2018 Digital Storage for Media and Entertainment Report

-- Digital Storage for the Capture, Creation, Editing, Archiving and Distribution of Entertainment Content --

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Coughlin Associates

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The Digital Storage for Entertainment and Media Report is published by:

Coughlin Associates
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Atascadero, Ca. 93422

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Acknowledgements

These reports are the result of extensive interviews with many people and companies from throughout the entertainment content value chain as well as in-depth analysis of historical trends and future technology drivers. Companies contacted included storage component and systems companies as well as companies that incorporate storage into their content creation applications. The list of companies contacted is extensive and the data we gathered over several months is pretty comprehensive, not all of it is included in this report. Our thinking and projections were shaped by many inputs.

In particular we would like to thank the following companies and organizations for their help and information over the years: Aspera, Atempo, ATTO, Avere, Avid Technologies, BitCentral, DataDirect Networks, Disney, CET, Chosun Group, Dell, Discovery Channel, Dolby, EBU, Edit Share, EFILM, Eluv.io, ESPN, Facilis, Fox, Front Porch Video, G-Tech (part of Western Digital), Harmonic, HDS, HGST (part of Western Digital), IBM Media and Entertainment Division, IMT, Iron Mountain, Isilon/EMC, LaCie, LSI, LTO Consortium, Maximum Throughput, Mediakive, Media Technology Market Partners, Micron, NetApp, NASCAR, NBC Universal, NetApp, Open Drives, Oracle, Panasonic, Paramount, Plastercity Digital Post, Promise Technology, Qlogic, Quantum, Rorke Data, SanDisk, SeaChange, Seagate Technology, SGI, Sony, SpectraLogic, Sun/Oracle, Technicolor, Turner Broadcast, Versus, Warner Bros, Western Digital, Xendata and Zadaro. We also thank all the speakers whose presentations have influence this report from the Creative Storage Conferences, SMPTE Conferences, the NAB show, IBC and the Storage Visions Conferences.

Also thanks to the following individuals for their help over the years—and the total list is much more extensive than this: Al Kovalik, Alex Grossman, Brad Giles, Brad Winett, Clyde Smith, Colin Dixon, David Baril, David Crosthwalt, David Trumbo, Fred Fourcher, Geoff Stedman, Nicholas Lim, Jim Lindner, John Morgan, Felix Poulin, Molly Presley, Pete Fasciano (for much discussion on earlier editions), Randall Dark, Rob Kobrin, Ron Tarasoff, Claus Trelby, Jim Wheeler, Joe Wojdacz, Steve Zivanic, Paul Koopman, Scott Rinehart, Steve Canepa, Tom Inglefield, and Wayne Arvidson.
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Executive Summary

This report is the sixteenth report on data storage and emerging applications and the fourteenth report on data storage in the entertainment and media market published by Coughlin Associates.

Data storage is a key element in the digital transformation of content creation, editing, distribution and reception. Data capacity and communication speed increases, changing form factors, lowered product prices and the growing familiarity with digital editing, digital intermediates and various forms of digital distribution are key components in the continued growth and development of entertainment.
Because of the large file sizes required for high resolution and multi-camera images there is increasing demand for high capacity storage devices as well as high performance storage. The entire content value chain of content creation, editing, archiving, distribution as well as consumer electronics content reception devices, provide an accelerating feed-forward mechanism. This drives growth in data storage for all entertainment content applications.

For many archiving and distribution applications where content is relatively static, low cost/high capacity SATA HDD storage, optical discs and tape-based storage libraries will predominate, with some flash memory used for caching and metadata. Hard disk drives as well as enterprise SSDs are also used in high performance storage applications where storage cost factors must be balanced with performance requirements.

For applications requiring rugged field use or fast playback response flash memory either as cards or solid-state drives (SSDs) are now standard fare.

Due to input from industry groups, SMPTE, HPA, EBU (and other media and entertainment workers) survey results and discussions with industry end users and equipment providers we have continued to adjust many of our models for current storage estimates as well as future growth in 2018. The 2018 report extends the updated capacity and storage cost model we developed in 2017. In addition, we have expanded the impact of solid state storage in our later projections based upon expected lower flash memory storage costs.

We list some key points of the report in the following list.

**Key Points**

- Creation, Distribution & Conversion of video content creates a huge demand driver for storage device and systems manufacturers
- As image resolution increases and as stereoscopic VR video becomes more common, storage requirements explode
- The development of 4K TV and other high-resolution venues in the home and in mobile devices will drive the demand for digital content (especially enabled by high HEVC (H.265) compression.
- HDD areal density increases are slower but flash memory growth has increased. This might cause more applications to use flash memory
- Activity to create capture and display devices for 8K X 4K content is occurring with planned implementation in common media systems by the next decade
- Active archiving will drive increased use of HDD storage for “archiving” applications, supplementing tape for long term archives
- Optical storage developments for higher capacity write-once Blu-ray optical cartridges will create higher capacity discs and this may help slow the reduction in optical disc archiving
• Flash memory dominates cameras and is finding wider use in post production and content distribution systems
• From 2017 to 2023 entertainment and media digital storage TAM (without archiving and preservation) will increase by about 1.9X from $4.5 B to $8.5 B
• The growth in storage capacities will result in a total media and entertainment storage revenue growth of about 1.9 X between 2017 and 2023 (from $6.9 B to $12.8 B)
• Overall annual storage capacity demand for non-archival applications is expected to increase over the period from 2017 to 2023 by 5.2X from 11.7 EB to 60.3 EB
• Between 2017 and 2023 we expect about a 3.5 X increase in the required digital storage capacity used in the entertainment industry and about a 3.7 X increase in storage capacity shipped per year (from 51.9 EB to 191.9 EB)
• In 2017 archiving and preservation is estimated to have been 35% of total storage revenue followed by content distribution (33%), post-production (27%) and content acquisition (5%)
• In 2023 the projected revenue distribution is 34% archiving and preservation, 33% content distribution, 26% post production and 7% content acquisition
• By 2023 we expect about 55% of archived content to be in near-line and object storage, up from 45% in 2017
• in 2017 we estimate that 71% of the total storage media capacity shipped for all the digital entertainment content segments was in HDDs with digital tape at 22.7%, 4.3% optical discs and flash at 2.0%
• By 2023 tape has been reduced to 15.4%, HDDs shipped capacity is 75.5%, optical disc capacity is down to about 1.0% and flash capacity percentage is at 8.1%
• Media revenue is expected to increase about 1.6 X from 2017 to 2023 ($1.8B to $2.9 B).
• The single biggest application (by storage capacity) for digital storage in the next several years as well as one of the most challenging is the digital conversion of film, video tape and other analog formats
• Over 131 Exabytes of new digital storage will be used for digital archiving and content conversion and preservation by 2023
• Storage in remote “clouds” is playing an important role in enabling collaborative workflows and in archiving
• Overall cloud storage capacity for media and entertainment is expected to grow about 13.3X between 2017 and 2023 (5.1 EB to 68.2 EB)
• Overall object storage capacity for media and entertainment is expected to grow about 4.9 X between 2017 and 2023 (10.4 EB to 51.6 EB)
• Cloud storage revenue will be about $2.7 B by 2023
• By our estimates, professional media and entertainment storage capacity represents about 4.5% of total shipped storage capacity in 2017. Professional media and entertainment uses about 13% of all tape capacity shipments, 8% of all hard disk drive shipments and 2% of all flash memory shipments in 2017.
• Digital cinema conversion complete in most countries with movement to 4K video wide-spread.
• Silver halide film as a content distribution media will vanish before the end of the decade.
• AXF and other new standards may help format obsolescence.
• Several petabytes of storage can be required for a complete stereoscopic digital movie production at 4K resolution and there is some production work as high as 8K.
• By the next decade total video captured for a high end digital production could be hundreds of PB, approaching 1 Exabyte.
• Movement to IP based workflows will reduce total costs for content management, including storage.
• Non-linear editing requires high performance storage devices. Over the forecast period lower network storage costs and higher performing low cost storage networks will result in faster growth of network storage than direct attached and local.
• ATA HDD arrays have become the dominant mode for readily retrievable fixed content storage, but flash memory will grow for this use as costs decline.
• Magnetic tape will remain as an archival media although use in other applications is in decline, particularly content capture.
• Flash memory is the clear majority storage media in professional video cameras with survey results showing about 56% utilization in the 2018 survey.
• The continued need to storage for higher performance and high capacity workflows are driving strong storage growth in the projection periods—assuming no great negative economic trends.

The data presented in this report is subject to change as the content storage market develops. We have additional information that we have gathered in addition to that included in this published report. We will continue to monitor and develop our models of this market as time goes on. We would be glad to work with customers on specialized presentations or reports and in general to conduct research to answer specific questions on a project or ongoing basis.
2018 DIGITAL STORAGE FOR MEDIA AND ENTERTAINMENT REPORT

This updated and expanded report is the fourteenth annual comprehensive reference document on this topic. The report analyzes requirements and trends in worldwide data storage for entertainment content acquisition; editing; archiving and digital preservation; as well as digital cinema; broadcast; satellite; cable; network; internet and OTT and VOD distribution. Capacity and performance trends as well as media projections are made for each of the various market segments. Industry storage capacity and revenue projections include direct attached storage, cloud (including object storage), real-time as well as near-line network storage.

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