Forensic analysis of a Sony PlayStation 4: A first look
$ whoami

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Are games consoles are just toys?

• Former Walt Disney World employee arrested on Xbox child porn charges
• Milford cops say threat made through Xbox
• Couple left sickened over child porn sent to Xbox
• PlayStation sex crime: criminal used video game to get girl’s naked pictures
• Police: Xbox used to lure girls
• Mississippi deputy fired over threatening Xbox live players
• Prisoners using PlayStation 3s to commit crimes
Raison d'être

• Games Consoles each have their own unique architecture and operating systems.

• In addition, manufacturers such as Sony and Microsoft utilise encryption standards.

• How do we conduct an analysis of an encrypted PlayStation 4 in a forensically sound manner, without circumventing security measures?
Objectives of Research

1. Are methodologies used in 7th generation consoles relevant to 8th generation systems?
2. What forensically sound acquisition methods are available?
3. What avenues of interest exist on the PlayStation 4?
4. What artefacts can be obtained from online/offline analysis?
Previous Work

- Vaughan (2004) – Microsoft Xbox
- Burke & Craiger (2007) - Microsoft Xbox
- Turnbull (2008) – Nintendo Wii
- Xynos et al (2010) – Microsoft Xbox 360
- Ridgewell (2011) – Networked Game Devices
- Moore et al (2013) – Xbox One
Features of Interest

- PlayStation Network (PSN)
- Sony Entertainment Network (SEN)
- Internet Browser
- ShareFactory
- System Storage Management
- Error History
- What’s New
- Trophies
- Profile
- Friends
- Party Messages
- Messages
Empirical Analysis

The experiment was carried out on firmware 1.01, 1.50, 1.51, 1.52, 1.60, 1.61, 1.62, 1.70, 1.72, 1.75 and 1.76 as follows.

- Activate video capture device, record time.
- Activate PlayStation 4. Record time as set on console.
- Introduce sample dataset, record time and data introduced.
- Turn off PlayStation 4. Deactivate video capture device, record time.
- Forensically image PlayStation 4 hard drive.
- Turn on PlayStation 4; investigate to identify user actions introduced during this experiment iteration.
- Compare the data retrieved in relation to the data introduced.
Test Data

The following sample data was used for each firmware iteration:

• Three offline (local) accounts: User1, User2, User3
• Two online accounts: PlayStation Network (PSN) account & PlayStation Plus
• “Friends List” contacts added to assess communication options
• Facebook account created to enable “ShareFactory” functionality
• Error History, Internet Browse URLs (Bookmarks, websites)
Initial Findings
Internet Browser
Browsing History

- Google Play
- Need for Speed™ Network - Android Apps on Google Play
- Need for Speed™ Network
- Golf - Google Search
- http://www.golf.com/
- Sign In: Sony Entertainment Network
- Sign In: Sony Entertainment Network
- My Profile | PSN - PlayStation®
- http://us.playstation.com/psn/play-memories/

Clear Browsing History
Error History

Error History - The Error History should be viewed first as errors may be introduced by the analyst during the investigation.
Trophies

- **Ghost Stories**
  Escape. (Complete "Ghost Stories" on any difficulty.)
  - Common 58.6%
  - 4/2/2014 15:16

- **Spatial Awareness**
  Kill your first enemy in the Call of Duty® Ghosts campaign.
  - Common 59.9%
  - 4/2/2014 15:08

- **Brave New World**
  Rendez-vous in Fort Santa Monica. (Complete "Brave New World" on any difficulty.)
  - Common 52.6%
  - 4/2/2014 15:39

- **Liberty Wall**
  Take down both attack helicopters.
  - Rare 39.5%

- **No Man’s Land**
  Make it to San Diego. (Complete "No Man’s Land" on any difficulty.)
  - Rare 47.5%
  - 4/2/2014 16:35
Write Blocker - Tableau
Write Blocker - Shadow Drive
### Jpeg Extraction

**C:\Users\user\Desktop\bentley.jpg**

**EXIF IFDO**

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<th>Value</th>
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<td>Camera Model {0x0110}</td>
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<td>X-Resolution {0x011A}</td>
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<td>Y-Resolution {0x011B}</td>
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MP4 Extraction
## Offline Analysis

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<tr>
<th>Firmware version</th>
<th>1.62</th>
<th>1.72</th>
<th>1.75/1.76</th>
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<tr>
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<td>✓</td>
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<tr>
<td>ShareFactory</td>
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<tr>
<td>Capture Gallery</td>
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<td>✓</td>
<td>✓</td>
</tr>
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<td>✗</td>
<td>✗</td>
<td>✓</td>
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<td>✓</td>
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<tr>
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<td>✗</td>
<td>✗</td>
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<tr>
<td>Trophies</td>
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<td>Friends</td>
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✓ = Fully Retrievable.  
✗ = Not Retrievable.  
P = Partially Retrievable.
# Online Analysis

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Summary

• Best practice methodology developed.
• Evidential integrity maintained.
• Offline vs. online considerations.
• Future firmware updates will continue to challenge investigators.
Future Work

PlayStation Camera
- The PlayStation camera enables users to utilise enhanced security features such as facial recognition login. Can this be used to prove ownership, can we use a picture etc. of suspect to make system unlock?

PlayStation Vita & PS4
- The implications of the PlayStation Vita when linked to the PS4. The PS Vita enables users to remotely access and control their PlayStation 4. Evidence of usage and communication?

PlayStation Companion App - Phones & Tablets
- The PlayStation Companion App is compatible with both modern smart phones and tablets and can be used to gain remote access of the PlayStation 4.
Questions?

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