

## Understanding Data Loss

Computer users and many experts have long considered lost data permanently destroyed, with no hope of recovery. And because much of the information about data loss is inconsistent or inaccurate, it's not surprising that data loss is one of the most confusing and misunderstood concepts users face.

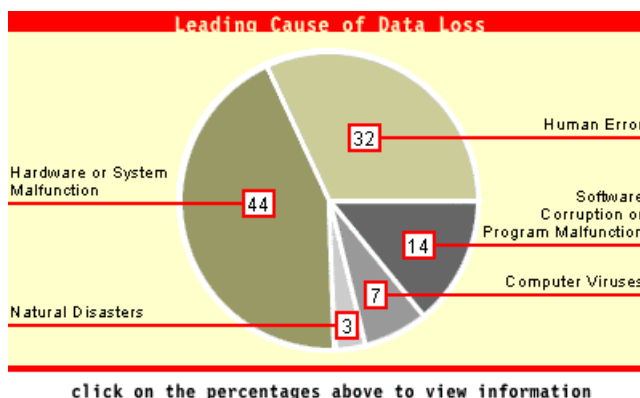
At Ontrack, we take the mystery out of data loss. Ontrack findings indicate that data is recoverable the majority of the time. So never assume your valuable data is unrecoverable. Always check with a qualified data recovery expert.

### Storing Data On Your Hard Drive

Knowing how your computer stores data makes it easier to understand the causes of data loss. Hard disk drives store data on one or more metal oxide platters, which spin at a rate of 3,000-10,000 revolutions per minute, holding magnetic charges. A read/write head attached to an actuator arm hovers 1-2 microinches (one millionth of an inch) above the surface of the platters. Data flows to and from these heads via electrical connections. Any force that alters this process may cause data loss to occur.

Here's a list of the most common causes of data loss. Click on the cause of data loss to see a listing of possible symptoms, examples and ways you can protect your data.

Leading Causes of Data Loss	%
Hardware or System Malfunction	44
Human Error	32
Software Corruption or Program Malfunction	14
Computer Viruses	7
Natural Disasters	3



Despite technological advances in the reliability of magnetic storage media, data loss continues to rise, making data recovery more important than ever. Ontrack engineers have identified three trends that are leading to this increase in lost data.

**1. More data is being stored in smaller spaces.** Today's hard drives store 500 times the data stored on the drives of a decade ago. Increasing storage capacities amplify the impact of data loss, making mechanical precision more critical.

**2. Data has become more mission-critical.** Hospital patient records. A graduate school thesis. Personal finance and tax information. Payroll records. Users today are storing more information electronically than ever. The loss of mission critical data can have staggering financial, legal and productivity ramifications on businesses and home users alike.

**3. Backup tools and techniques are not 100% reliable.** Most computer users rely on backups as their safety net in the event of data loss (a recommended practice). Ontrack research indicates that 80 percent of its data loss customers regularly back up their data, only to find them less than adequate at the critical moment they need to restore them. Backups assume that hardware and storage media are in working order; that the data is not corrupted, and that your backup is recent enough to provide full recovery. In reality, hardware and software do fail and backups don't always contain current enough data.

### **Leading Causes of Data Loss**

#### **Hardware or System Malfunctions (44 percent of all data loss)**

##### *Possible Symptoms*

- Error message stating the device is not recognized
- Previously accessible data suddenly gone
- Scraping or rattling sound
- Hard drive not spinning
- Computer hard drive doesn't function

##### *Examples*

- Electrical failure
- Head/media crash
- Controller failure

##### *Preventative Measures*

- Protect electrical components by using computers in a dry, shaded, dust-free area
- Protect against power surges with an uninterruptable power supply (UPS)
- Do not shake or remove the covers on hard drives or tapes.

#### **Human Error (32 percent of all data loss)**

##### *Possible Symptoms*

- Previously accessible data suddenly gone
- Message similar to "File Not Found"

##### *Examples*

- Accidental deletion or drive format
- Trauma caused by drop or fall

##### *Preventative Measures*

- Never attempt any operation, like installations or repairs, with which you don't have experience
- Avoid moving your computer, especially when it's in operation

#### **Software Corruption (14 percent of all data loss)**

##### *Possible symptoms*

- System messages relating to memory errors
- Software application won't load
- Error message stating data is corrupted or inaccessible

##### *Examples*

- Corruption caused by diagnostic or repair tools
- Failed backups
- Configuration complexity

##### *Preventative Measures*

- Back up data regularly
- Use diagnostic utilities with caution

#### **Computer Viruses (7 percent of all data loss)**

##### *Possible Symptoms*

- Blank screen
- Strange and unpredictable behavior
- Error message stating "File Not Found"
- Message announcing virus appears on screen

##### *Examples*

- Boot sector viruses

- File infecting viruses
- Polymorphic viruses

*Preventative Measures*

- Use a good anti-virus package, like [Ontrack Vet](#)
- Obtain software from reputable sources
- Scan all incoming data, including packaged software, for viruses

**Natural Disasters (3 percent of all data loss)**

*Possible Symptoms*

- While floods and earthquakes have obvious symptoms, brownouts and lightning strikes often leave no clues

*Examples*

- Fires
- Floods
- Brownouts

*Preventative Measures*

- Store tested backups in an off-site location
- Install a UPS
- Don't store critical data in a flood plain

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