Tech Accelerator
Data storage management: What is it and why is it important?

TIP

Immutable storage: What it is, why it's used and how it works

When data files must absolutely, positively remain forever unalterable, immutable storage technology is one affordable approach to consider.

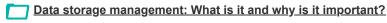**John Edwards**
Published: **16 Nov 2020**

As its name implies, the basic idea behind immutable storage is that the data storage will remain completely static and pristine for its entire existence. Immutable storage enables adopters to designate specific data that will be stored in a form that can never be tampered with, modified or removed.

"With immutable storage ... once something is written, it cannot be changed or deleted," said Scott Swigart, CTO at market research firm Cascade Insights.

Immutable storage can be applied to data stored on most conventional storage media and platforms, including tape, disk and SSDs. It's the cloud, however, that's now helping to make immutable storage an easy and flexible way to ensure data permanence.

One of the significant points of value in cloud computing is the element of managed services. "Immutable storage is an excellent example of how the meta/management layer actively works for IT security teams," said Bart Castle, cloud and network instructor for online training firm CBT Nuggets. With immutable storage, the user simply creates a file incorporating the desired immutability policy. "The service provider then takes on the burden of enforcing that policy and protecting the data itself," he said.

THIS ARTICLE IS PART OF

📁 **Data storage management: What is it and why is it important?**

Which also includes:
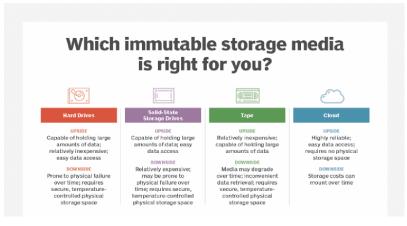
12 ways to manage your data storage strategy

Data storage management advantages and challenges explained

Worried about storing unstructured data? You're not alone

Benefits of immutable storage

Trust and compliance are the twin pillars of immutable storage. "If you need to know that a document hasn't been altered, immutable storage ensures that," Swigart said. "If you need to retain records for a period of time and don't want them accidentally deleted, immutable storage ensures that." Adopters of immutable storage technology can use it for legal holds, to supply a chain of custody, to secure digital evidence and to protect data from cyber attacks.

Another advantage is that immutable storage makes it hard to lose information through equipment failure or simple human error. "It also takes up less memory than conventional storage methods," said Eric McGee, senior network engineer at colocation services provider TRG Datacenters.

Which immutable storage media is right for you?

Hard Drives	Solid-State Storage Drives	Tape	Cloud
UPSIDE Capable of holding large amounts of data; relatively inexpensive; easy data access	**UPSIDE** Capable of holding large amounts of data; easy data access	**UPSIDE** Relatively inexpensive; capable of holding large amounts of data	**UPSIDE** Highly reliable; easy data access; requires no physical storage space
DOWNSIDE Prone to physical failure over time; requires secure, temperature-controlled physical storage space	**DOWNSIDE** Relatively expensive; may be prone to physical failure over time; requires secure, temperature-controlled physical storage space	**DOWNSIDE** Media may degrade over time; inconvenient data retrieval; requires secure, temperature-controlled physical storage space	**DOWNSIDE** Storage costs can mount over time

Consider the pros and cons of different storage media options when choosing one for immutable data storage.

A key immutable storage benefit is that the data is virtually impervious to ransomware. "Corporations can use this form of storage to quickly recover their data to the latest healthy backup, knowing that it is unaffected by malware," said Rick Vasko, director of service delivery and quality at technology and managed service provider Entrust Solutions.

Immutable storage effectively prevents ransomware perpetrators from fulfilling their strategy. "If anybody tries to do something [to the data], it just pops up an error message," said Jack Zmudzinski, senior associate at software development firm Future Processing.

Potential drawbacks

For all its benefits, immutable storage also presents a few drawbacks. "The downside ... is, if you can't delete the data, you're stuck with storing it for some amount of time, which could bring additional costs," Zmudzinski explained. "These costs are marginal, though, as cloud storage is getting cheaper and cheaper as time goes by."

Although immutable storage provides added security, the technology can't do anything to prevent physical damage to data caused by storms, fires and other disasters or hands-on tampering with the media. "It's recommended that organizations keep multiple copies of their data," Vasko said.

Who uses immutable storage?

Businesses tend to use immutable storage whenever they need to follow government or industry regulations or litigation requirements. "Some industry compliance mandates ask organizations to delete certain kinds of data after a set period of time," Vasko said. "With immutable storage, data can be maintained safely for a long time, while also giving organizations the power to set a date for it to be removed from their systems completely."

Law enforcement and private security organizations that routinely bank large volumes of video and audio surveillance data frequently turn to immutable storage to guarantee data authenticity. "These [immutable files] are used as evidence in most formal judicial setups and can vouch for someone's life or sentence," McGee said.

Organizations that store critical medical, pharmaceutical and scientific data are also prime immutable storage candidates. Zmudzinski pointed to the example of a university observatory. "Losing all those terabytes of data, even from one day of observation, would be catastrophic," he said.

Costs and providers

Immutable storage is generally no more expensive than storing conventional files. There's a catch, however. Storage costs can rapidly spiral upward if an organization stores a large number of immutable files tagged with lengthy timespans. "If, for example, you set a policy that a piece of data must be retained for a year, you can't delete it, and you have to keep paying for the storage until the data retention period expires," Swigart said.

When evaluating the overall cost of immutable storage, Vasko recommended factoring in whether or not the provider partner is write once, read many (WORM)-compliant. "WORM compliance guarantees that sensitive data remains secured for the time that it's stored," he said.

A wide range of on-site and cloud storage technology providers offer immutable storage-compliant products and services, including NetApp, Dell Technologies, HPE, Cisco Systems, AWS, Microsoft Azure, Google Cloud and Wasabi.

↘ Next Steps

Use immutable backups to prevent data loss, boost compliance

⬎ Dig Deeper on Primary storage devices

Immutable backups for ransomware defense may not be enough

By: Krista Macomber

Vast boosts QLC flash offer with ransomware-proof snapshots

By: Antony Adshead

Rubrik delivers faster backup for Sunrise Express

By: Johnny Yu

Catalogic CloudCasa charges for Kubernetes backup storage

By: Johnny Yu

DISASTER RECOVERY   DATA BACKUP   CONVERGED INFRASTRUCTURE

How to calculate and reduce MTTR

Mean time to repair is a helpful performance metric to ensure that important systems and processes don't fail. BCDR teams should ...

Prepare and conduct a ransomware tabletop exercise

Tabletop exercises help organizations practice response and recovery, but one size doesn't fit all. For ransomware attacks, use ...

About Us   Editorial Ethics Policy   Meet The Editors   Contact Us   Advertisers   Business Partners   Media Kit   Corporate Site

Contributors   Reprints   Answers   Definitions   E-Products   Events   Features

Guides   Opinions   Photo Stories   Quizzes   Tips   Tutorials   Videos