Building a Digital Forensics Program

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2017 NSF Cybersecurity Summit
2017-08-15

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Center for Trustworthy Cyberinfrastructure

CTSC’s mission is to provide the NSF community a coherent understanding of cybersecurity’s role in producing trustworthy science and the information and know-how required to achieve and maintain effective cybersecurity programs.
Who we are

Warren Raquel - Senior Security Engineer at the National Center for Supercomputing Applications

CTSC - Provides the NSF community with a coherent understanding of how cybersecurity is important to them and the resources to achieve and maintain a cybersecurity program appropriate for them.
Class Outline

- Introduction
- Section 1 — What is the role of digital forensics?
- Section 2 — The general Digital Forensics Process
- Section 3 — What you need to get your program off the ground
Forensics

Adjective
“relating to or denoting the application of scientific methods and techniques to the investigation of crime.”

Noun
“scientific tests or techniques used in connection with the detection of crime”
Organization of Scientific Area Committees for Forensic Science (OSAC)
Digital Forensics

The application of scientific methods and techniques in the investigation of a computer crime.

NIST SP 800-86 - Guide to Integrating Forensic Techniques into Incident Response
The Digital Forensic Process

- Collection
- Examination
- Analysis
- Reporting
Process - Collection

- Collection of data
- Chain of custody
Process - Examination

- Data Extraction
Process - Analysis

- Timestamp synchronization
- Log interpretations
- Observations that validate or refute your hypothesis
Process - Reporting

- Conclusion
- Keep audience in mind
- Provide action items
Logistics

- Equipment
- Staffing
- Support
Equipment

- Write blockers
- Adapters
- Software
- Storage
- Chain of Custody forms
- Anti-static bags
- Examination Workstation
- Forensic Software
- Office space
Equipment - Office Space

- Secured Office
- Safe
- Encryption
Equipment - Forensic Workstation

- Ability to keep cases separate
- Lots of storage access (local or network)
- Additional speed for indexing
- Forensic Recovery of Evidence Device
  - Digital Intelligence
  - Built for forensics
Equipment - Storage

- Where do we store acquired images?
  - SAN
  - External storage
  - Network shares?
  - Optical?
  - Tape?
Equipment - Write Blockers

- Could be done via software writeblocks
- USB
- SATA
- PATA
Equipment - Software

- Forensic Suites
  - EnCase
  - FTK
- Volatile Acquisition
- Open Source Tools
  - Autopsy - Free
  - Kali Linux
  - SIFT
Equipment - Miscellaneous

- USB drives
- Chain of Custody forms
- Anti-static bags
- Evidence Bags
- Mouse jiggler
- Hot-plug kit
- Camera
- Voice Recorder
- Notebooks
Staffing

- Pattern recognition is a key skill
- Experience with the platform they are investigating
- Ability to work with others
Starting your forensics program

- What do you need at a very minimum?
  - Policies
  - Staff
  - Workstation
  - Storage
    - Office/Data/evidence
  - Write Blockers
Growing your forensics program

- In-house procedures
- Expand storage to attached storage.
- Hardware based acquisition devices
- Upgrade forensics workstation
- Additional Training
- Look at enterprise level options like remote acquisition or suites for team analysis.
Other considerations

- How long to retain data?
- Do we need mobile forensics?
Core considerations

- Must be a repeatable process
- Tools and techniques must be easily repeated and/or accepted by the general forensic scientific community.
- Integrity of evidence must be maintained.
- Bias can often misdirect investigations.
Questions?
Thank You

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We thank the National Science Foundation (grant 1547272) for supporting our work.

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