



Contents

- **Tape media capacity out-ships disk capacity by 39% in Q1'CY11**
- **New analyst report predicts digital archive capacity to grow by 7.7x in the Media & Entertainment industry**
- **Broadcast media availability issues**
- **Purchasing Intentions Study shows strong demand for tape**
- **Tape's role for Big Data**



Tape media capacity out-ships disk by 39%

In the May edition of HP Tape-It, we reported that according to the Santa Clara Consulting Group (SCCG)¹, total worldwide tape storage media capacity shipped smashed through previous marks to reach a new peak in the first quarter of 2011. Now with the release of IDC Q1 CY11 WW Disk Storage Tracker it is clear that total tape storage media shipments continue to surpass total disk storage systems capacity by around 39%.

Aggregate tape media capacity in the first quarter of 2011 was 4,683 PB, a growth of 7.1% quarter on quarter (Q/Q) and 34.1% year on year (Y/Y).

This compares directly to 3,357 PBs of total external disk storage systems capacity shipped in Q1 CY'11 according to IDC.

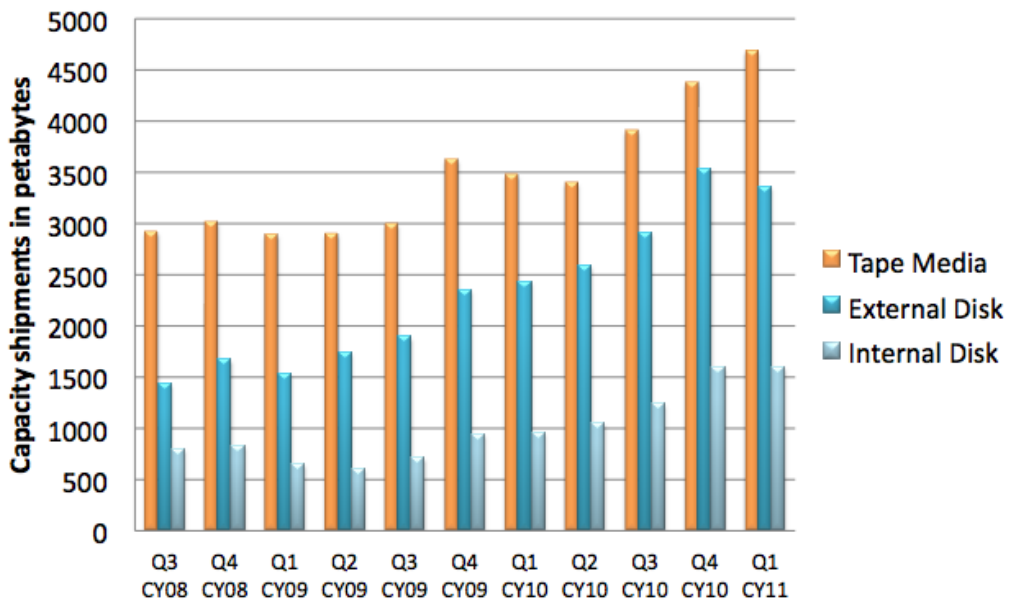
The shipped tape capacity media trends demonstrate tape's continued importance in the storage hierarchy.



Shipped tape media capacity continues to outpace shipped external disk storage capacity in Q1 CY'11

Figure 1

Tape media and disk storage system capacity shipment trends



Sources: IDC WW Disk Storage Tracker CQ410– March 2011 and Santa Clara Consulting Group Tape Media Tracker - February 2011

Digital video archive capacity to grow by 7.7x by 2016

Analysts Coughlin Associates report on the growth of LTO Ultrium shipments for digital media archiving

In their new 2011 Report on Digital Storage for Media and Entertainment, Coughlin Associates estimate that between 2011 and 2016 the media and entertainment industry will experience a 7.7x increase in the required digital storage capacity, and a 5.6x growth in storage capacity shipments per year.

Digital archiving, content conversion and preservation alone will require around 61 Exabytes of capacity by 2016.



Preserving content

Archiving digital content and converting historical analog video content to digital form for use and preservation remains the single largest user of digital storage capacity in the media and entertainment industry, five times greater than any other application. Coughlin estimates that about 57% of the total storage capacity will be used for content archiving and preservation in 2011 and this figure is set to increase to 60% of total capacity by 2016.

In terms of capacity requirements, digital conversion (converting older analog video to digital format) is set to be the single biggest application driving digital storage capacity demands over the next several years.

Many major digital conversion and preservation efforts are underway worldwide, including:

- Large libraries of material being converted to digital archives such as the 100,000 hour CNN library
- Stock Material at Major Networks such as ABC's 1,037,000 films/tapes
- Materials accumulated by Major Studios such as Disney (6,500 TV programs on 80,000 reels and tapes) and Warner Brothers (28,000 TV programs on 1,000,000 reels and tapes)

As older film stocks and substrates are aging rapidly, conversion to new digital media for content preservation is a high priority.

The importance of digital magnetic tape archive

"Our surveys show the highest percentage of true archived content is kept on digital magnetic tape. The most popular digital magnetic tape format for archiving (based upon our survey) is LTO tape (66% share)"

Coughlin Associates

The economics of LTO Ultrium are playing a key role in the growing trend towards using the technology for longer term archival. The Coughlin report includes a worked through scenario

comparing the cost of LTO tape with disk-based storage. The results are shown in the following page:

2011 estimated costs for archiving motion picture materials on HDD arrays and tape library for 5 years (\$/TB)

Cost Factor	HDD Storage	Tape Storage
Maintenance and System Administration	\$300	\$105
Facilities Costs, Space and Utilities	\$150	\$60
SW Maintenance and Licenses	\$230	\$153
Other Capital Equipment (Annualized)	\$477	\$151
HDD or Tape Cartridge and Hardware Cost (annualized)	\$80	\$60
Total	\$1,237	\$529

In addition to the low total cost of ownership, Coughlin also states that the new LTO-5 LTFS (Linear Tape File System) functionality is enhancing interest in LTO for media and entertainment applications. LTFS offers increased data mobility using file formats that make sharing across the

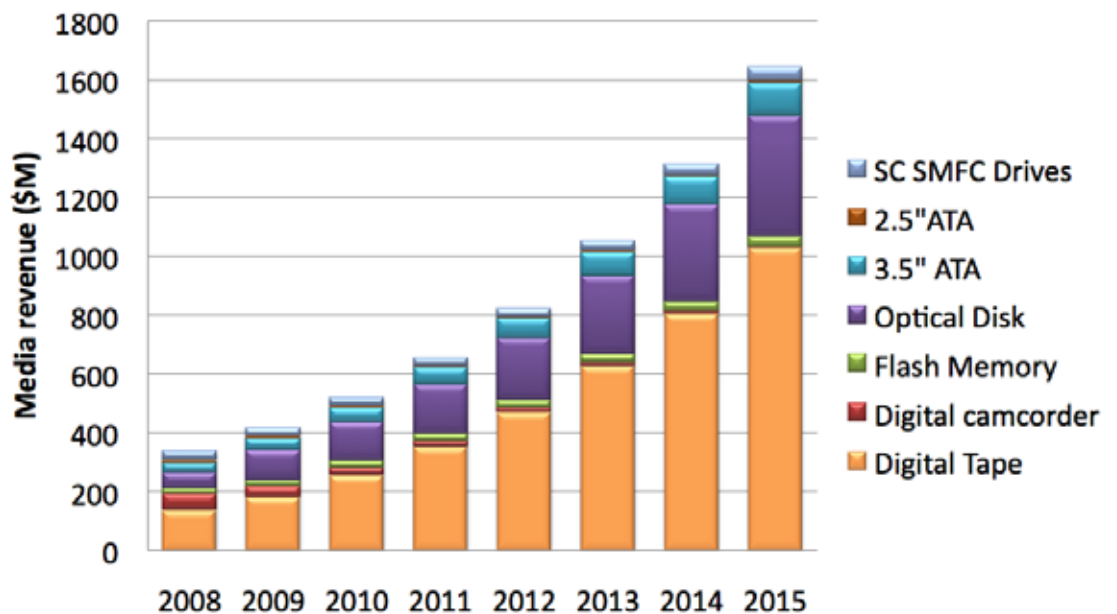
M&E workflow much easier. The file management interface that makes tape act like a storage volume (HDD or USB drive), means that the use of LTO-5 tape in workflows is also more transparent as the LTFS file information makes content on tape (metadata) viewable without special applications.

“LTFS has gotten a lot of interest by content creators, even smaller facilities, for long term tape archives. LTO can replace pro-video tape archives and it is less expensive than disk-based storage.”
Coughlin Associates

In summary, Coughlin Associates predict that the digital media storage market holds a great deal of potential for LTO Ultrium as a long-term

archive solution for the media and entertainment industries, as illustrated by the revenue projections in the chart below.

Digital Media Storage Revenue by Technology
Source: Coughlin Associates Forecast 2011



Broadcast media availability concerns

The disastrous Japanese earthquake and tsunami in March 2011 has had a significant impact on a number of the tape formats used by facilities for video archiving; in particular there are wide availability issues for Sony HDCAM-SR tape.

According to news reports², this technology is particularly complex and requires precision manufacturing; it may be some period of time

before manufacturing can begin at another facility. As a result, broadcasters are now scrambling to find alternative formats to support high-end programming for studio and broadcast workflows.

Consequently suppliers are being alerted to the potential for an increase in demand for LTO Ultrium tape.



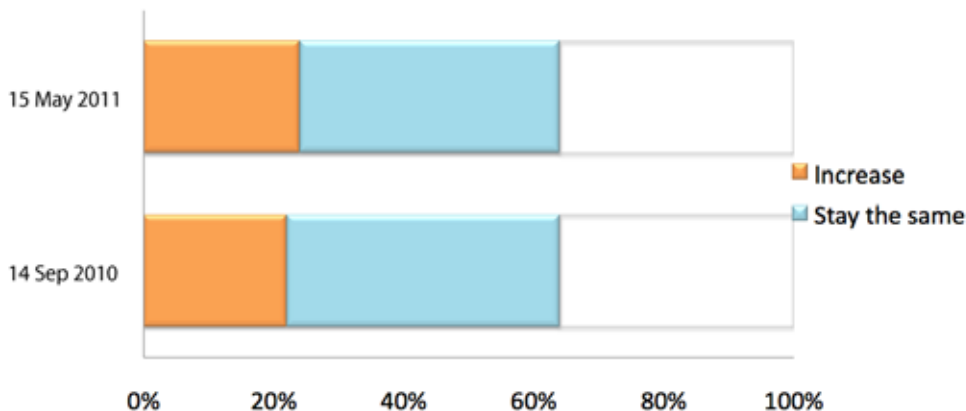
64% of survey continue to invest in tape

TechTarget Storage Purchasing Intentions Survey shows ongoing investment in tape in 2011.

According to the Spring 2011 TechTarget Storage Intentions Survey results published in May, 77% of companies continue to spin off all, or part of their data to tape. The survey shows that 64% of companies will either increase their spending or maintain their level of spending on tape during 2011.

A more detailed look at the report reveals a two percentage point increase in the number of organisations planning to increase their tape spend, up from 22% in September 2010 to 24% in May 2011.

24% of respondents set to increase spend on tape



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

Tape - delivering BIG BACKUP for BIG DATA

As the challenges of BIG DATA become more apparent, industry commentators are opening their eyes to the value of tape-based solutions in addressing BIG BACKUP.

One of the biggest “big data” challenges today for larger enterprises is the need to store, access, manage and analyse petabytes of data. Web 2.0 companies are coping with very large distributed aggregations of loosely structured and often incomplete data. Healthcare providers are figuring the best ways to handle the storage and archival of large amounts of medical image data. Media and entertainment companies are wrestling with creating, storing and distributing high-definition content. Increasingly huge data volumes also pose a challenge for any enterprise needing to store its data for compliance and regulatory purposes.

“Every two days we create as much information as we did from the dawn of civilisation up to 2003”

Eric Schmidt, Google

But it’s more than a “big data” problem—it’s a “big everything” problem

“Believe me, big data is nothing new and I don’t think it is a big surprise to many of you either. And what comes with big data isn’t new – big backup and big challenges.”

David Chapa, ESG³



³<http://www.enterprisestrategygroup.com/2011/05/notorious-b-i-g-data-infamous-b-i-g-backup>

In a recent blog , George Crump of analysts Storage Switzerland suggests that:

“While conventional wisdom, or at least the wisdom of the disk manufacturers, is that the entire Big Data store needs to be online and available (how convenient). The reality is that putting all data online is not a viable solution for most businesses from a cost perspective.”

Crump goes on to explain the two roles that tape can play in delivering a BIG DATA BACKUP solution.

1. Active Archive Tier

In this model, tape is used as part of an active archive infrastructure. Active data remains loaded onto the high performance disk tier, while a secondary disk stores data that may be required within a certain timeframe, or is loaded ready for some particular analysis. The final tier of data is inactive, but may be required in the future or must be kept for compliance purposes, tape is an ideal solution for this type of data.

2. Data Protection Tier

Using tape libraries to hold petabytes of data possibly backed up from secondary disk in order to avoid impact to system performance, in a way that is complete, offline and ultimately offsite.

In this model, tape is a compelling choice due to:

Economics – tape has the lowest cost of ownership in terms of cost per Gigabyte, power and cooling.

Scalable Capacity – scaling tape capacity in line with data growth can simply involve adding in more tape cartridges and tape drives in a tape library solution without the need to restructure or reinvest. Enterprise tape libraries are able to hold thousands of terabytes in a single 19-inch rack-mount solution, and can scale up to multiple petabytes if required.

Performance – big data often consists of large file sizes which are ideal for tape’s high performance streaming capabilities. HP LTO-5 can stream at 1TB/hour, which can translate to speeds of around 100TB/hour when configured in fully populated enterprise tape libraries.

Small physical footprint – tapes hold high densities of data in a relatively small space that’s ideal for storing in a vault or fire proof safe.

Dependable restore – robust LTO Ultrium tape cartridges have a shelf-life of up to 30 years at ambient temperatures.

Ease of use – the new LTFS functionality on LTO-5 means that files can be identified and restored quickly and easily, and in a way that is independent of file format.



In Summary

With over 75%⁵ of the business world’s data stored on tape, it’s fair to say that TAPE IS BIG DATA. Tape remains the only media that can scale to exabytes of capacity and still be cost-effective, physically easier to store, while remaining secure and dependable over long periods of time.

⁵ Results of the TechTarget Survey in May 2011 show that 77% of data is stored on tape