The Care and Feeding of your SSD

And What to do if Data Loss Occurs

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DriveSavers Data Recovery

SSD Customer Expectations

Performance:

- "I want 'out of box' performance for the lifetime of the device."

Reliability:

- "It should never fail!"

Endurance:

- "It should last at least as long as my old HDD."

Reality:

- Reliability continues to improve across the industry although inconsistent
- As we increase NAND flash density in 2D, endurance is reduced
- Manufacturers and 3rd party test labs are making more data publicly available
- Current SSDs and toolkit software help to monitor status in real time
- Maintenance is required to maximize the life and performance of your SSD

Maintenance of Your SSD

Manufacturers Toolbox Software:

- Examples: Intel SSD Toolbox, Samsung Magician, SanDisk SSD Toolkit…
- Diagnostics & SMART monitoring
- Performance Optimization
- Usage/Life Expectancy Estimate
- Over-provisioning Variables
- Firmware ID and reloading
  - Non-volatile or volatile?
- Data Migration software
- Secure Erase features

Third Party Software Tools:

- Goal is universal management functionality across SSD vendors and models
- Example LC-Tools Solid State Doctor
  - Disk wiping vs. Secure Erasing

Operating System:

- Windows 8 “Storage Optimizer” for TRIM configuration
- MacOS TRIM on by default for original SSDs, not for 3rd party

Potential Data Loss Scenarios

Data Deletion:

- User deleted data and emptied recycle/trash bin

File System Corruption:

- Logic corruption within file system and OS with no SSD hardware issue
- Data is corrupt or volume will not mount

Solid State Storage Device Failure:

- Firmware issue
- Controller issue with system area corruption
- NAND failure
- PCB issues
- Other component failure
- Environmental exposure
- Unknown issue

What You Can Do Yourself

Data Deletion:

- Think fast, act fast and don't panic. Time is critical depending on TRIM configuration
- Power down your system and boot from alternate media and OS with tools installed
- Run data recovery software of choice and save data to alternate media
- Consider yourself lucky to have recovered the data!

File System Corruption:

- Clone the SSD to another drive to create an identical image as a safeguard
- Run OS file system repair software to fix corruption
- If not resolved, do same as above for deleted data

Device Failure or Unknown:

- Power down and reboot your system to cycle power, hope for the best
- Boot from alternate media and OS and run manufacturer SSD Toolbox software
- Run Toolbox diagnostics and save any reports/logs to alternate storage device
- Update firmware if available and non-volatile!
- Reboot again and see if it boots or mounts, clone device or backup ASAP

Professional Data Recovery Services

When to Call a Professional Lab:

- When you have a hardware issue that the Toolbox software can't resolve
- If the device has been physically damaged or exposed to elements
- If data recovery software is unable to recover needed files
- If the data is critical and you don't want to risk endangering it yourself
- If the data needs forensic imaging or analysis as evidence

Capabilities:

- Specialized lab tools and software are developed for specific failures
- DR providers have special technology alliances with SSD manufacturers
- PCB rework and micro-surgery lab techniques may be required
- Data security for classified and government data
- Court approved forensic lab processes to produce data as evidence

Choosing a Data Recovery Provider:

- Do your homework and be aware that there are many choices
- Check references, proof of security and capabilities for your particular issue
- Ask questions and get it all in writing before you send your critical data to them

Thank You!

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