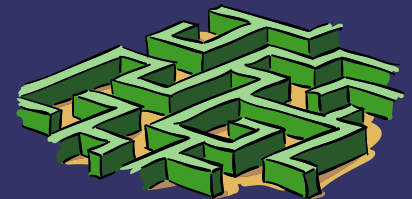


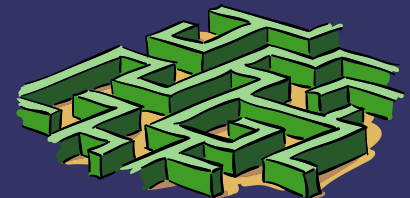
*Proposed Study:
Body Worn Cameras and other Video Asset Storage*

NC Criminal Justice Information Network



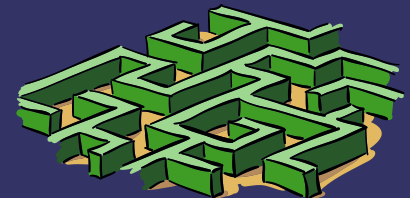
Study a Uniform and Lower Cost Option for Agency Video Storage and Sharing

- Study, propose and provide guidance for Police Agency storage, organization, retrieval and management of Video Media Assets
 - ◆ Understand current Agency contracts, obligations, issues and costs
 - ◆ Identify better lower cost alternatives
 - ◆ Improve access and organization media assets
 - ◆ Improve security and audit access
 - ◆ Uniformly comply with CJIS Security Requirements
 - ◆ Understand agency unique requirements
 - ◆ Eliminate insecure physical media like DVD-R
- Better and more secure uniform cost effective solutions are possible



Understand What Agencies Need

- Statewide, agency requirements for working with Video Media are not well understood
 - ◆ Body Worn Camera footage
 - ◆ Vehicular camera systems
 - ◆ FLIR and other thermal / night vision imaging devices
 - ◆ Surveillance cameras and devices
- Determine media access, sharing, redaction, archival and export requirements for:
 - ◆ Officers
 - ◆ Officer management
 - ◆ Agency management
 - ◆ District Attorneys
 - ◆ Courts
 - ◆ Public review and access



Typical BWC Deployment and Work Process Considerations

- ◆ Hardware Device Costs: BWC and Docks
- ◆ In Field Review Devices
- ◆ Device Operation Training
- ◆ Video Data Storage: Short Term, Long Term, Archival
- ◆ File location and access needs
- ◆ Video and Evidence Management Software
- ◆ Network Infrastructure and Load
- ◆ Power and Security for BWC Docks
- ◆ Video Redaction Costs
- ◆ Officer Labor spent Uploading and Classifying Video
- ◆ Recovering Accidentally Deleted Video
- ◆ New Officer and Staff System Training
- ◆ Ongoing Training for Policy Updates
- ◆ Ongoing System Support, Maintenance and Device Replacement
- ◆ Third Party Video Access



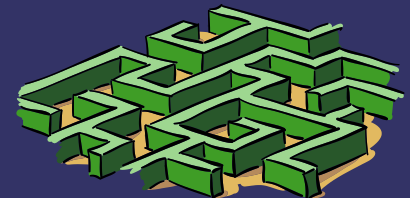
Today's Deployment

- Multiple vendors already have contracts established with agencies
 - ◆ Not all agencies have incorporated Video technologies
 - ◆ Vendor solutions are generally unique, proprietary and incompatible
 - ◆ Proprietary modified versions of media file standards
 - ◆ Differing organization and workflow
 - ◆ Unique training and operations
 - ◆ Vendor business plans vary considerably
 - ◆ Multiple Pricing models
 - ◆ Device provision and maintenance
 - ◆ Media import and transfer
 - ◆ Local and Remote Storage Solutions
 - ◆ Media Export and Access Interfaces
 - ◆ The cost of long term storage and access is value priced and excessive



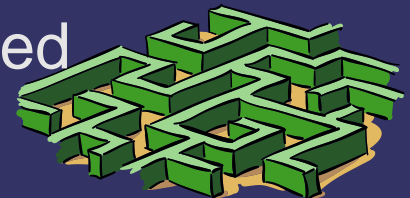
Task: Understand Video File Storage, Access, Management, Sharing and Archival Needs

- Determine the Process and Tasks involved in:
 - ◆ Managing daily video recording, downloading, device recharging and maintenance
 - ◆ Classifying video media, adding descriptive information, recording access and usage
 - ◆ Retrieving and searching video media, including location, personnel, incident classification
 - ◆ Accessing and reviewing video media
 - ◆ Redacting video prior to release and reuse between agencies, courts and public entities
 - ◆ Transferring media to short term and archival storage systems
 - ◆ Understand and plan for cost effective archival storage solutions



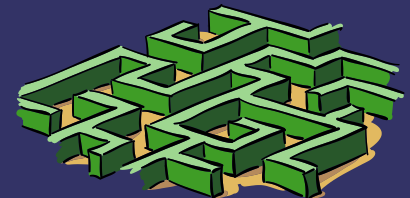
Task: Cost Analysis

- Understand and provide Guidelines for Total Cost of Ownership of Vendor Body Worn Cameras
 - ◆ Costs are often hidden in media storage and software licensing fees
 - ◆ Incremental costs have been tailored to impact ongoing operational budgets
 - ◆ Capital device acquisition costs and maintenance costs are often bundled in leases
- Media storage is value priced
 - ◆ Vendors own and license import, storage organization, management and access / display software
 - ◆ Some media elements are “locked” with vendor file structure extensions
 - ◆ Common file storage prices are grossly inflated



Example: Data Cloud Cost Analysis

- Generic Cloud Storage Example:
 - ◆ Google Cloud Storage
 - ◆ Multi-Regional Data Access \$.026 / Gigabyte / Month
 - ◆ Nearline Storage \$.01 / Gigabyte / Month
 - ◆ Coldline Storage \$0.007 / Gigabyte / Month
 - ◆ Amazon Cloud Front resold by Warpcache
 - ◆ \$.060 / Gigabyte Transferred
 - ◆ Akamai Media Delivery Solutions
 - ◆ Over 2,200 host distribution points
 - ◆ Microsoft Azure Cloud
- “Utility” Body Worn Camera Support
 - ◆ Storage, transfer and administration \$900 / officer / month
- Generic solutions have already been piloted within agencies



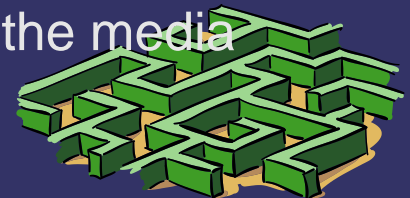
Overview: Characteristics of Video Media

- Digital Video Media is just a special type of computer file
 - ◆ Video files are very large Binary Objects (BLOBs)
 - ◆ Specialized browser clients and applications retrieve, organize and display these data files
 - ◆ Multiple file structures exist – often identified by a file's extension
 - ◆ Sound and Picture Essence is contained within that structure
 - ◆ All sound elements are encoded in terms of loudness
 - ◆ All picture elements are encoded in terms of brightness and color
 - ◆ All digital media must be compressed
 - ◆ Uncompressed 24 bit HD Video occupies 3 gigabits/second
 - ◆ “Codecs” Encode, compress, decompress and decode video images into file data
 - ◆ There are a huge number of competing encoding standards and implementations of those standards
 - ◆ The goal is to imperceptibly reduce data transmission and storage size
 - ◆ Vendors sometimes make files proprietary



Characteristics of Video Media (continued)

- Original Recorded Video Files Have Evidentiary Value
 - ◆ So original recordings must sometimes be retained and protected
 - ◆ But, they don't have to be widely transferred, manipulated and managed throughout the system
 - ◆ Users routinely work with “proxy” media files that have been more intensely compressed to make them manageable and usable
 - ◆ Later, full resolution copies are available when needed
 - ◆ Media Storage and Distribution Approaches can be Layered
 - ◆ High usage and fast access
 - ◆ Long term storage and slower access
 - ◆ Minimize transport impact across communications links
 - ◆ Improve access and usability
 - ◆ Minimize steps that impact quality and usability of the media



Next Steps of Action

- Study Current Agency Deployment of BWC systems
 - ◆ Understand business models and costs
 - ◆ Understand storage capacity and access requirements
 - ◆ Understand proprietary characteristics of the systems
- Study Available Vendor Cloud Video Storage Solutions
 - ◆ Generic video file storage, access and management
 - ◆ Identify open and generic solutions already used by Law Enforcement Agencies
 - ◆ Determine and Estimate Alternative Costs
- Identify Impact on Existing NC Information Assets
 - ◆ Identify storage infrastructures already available
 - ◆ Identify connectivity assets already available
 - ◆ Study efficient geographic distribution of data
 - ◆ Consider interfaces and extensions to current BWC systems
 - ◆ Consider interfaces and extensions to current systems Agencies use

