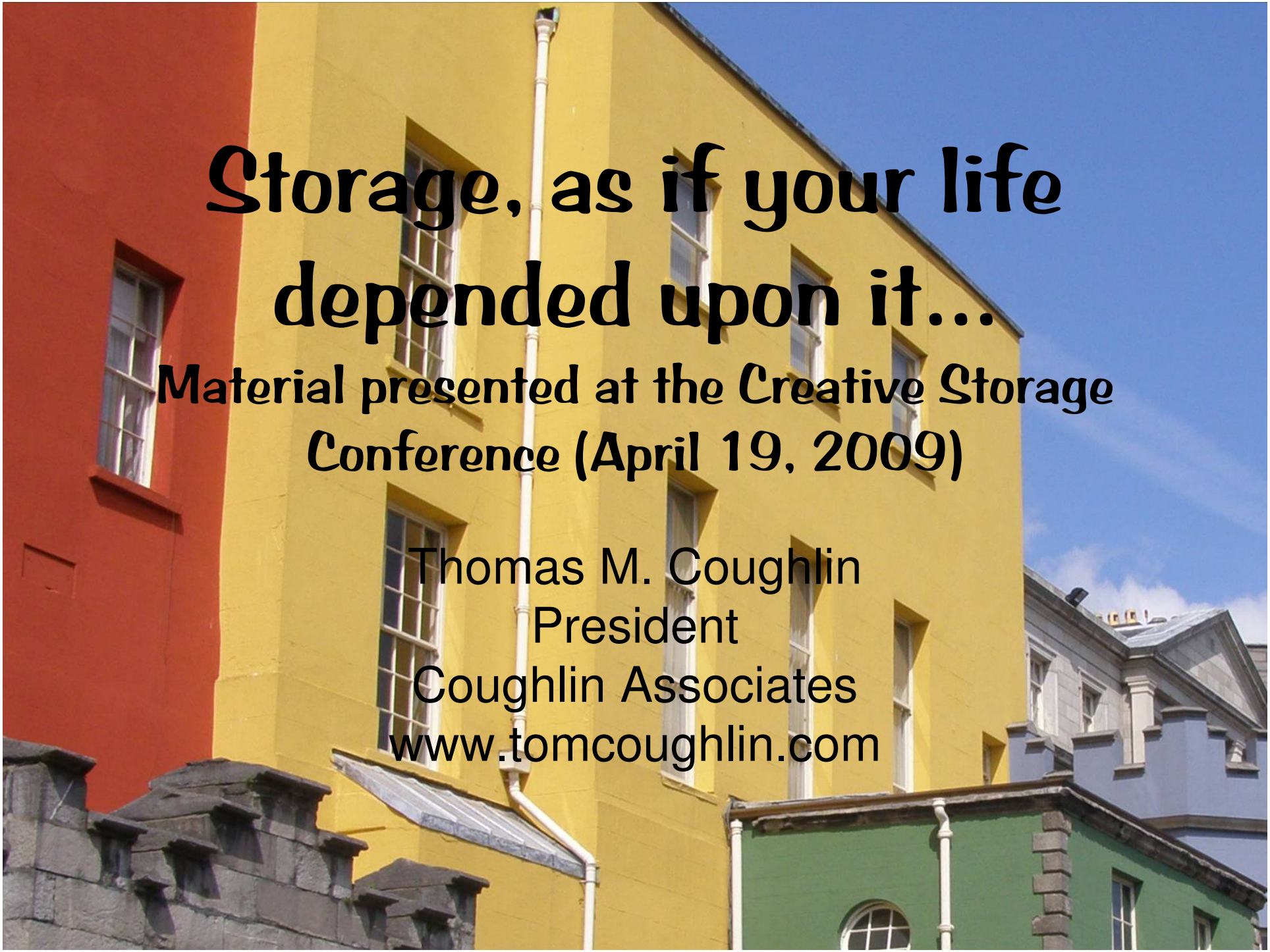

# Storage, as if your life depended upon it…

## Material presented at the Creative Storage Conference (April 19, 2009)

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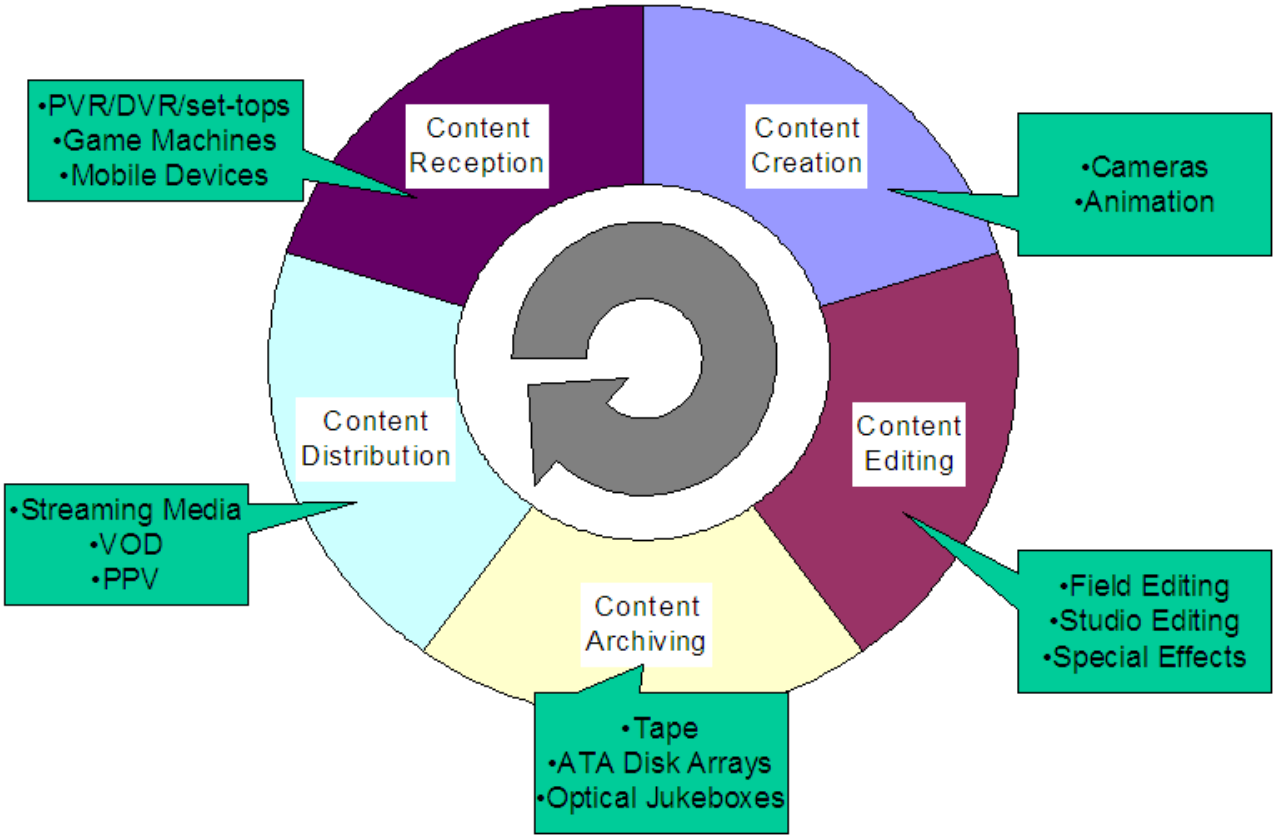
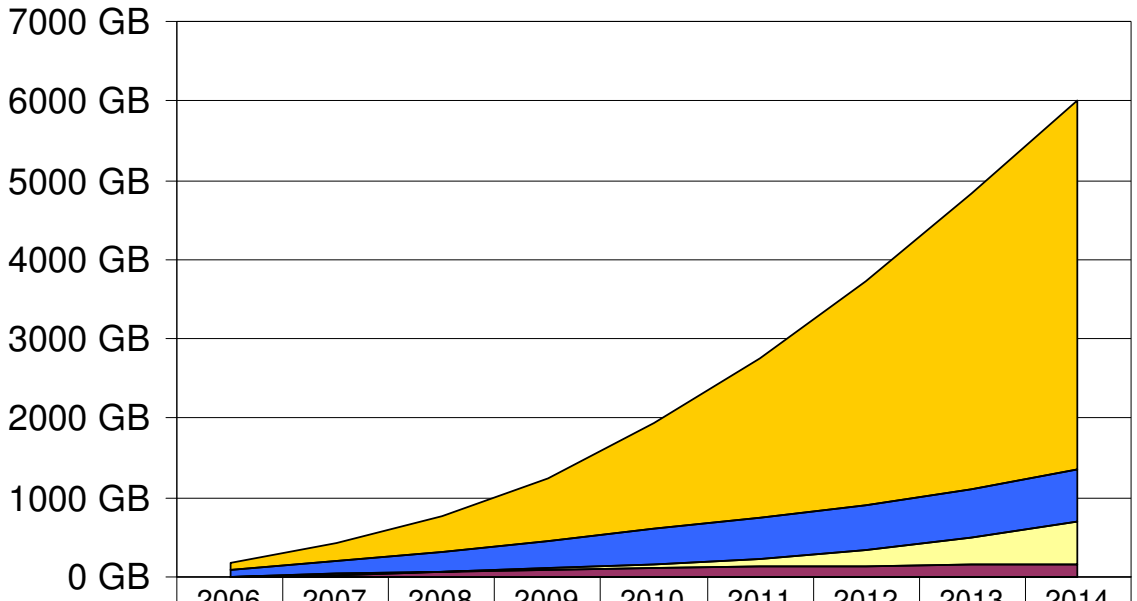
# Digital Entertainment Content Value Chain (An Accelerating Positive Feedback Loop)



# Home Entertainment Accumulated Digital Commercial Content per Average Household



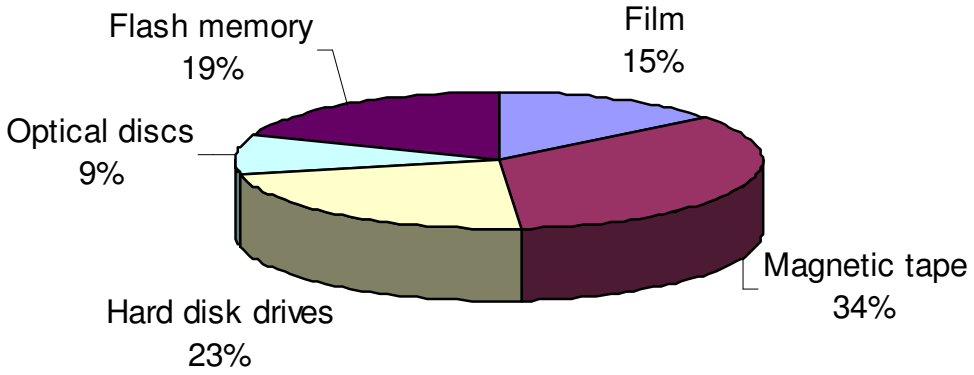

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|
| HD Television | 106.36 | 234.00 | 433.75 | 779.00 | 1,336.3 | 2,008.8 | 2,806.1 | 3,728.1 | 4,650.1 |
| SD Television | 78.07 | 164.66 | 257.80 | 353.80 | 447.65 | 524.29 | 582.30 | 621.69 | 661.08 |
| HD Video Download | - | 2.28 | 8.80 | 22.89 | 49.08 | 96.15 | 186.22 | 330.32 | 528.56 |
| SD Video Download | 6.71 | 32.74 | 58.37 | 83.19 | 106.62 | 127.60 | 143.34 | 152.49 | 157.95 |
| Music | 0.58 | 0.88 | 1.19 | 1.50 | 1.82 | 2.13 | 2.45 | 2.76 | 3.12 |

- Even an average household will have Terabytes of commercial data in the next decade
- The bulk of this storage is used for video
- As content resolution increases the required storage capacity must increase as well

•**2009 Digital Storage in Consumer Electronics Report** (Coughlin Associates, April 2009)

# Flash Based High End Digital Cameras

**Percentage of Recording Media in Cameras**

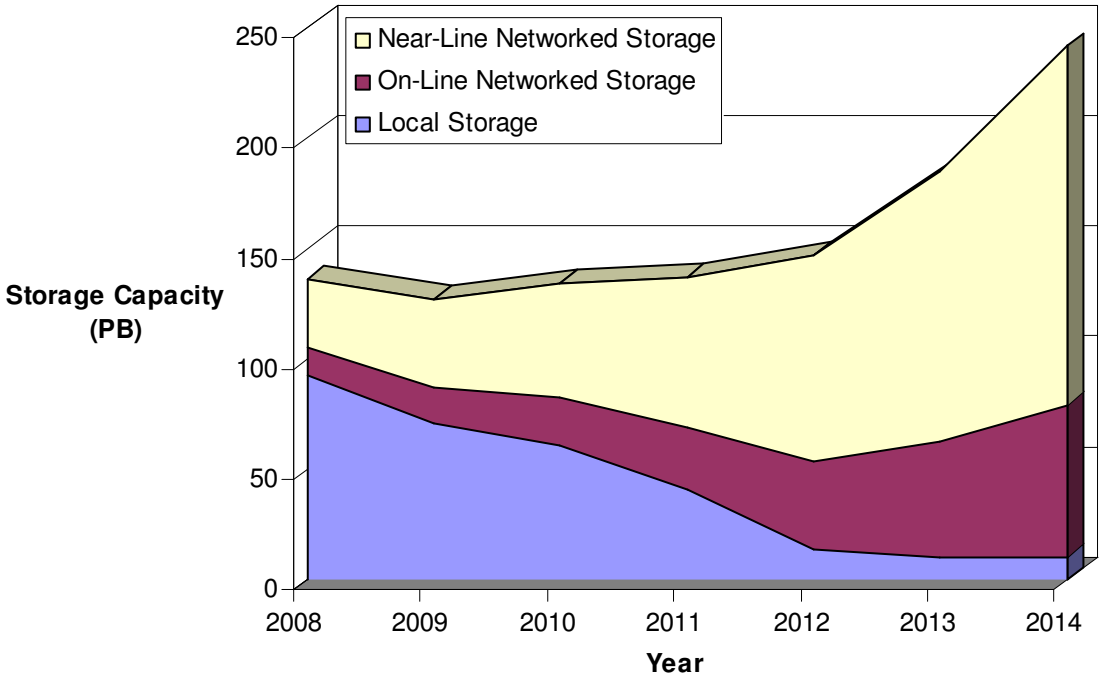



**2009 Survey of Media and Enteratainment Professionals**
(Coughlin Associates, April 2009)

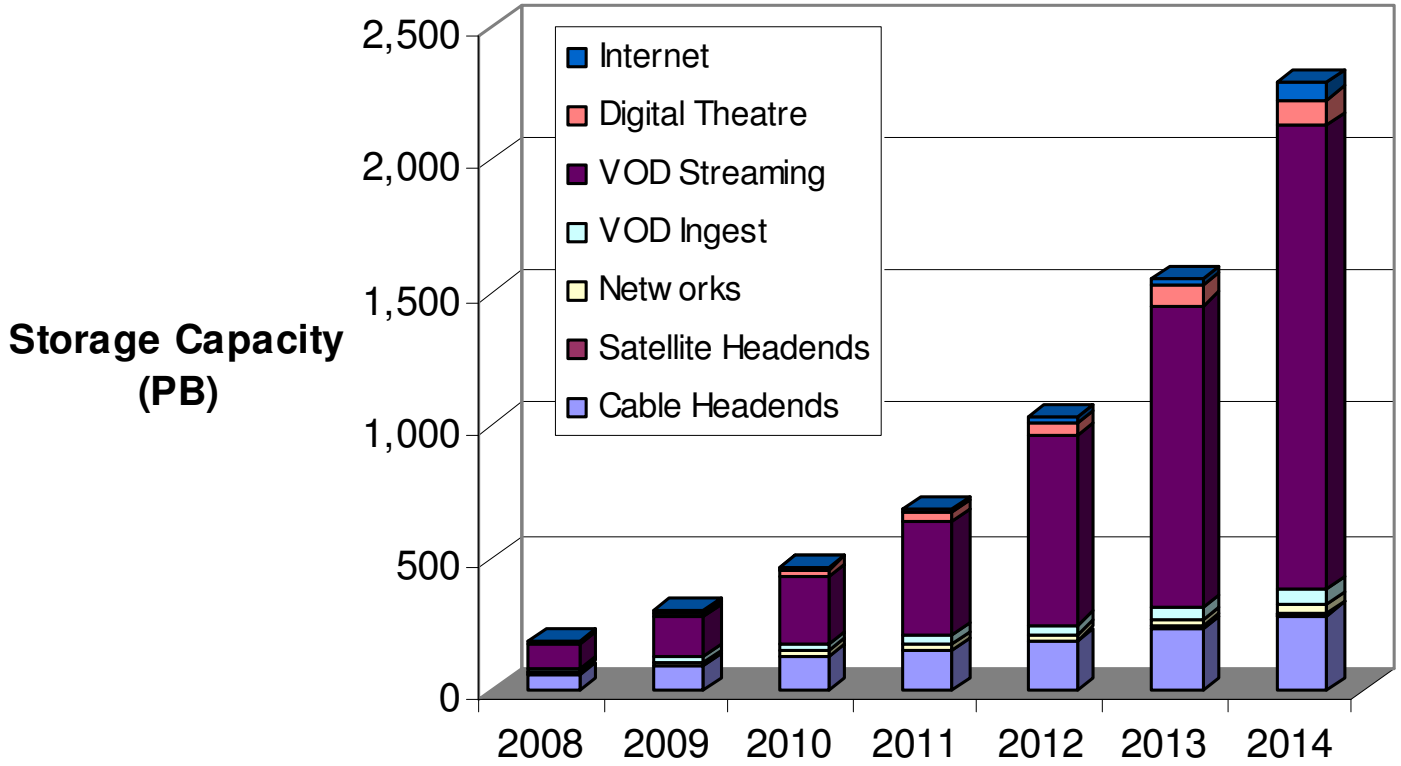

- Panasonic, Sony and other high end video camera manufacturers are making flash memory-based mobile video cameras
- Most of these use proprietary flash card formats

# Postproduction Digital Storage Growth Projections

- Post production is the single biggest driver of on-line networked storage demand in the entertainment industry.
- Along with archiving it is the biggest driver of near-line (lower performance but higher capacity and lower cost) networked storage
- Direct attached storage capacity will decline with the availability of high performance network storage



# Accumulated Storage Capacity for Content Distribution

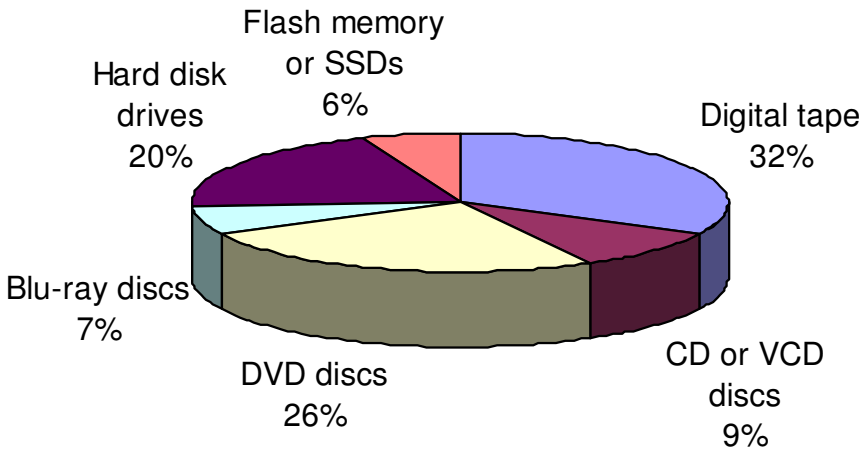



- Many distribution channels use compressed formats
- Distribution methods will require larger amounts of storage as the digital content resolution increases.

# Content Delivery Survey Results

- Average hours on central content delivery system was about 200 hours (varied widely) with about 150 hours ingested monthly
- About 20% used flash memory on their edge servers

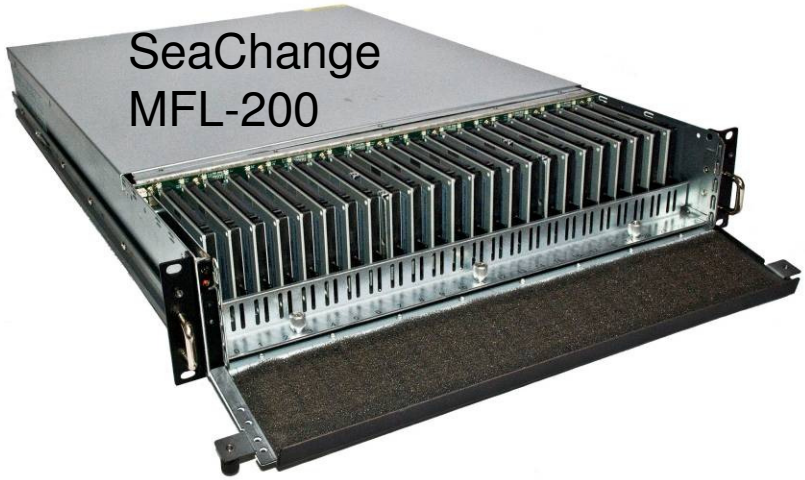
**Percentage Content on Physical Media for Content Distribution**



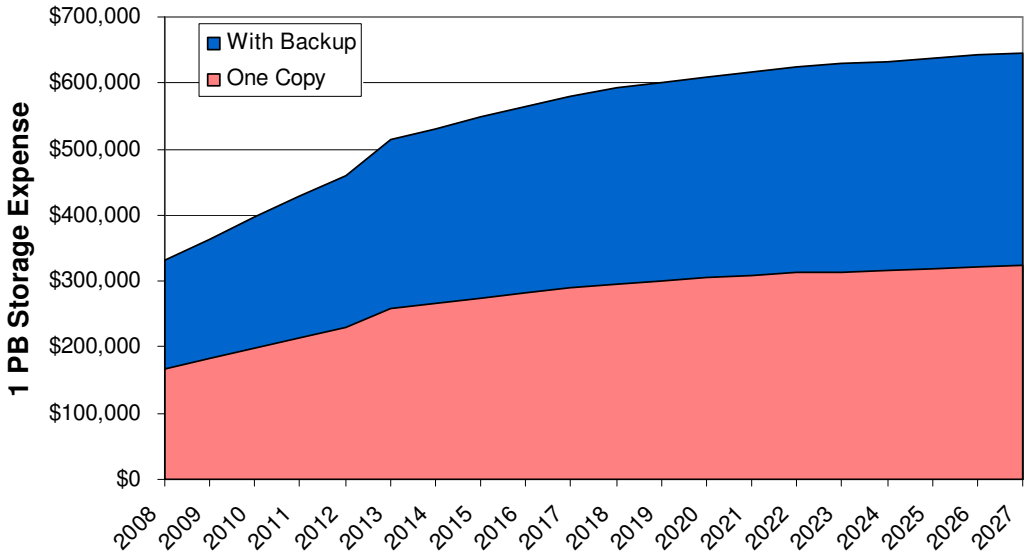

**2009 Survey of Media and Enteratainment Professionals** (Coughlin Associates, April 2009)

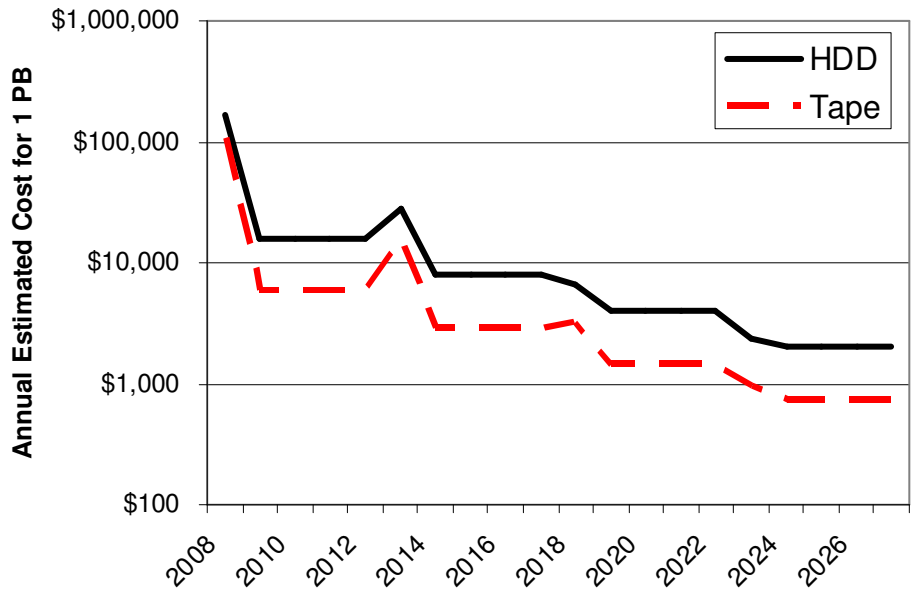
# Flash Based Content Delivery

- In 2008 we saw edge and central delivery products from several companies using flash memory including
  - SeaChange
  - Sun



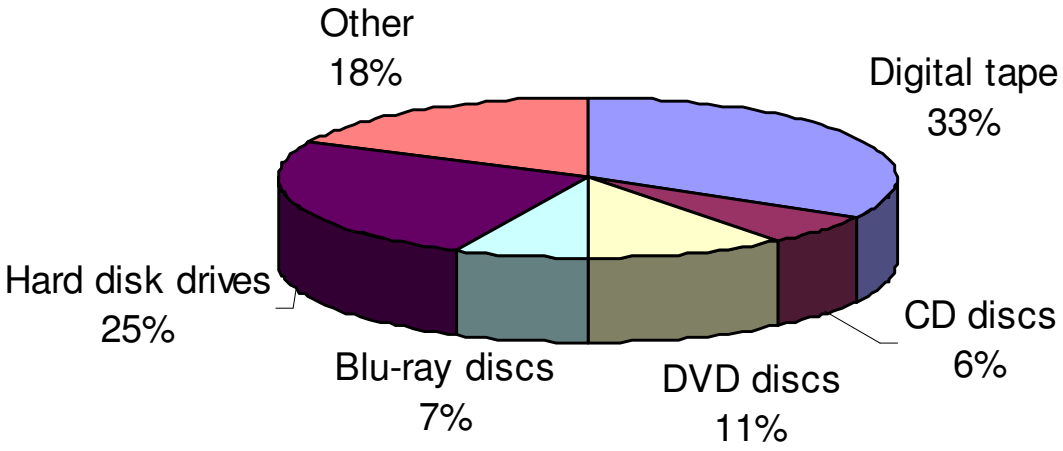

# Cost for Storing 1 PB for 20 Years



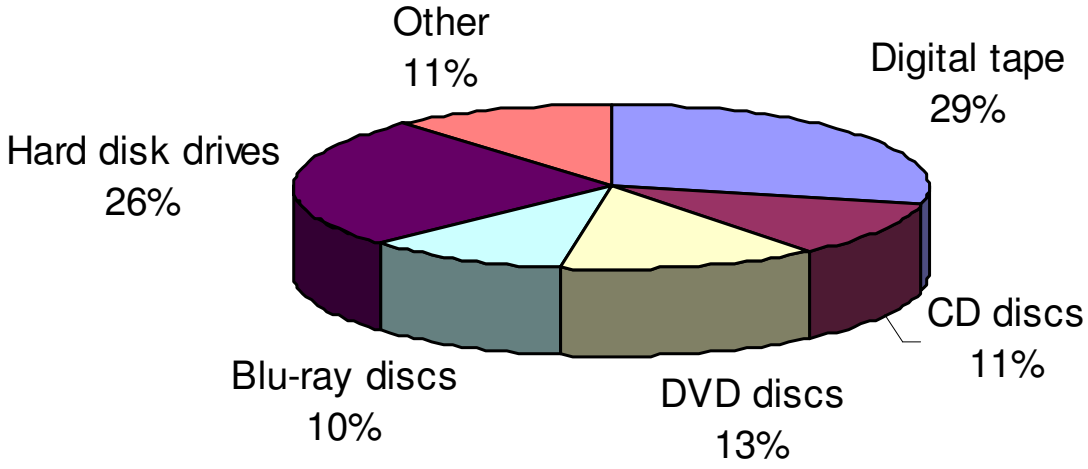




- 1 PB of storage using 1 TB HDDs with proper environment, racks, HVAC, etc. cost about $166,000 up front and $16,000 per year to maintain.
- **Over 50% of the total cost of preserving the 1 PB of content is in the first year.**

## Percentage of Digital Long Term Archives




## Growth Rate of Archival Media

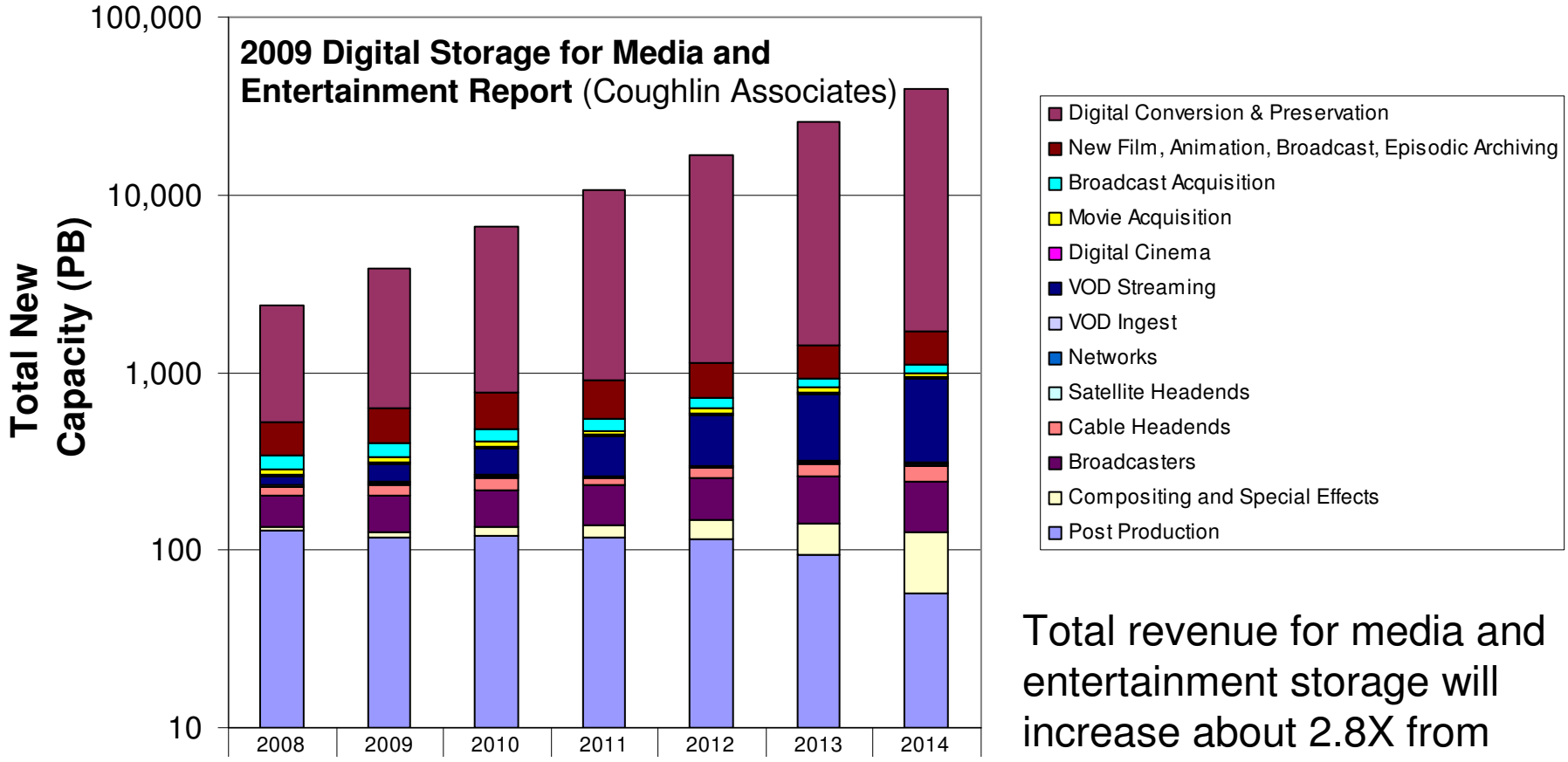



- Tape and HDDs predominate in long term archival media and are projected to show greatest growth rate in the future
- About 41% never update their digital archives
- 75% used different storage for archiving and working storage

**2009 Survey of Media and Enteratainment Professionals** (Coughlin Associates, April 2009)

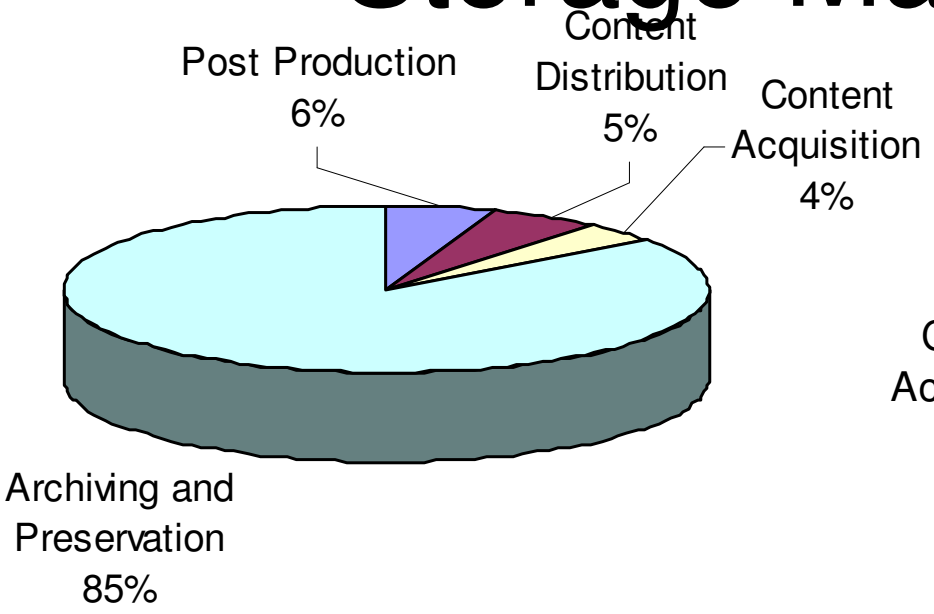
# Total New Storage Capacity for Media and Entertainment

(over 39 Exabytes of New Storage by 2014)

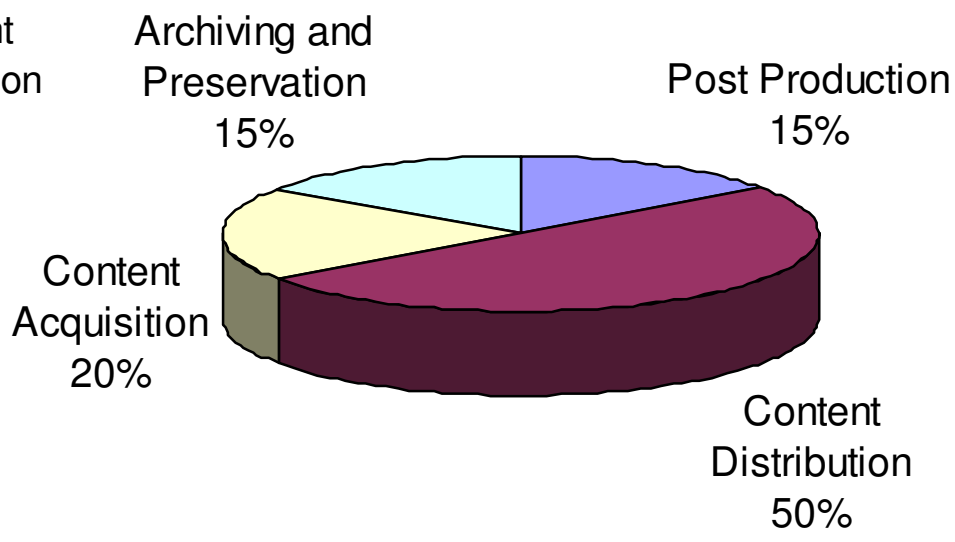



Total revenue for media and entertainment storage will increase about 2.8X from 2008 through 2014 ($3.5 B to $9.9 B)

# Media and Entertainment Storage Market (2008)




**Distribution of Storage Capacity for Entertainment Creation, Archiving, and Distribution Segments (2008)**




**Media and Entertainment Market Storage Revenue Share by Segment (2008)**

**2009 Digital Storage for Media and Entertainment Report**
(Coughlin Associates)

# Sources

- **2009 Digital Storage for Media and Entertainment Report**, Coughlin Associates
- **2009 Digital Storage in Consumer Electronics Report**, Coughlin Associates
- **2009 Survey of Media and Entertainment Professionals**, Coughlin Associates

For more information go to the tech papers section of www.tomcoughlin.com


Thanks!