Webinar will begin shortly.







Steve Paxton FileOnQ Property & Evidence Consultant & Trainer



Alexis Grochmal IAPE Board Member and Certified Property & Evidence Specialist

What Are Best Practices for Managing Digital Evidence?

Navigating file types, video formats, and methods for storing digital evidence.



IAPE 2025 Two Day Classes Register at IAPE.org

Commerce City, CO Allison Park, PA Hurst, TX Hanover Park, IL Humble, TX Maple Grove, MN Brookhaven, GA Cary, NC Columbia, MO W. Des Moines, IA 4/28/2025 - 4/29/2025 5/21/2025 - 5/22/2025 6/10/2025 - 6/11/2025 6/16/2025 - 6/17/2025 6/23/2025 - 6/24/2025 7/9/2025 - 7/10/2025 7/14/2025 - 7/15/2025 7/21/2025 - 7/22/20258/5/2025 - 8/6/2025 Marion, OH Sanford, ME Gonzales, LA Burbank, CA Indianapolis, IN Sarasota, FL Massillon, OH San Jose, CA Franklin, TN Roanoke VA 8/11/2025 - 8/12/2025 9/04/2025 - 9/05/2025 9/09/2025 - 9/10/2025 9/22/2025 - 9/23/2025 9/29/2025 - 9/30/2025 10/15/2025 - 10/16/2025 10/21/2025 - 10/22/2025 11/04/2025 - 11/05/2025 12/4/2025 - 12/5/2025



Webinar will begin shortly.

FileOnQ Solutions

Empowering Efficiency and Integrity in Public Safety

Digital Evidence

Digital Evidence (DEMS) Solution



Physical Evidence

Physical Evidence Solution



Found Property

Found Property Solution



Asset / Quartermaster

Asset Management Solution



Contact us at FileOnQ.com



INTEGRATION

PREMIERE PARTNERS

SEAMLESS

INTEGRATION TO PROVIDE USERS

WHAT THEY NEED



Webinar will begin shortly.

"WE SERVE PUBLIC SAFETY AGENCIES OF ALL SIZES!"

EMPOWERING INTEGRITY & EFFICIENCY WITH OUR NO-CODE PLATFORM

395 PUBLIC SAFETY & JUSTICE



99% CUSTOMER SATISFACTION 94% CUSTOMER RETENTION







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Webinar Topics

- Introduction to digital evidence.
 Types of digital evidence.
- Overview of the enormous growth of video.
 - Surveillance Video
 - o BWC & In-Car Camera Video
 - o Citizen Shared Video
- Overview of standard vs. proprietary file types.
- Overview of a powerful CCTV video decoding engine.
- Preserving Data Integrity
 - Verification and Authentication
 - Chain of Custody
 - o File Hashing
 - Original vs Copies
- Resources and Questions



Digital Evidence in Growing at an Exponential Rate

Over 90% of all crime today has a digital element...

NPCC, APCC, Transforming Forensics, Forensic Capability Network, Digital Forensics Science Strategy, July 2020



IDC – International Data Corporation

Digital Evidence in Growing at an Exponential Rate

Over 90% of all crime today has a digital element...

NPCC, APCC, Transforming Forensics, Forensic Capability Network, Digital Forensics Science Strategy, July 2020



IDC – International Data Corporation



Digital Multimedia Evidence

including standard and proprietary formats

Photographs, Images, and Video
 Taken by Officers

Surveillance Video

- Video and Still Images
- Standard and Proprietary Video
- Dash Cam (front, side, rear)

• Digital Audio

Interviews w/ suspects and witnesses.

BWC

Audio shared w/ officers and investigators.



- BWC, In-Car Camera, and Drone Video
- Citizen Shared Evidence
 - o Photos, Video, Docs, Email

blink

ring

- o Screenshots
- Traffic Collision Evidence
- Mobile and Computer Evidence





Video Everywhere

• Surveillance Video

- Private Commercial
- Private Consumer (Ring, Blink, etc.)
- o **Flock**
- Citizen Shared Video
 Mobile Devices
- Citizen Dash Cam Video
- Social Media
 - Criminal Activity Recorded and Shared



Video Everywhere

Same and the second second second second

• Surveillance Video

- Private Commercial
- Private Consumer (Ring, Blink, etc.)
- Flock Safety
- Citizen Shared Video
 Mobile Devices
- Citizen Dash Cam Video
- Social Media
 - Criminal Activity Recorded and Shared
- FUTURE: Augmented Reality Devices
 - Ray-Ban META Frames, Apple Vision Pro



- City and County Buses
- Passenger Trains
- o Subways
- BWC, In-Car Camera, and Drone Video
- Traffic Cams & ALPR
- Real Time
 Crime Centers





Ray-Ban Meta Frames

- Listen to audio, make phone & video calls
- Capture photos and video
- Livestream video
- Charging case (up to four hrs.)
- Two cameras and two open-ear speakers
- Five microphone array for voice capture
- Photo Resolution: 3024 x 4032 pixels
- Video Resolution: 1440 x 1920 at 30 fps
- 32 GBs of storage for 500+ photos and 50+ videos



Sample Video

Rapid Adoption of Surveillance Video

- 2013: 331 videos, 20 GBs
- 2014: 6595 videos, 279 GBs
- 2015: 13,013 videos, 541 GBs
- 2016: 17,154 videos, 789 GBs
- 2017: **19,801 videos**, 1.067 TBs
- 2018: 32,870 videos, 1.712 TBS
- 2019: 34,590 videos, 2.415 TBs
- 2024: 123,000+ videos, 5+ TBs

Overall Video Storage: 71 TBs

207% increase between 2016 and 2019!



United Health Care Homicide

2:44 p.m. CST, December 6, 2024

We are "processing a tremendous amount of evidence in this case," NYC police commissioner says

From CNN's Aditi Sangal

"We already have lots of forensic evidence, fingerprints, DNA evidence," she pointed, adding there's also a "massive camera canvass" of the suspected shooter's movements through the city.

Thousands of hours of surveillance video recovered in this case.

NAME	RESOLUTION	INDUSTRY NAME	APPROX. FILE SIZE PER HOUR
720p	1280 x 720 pixels	HD (high definition) or 'HD ready'	1 GB to 4 GB
1080p	1920 x 1080 pixels	FHD (Full HD)	4 GB to 8 GB
2K	2048 x 1080 pixels	Standard DCI (Digital Cinema Initiatives)	8 GB to 15 GB
4K	3840 x 2160 pixels	4K UHD (Ultra HD)	15 GB to 30 GB
8K	7680 x 4320 pixels	8K UHD	60 GB to 200 GB

- 8 bits = 1 Byte
- 1,024 Bytes = 1 Kilobyte (KB)
- 1,024 Kilobytes = 1 Megabyte (MB)
- 1,024 Megabytes = 1 Gigabyte (GB)
- 1,024 Gigabytes = 1 Terabyte (TB)



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An iPhone can store over 100 hours of HD video.

Up to 1 TB

Poll Question Where are you storing digital evidence?

Where are you storing digital evidence?

- Mix of discs, thumb drives, and portable hard drives impounded in the property room.
- On a traditional file server. Server
- Across multiple systems: photos & docs in RMS, video in BWC system, etc. RMS BWC Server
- Within a unified Digital Evidence Management System (DEMS). A single source of truth.



Example Formats



SOFTWARE

Video playback, analysis, correction, enhancement, and redaction.

SOFTWARE

- Amped Replay: The enhanced video player for police investigators. Easy to use video player for first-level analysis of video evidence with quick conversion, corrections, redaction, annotation functions, and reporting.
- **Amped FIVE:** Conduct investigations with advanced and fully customizable processes for conversion, restoration, enhancement, measurement, presentation, and reporting.

AmpedSoftware.com

Preserving Data Integrity



Preserving Data Integrity

Verification

 The process of confirming that the data (or files) presented are complete and unaltered since the time of acquisition.

Authentication

 The process of substantiating that the data (or files) are an accurate representation of what they proport to be.



Digital evidence processing must be Accurate, Repeatable, and Reliable.

Do we need to retain the original evidence files or are copies ok?



Original



Digital Evidence: Originals vs Copies

Federal Rules of Evidence (FRE) Rule 1001,1002 and 1003

Courts have grappled with the issue of whether a copied version of digital evidence can be considered the "original" for purposes of admissibility.

The issue typically involves the **Best Evidence Rule** (or "Original Document Rule"), which states the original version of a document is generally required to prove the content of that document. **Digital Evidence: Copy Considered an Original** Federal Rules of Evidence (FRE) Rule 1001

Rule 1001 defines "original" in the context of electronic records:

An "original" in the context of Rule 1001 refers to the actual document or recording itself, as opposed to copies or reproductions. The rule outlines that an original is necessary to prove the content unless the Federal Rules of Evidence or a federal statute provides otherwise.





Original



Copy

Copy





Copy



Copy



Copy

Federal Rules of Evidence (FRE) Rule 1002

Rule 1002 stipulates that in order to prove the content of a writing, recording, or photograph, the original writing, recording, or photograph is generally required. This rule is based on the principle that the original document is the most reliable evidence of its contents.

Purpose: The primary purpose of this rule is to prevent inaccuracy and fraud that might come with copies or secondary evidence. By requiring the original, the court seeks to ensure that the evidence is as close to the actual event or agreement as possible.

Federal Rules of Evidence (FRE) Rule 1003

Rule 1003 deals with the admissibility of duplicates in legal proceedings. Rule 1003 states that a duplicate is admissible to the same extent as the original unless a genuine question is raised about the original's authenticity or the circumstances make it unfair to admit the duplicate in place of the original.

Definition of Duplicate: Under the Federal Rules of Evidence, a "duplicate" is defined as a counterpart produced by means equivalent to the original. This includes photocopies, carbon copies, and electronically generated copies, among others.

Federal Rules of Evidence (FRE) Rule 1003

The rule acknowledges that modern technology allows for the creation of duplicates that are nearly identical to originals, reducing the risk of inaccuracies or alterations.

It is designed to facilitate the admission of evidence by recognizing that duplicates often serve as reliable and accurate representations of the original.

Authenticity: If there's a question about whether the original has been altered or is not what it purports to be, then the duplicate may not be admissible.

Federal Rules of Evidence

While case law supports the principle that a properly authenticated copy of digital evidence can be treated as an "original" for purposes of the Best Evidence Rule, the key factors are ensuring that the copy is **accurate**, **authenticated**, and **maintained under proper procedures**.

<u>Courts have recognized that, unlike physical documents, digital</u> <u>files can be reliably copied without alteration</u>, making the copy an acceptable substitute for the original in most cases.

More information can be found at RulesofEvidence.org.



Evidence Printed



 Case Number:
 2021-244345

 Case Date:
 11/10/2021

 Barcode:
 1001493

 Original File Name:
 DSC0001.JPG

Salem Police Department

 Taken On:
 11/10/2021
 6:23 PM

 Officer:
 A. Jones (1232)

 Classification:
 Persons Crimes Arson 2

Chain Of custody Information:

Date	Action		Officer	Details
1/10/2021 09:05:53 AM	Upload		A. Jones (1232)	Photos authentic. Captured w/ Nikon D200.
11/10/2021 09:09:23 AM	View		A. Jones (1232)	
11/10/2021 10:17:48 AM	Share		A. Jones (1232)	Mark Garrett (mgarrett@snoco.gov)
11/10/2021 10:46:24 AM	Share		A. Jones (1232)	Mark Garrett (mgarrett@snoco.gov)
11/10/2021 04:26:29 PM	Classify		M. Evans (1121)	Original Classification: Property, New Classification: Persons
11/15/2021 12:37:40 PM	Share		M. Evans (1121)	Mark Garrett (mgarrett@snoco.gov)
12/01/2021 06:37:36 AM	Download		C. Marks (1323)	
12/19/2021 10:53:42 AM	View		C. Marks (1323)	
01/30/2022 01:57:51 PM	View		A. Jones (1232)	
01/30/2022 01:59:39 PM	Share		C. Marks (1323)	Mark Garrett (mgarrett@snoco.gov)
01/30/2022 02:01:22 PM	Print		C. Marks (1323)	



Does your system track file chain of custody?

NIST Interagency Report 8387

NIST Interagency Report NIST IR 8387

Digital Evidence Preservation

Considerations for Evidence Handlers

Barbara Guttman Douglas R. White Software & Systems Division Associate Director for Laboratory Programs

Tracy Walraven

This publication is available free of charge from https://doi.org/10.6028/NIST.IR.8387

September 2022

NIST Interagency Report 8387

8.) Contamination. As with other types of physical objects, digital evidence can have chemical or biological contamination. Processes employed for safe handling of other evidence types (e.g., personal protective equipment) should be used. Digital media does not present additional risks. However, Digital Evidence Units may not be accustomed to working with potentially contaminated devices and may not be aware of the issue or the processes that need to be in place to mitigate it.

9.) Return to Owner. After media has been imaged or when the media or device is no longer needed, it may be returned to the owner.

10.) Reuse, Disposal or Sale. Computer media must be erased using either a full disk wiping program or via secure erase if that is supported by the drive. See <u>NIST Special Publication SP</u> 800-88, Guidelines for 56 Media Sanitization (Kissel, 2014). Simple erase commands are not sufficient since they normally only erase the directory, not the contents.

Preserving Data Integrity

Verification

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Authentication

 The process of substantiating that the data (or files) are an accurate representation of what they proport to be.



Digital evidence processing must be Accurate, Repeatable, and Reliable.

Ensuring File Integrity Through File Hashing

If the hash value matches, the file is the same.



bdbf 6150 9966 8893 328d 1024 1f0b edd6

bdbf 6150 9966 8893 328d 1024 1f0b edd6

Ensuring File Integrity Through File Hashing

If the hash value does not match, the file is not the same.



File hashing can detect a change in a single pixel.

Secure Hash: a971e147ef8f411b4a2476bba1de26b9a9a84553c43a9o2o4f662ca72ee93910

Hash Report



Santa Maria Police Department

Summary Report



Case number: 2022-6654 Case date: 08/02/2022



	Barcode:	1003021	Classification:	Persons Crimes
	Original File Name:	Cigarette Store 014.jpg		
	Taken On:	07/17/2003 1150		
	Location: 3415 128th WA (Cigarette Store)	Street SE Lakewood,	Description:Rob	obery at Cigerette Store
Annotation: Cigarette	Store Robbery (patrol p	hotos)		
Hash value: HFjs2OjERCgEGp5L6/Sj0Ib45bVZ9SyGMpZYF+LV0vJb8bzswlx3E4cRK1J1tJg+6CzyHMVzWMB4iSRA3iVi/32KxqKXFV4NDGXOcbP 8yi4gxJ8Rmk4md1rk82k5dGSoLM/30X3A7C10SY/TCiUeetUJAopirWWduF26U2TEOuY=				
	Barcode:	1003022	Classification:	Persons Crimes
2	Original File Name:	Cigarette Store 015.jpg		
	Taken On:	07/17/2003 1150		
	Location: 3415 128th WA (Cigarette Store)	Street SE Lakewood,	Description:Rob	obery at Cigerette Store
Annotation: Cigarette Store Robbery (patrol photos)				
Hash value: jNpfs/3Pir8vZLoJ9TqYLvfgmNfhZ7f8K6a+5P7pzBs5/rbrVdTnIewKgugAGScdZWuCBy6srCePUZkzGodYC9eOPGnIYLT/O9Vr+SN zeclmRPVaxx6GWECcbxxpS6NOCo3OtoqWjXGQcETo21SibN76KcYXhIP/D5UieJY7veI=				
zecimRPVaz	xx6GWECcbxxpS6NOCo3Otc	qWjXGQcETo21SibN76KcYXh	IP/D5UieJY7veI=	

End of Case number: 2022-6654

Is your storage secure?

- Mix of discs, thumb drives, and portable hard drives, impounded in the property room.
- On a traditional file server. Server
- Across multiple systems: photos & docs in RMS, video in BWC system, etc. RMS BWC Server
- Within a unified Digital Evidence Management System (DEMS). A single source of truth.



Best Practices Summary

Have an SOP for digital evidence handling Sample Docs: Tinyurl.com/Digital-SOP Provide regular training to officers and evidence staff. Store digital evidence in a secure environment. Utilize redundant storage (back up your evidence). Securely maintain the original evidence. \checkmark Always work on a copy. Utilize file hashing to track file integrity. \checkmark Document chain-of-custody and work done.

IAPE Best Practices for Handling Digital Evidence

- Standard 12.2: Preservation
- Standard 12.3: Security
- Standard 12.4: Infrastructure
- Standard 12.5: Digital Evidence Disposal
- Standard 12.6: Purging



Scientific Working Group on Digital Evidence (SWGDE)

The Scientific Working Group on Digital Evidence (SWGDE) brings together organizations actively engaged in the field of digital and multimedia evidence to foster communication and cooperation as well as to ensure quality and consistency within the forensic community through consensus-based documents.

Published Docs: SWGDE.org

Scientific Working Group on Digital Evidence (SWGDE)

Example Documents

- Best Practices for Digital Evidence Collection
- Digital and Multimedia Evidence Video Acquisition from Cloud Storage
- Introduction to Testimony in Digital and Multimedia Forensics
- Considerations for Release of Synopsis Videos for Public Review
- Guidelines for Video Evidence Canvassing and Collection
- Image Processing Guidelines
- Best Practices for Archiving Digital and Multimedia Evidence
- Requirements for Report Writing in Digital and Multimedia Forensics
- Digital Image Compression and File Formats Guidelines
- Technical Overview of Digital Video Files

Digital Evidence Resources

- Digital Evidence Organizations, Best Practice Standards, and Training Resources
- DEMS Guide for Police Admin and Prosecutors
- Sample SOPS: Tinyurl.com/Digital-SOP
- Synthetic Media Report
- Webinar Slides



Upcoming Training

- May 15 DigitalOnQ DEMS Demo (1 hr.)
- June 4 Ames PD (IA) Digital Evidence Training (6 hrs.)
- June 25 Crestwood PD (MO) Digital Evidence Training (6 hrs.)
- July 11 Maple Grove PD (MN) Digital Evidence Training (6 hrs.)
- October 1 Lawrence PD (IN) Digital Evidence Training (6 hrs.)
- October 23 Stark County SO (OH) Digital Evidence Training (6 hrs.)
- November 5 Boone County SO (KY) Digital Evidence Training (6 hrs.)



Would you like host a 6-hour digital evidence management training at your police department?

Live Events: FileOnQ.com/live-trainings



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Questions



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