of his sons' accomplishments, Teixeira does not enjoy opera.

makes the CPUs, so you can apply CPUs where you need them. Or you can apply the memory. What Datacore does is it takes the chain or the anchor to direct storage, and makes it a virtual storage, so that our storage now can float to where you need. So we are part of this whole virtualization movement to get CPUs, memory, disk and storage that you can apply where you need.

Okay but when you speak with an IT manager on virtualization, he will always say VMware. Don't you think that storage needs another word, since the two technologies are really different?

To me no. In fact, I would tell you it is a bit different, but from the standpoint of the technology, what we've done is turn storage into an icon, that is hardware independent, and which gets better utilization of storage. Well, what does VMware do? It turns machines into icons that are independent of the hardware. In fact, our tagline to our partners is 'Datacore does for storage what VMware and Citrix do for servers and desktops.'

Yes, but now VMware has storage virtualization software.

They do, and they don't. They have,

any machine that is virtualized has storage. That is not the same as taking storage that is in an entire company and turning it into a tool that you can thin-provision and apply to different people. So it's a very different idea. It's like saying that when you emulate a PC on a Mac, yes, you're doing virtual storage, but it's not the same.

But given that VMware is an EMC company, there is a risk…

Of course. But the truth is we've been in business 10 years, 10 years ago, if I looked back, we were so far advanced, and we are still advancing, but the truth is it took the recognition of products like VMware in the market for people to understand the benefit of products like Datacore. And the difference today is that at the time we talked years ago, we were lucky to be doing a few hundred a year. Today we're doing three, four, five hundred per quarter of these systems. And it's following the wave of the VMware-type people.

I have heard on occasion that it's risky to use your proprietary software installed on a standard server with a large volatile cache.

I don't know why, because if you look at VMware or Citrix…

I am talking about your product. On a standard server…

On any server…

It's very dangerous to use proprietary software on a standard server because you need high availability…

But it is high availability…

And you use a lot of volatile RAM cache, which is also dangerous.

The simple answer is how do you make a high-availability server? Well the way you do it is you take two computers. So how do you make a high-availability Datacore? You take two Intel servers, you connect them with an Internet, Ethernet or Fibre Channel, and they run independently. And yes, we have cache on both sides, but it is no different of a design than if you go inside an Hitachi or EMC. EMC is an example, if you look inside CLARiiON, there are two processors, which are older Intel, there is Windows NT Embedded, running the operating system, they call it Flare OS, and then you

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have disks. I mean, what is different, it's pretty much the same model, architecturally there is no difference.

Where is the best place to have storage virtualization? In-band, out-of-band, embedded in a director or in the disk array, eventually with your software?

The truth is it has changed. The answer to me is in-band, and the reason it has to be in-band is because otherwise you can't impact performance. What we do is we accelerate the performance of the storage by using memory to make the I/Os faster. But the truth is with Datacore, we always believed that portability is key, so we were the first to - I can take a blade, I can take a server or I can take a VM, and I can run Datacore on any of those right out of the box. So I can take SANMelody, SANSymphony, I can run it on two VMs, on two different virtual machines, and I now have a high-availability server that does not even have hardware.

Yes, but if you embed that in the director, you are in the heart and flow of the data. Isn't that better?

From a technology stand-point, there is no reason that it's better. The reason depends on what you need to run storage applications today. In the old days of IBM, it took a million lines of code. When EMC came along, you went to two million lines of codes. Today to do thin provisioning and these kinds of features, it's many millions of lines of code. What that means is you have to run on top of an operating system, because you need memory management, etc. Now what that really means is it has become an application that is sitting on top of an operating system, which is sitting on top of either a VM or hardware. What Datacore does, and we're proud of it, is we turn the storage control into a portable application. What VMware did was turn machines into a portable application. What Citrix does is the same thing. So if you believe that VMware can be successful and is the way to go for machines, that is no difference from what we're doing for the storage.

Don't you think, in the end, that server and storage virtualization will be included in the OS and that consequently, Microsoft, Unix, Linux or Apple OS will be the final winners?

Absolutely. I do believe that. But it will take years as it always has. And there will be people who will evolve the product. We all though, ten years ago

Company	DataCore Software Corp.
HQ	Ft. Lauderdale, Florida
Founded in	1998
Financial rounds	1998: $2 million
	1998: $6 million (first round)
	2000: $35 million (second round)
	2001: $37 million (third round)
	2004: $7 million (fourth round)
	2005: MBO (60% employee owned)
Total funding	$87 million
CEO	George S. Teixeira
Activity	Storage virtualization software
No. of patents	Half dozen
Acquisitions	RTware in 1999 (at the origin of SRM software SANmaestro),
	Demand Technology Software in 2000 (monitoring software systems)
Sales	$20 million to $30 million a year
Net income	NA (profitable since two years)
No. of employees	100
Offices	Reading, Berkshire, UK;
	Munich, Germany;
	Sidney and Melbourne, Australia;
	Tokyo, Japan;
	Seoul, Korea; Taipei, Taiwan
No. of licenses shipped	Approaching 4,000
No. of customers	Over 2,000
Average price per licence	$199 (home), $1,000 (virtualized SAN for SMBs), $10,000 (disaster revovery and high-availability) $20-100,000 (SANmelody)
Biggest customers	IKEA (100 systems around the world), Axa
OEM	NEC Soft
No. of reseller partners	130 including 80 in Europe
Biggest ones	Alternative Technology, CEMA, Centia, Kramer & Crew, Magirus
Main competitors	EqualLogic, IBM (SVC), NetApp

when we founded the company, that Microsoft was going to be able to do this, I still don't see it. Veritas was going to be there, it's still not there. So the reality is that the idea is obvious, and I do believe it will become part of the operating system eventually, but how long is eventually?

You've said you're proud of thin provisioning. How do you explain that thin-provisioning is so popular now that the prices of hard disk drives are going down drastically?

Independent issues. Thin provisioning makes better use of a disk drive. The fact that the disk drives are now available at better cost doesn't stop you still from wanting better use. This is like saying why do you faster processors on a PC when you really don't need them. People still want the maximum utilization. The big advantage of thin provisioning is that four terabytes of storage can look like ten terabytes. So if you look at, I would actually argue that it's also very powerful for

the "Go Green" kind of movement, because the big problem is that we have, with our hospitals for example, because of doing things like PACS, where they're doing the x-rays and turning those digital, they're growing at such phenomenal rates that doing thin provisioning is a huge advantage.

Last year, you launched virtualization software for iSCSI SANs for under $1,000. What was the market's response?

It's been our most successful product ever. Of course. We shipped over 500 licenses within the first six months. More importantly, most of those grow, because people realize that the capability… one of the problems, to give you an example, is that people wanted to learn about thin provisioning, but to get thin provisioning today, you have to buy a Hitachi or a 3PAR. How much are those? Plus the hardware. Datacore, you can go to our website. You can download thin provisioning, that iSCSI software for $1000, you can

download and try it for 30 days. So after 30 days, what we found was people were just buying it. Now that they understand thin provisioning, and realized its advantages, we saw the growth of the market.

And you have a $199 product. What's that?

It's a smaller, it's a version that only supports up to 2TB SAN, it's iSCSI, it does not include thin provisioning and it has a smaller cache.

It's just to virtualize.

It's just to virtualize, it supports maybe 4 drives, so it's really just for home use.

On which storage platforms do you sell the most?

The most common is probably the HP MSA. Mid-range is the most common. Again it depends, the issue I have is my revenues are equal between SANSymphony and SANMelody. But my unit count is four times as many SANMelody's because of the price. So I sell a lot more on top of HPs, but on SANSymphony, it typically is an EMC, Hitachi or IBM that is behind SANSymphony, so it's a different class.

What is the percentage of your sales on FC and iSCSI?

Still very much more fibre channel. I would say 75% fibre channel, but it is changing. It's very obvious because we're selling all of these $1000 SANs, so the percentages are starting to change.

The percentage of your sales associated with virtual servers?

It's probably, new sales, I have to be careful, new sales is over 50%.

In Europe, U.S. and Asia?

Europe is about 60% of our business, the U.S. is about 30%, and then obviously 10% is Asia.

Why do you think you better in Europe?

I like the food better…

I think you told me once that in Europe, they don't like to be locked into one company as much, do you still believe that's true?

If you want the truth, I think I would actually modify that and say that we found the level of the resellers and integrators was better for software in Europe. They were more trained, more certified. I'll give you an example, Germany is our biggest market, and I think it's because they do the certification, there was a group that learned how to do Citrix and VMware very well, and we hooked up with them fairly early, and we've reaped the

benefits.

Your percentages for software and services?

It's at least 80% product. We try to do as much of the service through our partners, so our business is really licensing product.

Between OEM and the channel?

Very small OEM, and we do no direct.

Even though the company started in 1998, do you still consider Datacore as a start-up, looking at an IPO, trying to be acquired or staying private?

Oh boy. I don't know what we are now, in reality. We have the agility and the passion of the start-up, but we have the experience of a ten year-old company. We are profitable, we can run the business at this point and grow from our own profits. So I'm not dependent on being bought out.

No, but you observed that Wall Street is beginning to pay attention to storage…

I mean obviously from our standpoint, we are in the business of maximizing our shareholder value, so if something arises. Our plan of record is to go to an IPO. From that point of view, we are a start-up.

You don't know when?

No, it depends on the market, and revenues and everything else.

Will you enter tape virtualization as FalconStor did?

We can, and in fact we have in our lab and all that, but I don't see a real benefit for us as a separate product. The reason I say that is because we have a product called Traveller that does CDP. And in the CDP arena, we will probably do some form of virtual tape, but it's because if I look at storing the data, I may choose to store it where the line goes from disk to tape, I make it blurry, and now they can do it. But the truth is there are people out there with VTL, and at this point, I don't want to go and compete in an area that's not our expertise.

What's you opinion on FAN?

I read the marketing, I don't know that much about it, to be honest. To be honest I don't even know some of these words anymore, maybe I'm not technologist, NAS is a file system. A file system by definition is virtualization. So I don't know, when they say FAN, I think it's associated with spanning multiple files…

Will you offer a product for storage grids?

There is nothing… it's interesting, because I can run on a VM, because I

can run on a blade, we are already being run in some research projects as if are grid computing.

You already have CDP. When will you add de-duplication for primary and secondary storage?

We have some stuff in the works, but it's probably too broad of a question, is my problem. There are products out there for instance like Windows Storage Server which does single-instance.

But that's not really de-dup.

You're talking at the disk or block level? We've been looking at it, but have no dates yet.

Do you intend to enter the archiving market?

Not directly, there are many products out there already. We will interface to it, or we will do the CDP…

Roadmap?

The roadmap is actually to create a framework which will integrate NAS and SAN underneath us…

Because today you don't manage NAS...

That's correct. We will provide a framework, and we will announce some of that in the first quarter that will integrate NAS and SAN, and will allow us to cache the NAS as well, so that we give performance, because otherwise you can't scale, but more importantly, the idea is that you can add our Traveller like CDP, so it can also do CDP for the NAS as well as the SAN.

So you will go from block virtualization to file virtualization…

We'll do both. We'll make an announcement in the beginning of the year…

Did I miss an important question?

You covered a lot… no, I think the biggest thing is the impact of the virtual server stuff. What I've seen is that something like 85 of the virtual servers need a SAN. The problem is if you get a SAN, it's expensive, so most of the small businesses can't afford it. What we've found is this whole idea that we can run on the hardware, we can run on the VMs, and then the $1000-type SAN or 10,000 fail-over SAN brings the price, and that what's really driving our growth right now. It's really to your first point, which is that once people recognize VMware and start recognizing that what you need to do things like VMotion is really have products with a SAN, it drives the need to look at our kind of solution.

How many days of vacation did you have this year?

Two few… did I actually make ten? I may have… it's not a good sign.

Hard disk drives

New 1.3 hard disk drive

Manufacturer	Model	Max. per platter	Total capacity	Height	# of disks/heads	Access time	Rotational speed	Interface	Production	Retail price
SAMSUNG	A1	30GB 40GB	30GB 40GB	5mm	1/2	NA	3,600rpm	PATA, CE ATA, USB	1Q08	$199

The most surprising HDD announcement for the new year is this new 1.3-inch hard disk drive. Only two lines of devices in this form-factor have been ever launched:
- The KittyHawk by Hewlett-Packard with Citizen in 1992 (14.4MB and 21.4MB) and in 1993 (42.8MB)
- Two models (175MB and 350MB) in 1996 from PicoDisk, a start-up that has since vanished.
All these products, however, failed to find a market. Aura Associates, Maxtor and MiniStor were also working on this form factor around 1992.
As for the new Samsung product, its capacity (30GB or 40GB) and price ($199) can compete for now with flash drives, much more than one-inch units. LaCie has already chosen the model in its design for a tiny external drive, replacing previous units that integrated one-inch HDDs, and for good prices compared to Samsung: USB Key Max at €94.90 for 30GB and €124.90 euros for 40GB.

New 1.8 hard disk drive

Manufacturer	Model	Max. per platter	Total capacity	Height	# of disks/heads	Access time	Rotational speed	Interface	Production	Retail price
TOSHIBA	MK1214GA MK6028GAL MK8025GAL MK6014GAL MK6015GAA	60GB 60GB 80GB 60GB 60GB	120GB 60GB 80GB 60GB 60GB	8mm 5mm 5mm 5mm 5mm	2/4 1/2 1/2 1/2 1/2	15ms	4,200rpm 4,200rpm 4,200rpm 4,200rpm 3,600rpm	ATA-7, LIF connector	12/07	-

Only Hitachi GST, Samsung and Toshiba continue to manufacture 1.8-inch hard disk drives. For this form factor, the biggest buyer is Apple for its high-end iPod. Toshiba has already announced a 160GB 1.8-inch drive but at 3,600rpm only (SN 10/07), one of the first HDD using a 4K byte per sector. The new 120GB MK1214GAH, 60GB MK6028GAL and 80GB MK8025GAL are aimed at tablet, mobile PC, ultra-portable, ultra-mobile PC, the last one weighing only 45 grams. For CE products, the two 60GB MK6014GAL and MK6015GAA use 1KB-per-sector format optimized for CE applications.

New 2.5-inch hard disk drives

Manufacturer	Model	Max. per platter	Total capacity	Height	# of disks/heads	Access time	Rotational speed	Interface	Production	Retail price
HITACHI GST	Travelstar 5K500	134GB 167GB	400GB 500GB	12.5mm	3/6	12ms	5,400rpm	SATA 3Gb/s	2Q08	-

The company may have launched the first half-terabyte notebook drive in history, but its supremacy lasted only a few days (see below). Until now, the record for capacity in the 2.5-inch form factor was 320GB (already announced by Fujisu, Toshiba and Western Digital).
But note that in one important specification, the Travelstar 5K500 differs from the majority of the notebook drives: its height, at 12.3mm rather than 9.5mm. Why? The 5K500 contains three magnetic disk platters, the others ones only two.
In term of areal density, it's ultimately about the same: 167GB per disk for this model, 160GB per disk for 320GB 9.5mm high units.
PC maker ASUS has already decided to integrate these 500GB drives into its M50 and M70 notebooks, the last one even containing two drives for a 1TB capacity. Not bad for a laptop!
The Travelstar 5K500 drives also feature optional data encryption but with 1.5Gbs SATA interface.
There is also another version, the Travelstar E5K500 for 24x7 operation aimed at blade servers, network routers, POS terminals and video surveillance systems.

Manufacturer	Model	Max. per platter	Total capacity	Height	# of disks/heads	Access time	Rotational speed	Interface	Production	Retail price
SAMSUNG	Spinpoint M6	167GB	500GB	9.5mm	3/6	NA	5,400rpm	SATA 3Gb/s	03/08	-

Samsung has traditionally been a follower in hard disk drive technology. Yet for the past two years, the contrary has been true in all categories of HDDs except enterprise units. At CES, the company has been in the habit of launching incredible HDDs that prove it. Here the Korean company announced a new 2.5-inch unit with a record capacity of 500GB in a smaller volume that the formerly announced Hitachi GST Travelstar 5K500. Up to now, all the 9.5mm notebook units could contain a maximum of only two platters and four heads. Samsung has really done a great job to put three disks and six heads in that box.

IMATION:
ULYSSES' LAST VOYAGE

The idea behind Ulysses (SN 9/05) was to put a 2.5-inch hard disk drive into an LTO cartridge and stack several such units in an autoloader or a tape library, with the disk cartridges read by a special tape emulator developed by part-ner Mountain Engineering or MP Tapes. According to Mary Rawlings-Taylor, Imation's director of communications: "*We are not continuing additional Ulysses development.*"

In the sector of removable disks, Imation is nevertheless pursuing two parallel lines, which is some-what unusual, since they compete with each other. Odyssey, an Imation development that apparently integrates some Ulysses IP, is a dock that can hold a removable 2.5-inch HDD, different from the RDX which it resells and is of ProStor Systems provenance, although the result is highly similar.

EMC FIRST TO ENTER ENTERPRISE FLASH DRIVES WITH STEC

This announcement could drastically change storage industry.

Flash drives were already offered as an option to replace magnetic hard disk drives for notebooks, for example by Dell with Samsung's units. But nobody thought that they could replace or even complement enterprise drives so rapidly. With the recent announcements from EMC and STEC, the time has come.

EMC will offer the possibility to have three tiers on its Symmetrix DMX-4 enterprise storage array: very fast (but expensive) flash disks, enterprise HDDs rotating at 15,000rpm, and low-cost, slower but high-capacity SATA drives.

Of course, HDDs will continue to co-exist with flash, which cannot compete in terms of per gigabyte cost at higher capacities, but you can now expect that flash disks will progressively enter disk arrays and replace hard disk drives as the price of flash chips goes down faster than HDDs. And for a good reason: with all their mechanical parts, magnetic disk drives cannot compete with flash for speed, especially with access time of HDDs limited to 7 to 10 milliseconds while flash are more in the hundreds of microseconds range. The rotation speed of Winchesters, the key for the transfer rate of data, has stalled at 15,000 rpm for many years now, and even increasing this speed will not be that big a factor in enhancing the flow of data.

A number of big users of mainframes are ready to pay a premium to get a faster way to access their data for online transactions and they will jump on flash memories, even if EMC said that the price for these new flash disks will add around 10% to the Symmetrix.

There are two kinds of flash memories: SLC (Single-Layer Cell) and MLC (Multi-Layer Cell). EMC chose faster and more robust SLCs but they are more expensive than MLCs, which we will now find more and more present in consumer products (MP3 players, USB keys, etc).

The choice of STEC by EMC is not surprising. There are only three companies in the world capable of designing FC controllers for flash disks: BiTMICRO Networks (4Gb FC up to 16TB), Texas Memory with its RAMSan-500, a 4U rack containing one to two terabytes of flash memory with a 4Gb FC host controller with incredible speed (and pricing!), and lastly STEC. None of these firms are manufacturing flash chips (STEC uses Samsung's chips), but instead the controllers that manage them, as hard disk drives are also managed by controllers containing ASICs, processor and RAM.

Who or what is STEC?

Founded in 1990 as Simple Technology and based in Santa Ana, CA, STEC entered flash controllers following the acquisition of Cirrus Logic (then named Lexar) in 1994 and then SiliconTech in 1998. After an IPO in 2000, the company changed its name to SimpleTech a year later. Others acquisitions: SSD company Memtech in 2005 and Gnutek in 2006. Last year, Simpletech became STEC and sold its external disk drive business to start-up Fabrik. One of the pioneer in flash disk controllers with BitMICRO, M-Systems (acquired by SanDisk), SST and Targa Systems Division, STEC has designed flash disks with different interfaces (IDE, SCSI and then SATA, SAS and FC).

For its last financial quarter ending in December, STEC expects revenues between $48 million and $51 million, to be compared to $44.7 million in 3Q07 and $43.7 million in 2Q07. The firm is currently opening a brand new manufacturing plant in Malaysia.

Reaction
from EMC's competitors

We are now waiting for a reaction from HP, HDS, IBM, NetApp and others. They will have to follow, the only question is when and with which flash subcontractors.

Another company that will not appreciate EMC's latest choice is Seagate Technology, its largest hard disk drive supplier. Seagate has already entered flash technology for notebooks with hybrid disks that integrate both an HDD and a flash buffer simultaneously, but these products have yet to show much sign of life. But this time, it's a drive offered by its best customer with flash memory only...

If this doesn't spell the end of the HDD industry outright, flash has already eliminated the smallest form factor HDDs, it is entering portable PCs and now even enterprise arrays. Today, HDD has only one argument left up its sleeve: its price per gigabyte for a minimum capacity, around 20GB today, but more and more tomorrow.

Nevertheless, we will have to wait a decade to see a 1TB flash drive at

the price of a 1TB magnetic disk unit, currently at less than $300, not far from what a flash unit with only 16GB costs. It's worth noting that EMC, STEC or any other flash manufacturer for that matter always seems reluctant to give the exact price of their high-capacity units.

Return to the source

To conclude, it's odd to see EMC coming back to solid-state drives. It was founded by Richard Egan and Roger Marino in Newton, MA in August 1979.

Egan, a former Intel general manager, was attracted by the opportunity to sell add-on memory to the rapidly growing minicomputer marketplace. EMC's first product was a 64KB solid-state memory board, its most recent a 73/146GB solid-state disk.

Recall too that the company killed IBM mainframe disk arrays in the old days, with the emergence of its first Symmetrix, not only because they used the smaller and cheaper 5.25-inch form factor but also a

massive solid-state cache for excellent performances. One storage veteran told us that at the time EMC was not primarily selling disks, but cache. The successful period in the history of EMC hardware was based on one word: SSD. For its CLARiiON line the story is slightly different, however, since it doesn't use more RAM than the competition - of course, this product was originally designed by Data General (acquired in 1999), not EMC.

A RECORD 832GB 2.5-INCH FLASH DRIVE FROM BITMICRO FOR 3Q08

BiTMICRO Networks plans to launch an 832GB version of its E-Disk Altima E2A3GM SATA flash drive, with MLC chips, in 2.5-inch form factor, with sustained transfer rate of up to 100MB/s and up to 20,000 I/Os. Sampling is expected to begin in 2Q08 and shipping in volume by 3Q08 in capacities ranging from 32GB to 832GB.

BiTMICRO is really a technology leader in flash disk and a pioneer in this field with already around 37 models announced since 1999.

The firm claims to be the first to market the following flash drives:
- 2.5-inch EIDE (up to 4GB) in 2000,
- 3.5-inch Ultra Wide SCSI LVD (48GB) in 2000
- 2.5-inch Ultra SCSI (up to 4GB) in 2000
- 3.5-inch Differential SCSI (19GB)
- 2.5-inch ATA/UDMA-66 IDE (up to 17GB) in 2002
- Ultra320 SCSI (up to 155GB) in

2004

Its flagship product, the E-Disk SSD, is offered with SATA, SCSI Narrow and Wide, IDE/ATA and FC interfaces in 2.5-inch and 3.5-inch hard disk drive footprints, and 19-inch rack mount configurations scalable up to several terabytes of pure solid state storage.

BiTMICRO launched last year a high-end 1.6GB SSD device, twice the capacity compared with the new Altima E2A3GM flash SSD, but in a 3.5-inch form factor and with 4Gb FC interface and an impressive 55,000 I/Os per second.

The others capacity leaders in this market are STEC (512MB in 1.8-, 2.5- and 3.5-inch), Fusion-io (640GB of flash memory in a PCI card). Texas Memory reaches 2GB, but in a big 4U rack.

Biggest companies like SanDisk or Samsung (up to 64GB), and Toshiba (up to 128GB) are far

behind. But today, only the flash disks of a maximum capacity of 128GB are effectively competing in term of price with 2.5-inch hard disk drives for the current biggest market for flash disks: notebook PCs. BiTMICRO didn't give any price for its new 832GB unit, probably to avoid the comparison with a hard disk drive of a comparable capacity.

• Flash is invading everywhere, even blades now. **SiliconSystems** has launched one of the first SSD drive for embedded storage applications, the USB Blade, at capacities of 512MB, 1GB and 2GB.

For its BladeCenter, **IBM** has also introduced a solid state drive, a new option available as a single 2.5-inch 2-watt 31.4 GB drive. SATA compliance enables the drive to connect directly into BladeCenter.

TANDBERG's HH LTO-4 FOR 1Q08, QUANTUM NOW

Tandberg Storage has confirmed that its half-height LTO-4 cartridge tape drive will be on the market in 1Q2008 and its development is based on the LTO-3.

Furthermore, the company finally has some hope with respect to its O-Mass activity. "*A special part of the O-Mass technology has shown some interesting potential in other markets than it originally was designed for. The company believes that there is a possibility that one or more of these products can be developed and brought to the*

market during 2008."

For its 3Q07, the manufacturer of HH LTO devices increased LTO-2 shipments significantly but LTO3 is shipping at lower volumes than expected, even if the volumes have steadily increased during the quarter. For this period, its operating revenue reached NOK 72.3 million compared to NOK 52.2 million in 3Q06. Its gross margin, however, is still unacceptable. This reduced margin is a consequence of earlier low production volumes in 1H07 and increased demand in 3Q07 above expected levels. "*This required additional short term compo-*

nent purchases as well as production of modules with higher component cost to secure the volumes in the channel," comments Tandberg Storage.

Net loss before taxes was NOK 6.8 million in 3Q07.

• Meanwhile, **Quantum** announced the availability of its own HH LTO-4 device (800GB, 120MB/s) with AES 256-bit native encryption and WORM cartridge support, at MSRP beginning at $3,849. These technical specs are the same as the StorageWorks Ultrium 1840 Tape Drive from Hewlett-Packard.

• **Pat Clarke**, 42, has been promoted CEO of **Tandberg Data** in order to attempt to get the company back on the rails, financially speaking. "*A broad but effective Steering Group will be set up to identify and monitor plans and actions. I'm eager to start getting the company back to black,*" said Clarke who was formerly executive VP and replaces Kristian Jacobsen.

The new CEO has seen a wide range of companies during his 15-year career in the storage industry: Pillar Data, BakBone, Overland, IBM and Quantum, after serving some years in the British Armed forces.

• **Takayuki Nishioka** is taking the position of CEO at **Buffalo** Technology USA, remaining on the board of Buffalo Japan, which he's held since 2001. Prior to being named CEO, Nishioka led the entire Buffalo Japan sales team, after joining the company twelve years earlier as sales manager.

• **RELDATA** promoted **Dave Hubbard** as the new president and CEO, following on his role as COO since February 2007. He replaces Boris Anderer. Hubbard's 25-year career includes senior executive roles at QLogic, Inrange/Computerm, Computer Network Technology, and DEC.

Additionally, the company appointed storage veteran **Jeff Helthall** as VP of sales, and added Bruce Rudin as VP finance/controller.

• **Symantec** has a new COO, **Enrique Salem**, reporting to chairman and CEO John Thompson, while **Gregory Hughes** has been named chief strategic officer. Salem most recently served as group president for WW sales and marketing and Hughes as group president of global services.

Tom Kendra will remain group president of the security and compliance group (previously referred to as the security and data management group). **Greg Butterfield** will also continue in his interim role as group president for the storage and server management group (previously data center management group) and as group president of the Altiris business unit. **Janice Chaffin** remains group president of the consumer business unit.

• From several U.S. sources, it appears that **Tony Asaro** has been recruited by **Dell** as director of product marketing and iSCSI evangelist.

He is a well-known senior analyst from Steve Duplessie's Enterprise Strategy Group, where not surprisingly, he is no longer listed as an analyst. Asaro is an ardent supporter of iSCSI, and was running the ESG lab. "*All of the major storage vendors will step up their investments in iSCSI,*" he wrote in his blog. And, as most already know, Dell has just acquired iSCSI specialist EqualLogic.

Asaro was a co-founder of I/O Integrity developing a high-performance storage controller as a system on a chip.

• **nCipher** appointed **Ira Zalesin**, 52, as executive director, chief marketing officer and COO North America, along with **Aidan Hegarty** as VP of operations of the newly acquired Neoscale storage security product lines. **Richard Moulds** was promoted from VP marketing to executive VP product strategy.

• Formerly VP for channel sales at Seagate's Evault, **Dave Ferretti** has been recruited as senior VP of WW sales at **StoredIQ**. Many years ago he worked for Array Technology, acquired by EMC in 1994.

• Coming From Evault, **Dave Loewith** is the new VP engineering for **PowerFile**. He formerly served as VP of information protection at Legato Systems and was a key factor in the latter's acquisition by EMC, after a stint as director of storage solutions at Amdahl.

Meanwhile, **Keith Son** has been named senior director of hardware engineering. He comes to PowerFile from Marvell where he was director of the storage controller business unit after being system architect for NetApp.

• Formerly at Dot Hill, industry veteran **Jim Wayda** has been appointed as VP software engineering for **iStor**. He currently has twelve patents pending in the areas of snapshot and data replication.

• **Secured Digital Storage** hired **Jeff Pfeiffer** as director of product management. He most recently managed the Verizon channel partnership for storage services provider Arsenal Digital Solutions.

• We just learned that **Dennis Conner**, who was previously a reporter for IDG's Network World, last year launched **SSG-NOW**, an Austin, TX-based company that provides a selection of briefs and white papers on storage companies and their technologies.

• **EMC** has named **Kristian Thyregod** as distribution director for EMEA. Before coming to the company, he was executive VP for sales and marketing at FoursLeaf/LOGIX.

Arnaud Allouche, 36, was promoted director of global services at EMC France. He joined the company in June 2004, and previously held the position of regional manager of customer service for the Southern Europe region.

• **Hitachi GST** has promoted **Karthik Laxman** as country manager of India and the SAARC region.

• **Patrick Cowden** is the new GM of **HDS** Germany, reporting to EMEA senior VP and GM Michael Väth. He succeeds **Richard Evans**, who will take a management position at the international level. Cowden hails from Dell Germany, where he worked from 2003 to 2007 after experience with EMC as area sales manager.

• After stints at Addit and StorageTek, **Andreas Fink** has switched from channel account manager for Northern Europe at HDS to channel advisor at **Overland** Storage in Germany.

• **Iron Mountain** has named **Fred Pirat**, 43, regional channel mana-

People

ger for Southern Europe. In 2001, Pirat joined Connected, which was acquired by Iron Mountain in 2004.

• **Siegfried Betke** is the new Director Central Europe of **Datacore** Software, where he's worked since 2000, along side **Iris Hatzenbichler**, now promoted marketing and operations manager for EMEA.

• **ONStor** has recruited **Kin Lai** as GM of Greater China and Singapore, reporting to Tom Gallivan, senior VP of global sales. The firm will open an office in Beijing to expand on their current operations in Japan.

• German VAD **Digital Network Services** has asked **Ronald Kuffer** to take charge of resale of NetApp's VTLs.

• Who can forget **Tom Mitchell**, the controversial companion of Al Shugart and Finis Conner at Seagate Technology? He co-founded Seagate in 1979 and served as its president from 1983 to 1991,

where he established manufacturing operations in Singapore, Thailand, Malaysia, the PRC and India. For the past seven years, he is the president, chairman and CEO of **Fabrinet**. In the company we also find executives from Hitachi GST, IBM, Magnecomp, Maxtor, Read-Rite and Seagate. Fabrinet began operations by acquiring a 21,550 square-meter facility from Seagate Technology in Bangkok, Thailand and is now mainly a manufacturer of optical communications components and modules. The company just filed a registration statement with the SEC for a $250 million IPO.

• **David Cuyler** has been named to the new position of director of membership development for **Content Delivery and Storage Association**.

• Formerly CEO of RAIDCore, **Tom Marmen** has been elected to the board of **Ciprico**. Most recently, he was president and CEO of TimeLab, maker of a performance-enhancing technology for PC chips.

From 2001 to of 2004, Marmen was CEO of RAIDCore, sold to Broadcom and served through April of 2006 as VP and GM of Broadcom's storage line of business purchased by Ciprico in June 2006. Prior to joining RAIDCore, he served as senior VP and GM of the high-end storage division of Quantum and VP of the enterprise solutions group at Adaptec, where he was responsible for that company's RAID business.

• **EMC** has added Akamai's president and CEO **Paul Sagan**, 48, to its board. He will also serve as a member of the firm's mergers and acquisitions committee.

• **Mike Ruettgers**, 64, previously CEO and then executive chairman of EMC, has been appointed chairman of British chip-maker **Wolfson** Microelectronics.

• **Brocade** former CEO **Greg Reyes** has been sentenced to 21 months in jail and a $15 million fine for backdating stock options, but remains free pending appeal.

OEM/Distribution

IBM VENTURING INTO STORAGE GRID FOR CAS WITH BYCAST

Although hardly news (it dates back to July 2007), the story went largely unnoticed when it should have stirred great interest. IBM is venturing into grid storage by OEMing a storage grid software published by a small Canadian company, ByCast, whose product StorageGRID is named IBM Storage Grid Access Manager Software to provide the basis of its DR550, a competitor of HP's Integrated Archive Platform (formerly RISS) and EMC's Centera. Since 2005, the two companies have been jointly delivering the IBM

Grid Archive Solution although the OEM agreement will enable multiple vertical applications.

StorageGRID delivers a virtualization and data protection layer that creates unified fixed-content storage across hundred of sites and heterogeneous storage hardware that can scale to petabytes.

A node can be added at any time and the grid automatically reconfigures itself to incorporate the new node.

It also enables the storing of objects on tape and optical media.

Miscellaneous

IBM SHIPPED ITS 10,000th SVC CONTROLLER

IBM has shipped its 10,000th storage virtualization engine, the SAN Volume Controller or SVC, in more than 3,400 installations.

The milestone sale went to Able Body Labor, a mid-sized business in Florida. SVC is now in version 4.2.1, with enhanced FlashCopy and improved supported storage capacity going from 2PB to 8PB.

It also now supports new operating environments with VMware ESX Server, Red Hat and SUSE Linux, and Novell Netware.

Start-ups

• Established in 2001 in Marseilles, France, **Dmailer**, a provider of portable back up and synchronization software for a range of mobile devices, has received €2.5 million in new funding from VC firms BNP

Paribas Private Equity and Alto Invest. Since its launch in May 2004, its flagship Dmailer V7 product has sold over 20 million licenses in 120 countries worldwide, according to the start-up.

• New York City-based **Drop.io**, a Web site that allows people to privately store and share online pictures, video, audio, docs, etc has announced a $1.2 million Series A financial round.

HITACHI, FUJITSU AND TOSHIBA TOGETHER FOR A NEW JAPANESE CONGLOMERATE IN HARD DISK DRIVES?

This rumor is circulating across the Web, but awaits confirmation. We'll wait and see. We've outlined the potential consequences of such a deal.

The truth is that HDD manufacturer Hitachi GST was approached by buyers such as Silver Lake Partners and others, given that it has been losing money since its acquisition of IBM's disk business for more than $2 billion in 2002.

Hitachi GST, Fujitsu and Toshiba together would represent an enormous shift in the hard disk drive landscape, with only five HDD manufacturers remaining on the market if we add tiny Iomega/Excelstor, Samsung, Seagate and Western Digital.

We have counted 192 HDD makers that dabbled in the sector since the origin of the industry in 1956 by IBM. Now only 5 remain! And only two of these are actively engaged in manufacturing enterprise units - Seagate and the new Japanese conglomerate.

Based on the best figures in the industry, provided by TrendFOCUS for 3Q07, the new venture will be not far off from Seagate in terms of units shipped:

- Seagate	35.3%
- Hitachi GST + Fujitsu + Toshiba	33.4%
- WD	22.0%
- Samsung	8.9%
- Iomega/Excelstor	0.5%

Any deal will be complicated. Combining two companies is not an easy job, but three? And which company will head the merger? The biggest one, HGST, even if it's unprofitable? Will there be parity between Fujitsu and Toshiba, which produce roughly the same number of drives? And what about the restructuring? Which manufacturing plants stay and which go? How will they combine R&D teams in Japan and in California, not to mention sales and marketing forces spread throughout the world? It will not be easy to find a new name for the entity: HGST-Fujisu-Toshiba Hard Disk Drive Co.? It doesn't exactly trip off the tongue. Why not simply JapanDisk, since it will encompass all three remaining Japanese HDD makers in the market.

Historically, large Japanese companies don't like to shake hands. And these three compete in a slew of other product arenas, not just in IT. And there's no shortage of examples in (optical) storage also: NEC and Sony with Optiarc, Hitachi and LG with Hitachi-LG Data Storage, and also Toshiba and Samsung with Toshiba-Samsung Storage Technology Corp..

How will this affect the historical and continuing war on prices? Probably not very much. In such a competitive industry, even if there were only two HDD makers left standing, the boxing scheme would still not change much.

It's hard to believe that leader Seagate and successful WD will not try to do their best to avoid this incredible consolidation, which will change the face of the worldwide disk drive manufacturing industry entirely. And don't wait for any start-up to add players in this field. Cornice and GS Magicstor, the last two to try entering the HDD sector have both collapsed. For two reasons: 1) this activity needs a huge investment; 2) all the patents you need to design your first unit are already owned by the current field of manufacturers, and the price to license them would be as high as the Eiffel Tower.

• When **Seagate** Technology acquired Maxtor, its CEO Steve Luczo confirmed that *"We aren't going to lay off any Seagate employees."*

However, with the closing of one of its two Northern Ireland manufacturing facilities, the HDD maker will now cut back around 900 of its own workers and temporary employees. The 10-year old plant in Limavady, County Londonderry, was manufacturing aluminum disk substrates, a component of hard disk drives. The activity is no longer profitable for the company, and it plans to open a new substrate facility in Malaysia this year.

A second Seagate plant operating at nearby Springton will be unaffected.

The latter facility produces thin film wafers for disk heads and employs 1,400. It is also, to our knowledge, the last manufacturing plant in Europe to underake the assembly of HDD components.

Seagate was considered the largest private-sector employer in Northern Ireland.

• **Ciprico** has applied to transfer its NASDAQ listing from The Global Market to The Capital Market because the company fails to comply with the minimum $10 million stockholders' equity requirement for continued listing on the Global Market.

• **Mountains West Exploration**, Inc. d/b/a Secured Digital Storage has filed an amendment to its articles to change the company's name to **Secured Digital Storage** Corporation, following the acquisition of the latter company last November, 2007.

TOP TEN STORAGE PREDICTIONS OF IDC FOR 2008

Demand for storage capacity continues to grow at a rate of nearly 60% per year and IDC believes that during 2008 the industry will see significant shifts in the way data is stored, managed, and protected according to its report *Worldwide Storage 2008 Top 10 Predictions: New Paradigms*. The overarching theme of storage efficiency will intensify throughout 2008 and increase the industry's focus on virtualization strategies and green initiatives as well as information consolidation techniques like deduplication. "*In the past several years, storage trends have tended to be tactical and focused on developments in specific technologies*," said Benjamin S. Woo, VP of enterprise storage systems at IDC. "*2008 is likely to represent an inflection point in the way applications and storage will be interfaced.*" Among IDC's key predictions for 2008 are the following:

1) Online storage services (storage-as-a-service) such as online backup, archiving, and replication will be accepted as a viable option.

2) New role-based storage systems will enable vendors to target specific storage and data management issues, but will require tighter integration between the content-generating application and storage layer.

3) SSDs will become more viable for mainstream storage solutions as a result of declining price points.

4) Virtual servers (e.g., VMware) will emerge as the killer application for iSCSI.

5) Vendors will create more attractive 'all in one' solutions using an integrated server and storage approach to address the lucrative SMB market.

6) Value-added storage services will begin to be divorced from storage subsystems, resulting in further commoditization of storage subsystems.

7) A growing number of enterprises will adopt full-disk encryption within the datacenter to adhere to safe harbor provisions of many compliance regulations.

8) Vendors will create more attractive 'all in one' solutions using an integrated server and storage approach to address the lucrative SMB market.

9) Partial hardware refreshes that require nondisruptive expansions/replacements will be demanded by customers to up the ante on 'green' initiatives

10) De-duplication, single instancing, VTL, and thin provision will become standard options on storage systems to enable customers to become more 'green.'

HOT CZECH DISK STORAGE MARKET TO HIT 10PB IN 2007

The buoyant Czech disk storage market is expected to reach 10,000TB of installed capacity in 2007. According to a study from IDC, *Czech Republic Storage 2007-2011 Forecast and 2006 Vendor Shares*, the growing importance of data management as a source of business value, digitization of all forms of media, and EU regulations on data retention are fueling demand for enterprise storage systems. In 2006, the Czech disk storage market grew more than 17% year on year to exceed $114 million, with capacity increasing by almost 29% to nearly 8,000TB, while shipments rose 1.8% to more than 14,300 units. In 2007, the country's market will pass $139 million in value.

Currency rates: 1 U.S.$ = €0.68 = ¥107 = £0.51