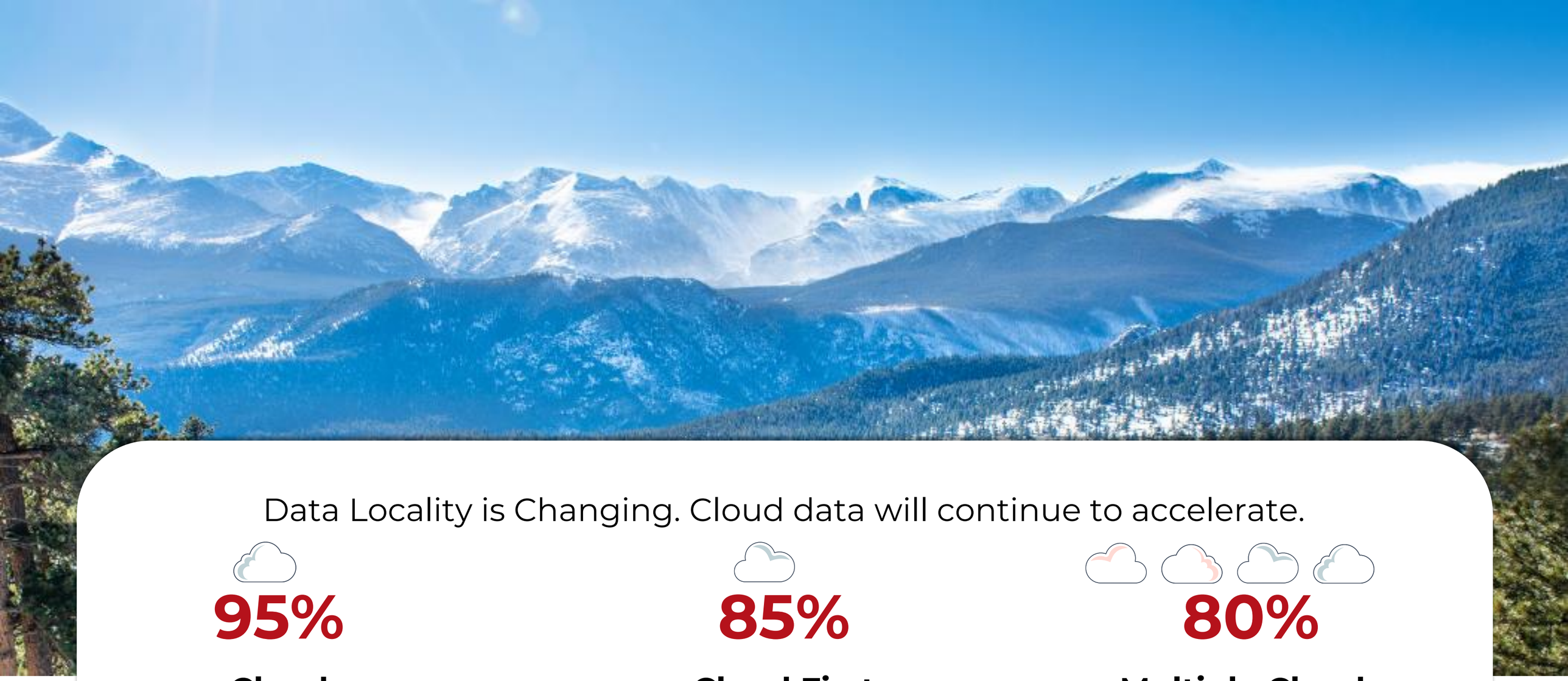
Spectra Digital Archive



Data Locality is Changing. Cloud data will continue to accelerate.

95%

Cloud

Approximately 95% of new digital workloads will in the cloud by 2025[1].

85%

Cloud First

85% of organizations will have a cloud first principal by 2025[4] – in two years.

80%

Multiple Clouds

80% of IT organizations will be using multiple clouds with three years[3].

SPECTRA

https://www.lightedge.com/blog/cloud- trategy/#:~:text=This%2C%20coupled%20with%20other%20advantages,up%20from%2030%25%20in%202021.

Customer Challenges Drive Our Innovation

Software

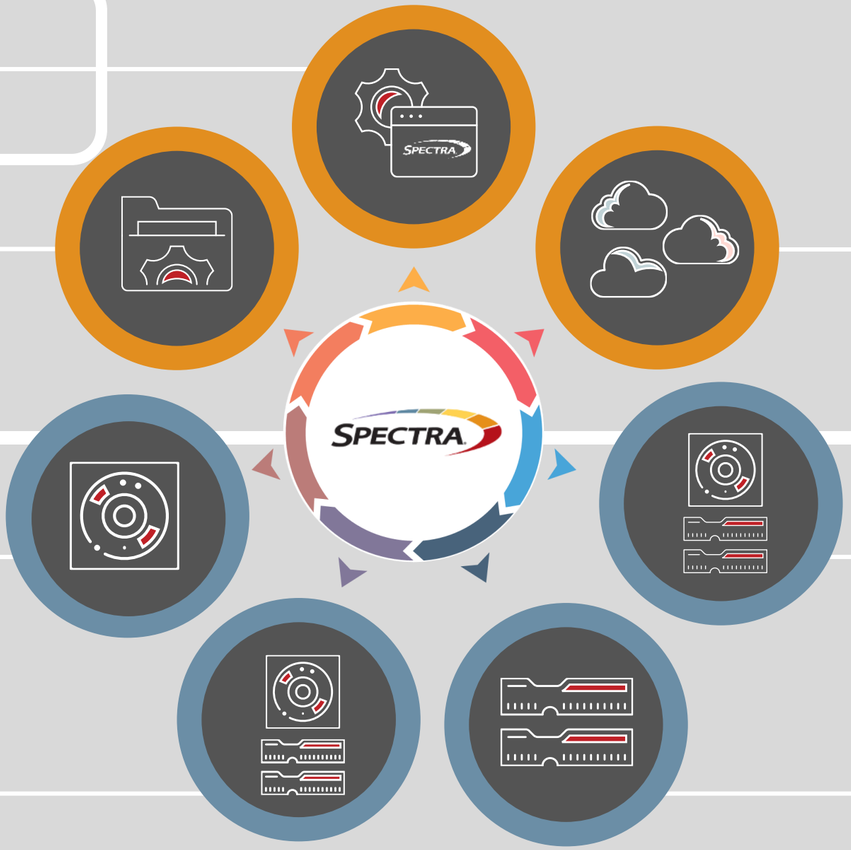
Hardware

Digital Archive
StorCycle

Data Mover
RioBroker

Tape Libraries
Large, Medium & Small

Nearline Gateway
BlackPearl DS3



Hybrid Cloud Object Data Management
Spectra Vail

Hybrid-Cloud Storage
BlackPearl S3 & On Prem-Glacier

NAS
BlackPearl NAS

SPECTRA

What is Spectra Digital Archive?

A complete software and hardware solution designed to archive and manage hundreds of terabytes to petabytes of unstructured data.

Substantially lower cost for storage, archive & administration

Archival Data
Medical records, video footage, broadcast media, aerial images, genomics data, compliance data, completed projects, and more.

Archive Software
Spectra StorCycle
Running on VM or dedicated server

Archive Storage Targets

Best Data to Archive

Medical records, video footage, broadcast media, aerial images, genomics data, geological study data, compliance data, completed projects, and more.

Top 8 Reasons to Archive

1. Large dataset management
2. Ransomware resiliency
3. Digital preservation
4. Compliance
5. Disaster recovery
6. Future utilization of data
7. Storage cost control
8. Sustainability

Archive Options

Project Archive

Preserve large datasets for long-term retention

Bulk Archive

Migrate, manage, and protect on cost and carbon-footprint-efficient storage

Active Archive

Preserve growing datasets while maintaining user accessibility

SPECTRA

Capabilities and Components

StorCycle Software

1. Simple to set up and use
2. Active, Project and Long-term archive use cases
3. Policy driven automation
4. Highly scalable
5. Low impact high performance data transfers
6. Maintains original file formats and no lock ins
7. Mixed storage targets – disk/flash, tape, cloud
8. Data redundancy options – inclusive of "tape eject"
9. Ransomware protection – inclusive of "air gap"
10. File search and reporting
11. API and GUI driven interfaces
12. Supports environmentally sustainable initiatives

+ Platform Solutions

- Small and Large tape libraries
- NAS and Object storage
- Nearline disk/libraries
- Hybrid Cloud – disk/libraries/cloud
- Professional Services

+ Spectra Logic World Class Support

Benefits

Scales with near limitless capacity

- Offers assurance that your archive solution will scale as your data volumes grow.

Supports sustainability initiatives

- Reduces energy consumption and **CO^2** emissions by ~85%.

Secures data against cyberattacks

- Creates air-gap copies of data ensuring your data cannot be infected or accidentally deleted when not directly accessible on the network.

Improves compliance

- Data is securely stored and only those authorized have access to the data, increasing security and improving compliance.

Complements the cloud

- Replicating data to the cloud enables geographic distribution of data and improves data availability and accessibility.

Reduces costs

- Reduces TCO by ~78% as a result of freeing up valuable space on expensive primary storage and reducing backup costs.

SPECTRA

Spectra Digital Archive Components

Spectra StorCycle Software

- StorCycle as the software component of Spectra Digital Archive with a variety features including:
  - Data retention settings
  - Policy based management
  - Scales to manage terabytes to tens of petabytes of data

Automated Tape Storage

- The Spectra tape library family coupled with Spectra BlackPearl Appliances delivers the industry's best combination of capacity, performance, scalability, reliability, support and affordability.
- Non-proprietary LTFS format environmentally sustainable storage
- Scalable hundreds of terabytes to exabytes of storage

Capacity NAS & Object Storage Disk

- BlackPearl NAS & Eco Object Storage scale-up architecture gives expandable enterprise-grade storage.
- **Self-Protecting Ransomware Resilient Storage**
  - Multi-factor authentication, triggered immutable snapshots, multi-site replication
  - ZFS designed for data reliability and data integrity
  - Self-encrypting drives for additional security
- **Cost-Effective Scale-Up Architecture**
  - Add capacity without adding nodes – expand existing pools dynamically
  - 80TB to 20PB per system
  - Hot expandable at any time

On-Premises vs. Public Cloud
Scale of Data Makes a Big Difference

The public cloud is cost effective when archiving small amounts of data.

On-premises storage is far more economical for archiving large datasets.

Spectra Digital Archive relieves the financial burden of managing large datasets

- Reducing backup capacity and cost
- Reducing recovery time from backup – improved RTO / RPO
- Avoiding ongoing cloud bills
- Reducing WAN bandwidth costs
- Reducing / eliminating cloud egress fees and access charges
- Reducing primary storage costs
- Providing near-instant access to archived files and projects

Amazon Cloud Glacier vs. Spectra On-Prem Digital Archive

Amazon S3 Glacier

100% cloud accessed and retrieved

Archival data
Medical records, broadcast media, aerial images, consumer photos, videos, and more.

Expect costs for bandwidth and egress fees

Amazon S3 Glacier Instant Retrieval storage class
Milliseconds retrieval of data in a low-cost S3 storage class

Milliseconds vs. Milliseconds

Amazon S3 Glacier Flexible Retrieval storage class
Minutes to 12 hours retrieval of data in a lower cost archive S3 storage class

Minutes to 12 Hours vs. Seconds

Amazon S3 Glacier Deep Archive storage class
12 to 48 hours retrieval of data in the lowest cost archive S3 storage class

12 to 48 Hours vs. Minutes

Optimizes your storage costs with low-cost storage options for long-term digital preservation for rarely accessed data.

Spectra Digital Archive

On-premises archive with hybrid cloud option

Archival data
Medical records, broadcast media, aerial images, consumer photos, videos, and more.

No additional fees

Instant Retrieval storage class
MILLISECONDS retrieval of data in a low-cost S3 storage class

Scale: up to 20PB

Eco Object storage
Retrieval of data in **SECONDS** with spin-down disk for reduced carbon footprint

Scale: up to 20PB

Archive S3 storage class
Retrieval of data in **MINUTES** the lowest cost & most environmentally positive solution

Scale: up to 100s of PBs

>50% lower costs and no surprises with hidden fees.

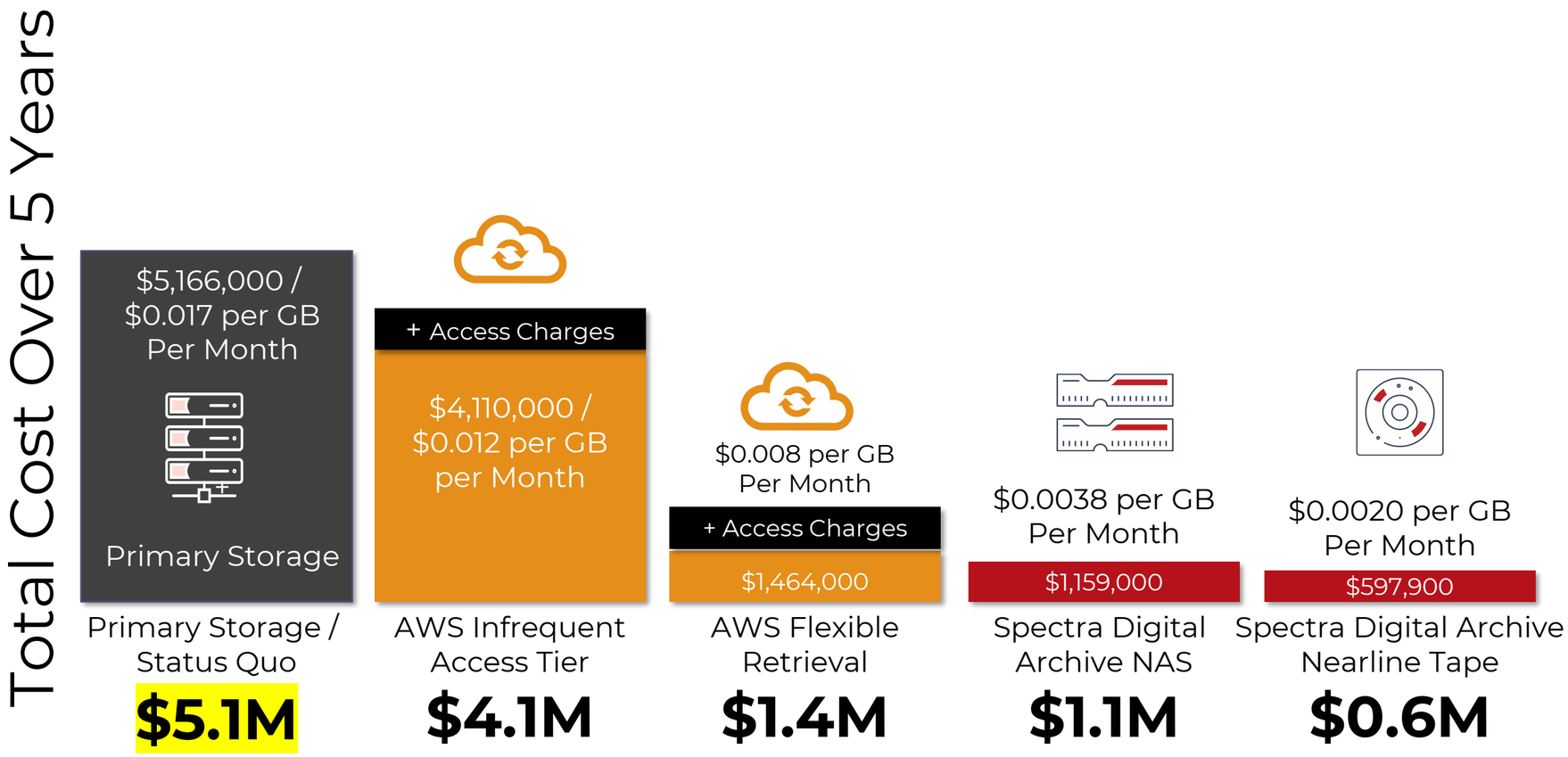
SPECTRA

The importance of keeping your archive data in the right location

5PBs Storage, 5-year TCO comparison

Assumptions:

- 2% Restoration per Month
- Single Copy on Primary
- Single Copy on Cloud Storage and Spectra Digital Archive NAS
- Two Copies of data on Spectra Digital Archive Nearline Tape
- US list prices



Data Centers Impact Global CO^2 Emissions

- Processing and storage continue to accelerate need to electricity which impacts CO^2 emission.
- Power and cooling requirements and expenses have grown to be a substantial consideration in data center design.
- Data centers generate up to 2% of global CO^2 emissions.
- IT consumes about 7% of global electricity. This is forecasted to rise to 13% percent by 2030.
- In addition to the environmental cost and implications of this power consumption, there is also a financial burden.
- Spectra Digital Archive may save as much 85% the amount of energy consumed by primary storage flash or disk-based solutions.

SPECTRA

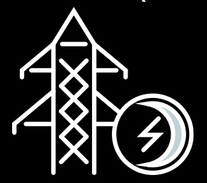
*Information Storage Industry Consortium (INSIC) Report, July 2019

Trade-offs between access time and power consumption maters

Below is a comparison of energy consumption for different storage types at different capacity levels

Online Disk Storage

(access in milliseconds)



1 PB: 3,500 watts

10 PB: 21,000 watts

50 PB: 101,500 watts

12:1

17:1

46:1

Nearline Tape Storage

(access in minutes)

1 PB: 300 watts

10 PB: 1,200 watts

50 PB: 2,200 watts

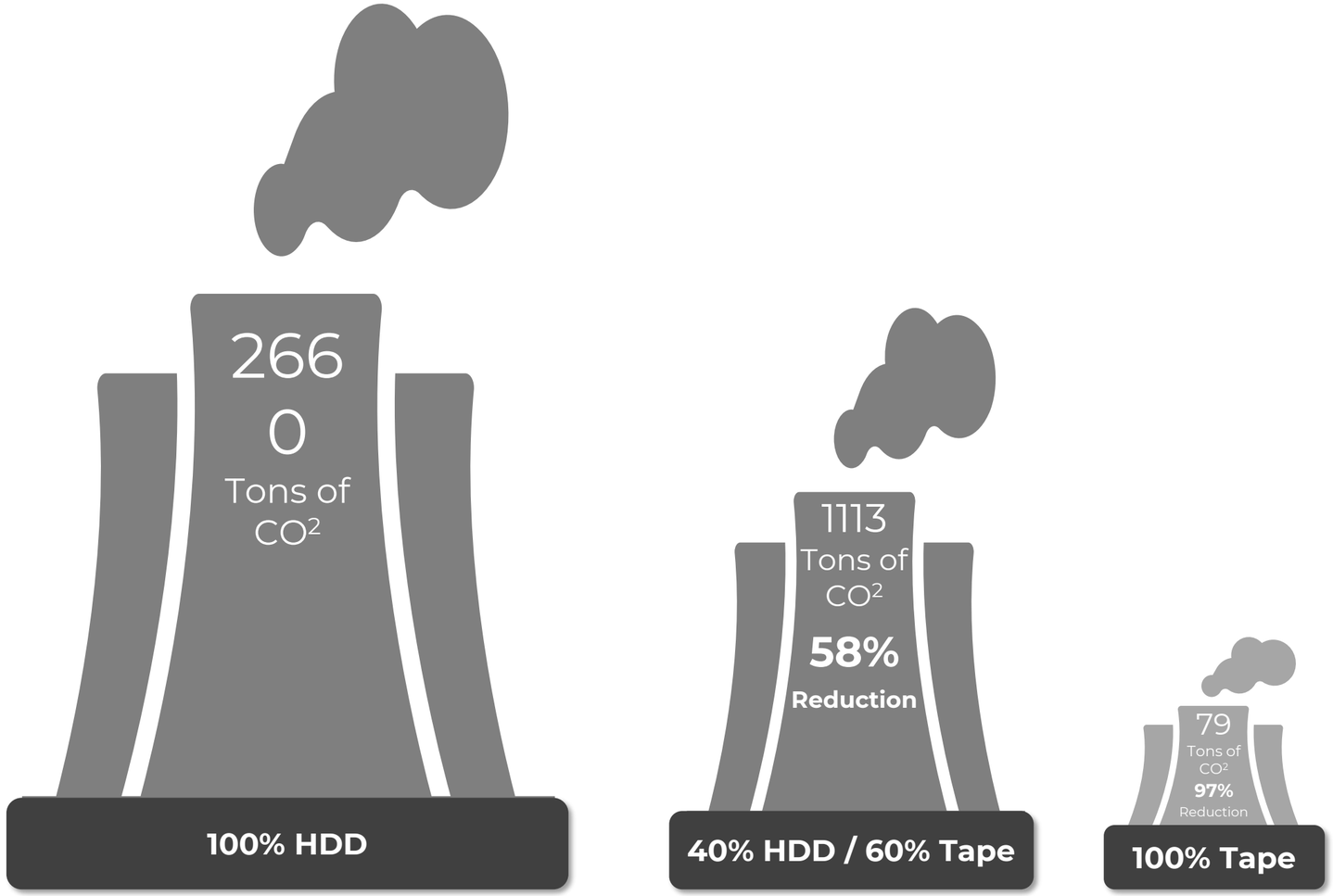
The power savings of tape vs. disk/flash is enormous

- A single tape library can handle an unlimited number of tapes since they can be removed and stored externally
- Tape storage requires 0 watts unless it's actively being written or read
- Disk storage requires constant power as disk is constantly spinning

SPECTRA

Moving Cold Data From HDDs to Tape Media Dramatically Reduces CO^2 * Equivalent

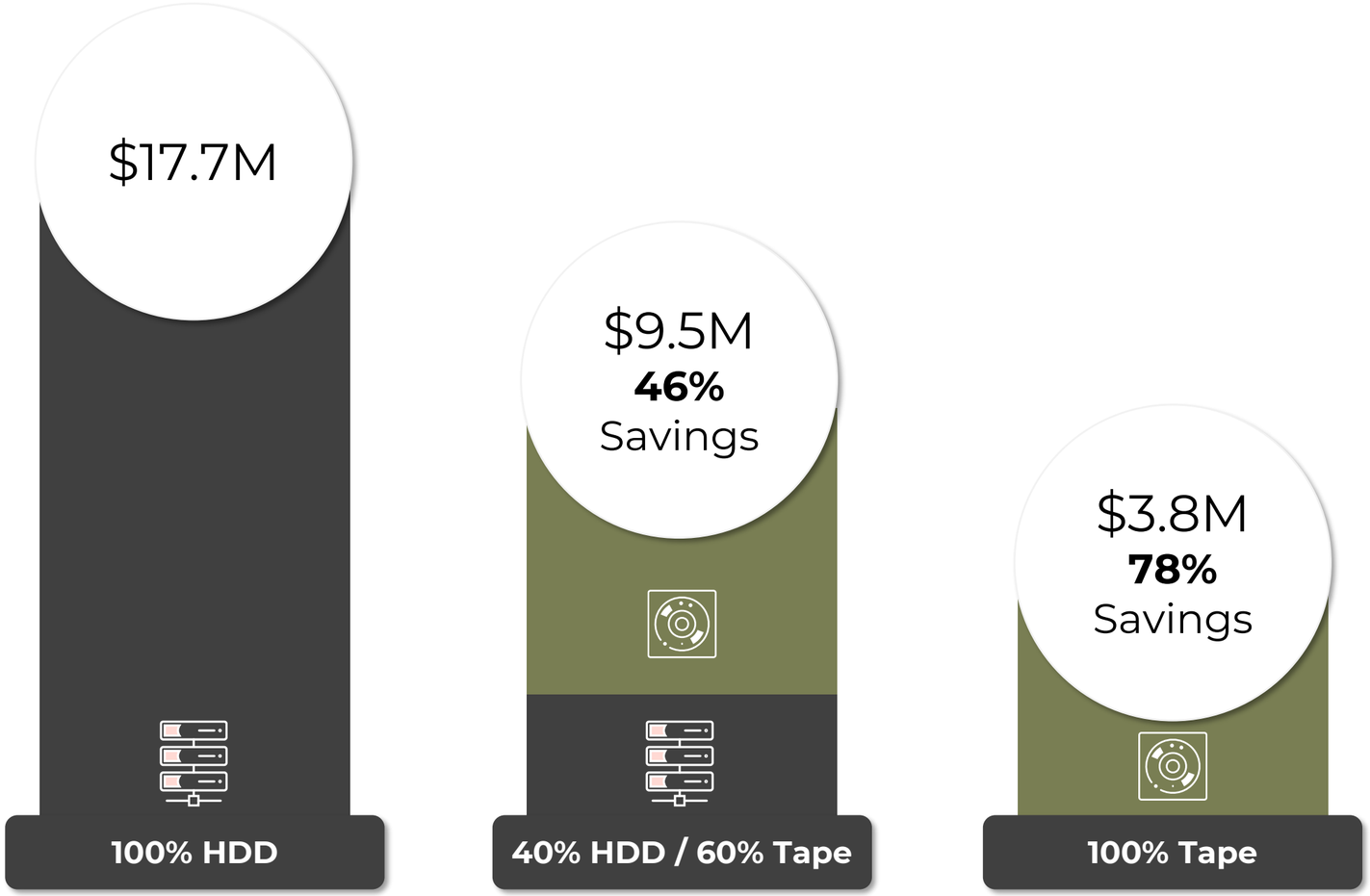
10-Years of CO^2 emissions for 100 Petabytes



*Source: Brad Johns Consulting, June 2022, based on 18 TB HDD and 18 TB LTO-9 - more

Substantial TCO Savings for Migrating Cold Data to Tape*

10-Year Total Cost of Ownership for 100 Petabytes



Source: Brad Johns Consulting, June 2022, based on 18 TB HDD and 18 TB LTO-9 - more

Spectra’s Eco Object Storage

Extends Life

Extends the life of system by powering down when not in use.

Eco-Friendly Option

Saves on power consumption by taking advantage of intelligent idling technology.

Delivers Quick Access

Delivers near instant access to drives and up to 30 second access to archived data, offering an ideal alternative to tape

Reduces Energy & Drive Failure

Reduces energy consumption by over 70% per rack and reduces drive failures by 1,100% over seven years, providing secure long-term storage while reducing the need for refresh migration.

Spectra Digital Archive Use Cases

Media & Entertainment

By archiving and managing older content and restoring it using modern digital archive technologies, media and entertainment companies can extend the lifespan of their content and make it available to new audiences.

Genomics

By archiving genomic data, researchers can ensure that it is available for future studies and can be used to verify or reproduce previous research findings.

Health Care

Healthcare organizations need easy access to historical data for R&D purposes and to improve care plans. Data is often backed up and stored indefinitely on expensive storage arrays. This becomes financially unsustainable.

High Performance Compute

HPC systems generate vast amounts of data that can be used for analysis and research. Archiving is used to retain this data for future analysis or to comply with regulatory requirements.

Spectra Digital Archive Use Cases

Data Intensive IT

Understand and move hundreds to thousands of files that are consuming primary storage space and need to be offloaded. This enables organizations to leverage existing investment and eliminate the need to purchase additional primary storage.

Digital Evidence Storage

Police department looking to archive petabytes of cell phone storage for preservation and future use upon conviction and completion of criminal proceedings.

Public Sector

A city government that needs to keep records and data that must be in compliance with public records mandates, be prepared for public records requests, and for risk mitigation.

University – Higher Education

Need to preserve research and findings of governmental grant data where the data must be kept for 7 years after publication.

Spectra Digital Archive Use Cases

Engineering and R&D

Preserve project data, such as chip design, while having easy access to data stored for longer-term retention

Energy Sector

Long-term storage of seismic or natural resource data

Video Surveillance

Retain video footage for long-term retention and offload capacity from NVR systems

Video and Film Archive

Identify, offload and preserve content associated with Media Asset Management (MAM) systems, leveraging secondary storage to free up valuable primary storage capacity.

IMPERIAL WAR MUSEUMS

Imperial War Museum (IWM) chose Spectra Digital Archive to greatly reduce storage costs and preserve historical data that cannot be reproduced.

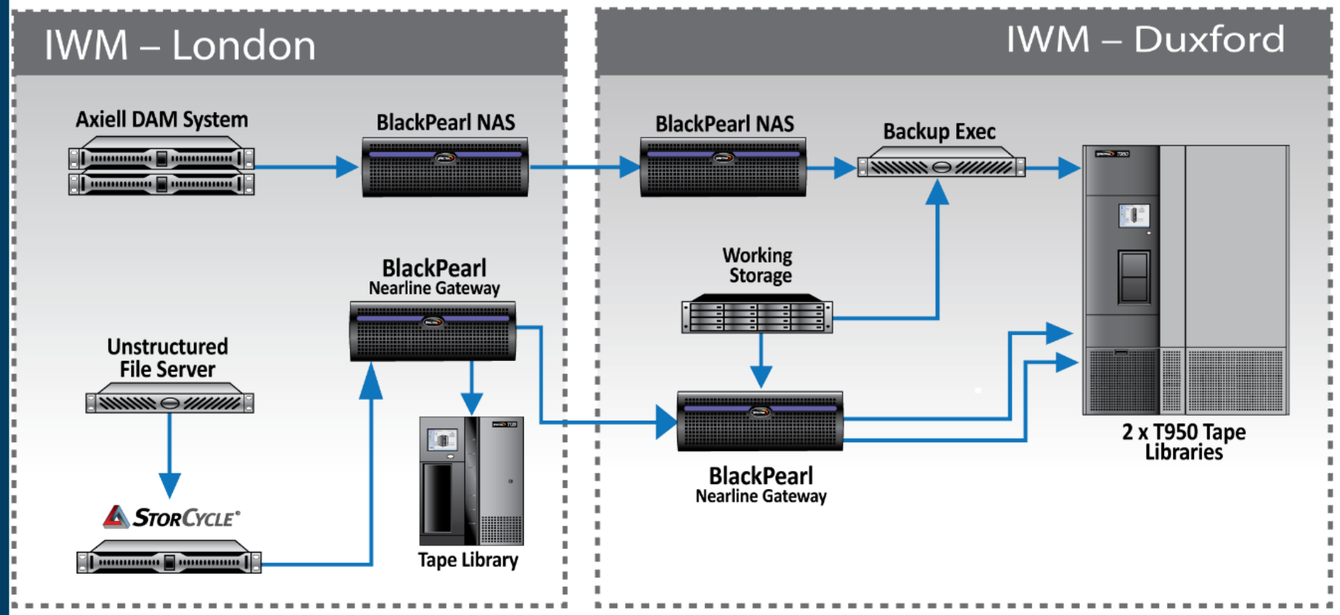
Challenges:

- IWM is home to hundreds of thousands of films, videotapes, audio recordings and photographs that must be preserved forever but won't last on their original media. They currently store an archive of around 750,000 digital assets, which amass a total of 1.5PB as uncompressed files.
- New scans in their film collection generate an additional 10TB of data per month, and the videotape scanning project is expected to create another 900TB over four years.

Solution:

- Their Spectra Digital Archive solution consists of Spectra StorCycle, an enterprise software for digital preservation that scans and moves data to a protected secondary storage tier.
- Spectra Digital Archive offers IWM the capacity, reliability and product longevity they sought for an extremely affordable price, and is backed by Spectra's efficient, award-winning support services.

Imperial War Museums
Spectra Digital Archive Solution



The Imperial War Museums (IWM) provides a collection of digital assets, including over 1 million items that tell the story of modern war and conflict, including documents, art, film, photographs, exhibits, library, sound, and databases.

SPECTRA

IQVIA chose Spectra Digital Archive to replace their aging archive system with a solution that is scalable while improving data availability with replication data across data centers.

Challenges:

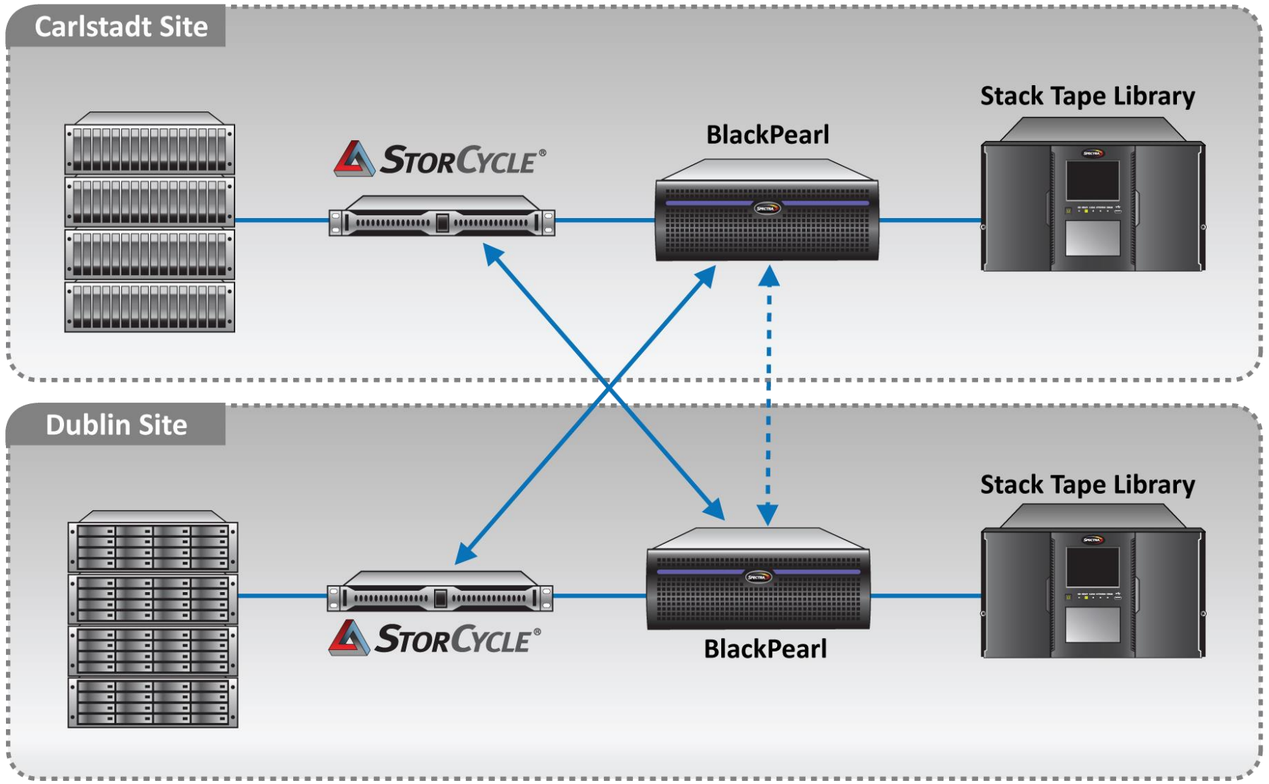
Their existing archive solution was aging, and needed a new solution that would scale while using their existing infrastructure.

The new solution must be able to replicate data across sites to provide data, and transition to the new archive with minimal disruption.

Solution:

Deployed three instances of StorCycle to scan primary storage and move data to
two BlackPearl Nearline Gateways and
two Spectra Stack Libraries located in
New Jersey and Ireland.

IQVIA
Spectra Digital Archive Solution



IQVIA enables modern data science advancements by capturing and preserving global healthcare data sets.