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## Video Storage and Recording Options

Avoiding colossal system design &  
integration failure;  
lessons from the trenches

### Disclaimer

- The named security manufacturer equipment and solutions identified in this presentation are not an endorsement of the manufacturer, and are offered in this presentation to provide a visual of the particular technology, issue, or feature benefit available in the industry.
- Points of view are those of the presenter and Sikurity LLC, and are not those of ASIS or the security manufacturers identified.
- The audience is further advised that strongly held opinions of the presenter are opinions only gained from over 20 years of experience in the security industry, and could be wrong. The reader is invited to consult the questions and information presented herein and undertake their own discovery of these issues prior to implementation of any particular design, technology, or plan.

## **Roots of Colossal (Costly) system design and Integration Failure**

1. Projects underspecified prior to build; without a plan, one plans to fail
2. Projects using boilerplate specifications not updated nor designed for purpose
3. Projects where the wrong equipment is specified
4. Projects where the systems were specified by inexperienced individuals without understanding the nuance of the technology design & installation requirements
5. Incompatible systems and components specified

## **Roots of Colossal (Costly) system design and Integration Failure**

6. Implementation SNAFU's, costly do overs,
7. Complex projects handled too simply
8. Absence of clean, stable, and grounded power
9. Lack of rigor in the system commissioning phase; Green blinking light does not mean a system is commissioned
10. Underspecified test and acceptance procedures; subsequent failure acceptance

### **Trend: IP Video and Systems Education Required for Security Industry Installers and Specifiers**

- IP video solutions are the preferred method of Chief Technology Officers, IT departments, and large scale deployments
- However security installers still favor legacy installation methods of coaxial cable over Twisted Pair or pure Ethernet/IP networks
- Determination to go forward with IP video solutions must be accompanied IP video training and tools, and end-users may need to find new technology partners if their legacy providers refuse to re-tool, re-certify, and bring their technology capability forward.

### **Choices that impact Video System project success**

- 1 Video Recording and Storage Decision
- 2 Analog vs Digital Storage Design Decision
- 3 Digital Video Recording (Appliance vs Software)
- 4 Digital Video Storage (On-board, Attached, Network, Online)
- 5 SAAS (to be, or not to be)

## Choices that impact Video System project success

- 6 VMS Decision (and its unique considerations)
- 7 Digital Video Retrieval- Expectations, Capabilities, & Limitations
- 8 Infrastructure requirements (servers, network, storage, etc)
- 9 Stand-alone and Integrated Systems
- 10 Management Services

## 1 Video Recording and Storage Options (1 of 3)

- Between camera (end point) and observation (monitor) there are decisions to be made in terms of to:
  - Record or not to record?
  - How long to record?
  - What do you want to see on recall?
  - What quality do you want to see video?
  - How quickly might you want to recall the video?
  - Will you need to view the video in any unique forms?
  - Will this be a digital or analog system?
  - Will the system need to interface with any other equipment (e.g., POS)
- What other questions might you want to know before you specify a recording and storage solution?

## 1 Video Recording and Storage Options (2 of 3)

- What of any of the following features and controls are required in your application?
  - Date/Time
  - Motion detection
  - I/R Sensor
  - Door Switch
  - Foot Switch
  - Access Control
  - Recording variability
  - Recall options
  - Other requirements?

## 1 Video Recording and Storage Options (3 of 3)

- What resolution do you want to view the stored data? Will the data be viewed for a specific purpose that requires certain imagery parameters?
- Are there any regulations governing video use in the target place?
- What impact does available bandwidth and budget have on your decision on where to record?
- What services and functionality are required to accompany the recording?
- Is this a 'brown field' installation, or a new 'green field' installation?
- Other important considerations? i.e., "What is your budget?"

## 2 Recorders (analog and digital)

- Analog video is to Digital Video what the horse and buggy is to the modern automobile. Both will get you to your destination. But the time taken to get there often determines whether you will take the trip at all. Here are some key differences between the recording technologies:
  - Multi-tasking
  - Speed of Information Retrieval
  - User Interaction
  - Signal Degradation
  - Smart Monitoring
- The greater challenge is deciding which of the 450+ Digital Video Recorders (DVRs), VMS, NVRs, and other digital methods to standardize in your solution.

## Legacy Equipment Not Needed In IP Video Systems... Creates Savings

- IP Video Systems have incorporated many CCTV video management features in software that were previously performed by hardware.
  - VCRs
  - Time and Date Generators
  - Independent Joy Sticks and Controls for PTZ controls
  - CRT Monitors (replaced by low-energy using flat screen monitors)
  - Multiplexers
  - Matrix Switches for Video Display Walls

## Analog vs. Digital Storage

- Whether cameras are analog or digital, through digital encoding the video signals can all be digitized making digital storage possible.
- Video quality of analog video served up full screen for one camera is still good, but the retrieval, archival, and meta data analysis of digital video outstrip the merits of staying analog in most situations.
- Consequently, the choice is not so much to go, or not go digital, but when?
- Digital from the edge (at the appliance)
- Digital from an encoder attached to a analog device
- Digital at the headend control room in the form of a traditional DVR
- Any of these methods enable digital storage whether at the edge, at the control room, off-site, or in the SaaS cloud.





## IP Video Systems have largely surpassed Analog Systems for Large and Medium Scale Projects

- IP video deployments make greatest economic sense once the overall system size exceeds 40 cameras
- IP video deployments also make economic sense for organizations with multiple remote distributed sites with as few as 1 camera each
- Large or small, the specified use and conditions of operation should determine whether to go IP, or remain analog, or some hybrid solution.

## 3 Digital Video Recording (appliance vs software)

- What is meant by an appliance?
  - An appliance is a device that has hardware and software designed for a purpose to digitize and/or record digital video data.
  - Appliance examples include Axis, VideoJet, and Indigo type camera servers
  - Appliances can also be stand alone devices such as DvTel and Verint encoder devices.
  - Appliances can truly be edge appliances with their own onboard software and services
  - Appliances can also be a built-for-purpose recording solution such as a VMS
  - However, all VMS are not appliances, as some are software that you can place on your own systems hardware, or use through the Internet cloud.
  - The choice of whether to use an appliance or software solution depends on your situation and a number of decision making factors, including some previously discussed in this presentation

## One View of the IP Video Pedigree and Leadership

<p style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">Pioneering Manufacturing Phase</p> 	<p style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">Proprietary Systems - Pioneering Phase</p> 	<p style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">Open Systems Revolutionary Phase</p> 	<p style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">Series IT Convergence Phase</p> 
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## Video Encoders

- Ironically, The “Noun” in the Industry is Axis; it has been the Market Leader since 1996
- Many Other IP Transmission Devices on market today
- Traditional central station monitoring services have been added to several systems (e.g., cVideo)
- What was formerly Integral Technologies RemoteView is now Exac Vision

## IP Video Pedigree and Leadership

- 4 Digital Video Storage Options (On-board, Attached, Network, Online)
- On Board
  - Within Encoder
    - Attached
    - Local Network
    - Online

## 5 Video Software As A Service (VSAAS)

- SaaS - means Software as a Service, typically internet based business services
- SaaS models feature Internet hosted security services such as alarm, camera, and condition monitoring
- Typically the hardware for the services is hosted at the SaaS central station, not the end-users site
- Online services for monitoring video and other sensors are being rolled out in niche markets from Do-It-Yourself (DIY) to specialized niche markets
- Anticipate greater expansion of SaaS models as IP cameras become more user friendly and widely used

## 6 Video Management Software

- Many options
  - Features
  - Capabilities
  - Location of processing
  - Location of retrieval
  - Cost models range from \$ per camera or connection, to bundled pricing options

## 7 Digital Video Retrieval- Expectations, Capabilities, & Limitations

- The old rule applies, 'garbage in, garbage out.'
- There are methods for video extraction and sampling available in digital video that are not available in analog
- Time slicing is a method performed by some systems to provide reference frames long after other systems delete data
- Search on video and meta tags vary widely in the industry
- The Graphical User Interface (GUI) and ease of use of key considerations
- Determining the ease of use, in terms of the number of hours of training required before competence is also important

## Beware of Manufacturer Claims

- **Beware the manufacturers literature;** Use a calculator (many available) to determine sizing of system hardware, thru put, and storage
- **>>> USE Estimation Calculators;**
  - DVR Harddrive Estimator
  - CCTV Network Bandwidth Estimator
- **Beware Frames Per DVR Claims;** some literature claims to store high speed images at long length; not necessarily so.

## 8 Infrastructure requirements (servers, network, storage, etc)

- The industry is increasingly becoming IP-centric, and having your IP-literacy is essential. If you do not have this skill set, it is highly recommended that you re-train, or retain the services of professionals
- Technical skill sets needed for specifying IP network video
  - Understanding of network topology
  - Use of sizing calculators for determining the math of networks
  - Working understanding of networking principles for layout, design, security
  - Working understanding of wireless networking principles and typical trouble areas
  - For truly large jobs, ability to access and use spectrum analysis and other system network loading and balancing tools
  - Experience, experience, experience; did I say Experience!

## 9 Stand-alone and Integrated Systems

- The choice of whether to purchase a stand-alone solution vs. an integrated solution is fast becoming moot.
- Many of the major industry manufacturers are now embedding the latent capability within their solutions to be both stand-alone, and an integrated solution.
- Tomorrow's presentation on integrated systems will go into these issues in greater detail.
- Pricing, competition, and technology feature creep are all serving to homogenize technology offerings so that the software/hardware are truly becoming building systems technologies, integrating many peripherals, and not remaining stand alone.
- However, price and need will also dictate that there will remain a strong market for simple 4 channel systems that are fast, cheap, economical, and do the job with a minimum of fuss.

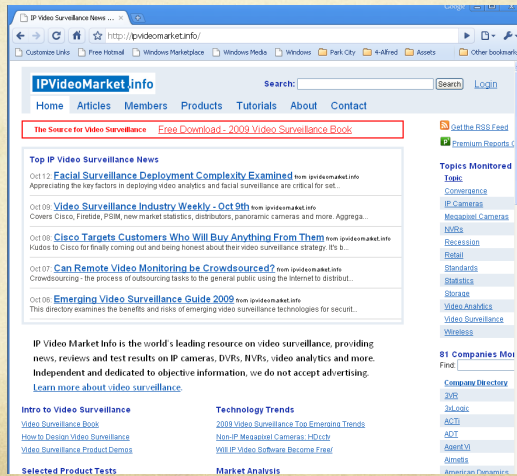
## 10 Managed Services

- Hosted Video
- Managed Video
- Video as a software service
- Concierge services, and many others, will provide robustness to the industry for years to come
- The distinction between managed services and hosted services is narrowing and is largely insignificant
- If time, we can explore the types of managed services being deployed now in the US in video markets.

## Suggested New and Emerging Technology Adoption Considerations

1. Technology Maturity Risk (integrating bleeding edge, leading edge, to fossil technologies)
2. Cost and projected Return on Investment
3. Usefulness
4. Appropriateness
5. Sustainability
6. Legality
7. Integration ease
8. Training requirement

# Additional Info Source: IPVideoMarket.info



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