

Whitepaper

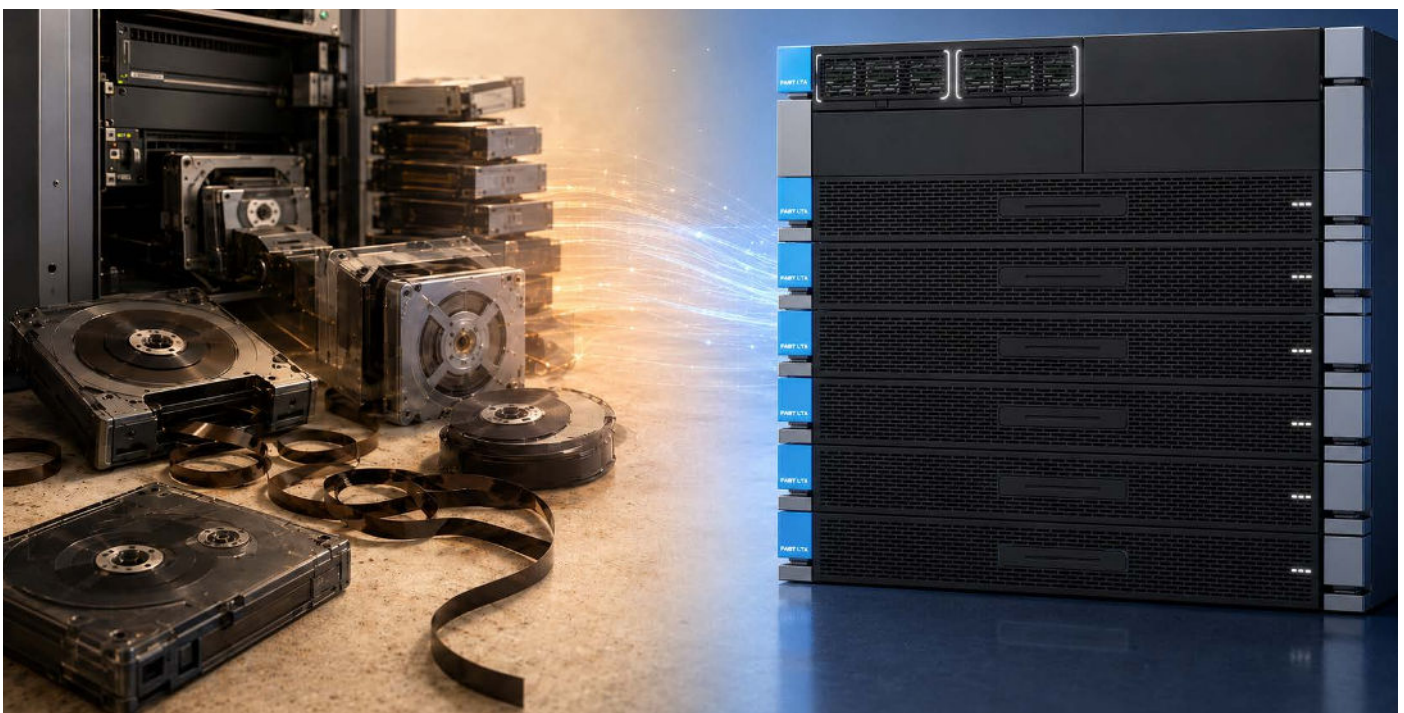
From tape to VTL:

How organizations modernize their existing storage strategy without rebuilding everything

Tape has played an important role in backup and archiving for many years. Logically so, because LTO tape is relatively inexpensive per TB, can be kept physically offline and fits well with long-term retention. For many organizations, tape is therefore still the last line of defense when primary data and regular backups are no longer available.

But the requirements have changed. Backup and archiving are no longer only about storage. Organizations need to be able to recover faster, withstand ransomware, demonstrate compliance and keep growing amounts of data manageable. Especially in sectors such as government, healthcare, industry, media and research, it is not enough that data still exists “somewhere”. The main question is how quickly, securely and reliably you can access it when needed.

This creates tension with traditional tape. Tape is strong as deep cold storage, but less suitable when data needs to be available more quickly or is accessed more often. A Virtual Tape Library, VTL, then offers a logical intermediate step. The familiar tape logic is retained, while the physical limitations of tape are replaced by modern disk-based storage. Silent Bricks from FAST LTA add speed, built-in data protection, energy-efficient operation and modern air-gap capabilities to that.



Why traditional tape is under pressure

Tape has clear advantages. The costs per TB are low, tapes can be kept physically offline and, when stored properly, they can last for years. Yet this immediately raises an important question: if you expect never to need data again, should you continue storing that data at all?

For all other data, including within large archives, the bar is higher. Organizations need to be able to provide access to files within a reasonable time. For example, for users, citizens or customers requesting information. Or for research, analysis and artificial intelligence, where historical data actually gains value again.

The limitations of tape become especially visible once speed, management and recoverability become important. Tape works linearly. Anyone who needs specific data has to wait until the tape is loaded, wound and positioned. In a normal restore, that is inconvenient. In a ransomware incident, data center outage or urgent information request, it can become a serious problem. At that point, recovery time is no longer a technical KPI, but a business-critical factor.

Physical management also remains a point of attention. Tapes need to be swapped, labelled, transported, stored and checked. For true air-gap security, tapes must also actually be removed from the library. As long as a tape remains in the library, it can be reloaded via software and can therefore remain vulnerable.

On top of that comes generation compatibility. New LTO generations cannot always continue reading older media. LTO-10, for example, no longer reads any older LTO version, which means organizations must periodically migrate to new generations. Such migrations take time, capacity and attention. In large archives, this can take many months.

So tape is not outdated. But the question has become narrower: for which data is physical tape still logical? As soon as data needs to remain available for recovery, service delivery, compliance, research or AI, a more active form of archiving better matches today's requirements.

What VTL solves

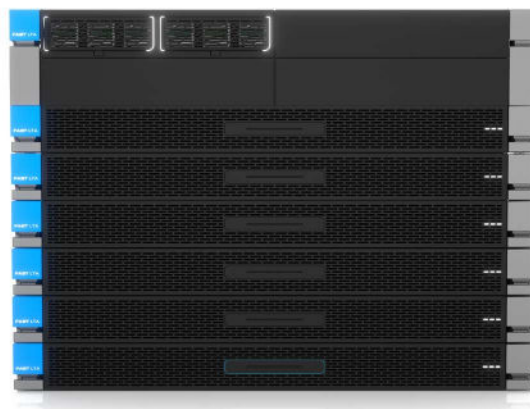
A Virtual Tape Library behaves towards backup and archive software like a traditional tape library, but uses modern storage as the underlying layer. Think of hard disks, SSDs or NVMe. This keeps the structure of tape backup software intact, while data becomes available more quickly.

That is important. Many organizations have invested for years in backup software, retention policies, workflows and compliance processes around tape. Replacing that entire environment is expensive, risky and often unnecessary. VTL makes modernization possible without a complete redesign of the backup strategy.

The benefits are concrete:

- * **Faster recovery:** data does not need to be searched linearly, but is directly available via random access.
- * **Less physical management:** no daily handling of tapes, transport or manual swaps.
- * **Better integration:** existing backup software and workflows can largely be retained.
- * **Active archive:** data remains usable for recovery, compliance, analysis, research or AI applications.

In other words, VTL gives organizations the opportunity to retain their trusted backup strategy, while gaining the speed, availability and manageability that traditional tape can no longer provide.



Why Silent Bricks make VTL stronger

Not every VTL solution is automatically suitable for modern requirements around speed, security and scalability. The difference lies in the underlying architecture. **Silent Bricks** were developed as secondary storage for large archives, backup and recovery. Within a VTL context, they combine familiar tape logic with the benefits of modern disk-based storage.

1. Fast access to data

Silent Bricks are based on hard disks or NVMe and provide random access to data. Connectivity via 100G Ethernet, Fibre Channel or iSCSI supports high transfer speeds. Where tape depends on loading, winding and positioning, Silent Bricks can access specific data much faster.

This is especially important for recovery. In an incident, you do not only want to know that the data is still there. You want to know how quickly you can retrieve it.

2. Built-in data protection

Silent Bricks use 12/8 Erasure Coding. This distributes data across twelve data carriers, with four redundancies. Up to four of the twelve data carriers can fail without data loss occurring.

That is an important difference compared with physical tape. A single tape has no built-in media redundancy. In the event of damage or media problems, the data on that tape can be lost or become difficult to recover.

In addition, Silent Bricks perform automatic Digital Audits. During this process, the integrity of files is checked regularly and errors can be repaired automatically. The system therefore does not wait until a restore fails, but actively checks whether data is still correct.

3. Energy-efficient for inactive data

A strong advantage of tape is that a tape on the shelf consumes no power. Silent Bricks approach that advantage by almost completely switching off individual Bricks when they are not in use. As a result, they consume almost no energy when inactive, while becoming available again quickly.

This makes Silent Bricks relevant for organizations that want to modernize their archive, but do not want to end up with an energy-intensive always-on storage environment.

4. Migrate without rebuilding everything from scratch

Silent Bricks can emulate existing tape libraries one-to-one. This allows organizations to keep using existing backup software and workflows. Migration can take place in parallel, without downtime and without major changes in the software layer.

This lowers the threshold for modernization. You replace the physical tape layer, but retain the logic above it.



Discover more about the power of Silent Bricks as VTL in our brochure at:
www.comex.eu/en/knowledge-center/

Air gap remains the starting point

Air gap is an important reason why organizations continue to use tape. A physical tape that is removed from the library and stored offline cannot be manipulated via the network. That is strong, but it does require discipline, logistics and manual execution.

In practice, that is not always easy. Tapes must be removed on time, stored securely and later be available again when recovery is needed. If that process is not carried out consistently, the air gap is less strong than assumed. As long as tapes remain in the library, they can be reloaded via software.

Silent Bricks approach air gap in a more modern way, but physical separation remains the starting point here as well. With Silent Brick Pro, the air gap is created by ejecting the Brick and physically removing it. Essentially exactly as with tapes, but faster. Silent Brick Max Air adds another variant. This solution can physically or galvanically disconnect the connection to the storage media, for example manually or via a timer. This creates true separation without the storage media having to be fully removed from the system each time.



This makes the execution of an air gap more manageable with the Silent Brick system. The core remains physical isolation. The difference lies in the combination with faster access, less tape logistics and more automation.

VTL in practice: German Aerospace Center, DLR

A strong practical example is the German Aerospace Center, DLR. DLR manages the German Satellite Data Archive at the Earth Observation Centre in Oberpfaffenhofen. Global satellite receiving stations send data there for long-term storage and archiving.

DLR worked with a hierarchical storage management system in which two copies of the data had to be based on different technologies. When one of the tape technologies being used was discontinued by the manufacturer, DLR chose Silent Bricks from FAST LTA.



Photo: DLR

The impact was not only in replacing tape. **According to Stephan Schropp, IT Manager D-SDA at DLR, significantly lower latency was measured when reading data from the archive. As a result, DLR was able to dispense with an additional copy on hard disks.**

This clearly shows where VTL with Silent Bricks becomes strategically interesting. It is not only about faster reading, but also about a simpler architecture, fewer cache layers and less management.

Why do organizations still choose tape?

An honest story about VTL acknowledges that physical tape still has a place. For extremely large archives that are almost never accessed, tape remains attractive because of its low cost per TB and low energy consumption during offline storage.

But as soon as an archive is used more actively, the trade-off changes. Think of data needed for audits, research, recovery, analysis, AI training or operational continuity. Then speed, integrity, manageability and reliability become more important.

So the choice is not simply tape or no tape. The better question is: **what role does the archive play in your organization?**

If the archive is mainly a final destination for data that is almost never used again, tape can be appropriate. If the archive becomes part of recovery, compliance, analysis or digital control, VTL with Silent Bricks is often the more logical step.

Conclusion

Tape has worked well for many years as the last line of defense. But modern organizations need more than storage that lies offline somewhere. They need fast recovery, demonstrable integrity, better availability and less operational complexity.

VTL makes it possible to retain existing tape processes, while modernizing the underlying technology. Silent Bricks strengthen that model with random access, 12/8 Erasure Coding, automatic Digital Audit, energy-efficient operation and modern air-gap capabilities. This makes VTL a practical evolution of traditional tapes.

So the question is not whether tape was ever valuable. The question is whether physical tape still fits the speed, security and control that modern organizations need today. For many organizations, the answer does not lie in completely rebuilding their backup strategy, but in replacing the physical tape layer with a more modern foundation.

Hello.

COMEX | Vogt 21 | NL-6422 RK Heerlen | office@comex.eu | www.comex.eu

FAST LTA | Ruedesheimer Str. 11 | 80686 Munich, Germany | info@fast-lta.de | www.fast-lta.com