Data Recovery Tool Development for SSD

Chris Bross
DriveSavers Data Recovery
Agenda

- Maximizing Data Recovery from SSD
  - Multi-phase approach of data recovery labs partnering with manufacturers to provide solutions

- It's All About the Tools
  - Diagnostic
  - Firmware
  - Imaging
  - Forensic

- The Challenges Ahead
Justifying Data Recovery on SSD

- Working With Manufacturers
  - Understanding the Value Proposition for partnering with data recovery providers

- Isn’t this Protected Information?
  - We don’t need the “keys to the kingdom”

- CSAT
  - Can be measured in many ways...
Diagnostic Tools

- **Goal**
  - To provide quick diagnostic failure analysis of SSD

- **Tools & Technology Utilized**
  - Diagnostic workstation used by FAE or RMA at manufacturer or component supplier
  - Triage failed SSD and extract FA data
  - Reference documentation for FA codes
  - Determine if hardware or firmware
  - Repair/replace/re-flash and hopefully recover
Firmware Tools

- **Goal**
  - Load special diagnostic or development firmware in attempt to recover failed SSD

- **Tools & Technology Utilized**
  - Special fault-tolerant (non-release) firmware
  - Non-volatile process to replace problem firmware
  - Force drive into read-only “best effort” state
  - Attempt to image LBA or extract critical data
  - Recycle/reboot/try again
Goal

• To create “best effort” LBA image of SSD where diagnostics and firmware fail to resolve

Tools & Technology Utilized

• Software to extract LBA via data interface regardless of state of device or FTL
• Next, a extraction tool to read all bands of data via data or serial interface
  • Requires heavy post-processing and reassembly
Imaging Tools (cont)

- **Goal**
  - To extract NAND from PCB for imaging in non-encrypting SSDs

- **Tools & Technology Utilized**
  - NAND programmer/reader
  - JTAG pin and decoding info if relative
  - If multiple images, tool to reassemble LBA
    - Requires even more post-processing
    - Last ditch effort to recover any data
Forensic Tools

- I’ll leave it to Jeff from Guidance…
The Future & Challenges Ahead

- **SNIA sig Approach**
  - Industry standard driven adoption of requirements would be easier and better for all

- **Security and Data Protection Advances**
  - Will make user data more secure, and data recovery more difficult

- **New NVM Technologies**
  - Will next-gen NVM still need data recovery?
Thank You!

Chris Bross

Chris.bross@drivesavers.com