Simplified and Inexpensive Mobile Digital Forensic Device

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Simplified and Inexpensive Mobile Digital Forensic Device

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Abstract

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1 Abstract

Keywords: Digital Forensics, Triage, Mobile, Digital Evidence Backlog, Raspberry Pi

2 Introduction

3 Background

3.1 Review Material and Analysis

Current challenges and future research areas for digital forensic investigation [7]

Some of the current challenges in digital forensic investigations are directly related to the amount of data being created. As Lillis et al[7] explores in their research, there are three main factors involved in the digital forensic backlog: increasing number of devices seized per case, increased number of cases involving digitial evidence, and the increasing volume of data per digital media. This has lead to a growing and already substantial backlog in digital forensic investigations.

One effect of this increased delay and backlog is that cases become inactive, waiting for new leads. A more aggressive approach to solving the backlog could help prevent dismissals, cold cases, and potentially more societal harm from a corrupt investigation suspect.

Raghavan[9] has accumulated a list of 5 major challenges that the digital forensics community is facing and continue to add to the backlog problem.

The first is the complexity of binary data aquisition, i.e. low level data aquisition through digital media duplication. This challenge causes the need for sophisticated data reduction techniques.

Another complexity is the diversity of data and lack of standard examination techniques. The plethora of operating systems and file formats has been increasing and is posing a more and more significant challenge over time.

The consistency and correlation problem is yet another challenge. This is a problem resulting from the current digital media investigation tools not providing the entire picture to investigators. Only part of the whole picture is provided when these tools find digital evidence.

Another issue that Raghavan[9] proposed is the volume of data to sort

through. The sheer amount of data that exists per user is increasing at an alarming rate [cite?], and has lead to a very large backlog of digital evidence to investigate. These delays have even caused some cases to be dismissed. This challenge is exacerbated by the lack of adequate automation for digesting the data.

The fifth, but certainly not the last, challenge proposed by Raghavan[9] is the timeline synchronization issue with digital evidence. Since the evidence could be collected in different time zones, with different timestamp formats, clock skew, etc, lining up the events in order can be challenging or infeasible.

With the proliferation of Internet Of Things (IOT) devices and cloud storage, the field of digital forensics continues to expand. These areas pose a great challenge, but also new opportunities. Lillis et al[7] researched cloud storage and found some areas of opportunity, for instance parallel processing, distibuted computing, GPU/FPGA utilization, and others. These areas for increasing the efficiency of ditigal forensics can be explored further due to the substantially reduced I/O limitations in cloud storage.

The Internet of Things (IOT) also poses new challenges. IOT devices are estimated to number near 40 billion by 2020, contributing to the overwhelming amount of digital data. Since these devices tend to have more non-persistent memory and less storage, this causes added complexity for gathering and analysis. In addition, a portion of IOT devices are battery operated and computationally challenged, leading to loss of data over time.

Testing the harmonised digital forensic investigation process model-using an Android mobile phone [8]

Forensic analysis of iPhone backups [10]

Forensic analysis of social networking applications on mobile devices [1]

A practical and robust approach to coping with large volumes of data submitted for digital forensic examination [11]

Jailbroken iPhone Forensics for the Investigations and Controversy to Digital

Evidence [2]

Methods and tools of digital triage in forensic context: survey and future directions [6]

A survey of digital forensic investigator decision processes and measurement of decisions based on enhanced preview [5]

Forensic examination of digital evidence: a guide for law enforcement [3]

Tiered forensic methodology model for Digital Field Triage by non-digital evidence specialists [4]

4 Conclusion and future work

Your work goes here

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