



Video Surveillance Storage Predictions in 2017 & Beyond

“Storage in the ERA OF DATA TECHNOLOGY “

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Moscow
Sokolniki Expo
ALL-OVER-IP

ONVIF[®]
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*The greatest value of a picture is when it forces us
to notice what we never expected to see.*

John Tukey, American Mathematician

Info Tech (IT) Era



Data Tech (DT) Era



*'Information Technology is about:
I have it, you don't have it '*

*Jack Ma,
Alibaba*



*'Data Technology is about:
I have it and I share it with you'*

Key Drivers of Data Growth

Video is a key contributor to storage growth



MOBILITY

Smartphones and Tablets

BIG DATA ANALYTICS

Waze, Splunk, Hadoop

INTERNET OF THINGS

Nest, Apple Watch, Fitbit, Google Glass, Wearable Technology



SURVEILLANCE AND SECURITY

Smart City, Shopping Malls



HD AND MEDIA-RICH VIDEO

iPhone 4K Video, Virtual gaming



Surveillance Industry is heading towards data technology..

Towards Data Oriented, Data Insights & Data Retention

**Adopt video broadcast
/M&E technologies**



Video Matrix
Analog Switches
VHS Recorder

Analog Surveillance

**Adopt IT oriented
technologies**



PC-Based DVR
Standalone DVR

Digital Surveillance

**Adopt IT oriented
equipments**



NVR
IP camera
VMS
Encoder/Decoder
Storage

**Network /HD
Surveillance**

**Adopt IT oriented
applications**



NVR
VMS
Video Analytic
Cloud – Vsaas
IP SAN/Storage

Converged Surveillance

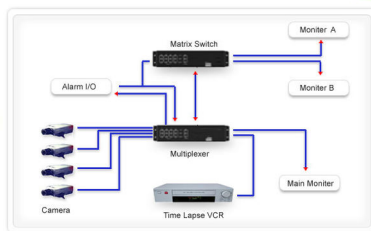
**Adopt AI/Big
Data/converged
sources**



Edge Focused | IOT / VR
Cognitive Based – AI/Deep
learning
Computing
Big Data
Scalable

**Smart / Cognitive
Surveillance**

Storage is a key enabler of Surveillance Technology



Analog CCTV



**Digital CCTV –
Analog & IP**



**IP Surveillance – NVR / VMS /
Open Platform**

SD Resolution (CIF)



SD Resolution – FULL D1/4CIF ~ 1080P



HD ~ 4K | Multi-imager | Metadata | VMS |
LPR and etc



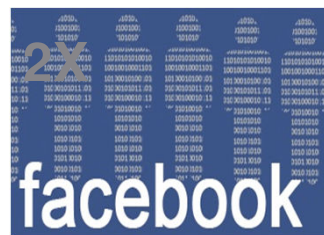
Daily Video Surveillance Recordings

2015:

566 PB recorded Daily
by all cameras installed
worldwide

- 11.3 million double-layer Blu-Ray discs
- 2x the data stored by Facebook
- 566,000 1TB Hard Drives Capacity are used up, per day

11.3M



2019:

2,500 PB recorded
Daily

**>4x Storage
In 4 years**

Just RAW capacity of **Enterprise Storage** for Video Surveillance will increase by
48% in 2016

Based on IHS, 2015

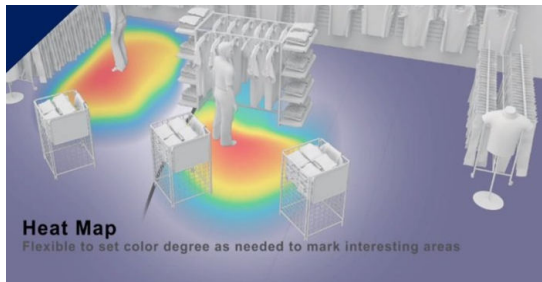
Key Technology Trends in 2017 & Beyond



Multi-Sensors Camera/Imaging



Cloud & Centralized Video Management Architecture

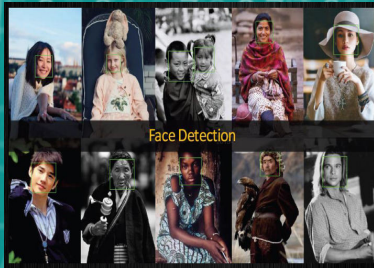


Artificial Intelligence / Deep Learning – Automating Video Surveillance Operation



Big Data & IOT Convergence

Challenges Ahead .. On Storage



Complex Image processing = Increase Data Workloads



Big Data & Analysis = Higher Video Retention (Lower Cost/GB)



Open Platform & Integrations = Beyond DVR/NVR recorder – Software Driven + Storage Solutions (Storage management)



BIG

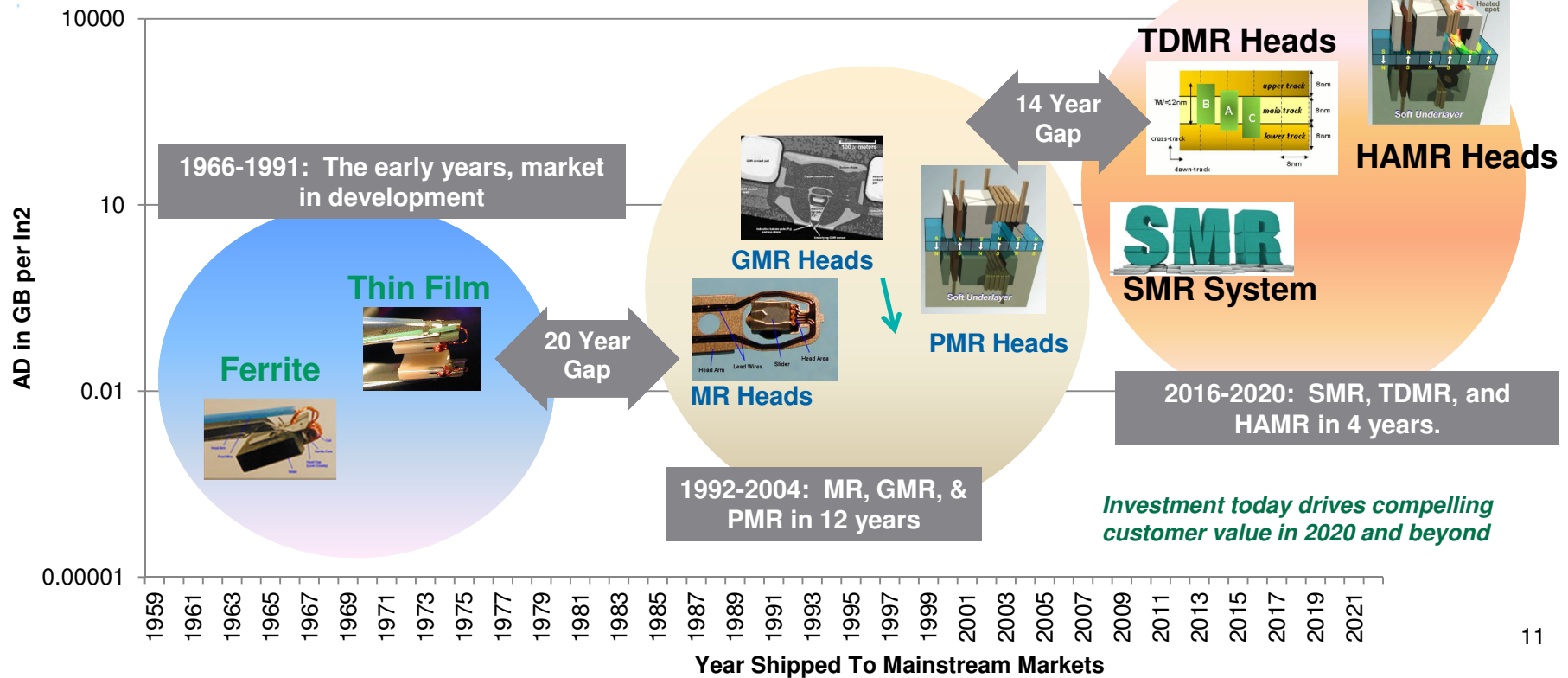
Smart

Purpose Built

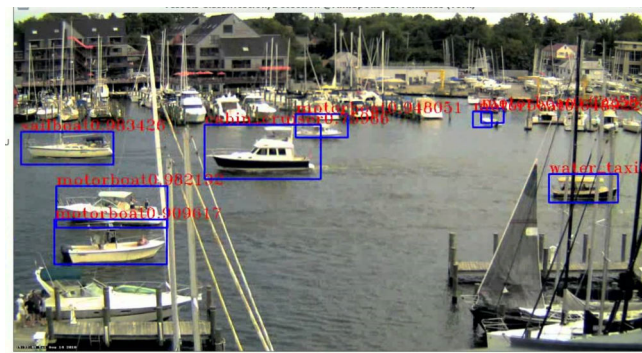
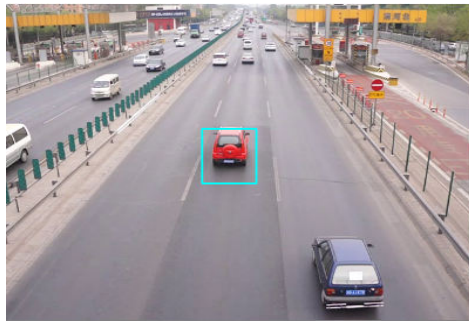
Storage Technology: Enabling BIG CAPACITY

HDD is still & will continue to be preferred medium for Surveillance Recording

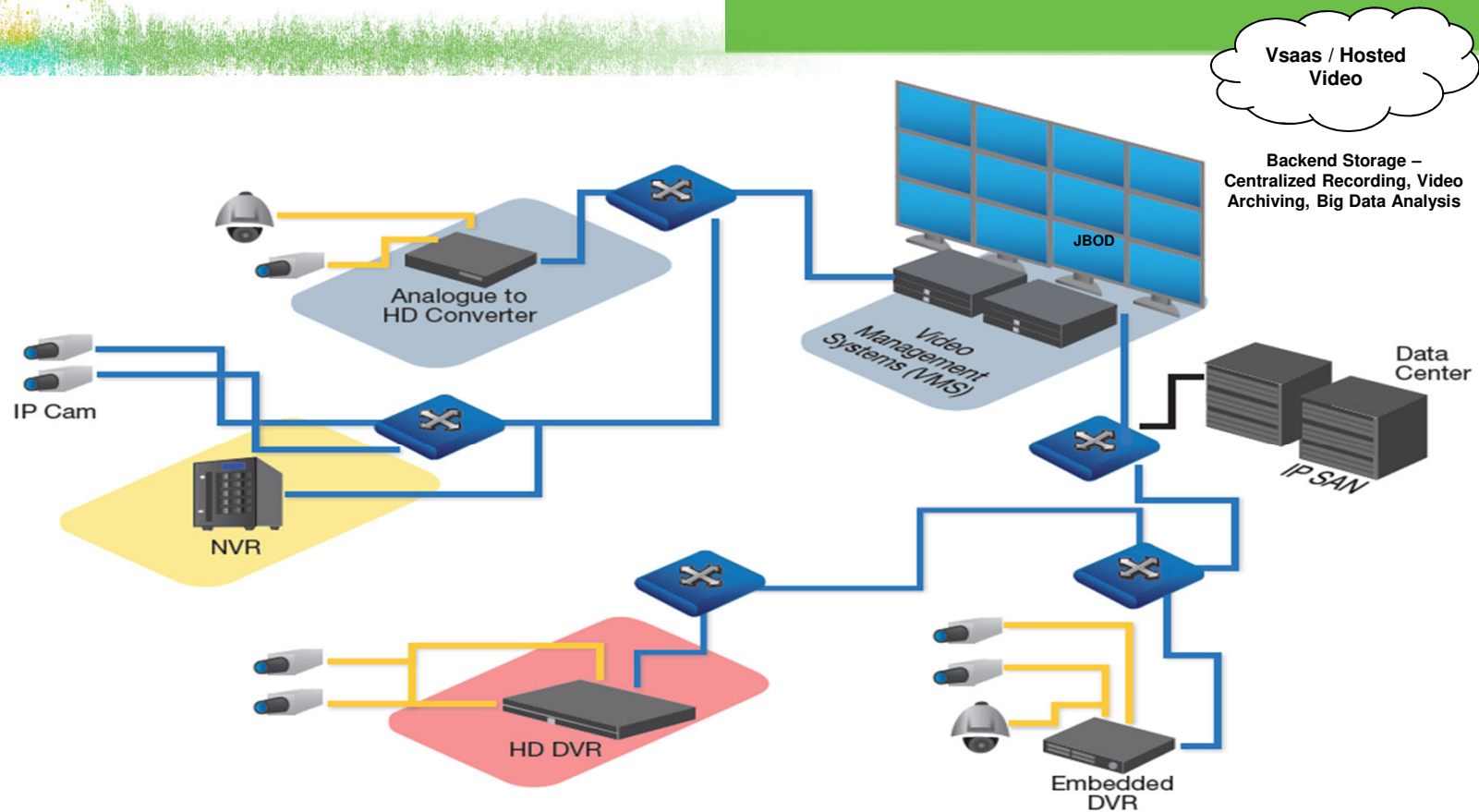
Big Investments: 3 technologies in 4 years



VCA..AI... Big Data ... Requiring Smarter Storage



Different Usage Models of Video Surveillance Requiring Purpose Built Storage



Key Criteria of Video Surveillance Storage



Evolution of Storage Solution

Yesterday



Form Factors

Today



Multi Products

Tomorrow




Big, Smart & Secure Storage
For Verticals


Video Recording Optimization Technology is Core of SV Purpose Built Storage



Video Frame Optimization – Reduce Video Pixelization & Data Integrity



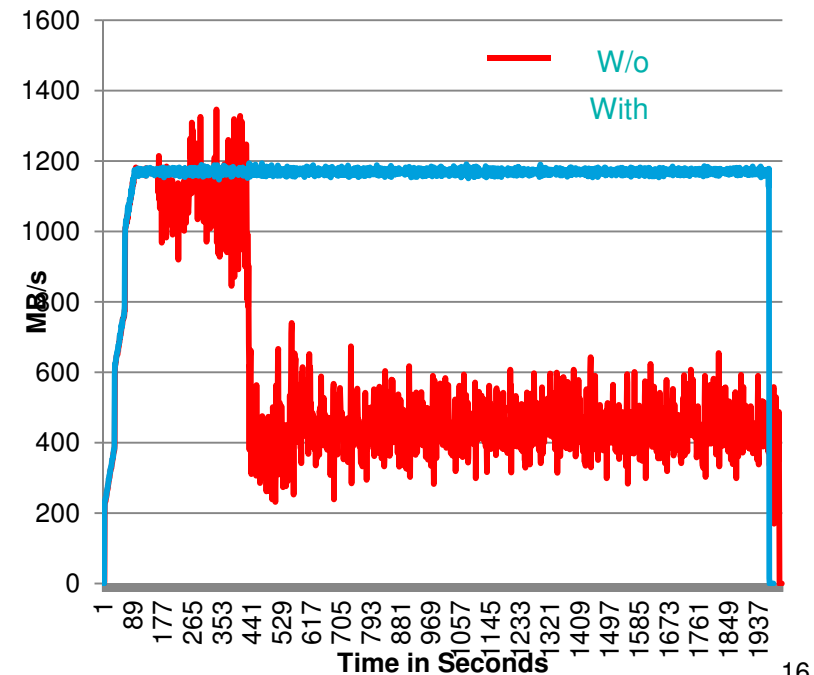
Regular Hard Drives
with Pixelization



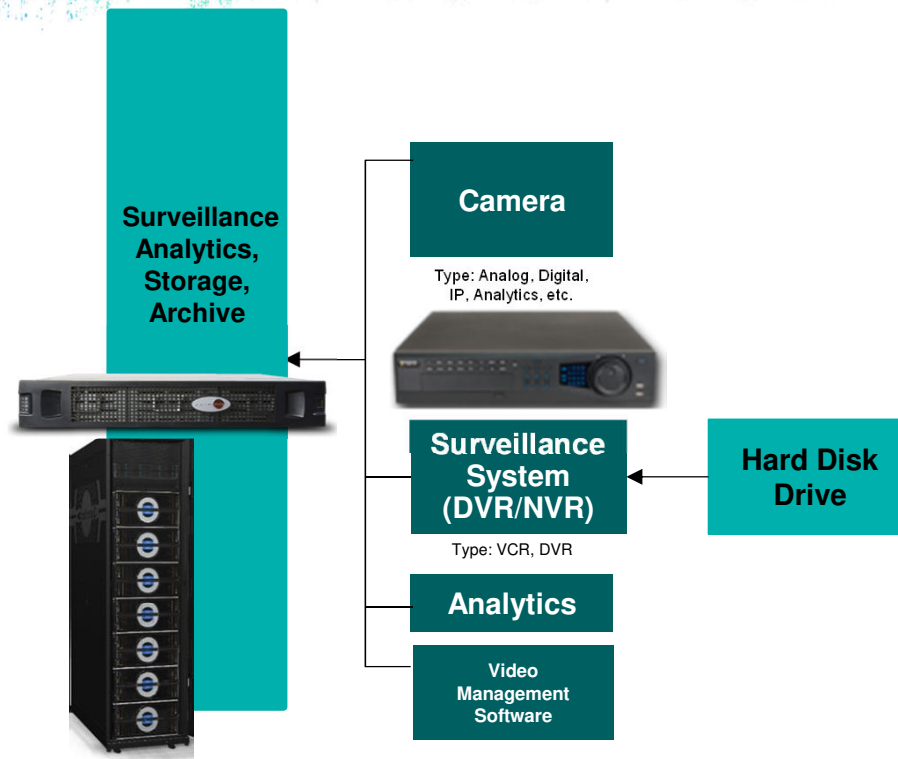
Seagate Surveillance HDD
with ImagePerfect Firmware

- ① Reduces data errors, allows for perfect images without pixelization to be stored without interruption with upto 64 cameras
- ② Intelligent Firmware algorithms prioritize video streaming integrity to prevent critical frames from being lost
- ③ Optimized for 90% "write" environment, Allows analysis of data streams for analytics

Consistent Video Streaming Performance under Multiple HD & 4K Recording



Storage For Every Surveillance Solution



Surveillance Systems are Complex – so are the storage needs

“One Size Doesn’t Fit All “

Using the right storage = Lower cost of deployment, Reduce Maintenance & Reduce Risks

- **SSD:** Highest IOPS Performance for Caching and video processing/analytic and big data
- **Enterprise NL HDDs:** High IOPS/Performance, Scalable, Secure & ES Class Reliability
- **Archive HDD :** Affordable active archive hard drives perfect for backup and Cloud storage.
- **Surveillance HDD :** Optimize system reliability and cost for surveillance specific applications (NVR/DVR)



BIG

Smart

Purpose Built