

# Tape Backup for Dummies

## The Ultimate Guide to Seamless Data Storage and Archival

- ✓ Easy-to-follow tape backup basics
- ✓ Effortless data storage
- ✓ Robust integrations with tape libraries

<b>01</b>	<b>Introduction</b> What is the purpose of this eBook?
<b>02</b>	<b>What Makes Tape Storage Stand Out</b> Fact Time Benefits of Tape Storage Tape Storage in Action, a Zmanda Story
<b>03</b>	<b>Understanding the Tape Landscape</b> What is Tape constituted of? What is the Tape Storage System? Investing in Tape Storage - Is it worth it?
<b>04</b>	<b>Integrating Tape Storage with the Cloud</b> The 3-2-1 Backup Rule What Data Goes Where? Zmanda to the Rescue
<b>05</b>	<b>Zmanda Tape Backup - Use Cases</b> Use Cases of Tape Backup <ul style="list-style-type: none"><li>• Tape Vaults</li><li>• Lights-Out Data Center</li><li>• Black Sites</li><li>• Disaster Recovery</li></ul> Zmanda's Valued Customer Stories <ul style="list-style-type: none"><li>• Zenn Innovations - The Global Trade Tracker</li><li>• Spectra - Hardware and Backup, The Perfect Duo!</li></ul>
<b>06</b>	<b>Tips to Store Tapes Safely</b> Impact of the Environment on Tape Storage The Often Overlooked Golden Tip - Good Organization Systems
<b>07</b>	<b>Conclusion</b> Tape Storage - A Summary Contact Information - Zmanda Support & Sales

# Introduction

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## What is the purpose of this eBook?

*“Data is a precious thing and will last longer than the systems themselves.”*

*-Tim Berners-Lee (Inventor Of The World Wide Web).*

Just like Tim said, data is endless, priceless, and immortal. And with such great power, comes very great responsibility. Data is responsible for the functioning of every appliance and application that relies on it. The absence of data and its power is equivalent to traveling back in time to the '60s. Something so good, however, comes with a price to pay. Data's price is the investment made in data storage, security, and preserving its integrity.

Cloud storage undoubtedly has its perks and has revolutionized over time while magnetic tapes have had their foundations deeply rooted in data storage and continue to thrive to date. Despite common misconceptions, magnetic tapes are in reality used immensely in the background for data backups. With very little light thrown their way, magnetic tapes have indeed been taken backstage with the spotlight on cloud storage, but they are yet to find a worthy opponent when it boils down to offering durability and rigidity.

Zmanda's Comprehensive Guide to Tape Storage is an all-inclusive eBook that discusses indisputable facts about tape storage, addresses common misconceptions, provides a thorough insight into the working of the tape landscape, its integration with other components, lists use-cases that highlight the power of tape storage, and Zmanda's powerful hand in transforming the usage of tape storage.

To learn more visit [www.zmanda.com](http://www.zmanda.com) or follow us on LinkedIn [@zmanda](https://www.linkedin.com/company/zmanda).

# What Makes Tape Storage Stand Out?.

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## Fact Time!

As the name suggests, magnetic tape is composed of a thin plastic ribbon coated by magnetic oxide and stores memory sequentially. It came into the picture for recording in the audio industry. Magnetic tape storage has a capacity ranging from 1MB to a substantial size of 15TB which can be further increased by integrating multiple tapes.

The tape consists of a read-write head to access the memory which is accompanied by a feature that truly sets tape storage apart, the air gap. The air gap is an electronically disconnected or isolated copy of the data present in a robotic library or tape rack that prevents all kinds of software-associated attacks. Ransomware attacks, cyberattacks, viruses and attempts by hackers are all cast away by tapes due to their air gap.

In a world filled with electronics in every nook and corner, this feature is of great utility. In present-day scenarios, magnetic storage's primary service is vaulting, where enterprises use magnetic tapes to back up their digital data and preserve them either on-site or off-site to act as a safety net in the event of a natural disaster or an untoward event.



## Benefits of Tape Storage.

The various benefits of tape storage trump its cost.

### >> Scalability

Magnetic tape storage offers improved scalability than hard drives. It is easier to obtain extra storage for magnetic tapes by simply procuring more of them, while hard disks would include the process of RAID and dataset manipulation. Companies with increasing clientele, constantly upscaling to meet the needs of the market etc, often find themselves indulging in tape backup due to its ease of scalability and the need for a fool-proof backup system for all their data.

### >> Cost

Despite disks requiring a cheaper investment for storage, maintenance cost is a dominant factor to consider. Disks require capital for power and cooling purposes, which averages out to have a higher investment than tapes as a whole.

### >> Bit Error Rate

Tape storage has better bit error rates than hard drives. It implies that far more data is written without error in tapes than in most storage devices. This feature emphasizes the ease with which data can be written to tape with the least number of errors and hence at a cheaper price as it prevents the need for error correction mechanisms or data having to be overwritten.

### >> Stability

Tape storage has a simple read-and-write mechanism in contrast to the complicated working of a hard drive. They also have multiple moving parts that may result in different failures. The absence of such moving parts prevents magnetic tapes from being susceptible to hardware failures and thus increases their stability. This stability is key for data backup as backup is expected to be a hundred percent reliable and resilient against online attacks or any offline mishaps that may be possible.

## >> Data Corruption

Tape storage offers a resilient approach to data storage through its sequential storage access and thus reduces the possibilities of data corruption.

In a nutshell, magnetic tapes are best suited for long-term off-site storage while other storage devices such as hard drives are suited for short-term on-site storage.

### Tape Storage in Action, a Zmanda Story.

*“Actions speak louder than words.”*

Statistics and facts aside, the ability to comprehend tape storage’s true potential is through illustrations of them in action. Magnetic tape offers its powerful hand in data backups and in assuring reliability to its clients. Technical giants like Amazon, Google, and Microsoft have their backups stored in tapes. With a need for resilient and trustworthy backup, magnetic tape storage was their unanimous choice.



Take for instance Haas Cabinet’s owner Carlos, what started as a hobby in his barn in Indiana, is now a highly sought-after company for styling your living space. They offer do-it-yourself workspaces and personal one-on-one consultancy with their clients to offer the best-customized solutions. With countless advancements and a growing customer base, their need for data storage increased and became of prime importance. Their data storage option? Tape storage. With Zmanda’s competence, a well-integrated and easy-to-maintain backup system was up and running to cater specifically to the needs of Haas Cabinet.

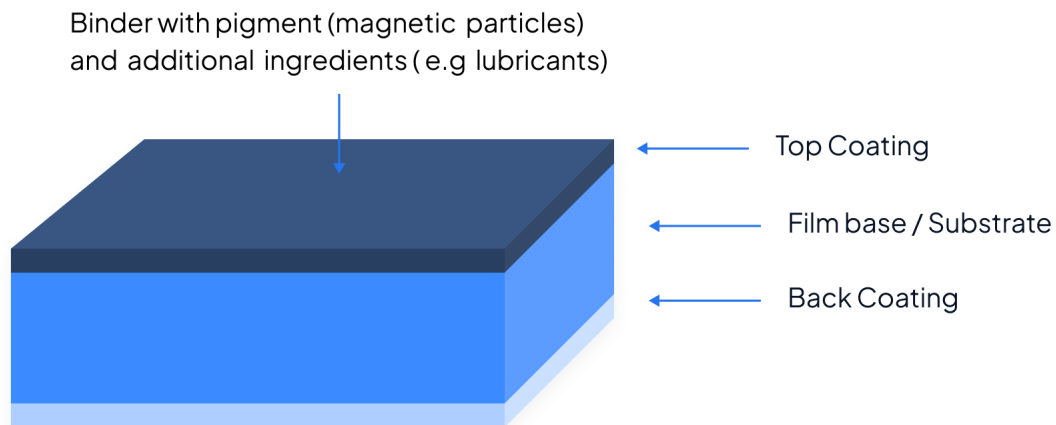
With Zmanda’s competence, a well-integrated and easy-to-maintain backup system was up and running to cater specifically to the needs of Haas Cabinet.

# Understanding the Tape Landscape.

*“When the why is clear, the how is easy.”*

We’ve established that magnetic tapes are a game-changer in today’s growing need for data storage and why it’s a better alternative to its competitors. However, maximizing its utility is a power wielded by the user. The following section provides an in-depth understanding of the tape landscape

## What is Tape constituted of?



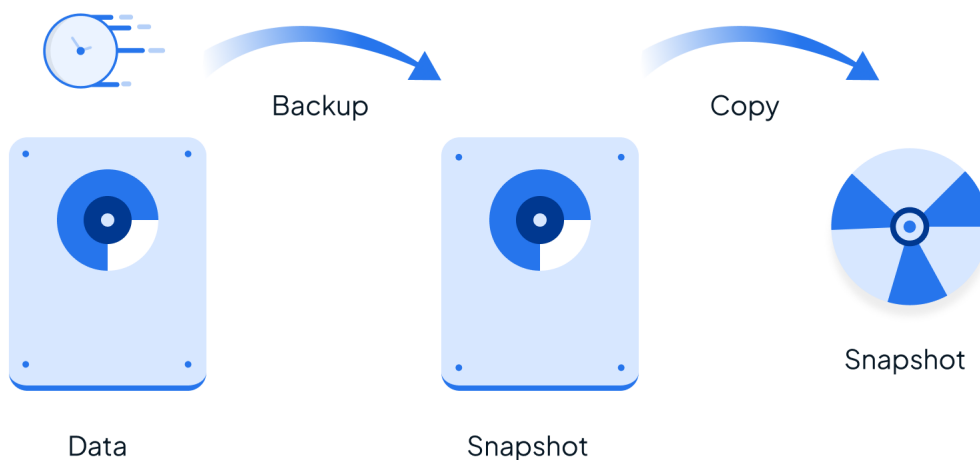
Layers of Magnetic Tape.

The magnetic tape consists of two main layers stacked together: the base film and the magnetic layer. The base film, also known as the backside of magnetic tape, is a substrate that provides flexibility and strength. Materials such as paper, cellulose acetate, and polyvinyl chloride compose this layer. The magnetic layer or the recording layer lying above the base film is typically made of metallic oxides. Iron oxide, chromium dioxide, etc. to name a few. This layer is where all the magic happens, where data gets stored due to its ability to get magnetized by electric signals.

## What is the Tape Storage System?

As a whole, backup to tape centers around tape libraries. A tape library, known by many names such as tape silo, jukebox, or tape robot, comprises multiple tape drives, slots to hold the tape cartridges, and a robotic system. The robotic system takes the help of an RF scanner or barcode reader to identify the required tape cartridge present in slots and loads them into the respective tape drives. This entire process is how the tape is backed up and used in tape libraries.

Virtual tape libraries, however, use a disk-based backup system that emulates the working of tape libraries. The virtualization of hard disks as tapes enables the user to integrate the data stored with existing backup software. Data is written sequentially, similar to tape storage's working, but the speed of writing and reading the data is improved as the underlying storage media is disks. However, the cons of using VTLs arise from the downsides of using hard disks as storage media.



Backup is performed on faster HDD, then  
a tape in background mode.

Working of VTLs.



## Investing in Tape Storage – Is it worth it?

The numerous components that constitute the tape landscape and their integration have been covered, leading to the next question, "How much am I investing, and is it worth the investment?". To answer this question, let us consider the financial aspects of tape storage with numbers extracted from present-day scenarios.

The cost of tape libraries ranges from around 11 thousand dollars to 110 thousand dollars or even a million dollars. The amount of money spent is dependent on various factors such as the size of the tape library, the number of tape drives, slots, and the cartridges it can support. The increase in complexity and capacity results in a proportional increase in the price. Further, tape libraries are capable of expansion, resulting in a reliable and scalable tape infrastructure. It is essential to understand that these tape libraries have an expensive upfront cost while cloud storage requires periodic installments. However, the type of data stored influences the decision of which storage means to use.

The cold storage data costs about half a rupee or more per gigabyte in cloud storage. This amount is small when compared to a rupee and half the user would pay in the case of tape libraries, but time is an influential factor. As the name suggests, cold storage is data that is to be preserved for a decade or more. Hence, over the years, cloud storage whose pricing is subject to market value would be a gamble and an expensive alternative to the slightly heavy upfront cost invested in tape libraries. The table below clearly captures the difference in cost between the tape and cloud storage.

Tape Library	Cloud Storage
Capacity: 36 TB	Capacity: 36 TB
Period: 15 Years (180 months)	Period: 15 Years (180 months)
Tape Drive: LTO Half height fiber	Cost per Gigabyte: \$0.004
Channel drive (12 TB, Qty: 3)	Estimated Cost: \$26,000 ~ Rs 19,80,000
Estimated Cost: \$17,500 ~ Rs 13,05,000	

As evident by the numbers, tape libraries are indeed a better alternative to cloud storage or hard disks on accounting for the time duration and the data to be stored.

# Integrating Tape Storage with the Cloud.

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*“We’re entering a new world where data might be more important than software.”*

*-Tim O’Reilly.*

In the realm of big data analytics, data science, and research centers generating abundant amounts of data to be verified and studied over time, data supersedes all things powerful. As Tim mentioned, we have seen the growing importance of data and its management over the choice of software that uses it. However, such a powerful tool goes hand in hand with the challenging task of data storage.

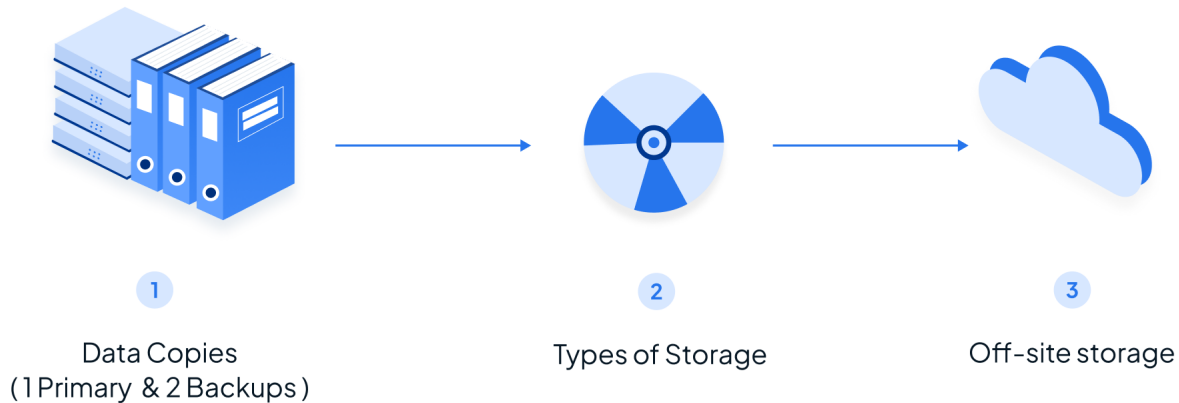
Tapes, hard drives, CDs, hard disks, cloud storage, pen drives, cassettes, etc., the list of storage devices are limitless, but the kind of data stored influences the decision of which device to use. Unfortunately, all these devices have their pros and cons, and selecting just one device is a tricky choice. Thus, hybrid environments came into the picture. Why use a single device when you can get the best of all worlds? Integrating the advantages of the various devices and nullifying their disadvantages provides the best environment for your data.

## The 3-2-1 Backup Rule.

*“Three copies on two different media, one offsite, and one offline.”*

*-The mantra of data storage.*

Delving deeper into the 321 data backup rule, we understand the need for a hybrid environment. Data present on-premise is easily accessible and should be the first recovery option.



Should that fail, cloud data present online is accessible at your fingertips with just the press of a couple of buttons. In the event of a calamity or an untoward disaster, data stored offline in tapes can get the company up and running in no time. Such a hybrid environment ensures to aid all types of storage issues, thus being the most sought-after storage solution for backup and disaster recovery.

### Hybrid Clouds:

A hybrid cloud is a method of mixed computing that involves on-premise infrastructure blended with private and public cloud services. Hybrid cloud storage facilitates the storage of dissimilar data. Dissimilar data meant different storage devices capable of supporting them were required. Recently, clouds have relied heavily on tape storage to provide an economical solution with tremendous scalability. Cloud and tape storage intertwine their characteristics to tick off all the requirements of an effective storage system.

### What Data Goes Where?

We've discussed the role of tape storage in a hybrid environment, but what kind of data is stored in the components making up the environment, mainly tape storage?

Interestingly, there is no one correct answer to this question. Undoubtedly, tapes are used essentially for data archival or cold storage data i.e. data accessed infrequently, but the size and type of data are influential in determining its other functionalities.

Large databases, objects, containers, etc., are stored on tapes, while small databases are stored on disks. Thus factors that dictate the type of data stored on tapes are:

- Size.
- Recovery Time Objective (RTO) to be achieved.
- Frequency of access.
- Importance and value.
- Retention period.

Taking into consideration these factors, data stored on tapes have their domain expanded from just archival storage.

With the data stored on tape, the next question is, "How long should the data reside in it?". Enter into the picture, the data retention policy. It is a set of guidelines that help organizations keep track of their data, and determine their retention period and the methods for its disposal. Companies can thus establish a timeline that best fits their needs. With such flexibility and its ability to be tailored to our requirements, hybrid environments score a hefty amount of points in our books.

## Zmanda to the Rescue.

Hybrid environments are unquestionably the perfect solution for mitigating disaster, enhancing data security, and integrating heterogeneous data. However, with the involvement of numerous components, we begin to ponder the complexities of managing such an architecture.

Thankfully, Zmanda offers the ideal solution for managing hybrid environments. With the help of a single console, Zmanda's proprietary software allows users to integrate all forms of storage, supports the use of heterogeneous data, and delivers on-demand flexibility that empowers even legacy systems. Zmanda's one-stop solution protects your entire business wherever present, on-premise, remote, private cloud, or public cloud.

Ready to try this for yourself? Start a free trial of Zmanda.

[Start Your Free Trial](#)



## Six Key Features of Zmanda's Hybrid Cloud Architecture:

- **Enterprise-Level Scalability**

Zmanda supports various levels of backup and allows users to scale easily from small networks comprising a limited number of nodes, using legacy on-premise and hybrid cloud environments.

- **Security You Can Trust**

Zmanda guarantees that data is kept private to you, with stringent access management controls to ease concerns regarding the accessibility and visibility of data.

- **Resilient Architecture**

Offering support to both on-premise and cloud environments, Zmanda's distributed architecture fortifies your system against infrastructure failure on all tiers of the system, ranging from a hard disk to that of a node or site.

- **Data Agility Solved**

Constituting a multitude of tenant architecture, Zmanda enables our users to carry out data migration tailor-made to suit user requirements.

- **High Flexibility**

Zmanda provides users the ability to use both public and private cloud environments, bolstering their architecture against any problems that may arise in the future.

- **Efficient Problem Resolution**

Offering our expertise and technical support around the clock, Zmanda puts our customers first in resolving problems and offering technical assistance without a second of delay.

# Zmanda Tape Backup – Use Cases

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## Tape Vaults

A use case of tape libraries is in the context of tape vaults. Tape vaulting happens offsite, away from the onsite primary infrastructure, and is used to secure and backup data. In this process, data is backed up and vaulted to tapes based on the recovery point objective, an indicator of the minimum amount of data loss that can be tolerated. Tape vaulting is a service that includes the collection of magnetic tapes in vaults, its storage under secure and optimal environmental conditions, and providing insurance to its users. Alongside tape vaulting is tape rotation, which ensures that data stored on the tapes are up to date and offers maintenance of data.

## Lights-Out Data Center

A lights-out data center works with complete independence from any form of human intervention. With no humans in play, the need for light is redundant, thus giving rise to the name Lights-Out Data Center also known as the Dark Data Center.

Here are a few advantages that contrast Lights-Out Data Centers with its much brighter sibling, human-intervened data centers:

- **Human errors**

The absence of humans offers resilience toward the errors made by them either intentionally or unintentionally, thus bringing it down to a bare minimum.

- **Remote work**

Remote work: Staff and experts will have to carry out mandatory routine checks for maintenance with the added advantage of doing it remotely. Remote resource management and access to hardware help assuage the employees' lifestyles.

- **Absence of Oxygen**

With the absence of oxygen, corrosion reduces, and the probability of a fire is non-existent. This enhances data security and offers a trustworthy guarantee to its clientele.

- **Tape Storage:**

With tape storage's magnification in terms of storage per unit, performance, and compatibility with earlier versions, tape libraries are used majorly in these centers. Thus, the countless advantages of tape storage tag along with it when used in lights-out data centers.

## **Black-Sites**

Air-gapped networks are secluded from other devices and insecure networks electromagnetically, electrically, and physically. A popular application of air-gapped networks is in black sites. Black sites are run by the military or government to carry out covert operations with opaque communication between them and the citizens. These sites require utmost security and thus require a fool-proof data center for their sensitive data. Black sites are used by the Central Intelligence Agency, Warface research centers and, the State Office of Information Technology Services.

Zmanda has signed deals for data management on black sites in the recent past. Zmanda promises complete confidentiality and honors the trust invested in them. The black site data centers function completely offline and are isolated from the internet to prevent unauthorized access. Zmanda matches the security requirements through the provision of the below features:

- **Air-gapped networks**

As discussed above, air-gapped networks enhance security measures by eliminating ransomware and cyber attacks. Further, Zmanda Management Console ensures that administrative work is performed with ease.

- **Tape-Archival**

Zmanda's forte in tape backup and archival surpasses other competitors in the market. With years of experience and evolvement, Zmanda sticks with improving tape backup from the ground up to provide a cost-effective storage solution.

- **Open Source Background**

Zmanda's foundation lies in its open-source software that enables its customers to view the code and customize appropriate storage format solutions pivoted on security.

## Disaster Recovery

Disaster recovery involves the strategies deployed to ensure that data is revivable and secured at off-site locations in the occurrence of an untoward event like natural disasters, cyber-attacks, etc. Disaster recovery includes two main components:

- Data Replication.
- Computation / Computer Processing when the primary server is down.

Data replication is the process of backing up data to an off-site location at regular intervals to abide by the 3-2-1 Backup Rule as discussed previously. The backing up of data to storage devices is essential for quick recoveries from any intentional or unintentional complication.

Computer processing includes the additional feature of computation power in off-site locations. When any harm comes to the data or servers at the primary site, the computation can be handed over to these remote locations to ensure that the company thrives non-stop with no hassle.

Let us look at a couple of use cases that highlight the need for disaster recovery and optimize the data storage solution using tape storage.

- **Enterprise Audits**

Enterprises today possess numerous offshore and onshore accounts with multitudes of transactions and taxes levied. These activities are recorded and verified through audits to ensure fair practice in accordance with government-enforced regulations. This necessitated a data storage mechanism and a disaster recovery plan that offers the utmost security and privacy for company trade secrets and transactions.

The most prominent solution sought-after was the [hybrid environment](#) that offered its clientele simple data management practices and a reliable disaster recovery plan. Zmanda equips its clients with advanced enterprise protection with features and packages like no other. We constantly scale up to stay on par with the continual development of technology and demands.

- **Mission Critical Production Systems**

Certain companies function with zero compromises on downtime and generate mission-critical data at regular intervals. These companies fall under the roof of Mission Critical Production Systems.



Data generated by said companies are called mission-critical data. The term mission-critical refers to any factor of a system essential to the company and whose disruption results in a tremendous loss in revenue, disruption of their activities, and an unfortunate hit on its reputation. Such systems make use of tape storage due to the security, scalability, and robustness offered by it.

- **Research**

Scientific explorations and laboratories like CERN generate a colossal volume of data. Every experiment performed generates conclusions and theories that are recorded and studied further. CERN's data storage relies heavily on tape storage. A consequence of a loss of such data is millions of dollars lost as these experiments and studies are carried out with utmost precision, heavy and complicated equipment, and with months of time invested. Thus, a disaster recovery plan and a backup system are key to sustaining data over a long period.

- **Healthcare**

A field of continuous burgeoning is healthcare. With an increase in technological marvels and healthcare equipment, the data generated must also be on par for optimum compatibility. Artificial Intelligence, Machine Learning, Neural Networks, etc, have seen a rise in their utility towards health care in terms of diagnosis and discoveries, resulting in the need for congruent data storage solutions.

Hospitals and clinics often opt for on-premise data storage to enhance control over internal data and thus improve security. Cloud storage or hybrid environments are used for backup and archival purposes. Moreover, healthcare data are tied to numerous regulations and standards to ensure client confidentiality and the harmonious working of the centers, which are best met with hybrid environments in compliance with the regulations.

The increase in clientele, research in health care, and loyal patients who visit over the years requires data backup and disaster recovery plans. With hundreds of in-patients admitted throughout, healthcare centers must ensure they have data such as doses administered, etc, handy and backed up in the event of untoward disasters.

Tape storage saves the day once again, with its ability to store the influx of data stored at minimal prices without compromising on security and performance. Zmanda offers its customers just the same with a promise to honor it. A real-life example of Zmanda's wonders in the healthcare industry can be found here.

<https://www.zmanda.com/blog/data-backup-for-healthcare-organizations/>.



## Zmanda's Valued Customer Stories.



zenINNOVATIONS

Zenn Innovations is home to the Global Trade Tracker, an extremely powerful web-based tool that grants its users access to trade statistics from the world's principal trading countries. Zenn witnessed a steady growth in the amount of data as multiple countries turned clients. However, the challenge didn't stop there. Zenn had to not just store the data in a viable platform but also ensure that it was compatible with its various tools to analyze the data and provide game-changing statistics to its customers.

Zenn started by using scripts and manual backup procedures, a truly tasking process and it thus turned out to be just a temporary solution. Zenn required backups with quick recovery time and timely backups that were automated to work efficiently. Further, bearing in mind the complexities of scalability and the manual labor involved, Zenn was in search of a trustworthy partner to deliver the same. Insert into the picture Zmanda.

Zmanda Enterprise offered the best integration of services across multiple platforms at the best price. With our expertise in tapes, drives, and cloud, Zmanda offered a seamless knit of all the storage media controlled with a user-friendly web-based GUI. The big three never fail. Tapes with its ability to scale up with ease, the cloud's cost-efficient ability to secure data, and drives with its transfer rates, all bound together have provided the best playground for data. Hybrid environments had once again saved the day.

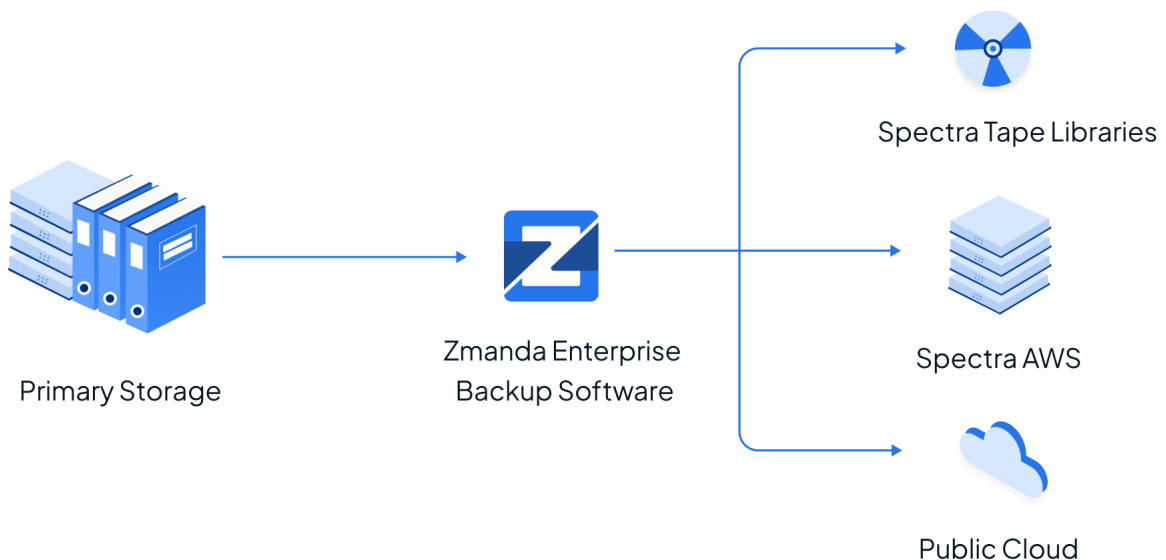
Ready to try this for yourself? Start a free trial of Zmanda.

[Start Your Free Trial](#)

## Spectra – Hardware and Backup, The Perfect Duo!



We are known for providing software that seamlessly integrates your storage media and a resilient backup system. With exponential growth in data, Zmanda tied up with Spectra to offer their customers fast installation, simplified management, enterprise-class functionality, and a cost-effective storage solution. Spectra produces tapes and disks that were designed from scratch to meet the demand in the market. Together, they provide the user with a centralized data management system for multiple IT environments and a secure long-term storage solution.



Zmanda and Spectra have joint forces to provide the best long-term data backup solution. With Zmanda's expertise in the tape industry and in providing robust backup software and Spectra Logic's popular Black Pearl NAS technology and their tape libraries, your data would have the best experience with Zmanda.

# Tips to Store Tapes Safely

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## Impact of the Environment on Tape Storage

The timeless persistence of data significantly relies on the safety of the tape storage. Despite tape storage's durability and dependability, like any other storage, it is susceptible to external factors such as the environment, storage facility conditions, etc. The key to safety is understanding the parameters that adversely influence it and mitigating the same.

Environmental Factor	Optimal Conditions
Temperature	60° to 90° Fahrenheit
Humidity	20% to 80%
Sunlight	Prevent direct exposure to Sun
Contaminants	Dirt, oil, smoke, dust, mold, etc., can compromise the stored data.
Magnetic Radiation	0 to minimal magnetic radiation. Maximum Limit: 50 Oersteds

The above table lists the optimal measurements for various environmental factors.



## The Often Overlooked Golden Tip – Good Organization Systems

*“For every minute spent in organizing, an hour is earned.”*

An organized system enforces a procedure to follow, rules to comply with, and a systematic way of achieving goals and targets. The benefits of such a system are limitless; greater efficiency, increased productivity, and greater throughput, to name a few.

Here are a few tips whose implementation results in organized systems for tape storage management.

- Barcode Labels

Right from identifying primary keys in databases to calling each other by our names, unique identifiers have played a key role in identification. As tape storage libraries are of large scale, barcode labels facilitate easy identification and provide the ability to store metadata made available by scanning them. Companies that use tape storage with different compliance guidelines employ these labels to ensure they meet regulations.

- Inventory Management System

Maintaining an up-to-date inventory management system prevents untoward hysteria and panic. A well-tabulated and comprehensive system containing all the required information on the whereabouts of a tape cartridge or drive, and its respective contents, aids in its management. An inventory management system also helps pinpoint tapes in line for rotation, recovery testing, or maintenance. It also eases the process of auditing tape storage.

- Tape Rotation

Operating systems employ a multitude of process scheduling algorithms to schedule processes of different priorities. These algorithms aim to work efficiently and fairly while maximizing the utilization of the internal hardware's processing power. Similarly, tape rotation is essential for maintaining tape storage in the most effective way possible. As the name suggests, tapes are rotated based on a predefined scheme and algorithm which helps ensure that data retention and minimizing the purchase of additional storage media finds the perfect intersection. Further, tape rotation prevents tapes from being overused, which can lead to unprecedented wear and tear, inevitably leading up to data loss and tape degradation.

- Regular cleaning

Organizing and scheduling regular cleaning of tape cartridges prevent contaminants from a degrading quality and data loss. Before drafting a schedule, personnel must be trained to carry out the cleaning, paying heed to minor details essential to maintaining tape storage.

- Recoverability Testing

A well-organized system must comprise a recoverability testing plan. A recoverability test entails testing the tape by reading its data. The recoverability test quickly identifies inabilities in reading data or signs of a loss in data integrity, allowing for proper mitigation by writing the data to other tapes.

- Calculating Backup Frequency

Companies have diverse sets of data, producing data at different rates and thus having varying frequencies of backing up data. An organized system is at its best when the frequency calculated is the optimal frequency that guarantees data security and backup, resulting in the prevention of unnecessary writes to tapes.

Following these simple tips leads to the prolonged and hassle-free use of tape storage. Customizing the organizational system and assigning responsible and well-equipped personnel to best suit the company's needs are essential to maintaining tape storage.

## Conclusion

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### Tape Storage – A Summary.

Tape storage may have been overshadowed by the limelight of cloud storage and hard drives, but its resilience and capabilities are unmatched, leading to its ability to be well sought-after for data backups across the world.

Essential tips and guidelines revealed all that's left is their implementation and securing data by the best means possible. Who better than Zmanda to entrust your data with superior security and integrity? Zmanda, Betsol's proprietary product, is your one-stop destination for tape storage. With maestros in tape storage equipped with unbounded experience and knowledge, Zmanda offers services for long-term data archival using tape storage.

### Contact Information – Zmanda Support & Sale.

Data has never found a better companion, and our enterprise customers have never been happier. Data backup has never been easier. The ideal yet realistic solution, the complementing benefits of the trio, all in one place. Zmanda's clientele has had a wide range of prerequisites and necessities that were fulfilled after numerous interactions with the clients and well-thought-out execution by our team. With an expanding skill set nurtured under the evolution of data storage and experts in the field, Zmanda offers quality products like no other.

For more information and adept assistance from our technical support team, reach out to us at.

Ready to try this for yourself? Start a free trial of Zmanda.

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408-732-3208 (INTL)

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