DEEPSPAR
Data Recovery Systems

Get serious. Dive for data the right way.

3D Data Recovery Phases & Issues

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3D Data Recovery Issues

- **Drive** failure (*drive-level issues*)

  - *Physical/Mechanical damage*
  - *Electronic problems*
  - *Firmware failure*

- **Disk** read instability problems (*disk-level issues*)

  - *Unstable or degraded drive*
  - *Media corruption (bad sectors)*

- **Data** corruption (*data-level issues*)

  - *File System structure corruption*
  - *User files corruption*

3D Data Recovery Phases

The **3D Data Recovery** Phases

1 **D**rive Restoration
Diagnose
Drive Repair (if required)

2 **D**isk Imaging

3 **D**ata Retrieval
File System Recovery
File Verification
File Repair (if required)

Phase 1 Issues

- ***Drive is not responding***
  - **Physical/Mechanical damage**
    - *Problems are diagnosed / identified. Failed parts are replaced.*
  - **Electronic problems**
    - *Failed PCB is replaced with a donor one while the contents of its ROM is copied to the donor PCB. If required the drive is re-calibrated to work with a new PCB.*
  - **Firmware failure**
    - *Firmware failures in ROM and System Area (disk platters) are diagnosed and fixed.*

- ***Drive produces useless data***
  - **Drive mislabels sectors or reads till certain point only.**
    - *Translator failures in System Area are diagnosed and fixed.*

Phase 2 Issues

- ## *Drive is unstable, degraded or has bad sectors*
  - ### Losing too much data in bad sectors
    - *Bad sectors are processed by using different read commands (Read Ignoring ECC).*
  - ### Drive stops responding occasionally
    - *HDD Hardware Reset or Repower procedure applies automatically to continue imaging.*
  - ### Drive is processing bad & problematic sectors too long
    - *The sectors are identified by Read Sector Timeout and skipped to be retrieved on later passes (if required).*
  - ### Drive may fail due to degradation or intensive reading
    - *Drive is preconfigured for lighter operations and fewer drive's resources are used while imaging on initial pass.*
  - ### Imaging takes a long time and results are unknown until it's done
    - *Real-time data evaluation is provided to identify user data on the fly.*
  - ### Drive cannot be imaged due to instability/degradation and needs to be fixed
    - *Special commands and algorithms are applied by the user to image slightly degraded drives in multiple passes to avoid necessity for parts replacement.*

Phase 3 Issues

- ## *File System Structure corruption*

  - **Operating System can't see partitions, directories, files**

    - *Corrupted File System elements such as MBR, boot sectors or directories are fixed.*

  - **File System structure cannot be fixed due to significant corruption**

    - *Files are retrieved in Raw Recovery mode.*

- ## *User data corruption*

  - **Cannot guarantee the integrity of retrieved files**

    - *Tools that verify the files for potential corruption and generate a report are used.*

  - **Retrieved files cannot be opened due to corruption**

    - *The files are repaired or bad sectors that are causing this corruption are processed once again by different algorithms at imaging phase.*