

# Mobile Device Forensics



Rick Ayers

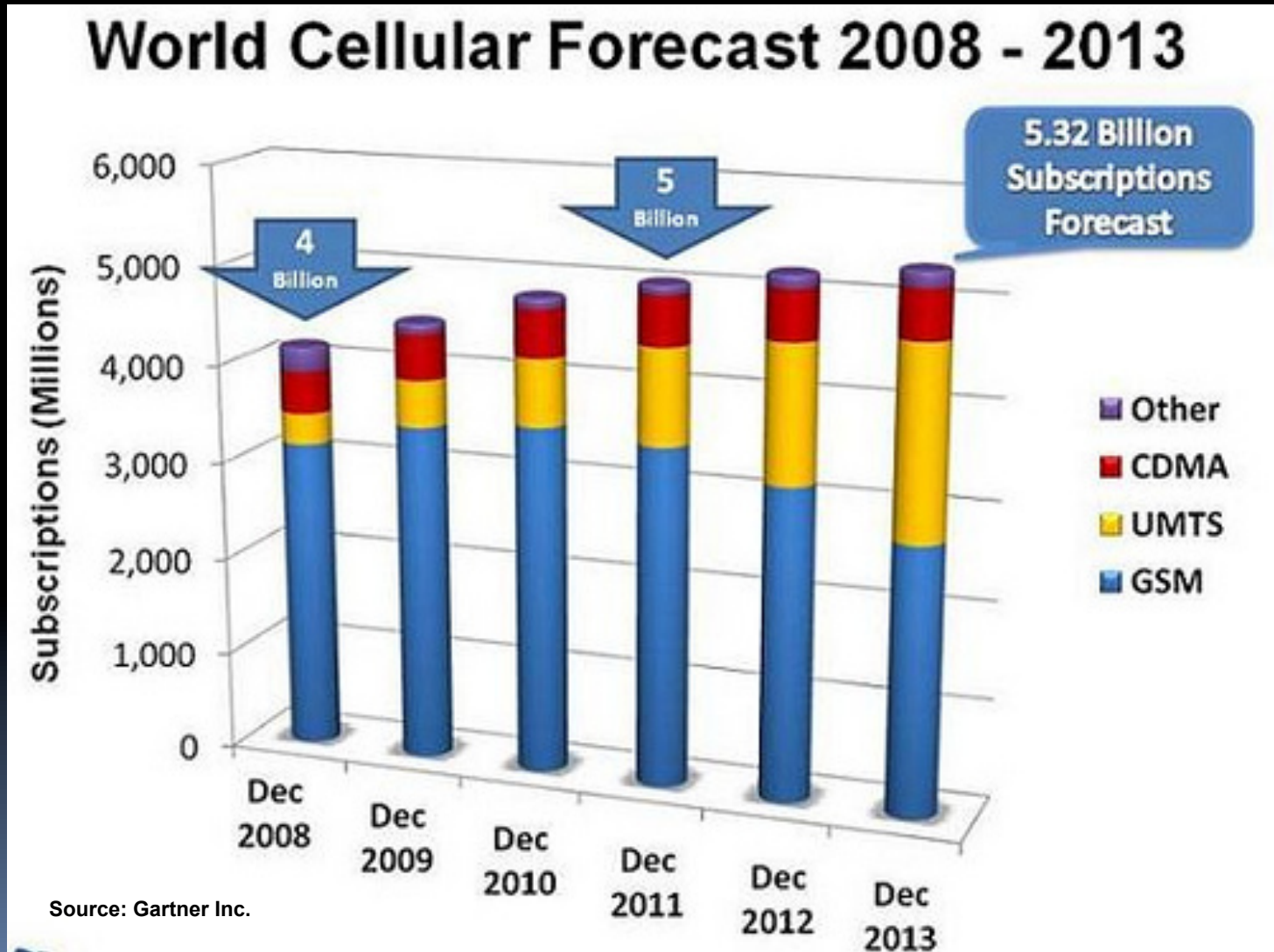
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# Agenda

- **Motivation for Mobile Device Tool Testing**
- **Evidence Sources**
- **Acquisition Levels**
- **Challenges**
- **CFTT Program**
- **Tool Validation**
- **Common Anomalies**
- **2014 Mobile Device Testing**
- **Conclusions**

# Motivation

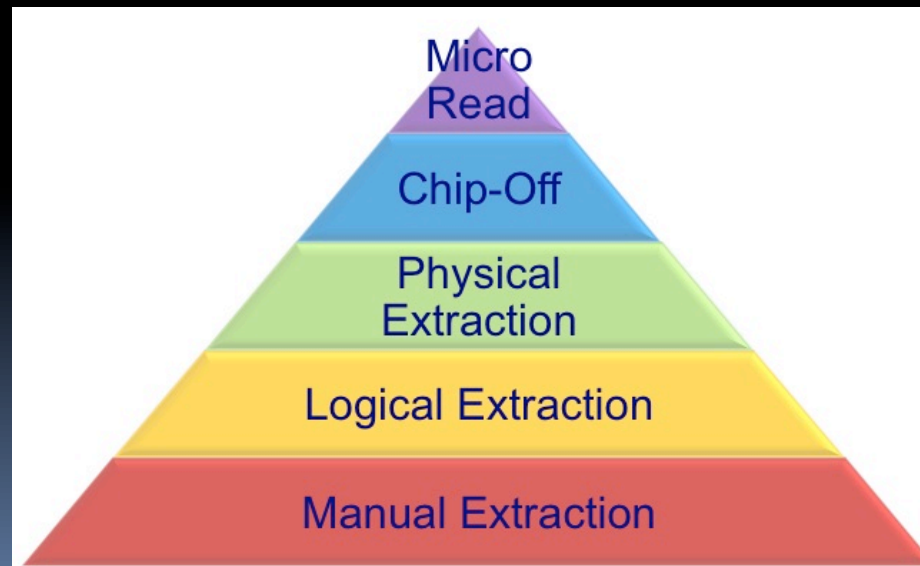


# Evidence Sources

- Phonebook
- Calendar
- To do list
- Electronic mail
- Instant messages
- Web information
- Electronic documents
- Photos
- Videos
- Audio
- GPS coordinates
- Social network data
- Subscriber identifiers
- Equipment identifiers
- Service Provider
- Last dialed numbers
- Phone number log
- Short text messages
- Enhanced messages
- Multimedia messages
- Last active location (voice and data)
- Other networks encountered

# Acquisition Levels

- **Micro Read**
- **Chip-Off**
- **Physical Extraction**
- **Logical Extraction**
- **Manual Extraction**



--Source – Sam Brothers, DHS

# Challenges

- **Multiple interfaces**
  - Smart Phones: mini-USB, micro-USB, proprietary
- **Acquisition support for old and current models**
  - Tool kits containing over a thousand cables
- **Quality Control**
- **Closed mobile device operating systems**
  - Reverse engineering the file system

# CFTT Overview

- **Computer Forensics Tool Testing Project**

**James Lyle, Project Leader**

100 Bureau Drive, Stop 8970

Gaithersburg, MD 20899-8970 USA

E-mail [cftt@nist.gov](mailto:cftt@nist.gov)

Website: [www.cftt.nist.gov](http://www.cftt.nist.gov)






# CFTT Overview

- **CFTT – Computer Forensics Tool Testing Program provides a measure of assurance that the tools used in the investigations of computer-related crimes produce valid results.**
- **Directed by a steering committee composed of representatives of the law enforcement community.**
- **The steering committee selects tool categories for investigation and testing. A vendor may request testing of a tool, however the steering committee makes the decision about which tools to test.**
- **CFTT is a joint project of: DHS, OLES, FBI, DoD, Secret Service, NIJ and other agencies.**



# CFTT Methodology


- **Test Specification – Requirements**
  - Test Plan – Test Cases and Assertions
  - Setup and Test Procedures
  - Final Test Report Generation
- 

# Requirements

- **Requirements – Statements used to derive test assertions that define expectations of a tool or application.**
  - **Core Requirements – Requirements that all mobile device acquisition tools shall meet.**
  - **Optional Requirements – Requirements that all mobile device acquisition tools shall meet on the condition that specified features or options are offered by the tool.**




# CFTT Methodology

- Test Specification – Requirements
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- 




# Test Plan

- **Test Cases** – Describe the combination of test parameters required to test each assertion.
  - **Assertions** – General statements or conditions that can be checked after a test is executed
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# CFTT Methodology

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# Setup and Test Procedures

- **Objective:** Documentation on data population of target media and test procedures providing third parties with information for an independent evaluation or replication of posted test results.
- **Contents:**
  - Techniques used for data population
  - Test Case Execution Procedures


# Mobile Device Population

- **Manual input (time consuming)**
  - SMS/MMS messages
  - Call logs (incoming, outgoing, missed)
- **Synchronization over webmail**
  - Contacts, calendar entries, memos
  - Email
  - Photos, video, audio files





# CFTT Methodology

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# Test Report

- **Results summary**
- **Test case selection**
- **Results by test assertion**
  - **An overview of the test cases executed, assertions checked and any anomalies found.**

# Tool Validation

- **Tool validation results issued by the CFTT project at NIST provide information necessary for:**
  - **Toolmakers to improve tools**
  - **Users to make informed choices about acquiring and using computer forensic tools**
  - **And for interested parties to understand the tools capabilities**

# Common Anomalies

- Non-Latin characters
- Truncated entries
- Connectivity issues
- Acquisitions ending in errors
- Subscriber related data not reported (IMEI, MSISDN)
- Unsuccessful recovery of non-overwritten “recoverable” deleted data
- Unsuccessful recovery of Internet and application related data

# 2014 Mobile Device Testing

- **11 mobile device acquisition tools**
- **20 mobile devices**
  - **CDMA**
    - feature phones
    - smart phones
    - tablets
  - **GSM**
    - feature phones
    - smart phones
    - tablets

# Additional 2014 Mobile News

- **SP800-101 Revision 1 “Guidelines on Mobile Device Forensics” will be released**
  - *Mobile device characteristics*
  - *Forensic tools*
  - *Preservation*
  - *Acquisition*
  - *Examination and analysis*
  - *Reporting*
- **Mobile Device Specification and Test Plan updated**
- **Upcoming Mobile Workshop – date TBD**

# Conclusions

- **Mobile device subscribers will continue to grow exponentially**
- **Data storage continues to expand**
- **Evidence sources**
- **Acquisition levels**
- **Challenges**
- **CFTT testing methodology**
- **Importance of tool validation**
- **Common anomalies**
- **Update on Mobile Testing for 2014**



Thank You!

Contact Information:

Rick Ayers

[richard.ayers@nist.gov](mailto:richard.ayers@nist.gov)

[www.cftt.nist.gov](http://www.cftt.nist.gov)

[www.cfreds.nist.gov](http://www.cfreds.nist.gov)