4K Video, Real-Time Analytics, and AI Applications Drive 24G SAS

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About Demartek

- Industry Analysis and ISO 17025 accredited test lab

- Lab includes enterprise servers, networking & storage (6/12Gb SAS, 10/25/40/100GbE, 8/16/32GFC)

- We prefer to run real-world applications to test servers and storage solutions (databases, Hadoop, etc.)

- Demartek is an EPA-recognized test lab for ENERGY STAR Data Center Storage testing

- Website: www.demartek.com/TestLab

Demartek®

- Full Report
- Short Report
- Video Report
- Infographic
- Commentary
- Speaking

Storage Interface Comparison

- Free reference page on demartek.com
  - www.demartek.com/Demartek_Interface_Comparison.html
  - Search for "**storage interface comparison**" in your favorite search engine
- Popular page – includes interactive PDF for download
- Provides comparison of storage interfaces
  - FC, FCoE, IB, iSCSI, NVMe, PCIe, SAS, SATA, Thunderbolt, USB
  - Transfer rates, encoding schemes, history, roadmaps, cabling, connectors
- *We're not a product vendor – we use these technologies in our lab*

What do these have in common?

- 4K Video

- Real-time Analytics

- AI Applications

4K Video

- UHD, DCI 4K standard: 4096 x 2160 ≈ 8.8M pixels
  - Used in theaters and by the movie studios
- UHD-1 or UHDTV: 3840 x 2160 ≈ 8.3M pixels
  - Used in consumer devices
  - 4x 1080p (1920 x 1080 ≈ 2.1M pixels)
  - 9x 720p (1280 x 720 ≈ 0.9M pixels)
- 4K TV broadcasting expected by 2019 or 2020 in USA
  - ATSC 3.0 specification, early trials in 2017

Storage Requirements for Video?

Data rates (MB/s) for video editing

- 4 – 444 depending on resolution, etc.*

- Per video editing station

SAS has the bandwidth for the storage back-end to support many video editing stations

* Source: Avid
http://avid.force.com/pkb/articles/en_US/White_Paper/DNxHR-Codec-Bandwidth-Specifications

Multiple cameras or video streams

- Number of cameras

- Number of hours of recording (per camera)

- Frames per second (fps)

- Resolution (4K, 1080p, 720p, etc.)

- Compression used (Codec)

- Length of time data is to be stored

- Number of backup copies

Imagine a video surveillance system:
100 cameras, 720p, 15 fps, 24 hours

Real-time Analytics

- Reminder: 1440 minutes/day and 86,400 seconds/day
- A few sources of data:
  - Internet of Things (IoT) sensors, cameras, etc.
  - IT infrastructure event logs (servers, network, storage, security, etc.)
  - Payment transactions
  - Smart buildings, cars, cities
  - Medical procedures, studies
- Ingest, extract and process in real-time requires:
  - Fast storage access and processing power near the data source
- SAS infrastructure supports this today

Artificial Intelligence (AI) Applications

- AI and machine learning are hungry for massive amounts of data in order to make predictions and other analysis
  - Free dashcam example
  - MyShake example
- The nature of storage needs to adapt
  - Faster
  - More metadata   SAS supports this today
  - Policy-based management

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- 4K Video
- Real-time Analytics
- AI Applications

- Huge amounts of data
- Need fast access to storage

Demartek®

24G SAS

- Takes advantage of the faster PCIe 4.0 bus
- Backward compatible with the full SAS ecosystem
- Already supported:
  - Scales to thousands of devices
  - Dual-ported drives
  - Hot swap
  - Multi-path I/O (MPIO)
  - Broad O.S. and hypervisor support
  - Management infrastructure