# Why Cloud Storage Use Could Be Limited in Enterprises

October 9, 2009
By Henry Newman
Send Email »
More Articles »


It seems like just about every day brings with it a new cloud storage product announcement from vendors big and small, but the reality is that beyond enterprise firewalls, cloud storage's potential is limited.

There are two reasons for this: bandwidth limitations and the data integrity issues posed by the commodity drives that are typically used in cloud services. Together those two issues will limit what enterprise data storage users can do with external clouds.

## Cloud Challenges

The ideal for cloud storage is to be self-managed, self-balanced and self-replicated, with regular data checksums to account for the undetectable or mis-corrected error rates of various storage technologies. Cloud storage depends on being able have multiples copies of files managed and checksummed and verified regularly, distributed across the storage cloud for safekeeping.

It's a great idea, but it faces more than a few challenges, such as reliability, security, data integrity, power, and replication time and costs. But one of the biggest issues is simply that hardware is going to break. There are two ways disk and tape drives break:

- Hitting the hard error rate of the media, which is expressed in average number of bits before an error occurs
- Hitting the Annualized Failure Rate (AFR) of a device based on the number of hours used

Post a comment
Email Article
Print Article
Share Articles

The most common type of failure is known as the vendor's bit error rate. The bit error rate is the expected failures per number of bits moved. The following is generally what is published by vendors:

| Device | Hard Error Rate in Bits |
|---|---|
| Consumer SATA Drives | 1 in $10E^{14}$ |
| Enterprise SATA Drives | 1 in $10E^{15}$ |
| Enterprise FC/SAS Drives | 1 in $10E^{16}$ |
| LTO Tape | 1 in $10E^{17}$ |
| T10000B Tape | 1 in $10E^{19}$ |

These seem like good values, but it is important to note that they haven't improved much in the last 10 years, maybe by an order of magnitude, while densities have soared and performance has increased moderately. This will begin to cause problems as the gaps get worse in the future (see RAID's Days May Be Numbered). So using vendors' best-case number, how many errors will we see from moving data around, which is needed for replication in clouds?

Related Articles

- RAID's Days May Be

| Errors Per Data Moved | 1PB | 10PB | 40PB | 100PB |
|---|---|---|---|---|

Free Newsletters : Storage Daily

Most Popular Stories

Today | This Week | All-Time

1 Top 10 Data Storage Technologies That Could Disappear
2 Could Solid State Spell the End for Hard Drives?
3 Network Storage - The Basics
4 Storage Basics: Storage Area Networks
5 Emulex, QLogic Battle Over Data, Storage Networking Convergence

Most Commented On

This Week | This Month | All-Time

1 HP Upgrades SAN Storage, OEMs QLogic Fibre Channel Switches
2 Can Cloud Computing Replace Your Storage Network?
3 RAID's Days May Be Numbered
4 Top 10 Data Storage Technologies That Could Disappear

Partners
Partner With Us

More Storage and Networking
EnterpriseNetworkingPlanet
EnterpriseITPlanet
Datamation
ServerWatch.com
Wi-FiPlanet.com
VoIPPlanet.com
Storage Definitions
Storage Products

Key IT Solutions

APC Data Center Management Resource Center
Google Cloud Computing Resource Center
Microsoft Windows Server 2008 R2 Index
Microsoft | Unified Communications
Microsoft SQL Server 2008 Index
Intel Resource Center