



Hybrid Flash Arrays for Video Surveillance

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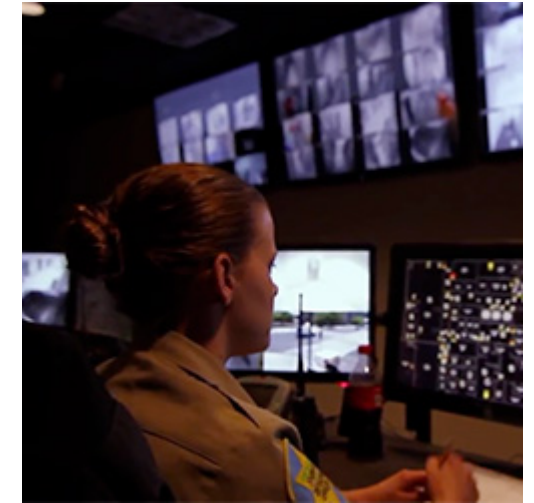
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Real Time Matters™

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- Requirements for Video Surveillance
- What has Changed -- and Why Flash
- Profile of a Customer Installation
- What Makes This Work
- Market Opportunity for Video Surveillance



Traditional System

- Many cameras writing to NVR
- Low frame Rate
- Moderate resolution
- “Good enough” to see an image

Traditional Storage Requirements

- Need lots of capacity, cheap
- High write ratio
- Sequential throughout performance
- Did I mention cheap?

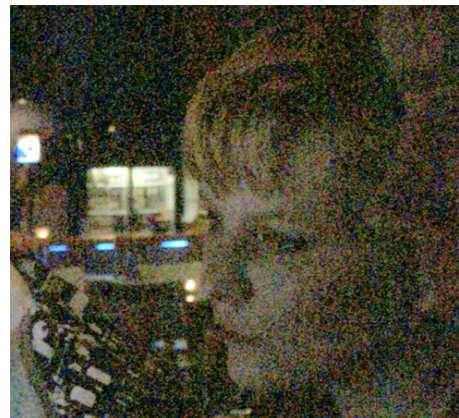
Too many incidents
with high public
awareness



Greater security concerns



“I can use my cell
phone, why can’t you
get better video?”



What is Enabling Data Growth in Video Surveillance Storage?

- Security Threats across the World
- Growing Installations of Surveillance Systems
- 3D, 4K HD and new Pattern Recognition Analytics

Today's System

- Hundreds of cameras writing to centralized storage
- High frame rates
- High resolution
- Sophisticated software for identification and analysis
- “I want to see the detail”

Today's Storage Requirements

- Huge capacity, affordable
- High write ratio
- Sequential throughput performance for massive simultaneous streams
- Transaction performance for transcoding and analytics

Customer Profile: Bakersfield City School District

- 28,000 students
- Elementary, Middle, and High Schools
- 158 square miles
- 43 campus locations plus 2 administration sites
- 2000 IP-based cameras in operation



Requirements:

- Must capture, convert and securely store video content
- Combined need for high-bandwidth, performance-intensive transactions on top of archival requirements
- All cameras record at 10-15 frames per second
- Video resolution at 640x480 or greater
- Ability to store all content for 30 days



“The system needed to handle fast transaction workloads consistently and also provide cost-effective archival storage for video files.”

Solution Overview

- Implemented centralized storage with Dot Hill AssuredSAN hybrid flash array and RealTier software
- Video is captured in various native formats from individual cameras
- Video is converted to H.264 format resulting in a 35% reduction; and stored for 30 days
- Installed and supported through West Coast Technology



Benefits

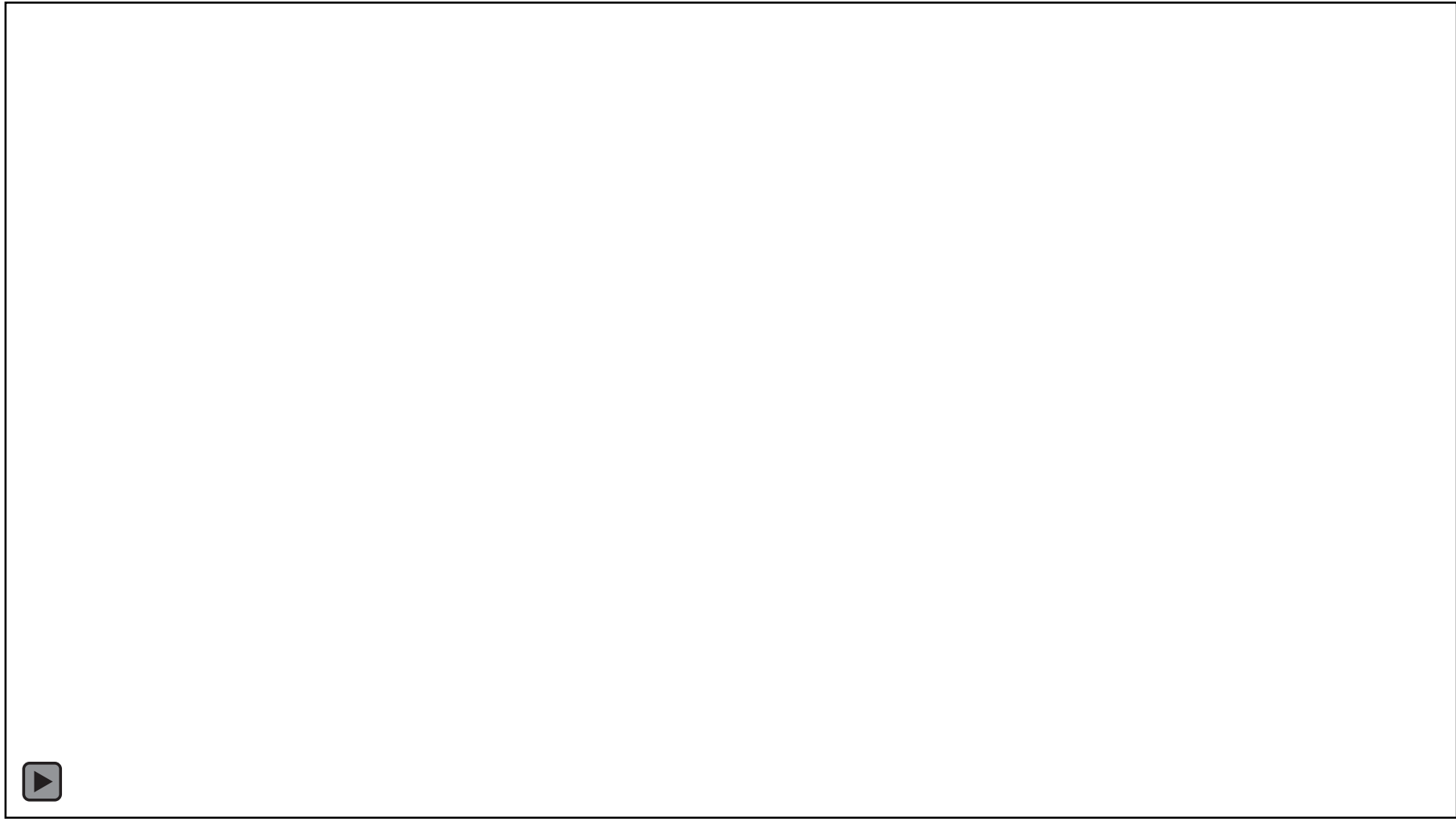
- Performance is optimized for transactions, capacity is optimized for long term storage
- Reduced rack space, reduced power requirements
- Ease of use

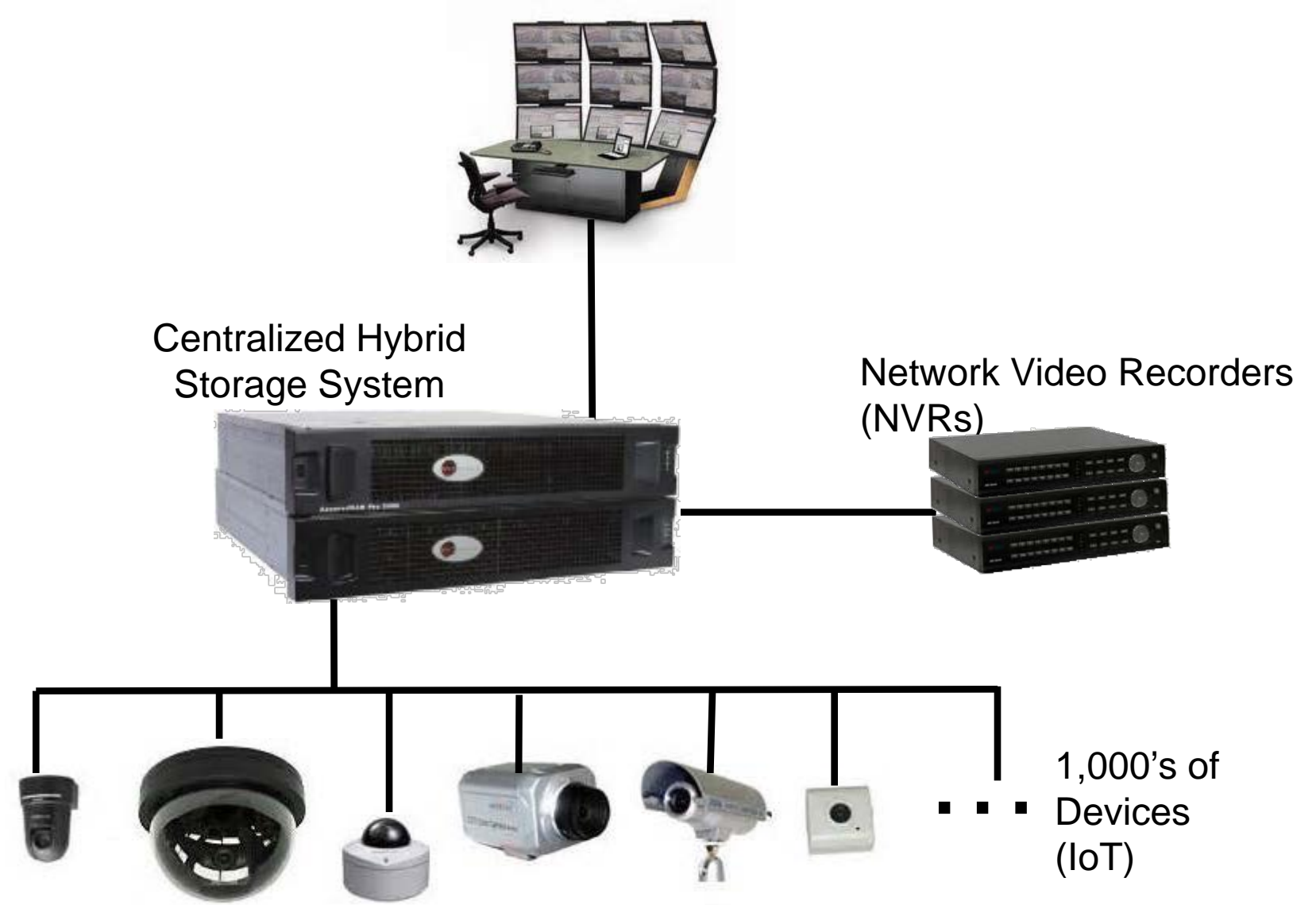
Two keys to success:

1. Hybrid Storage Array
2. Real Time Tiering

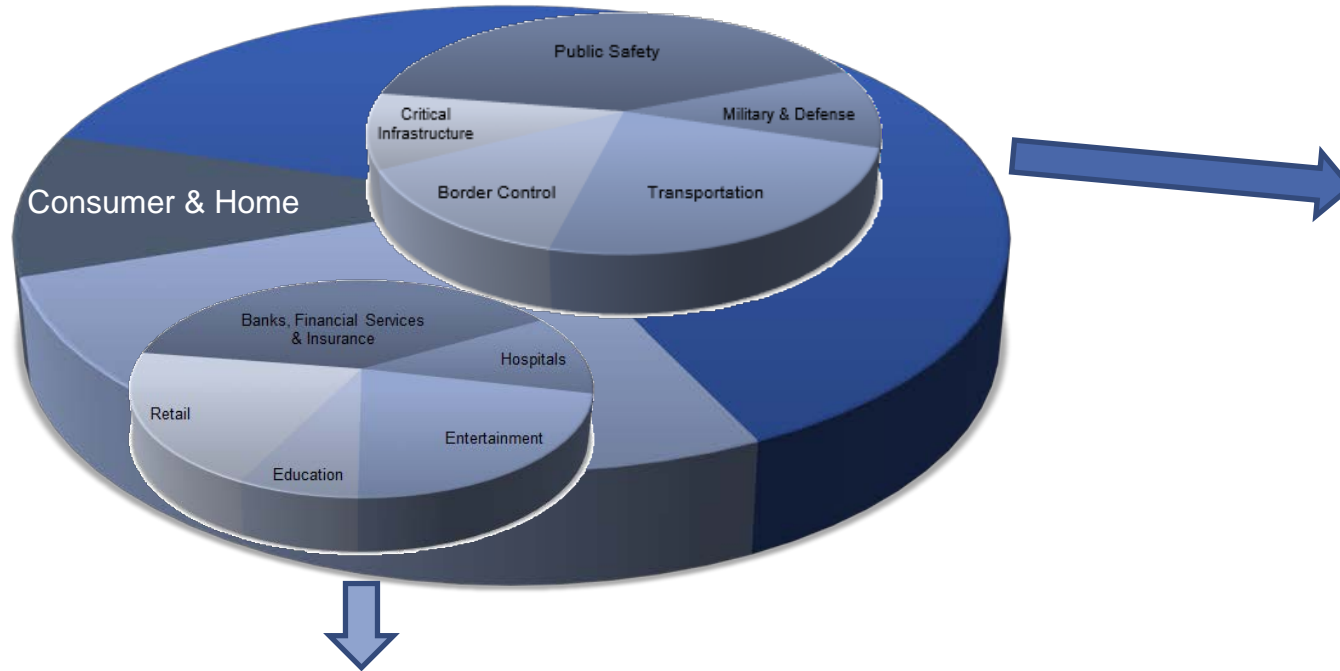


- **SSD's are 10 times more expensive than HDD's**
That's true on a per-capacity basis
- **HDD's are 10 times more expensive than SSD's**
That's true on a per-IOPS basis
- **Economics of a hybrid array**
Design a system with only 5% - 10% of the capacity as SSD, that can deliver 70%-80% of the I/O via SSD



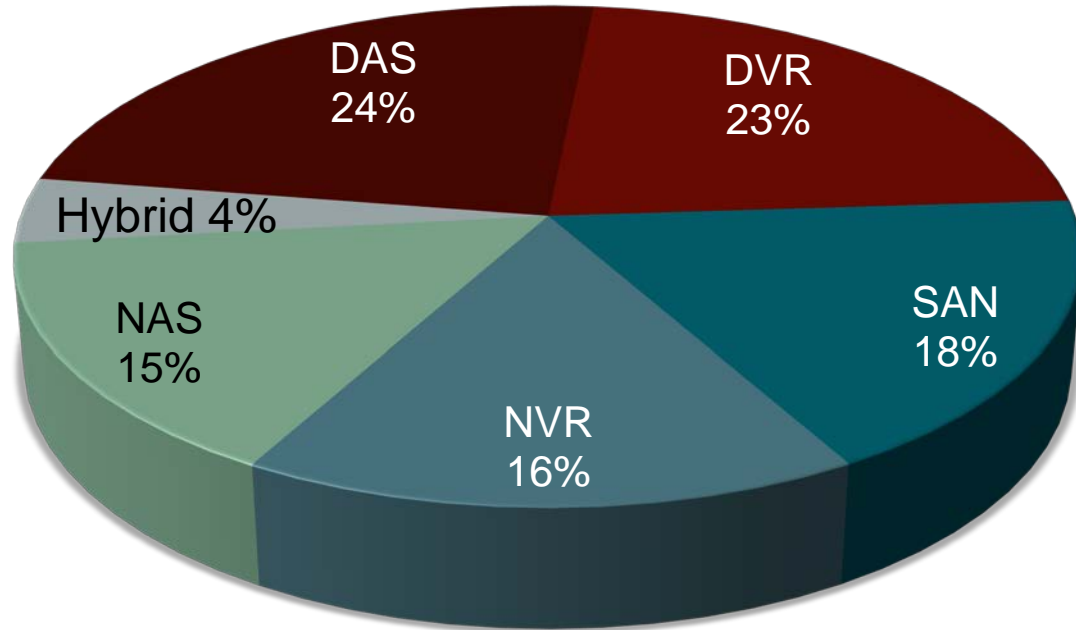


Revenue: 6.57B

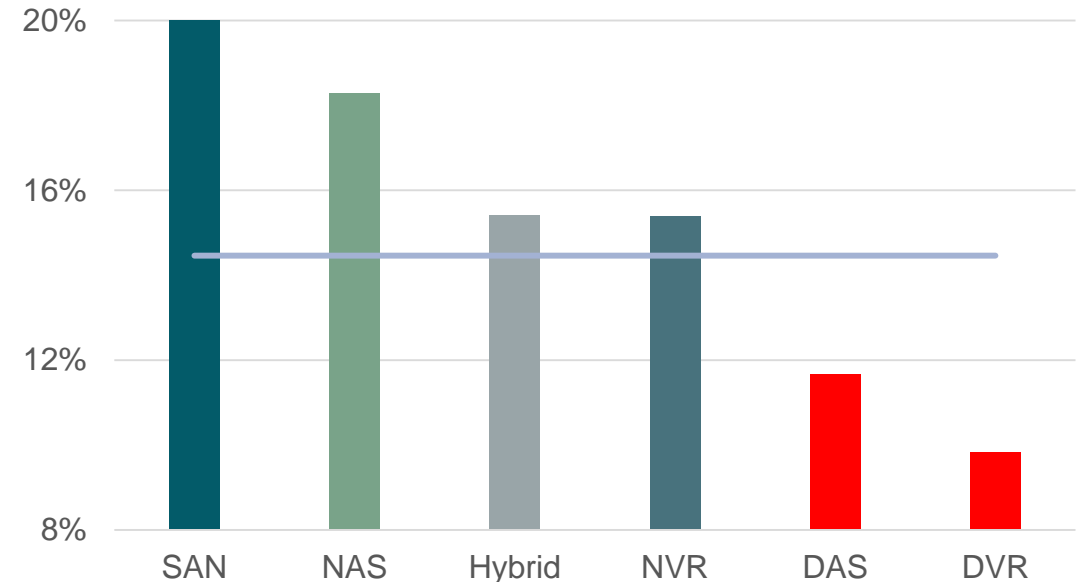


The largest opportunities for storage include Government & Utilities and Enterprise. And these segments are growing at a 12.9% and 20.7% CAGR respectively.

Storage Revenue: 3.46B



2013-2016 Growth Rates (CAGR %)



Older technologies (DVR & DAS) represent close to half of the market, **but . . .**

New storage systems including Hybrids are driving the storage growth for the future.

What is compelling about this story?

- This could be your neighborhood, your child's school
- Combination of
low cost cameras,
flash-enabled storage,
and intelligent software
can make you safer

Beyond security to Business Intelligence
and other applications





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