Mobile Device Forensics

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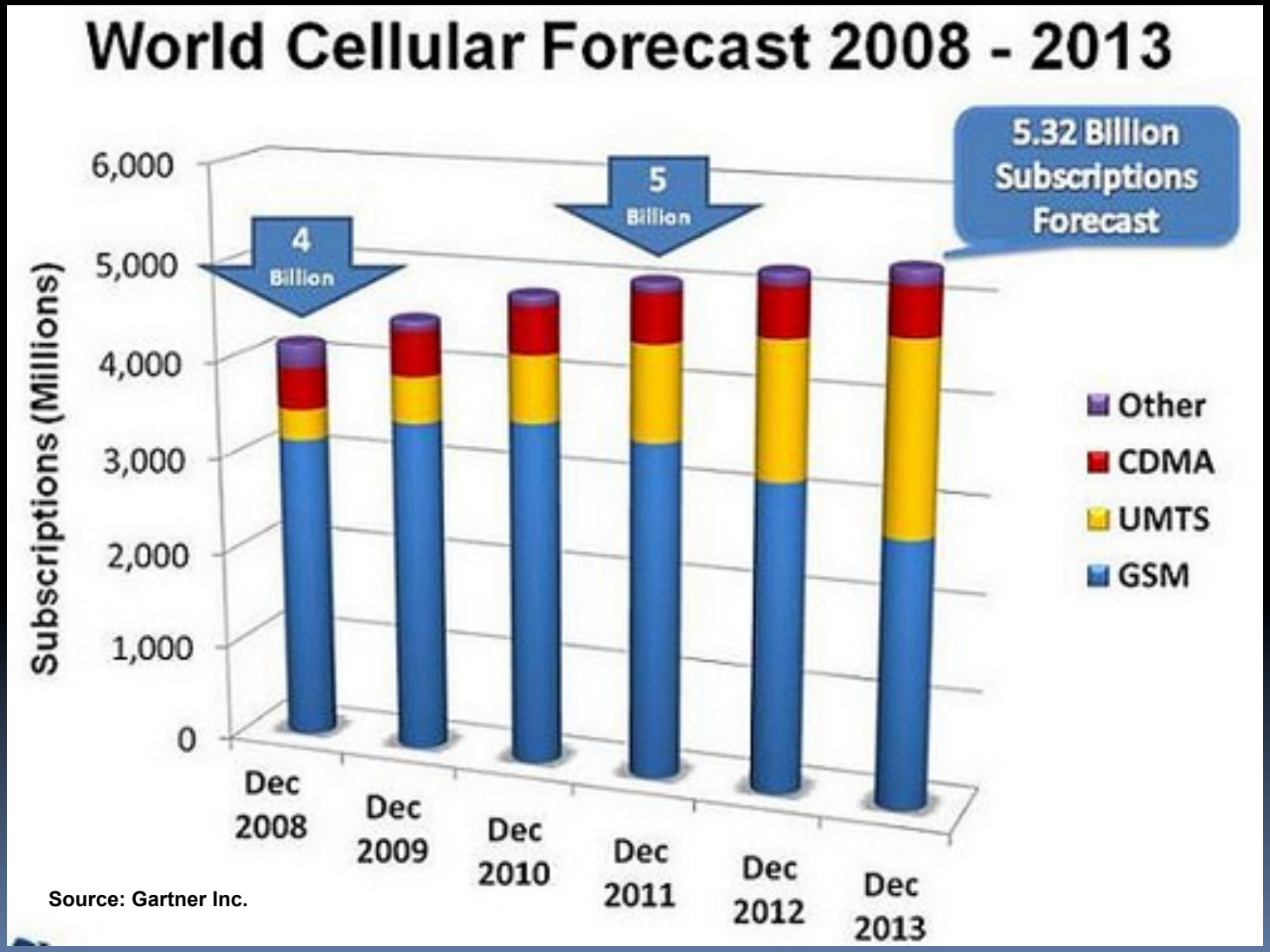
Agenda

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

Motivation


World Cellular Forecast 2008 - 2013
5.32 Billion Subscriptions Forecast
4 Billion
5 Billion
Subscriptions (Millions)
6,000
5,000
4,000
3,000
2,000
1,000
0
Dec 2008
Dec 2009
Dec 2010
Dec 2011
Dec 2012
Dec 2013
Other
CDMA
UMTS
GSM
Source: Gartner Inc.

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

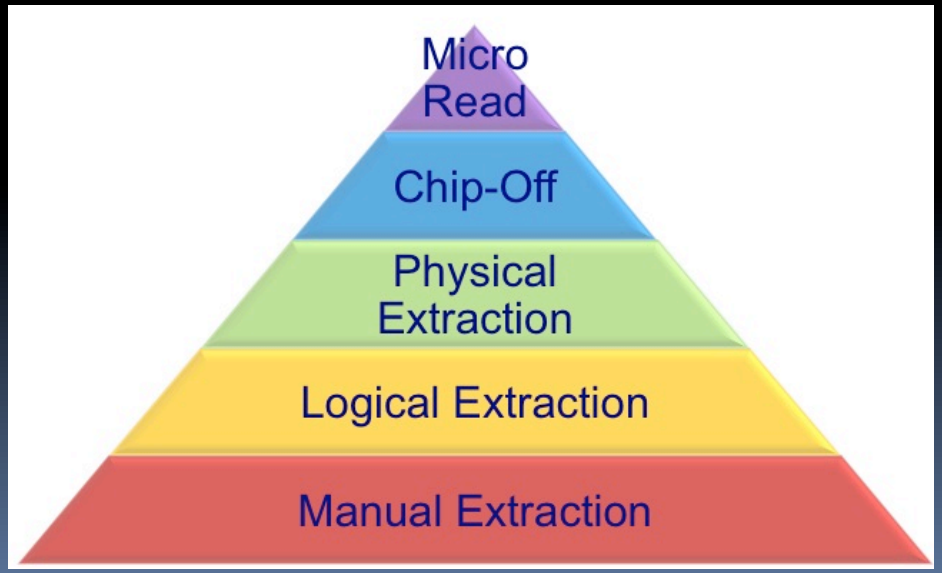
- Last dialed numbers
- Phone number log

- 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**

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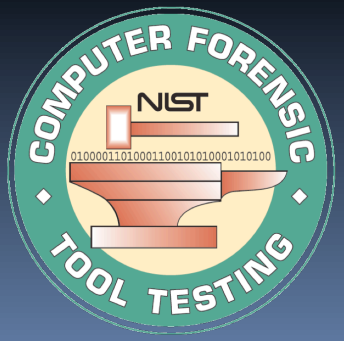

CFTT Overview

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

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

CFTT Methodology

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

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

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

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 Revision1 "Guidelines on Mobile Device Forensics"**
  - ***Mobile device characteristics***
  - ***Forensic tools***
  - ***Preservation***
  - ***Acquisition***
  - ***Examination and analysis***
  - ***Reporting***
- **Mobile Device Specification and Test Plan updated**

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!

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