Tape IT

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IDC increases LTO drive unit forecast by 70% and forecasts growth for LTO automation market

Increasing recognition of Tape's role in archive and tiered storage results in additional 700,000 ITO drives in IDC's latest forecast for 2011-2014

"We believe midrange and enterprise tape drives integrated in automation will be well suited to deep archive and tiered storage applications" [1] Robert Amatruda, Research Director, Data Protection and Recovery, at IDC

Over the last several months we have reported on increasing industry recognition for tape's role within the data center as IT Managers tackle the 'big data' challenge. As a further proof-point, IDC's June 2011 Worldwide Tape Drive and Automation Market Forecast has increased the number of LTO tape drive shipments by 70% over their May 2010 forecast for 2011 to 2014. The majority of this increase is the result of IDC's enhanced forecast demand for tape libraries for 2011-2014, which has increased by 31% over IDC's forecast from last year.

IDC's improving view of the tape market is driven by a number of factors.

[1] http://www.idc.com/getdoc.jsp?containerId=228694

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Tape market strength

Continued strength in LTO Ultrium Tape Drive Shipments: according to IDC's Q4 2010 WW Tape Market Report, 436,000 LTO Ultrium Tape Drives shipped throughout 2010; a double digit unit growth of 13% year-on-year over 2009.

Record tape media capacity shipments: aggregate tape media capacity shipped in the first quarter of 2011 was 4,683 PBs, according to the latest Santa Clara Consulting Group (SCCG) Tape Media Market Tracker; a growth of 34% year-on-year. This compares directly to 3,357PBs of total external disk storage shipped in the same period.

Tape's unique positioning for longer term storage of 'big data'


The latest IDC Digital Universe Study results for 2011 (see article later in this newsletter), show that the amount of data being stored is more than doubling every two years, and by 2020 could grow by 50 times. These results continue to reinforce the need for new ways to manage data and derive value from it, and industry commentators are increasingly pointing to tape as the most cost-effective way of storing data for longer periods of time due to a combination of:

- **Economics** – tape has the lowest cost per gigabyte, and the lowest energy and space requirements.

- **Reliability** – tape offers multiple levels of reliability including a lower bit error rate than disk, and standard read-after-write functionality.

- **Scalability** – simply add tapes to the tape library and the tape repository.

- **Performance** – LTO-5 offers streaming rates of 1TB/hour or 100TB/hour when configured in a typical fully populated enterprise class tape library.

- **Ease of use** – LTFS enables files to be identified and restored quickly and easily, independent of file format.

- **Dependable restore** – with a shelf-life of up to 30 years for LTO tape media.

- **Small physical footprint** – up to 3TB on a single tape means that data is easy to store in a fire proof safe.

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Increased demand for LTO automation

As illustrated in the chart, IDC are forecasting volume growth for every library size category in the LTO mid range automation market (excluding autoloaders), with the 21-100 slot library category representing the unit shipment sweet spot.

IDC Total Worldwide Mid Range Tape Automation Forecast Shipments by Library Size (2010 to 2015)
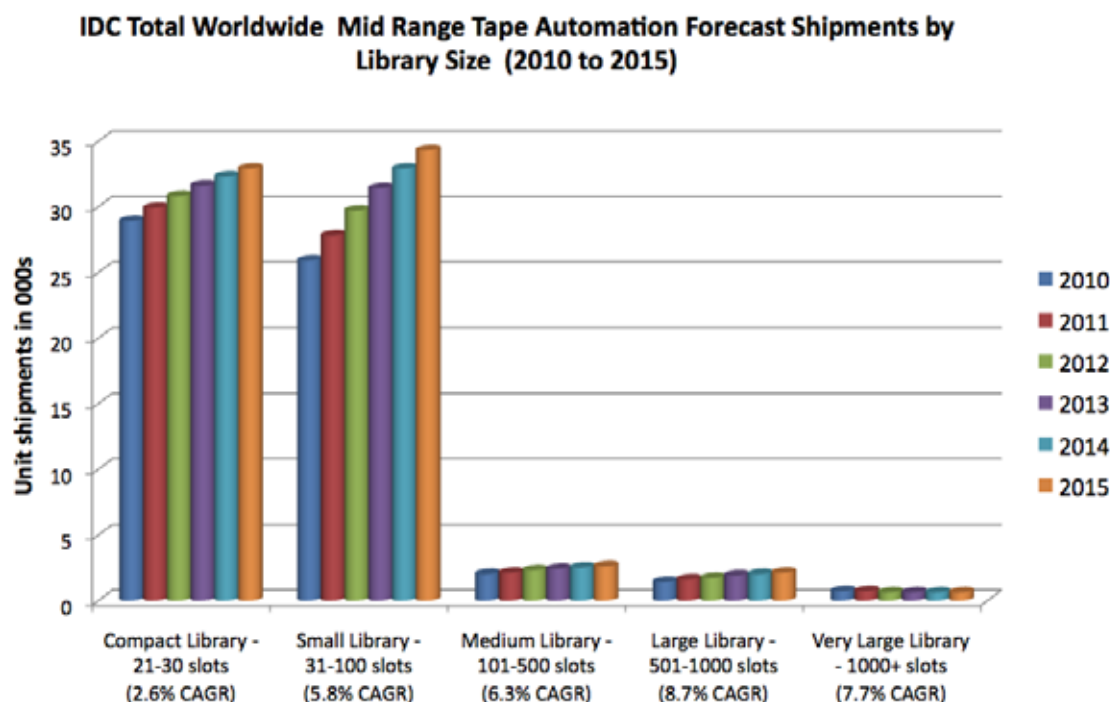
This growth will be fuelled by organisations seeking to keep pace with data growth through automating and consolidating backup and archive to a single tape library. This makes the backup and archive process:

- Easier to manage– rather than deploying several standalone tape drives, backup is consolidated into a single appliance which can be easily managed locally or remotely. Tape libraries also facilitate easier tape media handling.

- More reliable– consolidation of storage helps to eliminate human error from the backup and restore process.

- Consolidated to a single data protection solution– automated backup, easier archive and robust disaster recovery can all be delivered using a single multi-purpose solution.

- Easily scalable to keep pace with data growth– simply add drives and slots to meet the capacity and performance demands for more storage, often within the same physical footprint.

- Less expensive– tape has one of the lowest costs of ownership of any storage technology. It becomes even more cost effective as capacities and volumes increase in a tape library solution. Furthermore, automated data protection can reduce the level of IT resources required to manage the data protection processes.

IDC's increased tape drive and tape automation forecasts are the result of growing recognition for the role tape must play in the evolution of the data center as it adapts to keep pace with data growth. Refer to an article later in this edition on the growth of the digital universe.

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LTO-6 Format specifications released

LTO program announces availability of LTO Ultrium format gen-6 technology licenses

"Just like the LTO program overall, this first step for LTO-6 tells us one very important thing about tape as a storage medium: It's alive and well."
B&L Associates[2]

Although the LTO Ultrium Generation 6 format is still in development, the LTO Technology Provider Companies (TPCs) have provided the opportunity for licensees to gain insight on the emerging tape specification through a series of regular discussions surrounding its development. This visibility into the specification is intended to enhance licensee product development programs.

Current plans for specifications for LTO Generation 6 include:

- Cartridge capacity of up to 8 TB* - almost triple the capacity over the previous generation.

- Tape drive data transfer rates of up to 525 MB per second.*

- Backwards-compatible read-and-write capability with LTO Ultrium 5 cartridges, and backwards-compatible read capabilities with LTO Ultrium 4 cartridges, helping to protect investments and ease implementation.

- Also included are features from previous generations of the LTO Ultrium format, such as:

  o Data encryption to help protect data in transition.

  o Write Once Read Many (WORM) support to help address data security and compliance needs.

  o Dual partitioning feature, introduced in Generation 5, which when utilized by the Linear Tape File System (LTFS) specification can help provide faster data access and improve data management.

[2] http://bandl.typepad.com/bandl/2011/06/lto-6-the-next-generation-of-tape.html

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Over 3.7 million LTO tape drives and 100 million LTO cartridges have shipped since launch. The announcement of the LTO Generation 6 Format is therefore a significant step in delivering ongoing investment protection for this enormous installed base of LTO Ultrium tape users, by enabling them to benefit from:

An assured upgrade path– current installed base customers can be confident in an upgrade path to higher capacity and performance.

Ability to keep pace with data growth– responding with higher capacity and higher performance to keep pace with backup windows and to provide high density storage in a small physical footprint.

Additional usability and security features– the roadmap continues to support LTFS enabling tape-based file management, in addition to added data encryption to protect data at rest.

Confidence of supply– ongoing investment in the LTO Ultrium open standard by leading tape drive manufactures including HP, IBM and Quantum, in addition to media manufacturers, means that customers can be confident in the availability of drives and media at competitive prices.

Development of HP LTO-6 Ultrium tape drives is already underway. For more information on the HP LTO-6 drive roadmap and anticipated delivery dates, please contact your OEM Sales Representative.

* Assuming a 2.5:1 compression with use of a larger compression engine history buffer

The world's data is more than doubling every two years – driving the opportunity for tape

The first IDC Digital Universe study was conducted in 2007. With exponential data growth, the study has now become an annual event aimed at quantifying and describing the enormity of data our society is generating. The latest results published in June 2011 find that the world's data is doubling every two years – growing faster than Moore's Law. The study forecasts that 1.8 Zettabytes (ZB) of data will be created and replicated in 2011. This is the equivalent of 1.8 trillion gigabytes, sufficient data to completely fill 57.5 billion 32GB iPads.

The main conclusions in the IDC report include:

Data growth rate is still increasing

- Over the next decade, the number of servers (virtual and physical) worldwide will grow by a factor of 10.

- The amount of information managed by enterprise data centers will grow by a factor of 50, and the number of files the data center will have to deal with will grow by a factor of 75, at least.

- Meanwhile, the number of IT professionals in the world will grow by less than a factor of 1.5

- A single e-mail with a 1MB attachment sent to four colleagues can generate 50MB of information in the digital universe (based on an IDC-like architecture).

These factors drive the need for automated storage, backup and archive technologies that are highly scalable to keep pace with unpredictable data growth, easy to manage and also deliver high density in a small space. Tape is ideally suited for this task.

The world's information is doubling every 2 years

1.8 Zettabytes of data created and replicated in 2011 Or equivalent to...

Each person in the USA sending three tweets per minute for 26,976 years

Or 200 billion HD movies at 120 minutes long

We would need 57.5 Billion 32-GB IPad's

If we built them up, we'd make a mountain 25x HIGHER than Mount Fuji

2 http://www.theglobeandmail.com/report-on-business/your-business/grow/expanding-the-business/plant-shutdown-sends-small-production-firms-scrambling/article2000441/

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Growing awareness of data security issues

"The frightening realization is that the amount of information that needs to be secured is growing faster than our ability to secure it as employees leverage more mobile devices, consumers knowingly (and unknowingly) share more personal data, and companies find new ways to mine this data."
John F Gantz, IDC

- While 70% of the information in the digital universe is created by individuals, enterprises have some responsibility or liability for 85% of it.

- In 2010, 28% of the digital universe required some level of security.

- But less than one third of the information in the digital universe can be said to have at least minimal security or protection; only about half the information that should be protected is protected.

With pressure from industry bodies and government legislation, organizations are increasingly looking for ways of securing data in their domain. Tape delivers the last line of defence, it provides a way of taking the data off-line from threats, and can be easily stored off-site away from the data center. Furthermore, there's a compelling reason for organizations to seek LTO-4 and LTO-5 in order to gain tape based data encryption and added security for data at rest.

Pressure on budgets

"Data center architectures and organizational models will need to evolve as big data applications pervade a company's infrastructure." John F Gantz, IDC

- Since 2005, the investment by enterprises in the digital universe has increased 50% — to $4 trillion. This represents expenditure on hardware, software, services, and staff to create, manage, and store — and derive revenues from — the digital universe.

Organizations of all sizes will feel the impact of data growth on their operational budgets. Tape offers the lowest cost per gigabyte of storage, and particularly low energy costs. It has an important role to play in helping to drive down the cost of storing and managing vast amounts of digital data. As a consequence, tape is gaining increasing recognition as the solution of choice for digital archiving.

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Tape: the last line of defense at Google

In a recent press interview, Urs Hözle of Google reveals why tape plays an important role in enterprise data protection at the company

"We use tapes, because they're actually a very cost-effective way as a last resort for Gmail. The reason why we put it in is not physical data loss, but once in a blue moon you will have a bug that destroys all copies of the online data and your only protection is to have something that is not connected to the same software system, so you can go and redo it."
Urs Hölzle, Google

As a large-scale systems user, Google experiences all the corner cases in virtually every piece of hardware and software, even if it's a shipping product. According to Urs Hölzle, Senior VP of Operations at Google, "at scale, everything breaks". Consequently Google is constantly walking a tightrope between increasing the scaling of its systems while avoiding cascading failovers, such as the outage that affected Gmail in March this year.

In the interview published by ZDNet[3], Hölzle explains that overcoming system failure, without making it apparent to the users remains the biggest challenge he faces. He goes on to explain that tape continues to play a strategic role in data protection for Google.
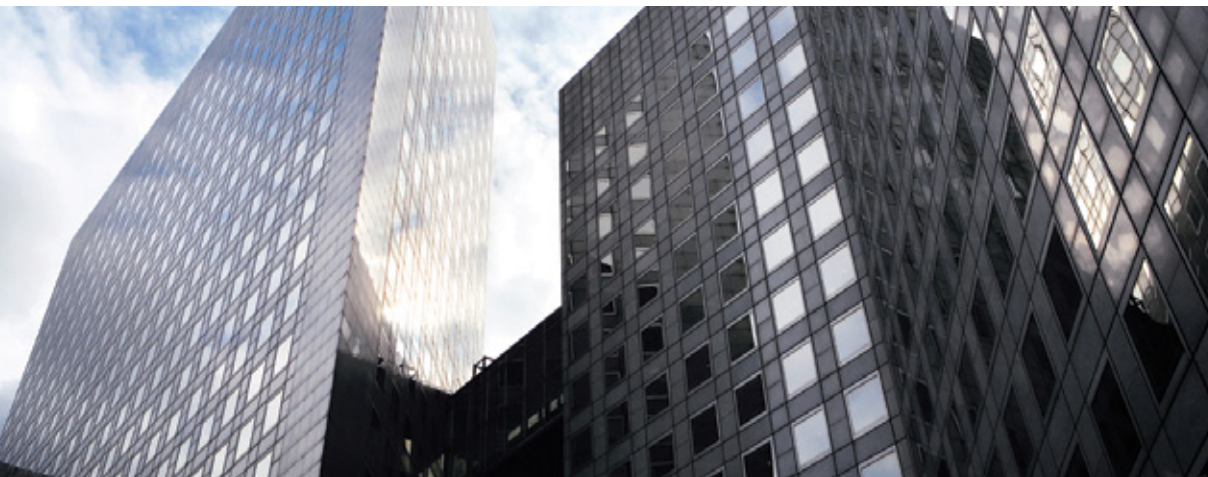
Tape remains essential for backup and disaster recovery for the majority of organizations

A survey of organizations in North America and Europe found that 57 percent are still using tape-based systems at the core of their backup and disaster recovery strategies.

"Survey results indicate a growing concern in enterprise data centers about their ability to adequately protect massive data volumes and increasingly complex environments. Large enterprises are increasingly focusing on protecting data in branch locations and in implementing more effective disaster recovery solutions," the report stated.

Survey after survey concludes that the greatest challenge for today's IT Manager is the ability to manage data growth. A recent study, conducted by an enterprise data protection vendor[4], is no exception; 33% of respondents saw a greater than 30% growth of data for 2011.

The survey polled 581 IT professionals, of which 168 were enterprise IT Managers - that is, they work at companies with at least 1,000 employees and oversee at least 50 TB of data.

In order to handle burgeoning data requirements, many companies have to deal with unplanned backup system "sprawl" as they struggle to keep up.

Additionally, among enterprises, some 52 percent are using physical tape backups for branch offices.

[3] http://www.zdnet.co.uk/news/cloud/2011/06/22/google-at-scale-everything-breaks-40093061/?s_cid=217
[4] http://www.infostor.com/backup-and_recovery/tape/half-of-organizations-still-use-tape-.html

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Changing industry perception of tape

As a leading industry commentator, Curtis Preston has had his share of doubts about the continued role of tape in the data centre, but like many others he has begun to write about a tape renaissance. Following the Tape Summit held at the NAB show in April 2011, Preston wrote the following:

Here's a brief summary of how my opinion of tape has changed over the years:

Stage 1: Tape was it. It was all I knew. Backing up to disk was crazy, as it was too expensive.

Stage 2: Tape was still it, but tape drives were getting too fast. Multiplexing or disk staging was starting to be required. Disk was too expensive to hold backups long term.

Stage 3: The dedupe craze hit. It was both theoretically possible, as well as financially feasible (for some) to store all backups on disk — and still have an offsite copy.

Stage 4: (Pretty recently). I compared the pricing of today's dedupe systems to similarly-sized tape systems. I was shocked at how expensive disk still was (4x-8x the price of tape).

Stage 5: (Today) I think we have unsuccessfully put a very good backup and archive target out to pasture and we should really reconsider that.

"Tape is Dead" mantra is the definition of insanity

For decades proponents of disk only data protection solutions would have us believe in tape's imminent demise. A recent video on YouTube takes a satirical view of the 'tape is dead' mantra.

VIEW VIDEO

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