SEAGATE | mozaic 3+

Where the Future Is Read and Written

Seagate Enterprise.

MCOMPUTERS EXPERT M TALKS: SEAGATE

IVA SCHERBAUMOVA – EMEA SALES MANAGER

LACO HUDEC – EMEA SR. SYSTEMS ENGINEER

MAREK RIHOSEK – EMEA CA ENGINEER

SEAGATE

Reading & Writing the Future of Data

01

02

03

Technology Innovation
Areal Density
Scale, TCO, Sustainability

Enterprise HDD & SSD News
Exos X24, Exos 2X18, Nytro, IronWolf PRO
Powerful performance, Proven technology

Systems Overview
New Systems
Key features, Use Cases

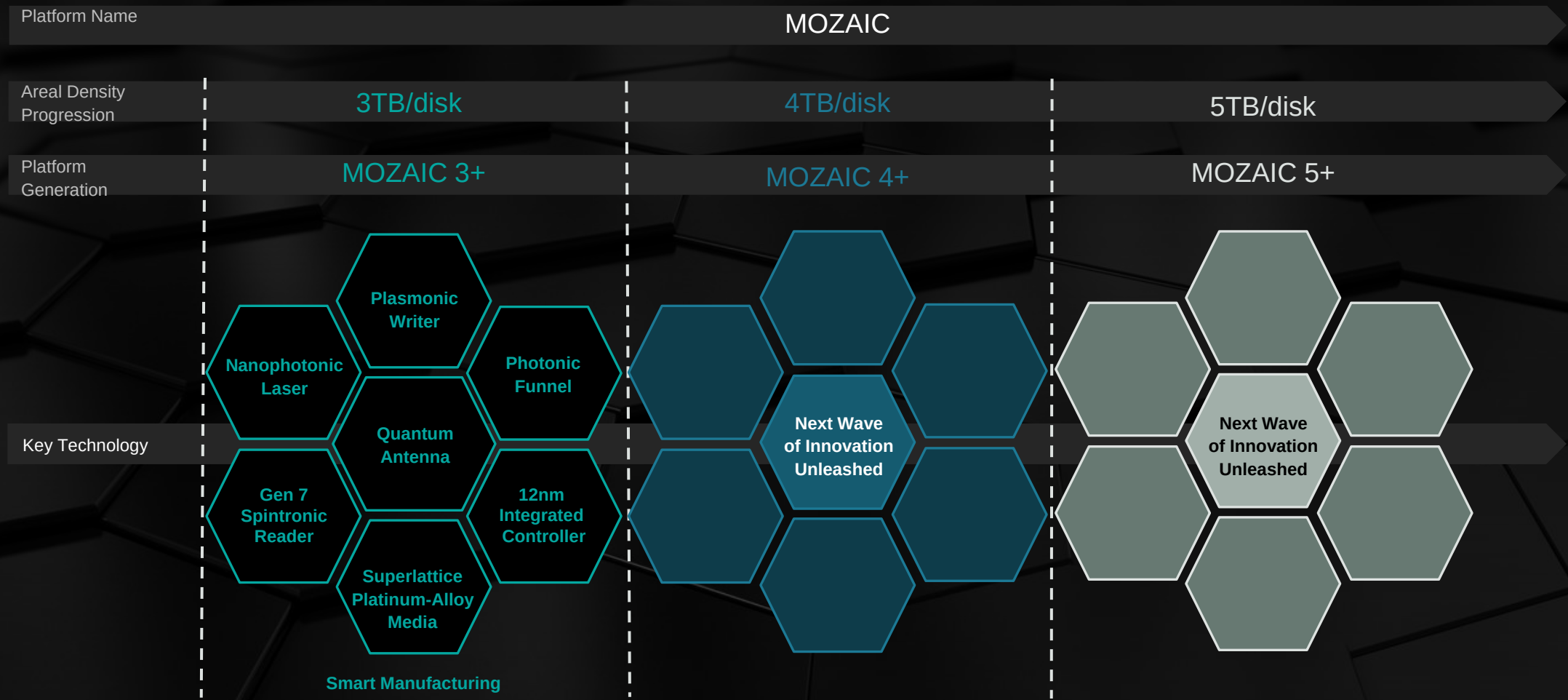
A NEW ERA OF STORAGE

Mozaic 3+™ is a breakthrough hard drive platform that incorporates Seagate's unique implementation of HAMR to deliver mass-capacity storage at unprecedented areal densities of 3TB/disk and beyond.

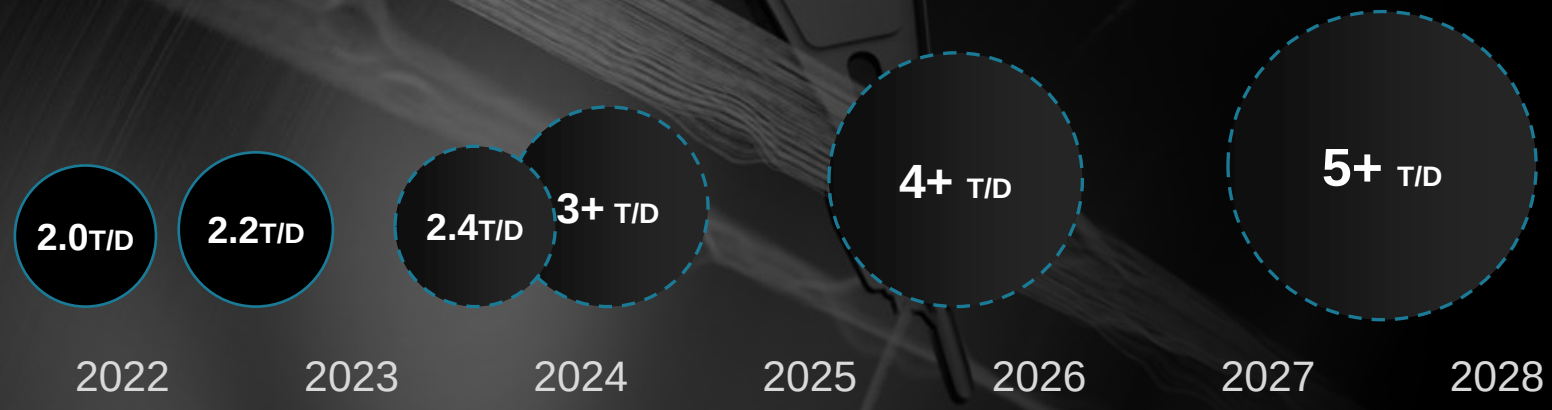
mozaic 3+™

Tomorrow’s Advancements are Happening Now

Mozaic represents both current and future generation technologies driven by Seagate innovations that increase areal density.



The most meaningful measurement of technology progression is areal density innovation—not merely unit capacity

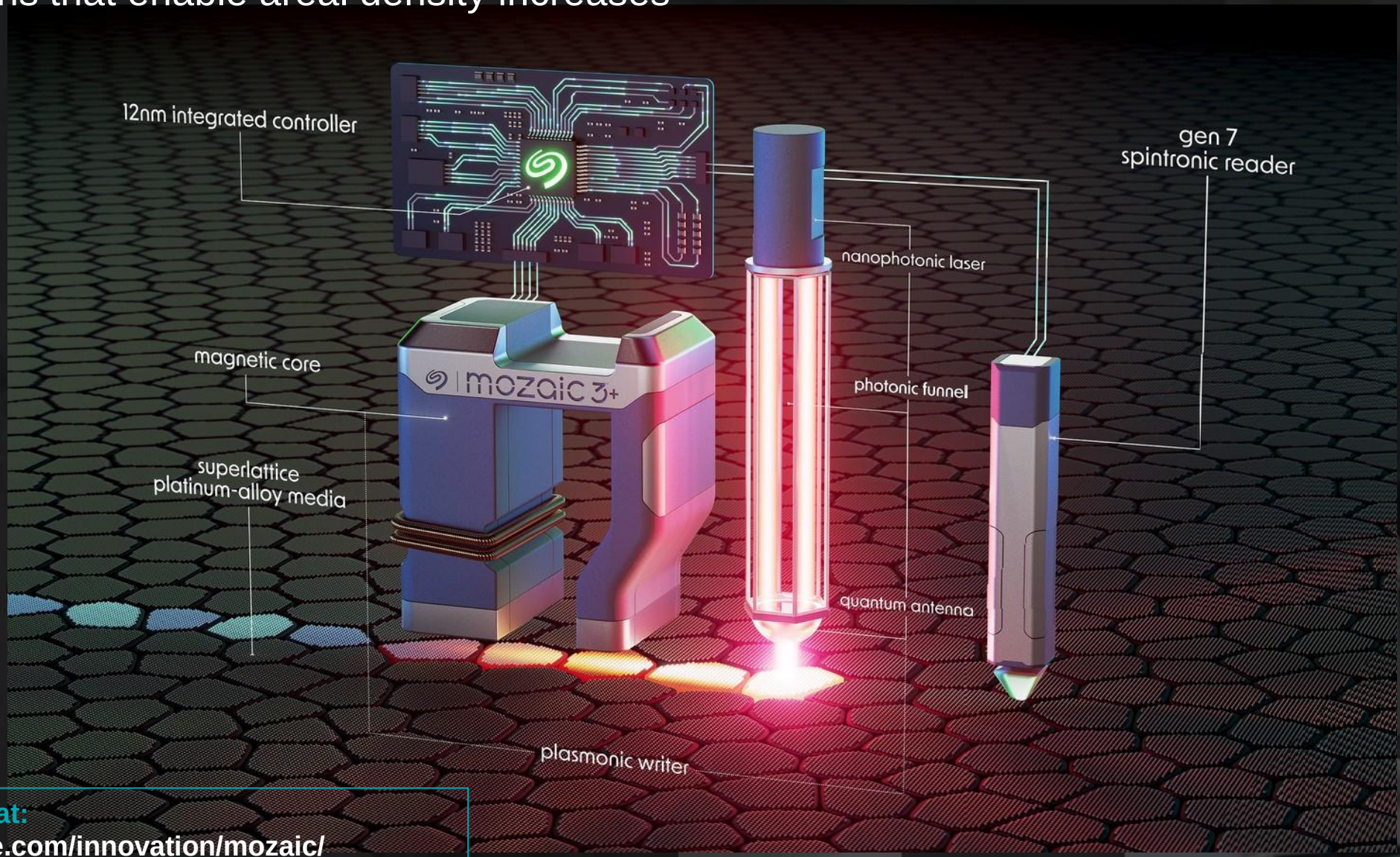


2× capacity gain per disk in under 4 years*

*AD-driven capacity growth from 2023 (2.4TB/disk) to 2027 (5.0TB/disk) more than doubles in 4 years. When compared with PMR technology, capacity took 9 years to double.

Mozaic 3+ Technology Elements

Key breakthroughs that enable areal density increases

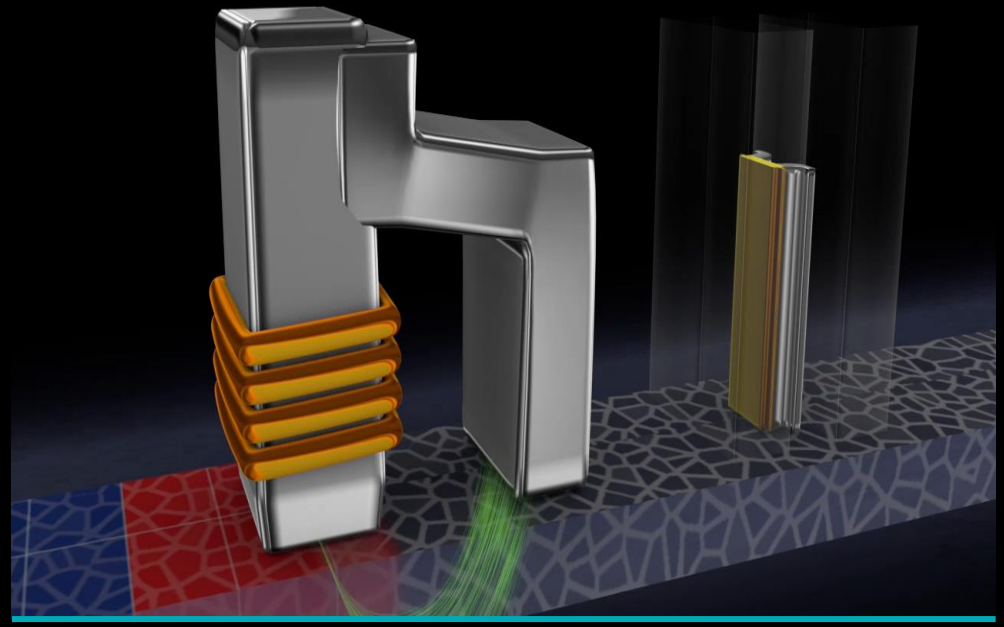


Read more about it at:
https://www.seagate.com/innovation/mozaic/

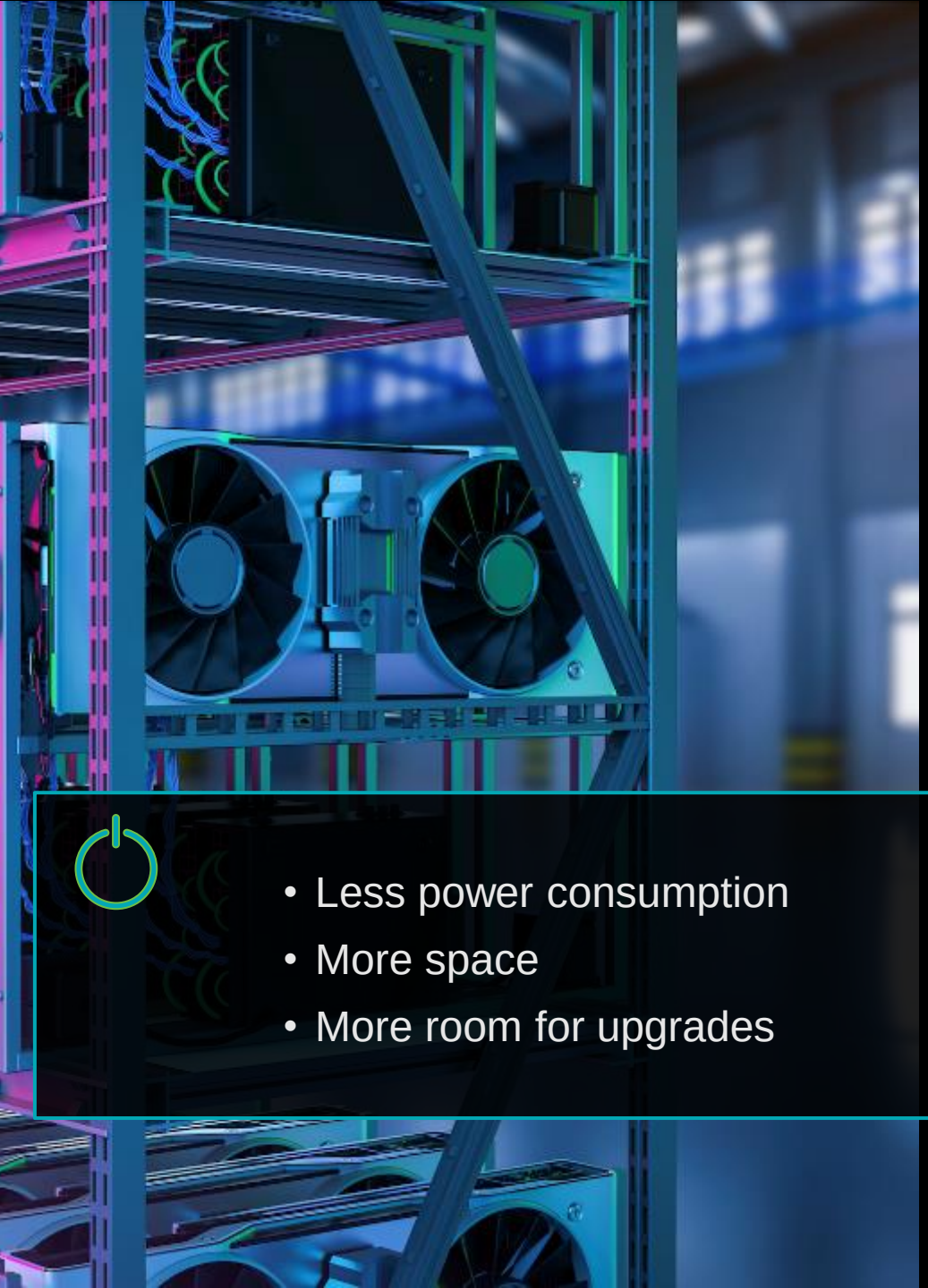
mozaic 3+ Delivers

95%

same hard drive technology—just better.



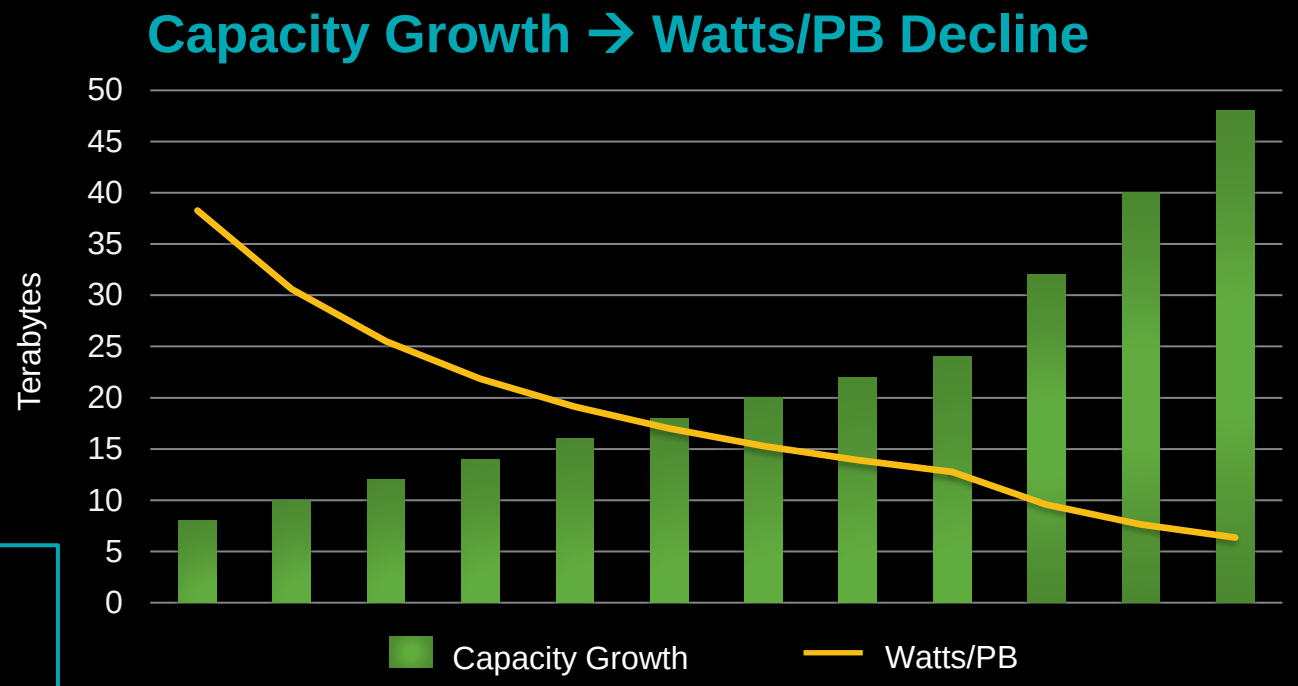
- Reader and writer use same technology but are refined by only using a single reader and near-field transducer (NFT) for writing.
- HAMR uses a unique magnetic layer to handle thermal conditions.
- Scaled for efficient areal density by using a unique grain media formula and size.



Modernize

Your Datacenter

- Less power consumption
- More space
- More room for upgrades



Power-Efficient Data Accessibility

Parallel data streams enable performant deployment of dense storage

2X

BANDWIDTH

> 10GB/s in Bigfoot Large
> 20GB/s in Bigfoot XXLarge

< 25%

INCREMENTAL POWER

MULTI-ACTUATOR TECHNOLOGY

Sustainability

SUSTAINABILITY

Mozaic 3+™ Stores more without increasing consumption of space, power and natural resources.

RETAIN:
REGEN to keep drives in service

REUSE:
There is a robust secondary HDD market through instant secure erase

RECOVER:
Disassemble HDDs in data centers to recover rare earth magnets

SEAGATE A NEW ERA

Enterprise

SEAGATE ROADMAPS

www.seagate.com

Q1CY24

Exos X24

Powerful performance. Proven Technology. Scalable design.

Delivering maximum storage capacity with the highest rack-space efficiency.

Other Resources

Product Manual

Datasheet

Data Security & Compliance

Seagate Website

- **Capacities:**
  - 24T / 20T / 16T / 12T CMR
  - Interface: SATA & SAS
  - DRAM: 512MB
- **Helium design** enabling lower power consumption & weight for reduced total-cost-ownership (TCO)
- **Consolidation** of all capacities into one family – Common Heads/Media/Firmware
- **Power Balance –** allows performance/power optimization
- **Instant Secure Erase (ISE)**
  - Base offering for Summit. Instantaneous drive erasure for secure drive retirement or reuse
- **Cache 2.0** increases Random Write Performance
- **Serial NAND** – Increases WCD Performance
- **Tri-stage actuation** for improved performance under vibration environment
- **Customer Qualification Units** available now

Exos 2X18

Powerful performance. Proven Technology. Scalable design.

Performance

- 2x sequential bandwidth @ 520 MB/sec
- IOPS sufficient to avoid stranded capacity in latency sensitive storage applications

Capacity

- 18/16TB CMR

Efficiency

- Improved IOPS/Watt to optimize data center total ownership cost

Readiness

- In Full Production

SEAGATE

Light speed. Solid. Impressive.

Industry-leading storage density range up to 15TB in a 2.5-inch form factor

DuraWrite technology using intelligent lossless compression techniques to enable up to 3.5× higher random-write performance, greater power efficiency, and cost savings.

Endurance options to match the needs of wide enterprise workload ranges

Enhanced enterprise reliability, data protection and data security

BUILT FOR NAS

Seagate’s cutting-edge technology know-how enables a superior NAS experience that helps maximize data potential

Right Drive For The Right Application – IronWolf Pro in Enterprise NAS

	IronWolf (VN)	IronWolf Pro (NT, NE)	Exos
Target Users	Home, SOHO, Small-to-Medium business	C-Pro, M&E, Medium-to-large business	Cloud, Large enterprise
Best-Fit Applications	• Consumer and Commercial NAS • Professional DAS • Desktops & Workstations • IoT & Industrial NAS/DAS	• Commercial and Enterprise NAS • Cloud NAS • High-end DAS for video editing • High-end Workstations (video editing) • Media Servers (Plex etc.) • IoT & Industrial NAS/DAS	• Cloud (IaaS, PaaS) • High-density storage


IRONWOLF
NVMe Gen4 SSD 2TB
IRONWOLF
NAS
SEAGATE
IRONWOLF™
SEAGATE
IRONWOLF PRO™
IRONWOLF
HEALTH

IronWolf Health Management

IRONWOLF HEALTH

Prevention

Analyze NAS system environment and offer preventive actions to protect user data

Keep tabs on conditions: temperature, shock, vibration, intermittent connections and signal integrity

Intervention

Analyze several drive parameters to recommend backup ahead of catastrophic data loss events

Adaptive algorithms that analyze critical drive and health parameters: data transfer, performance, readability, writability and overall reliability

Recovery

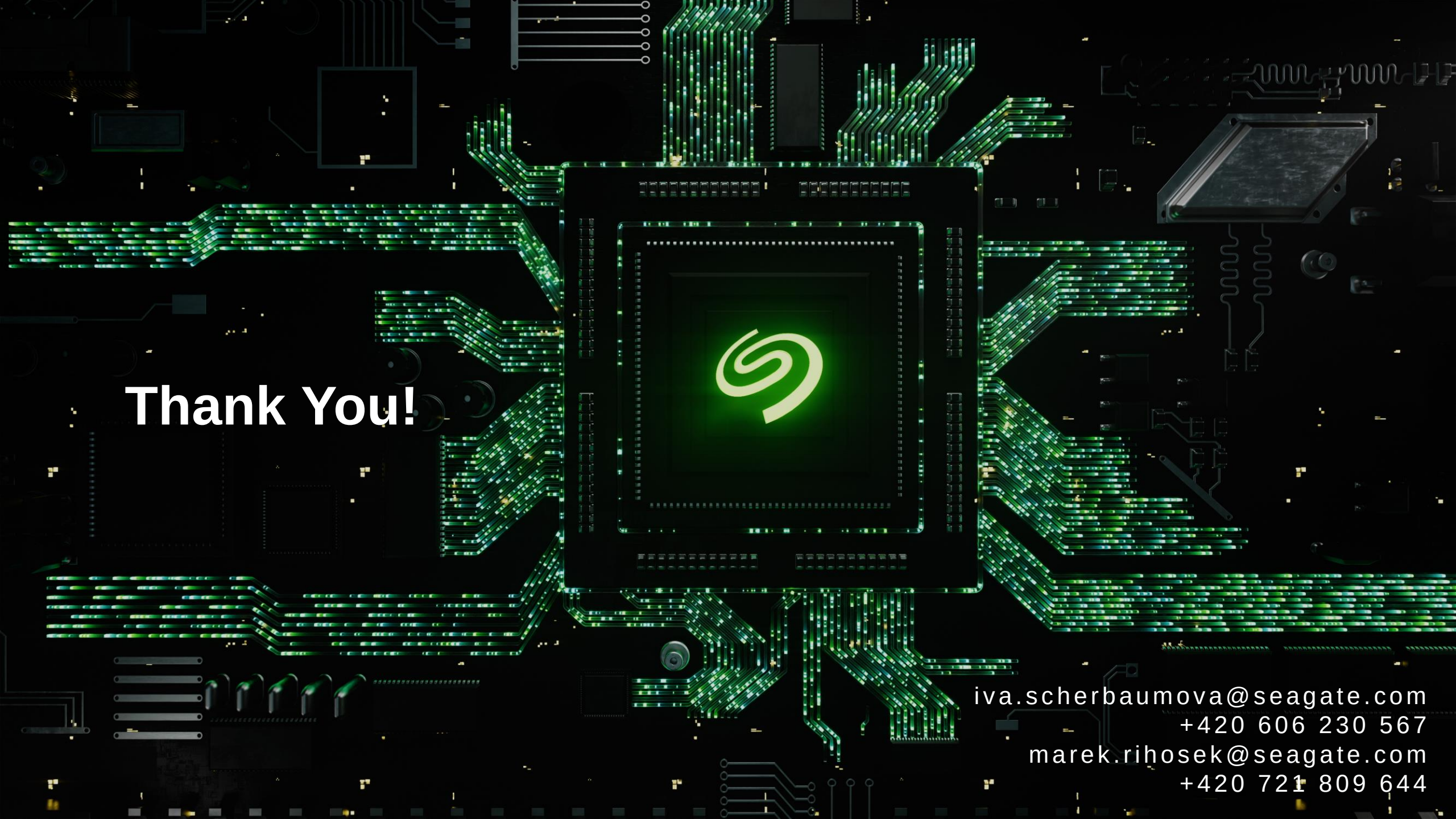
Defend against catastrophic data loss in the event of accidental data corruption or drive damage

Data recovery done by Seagate's in-house Rescue Data Recovery Services in a secure environment: industry-leading recovery rate of 95%

Key Takeaways

IW Pro 24TB Launch

- 24TB target Go-Live Jan 25th.
- **NEW** 24TB target Go-Live Mar'24, CTUs by Jan'24



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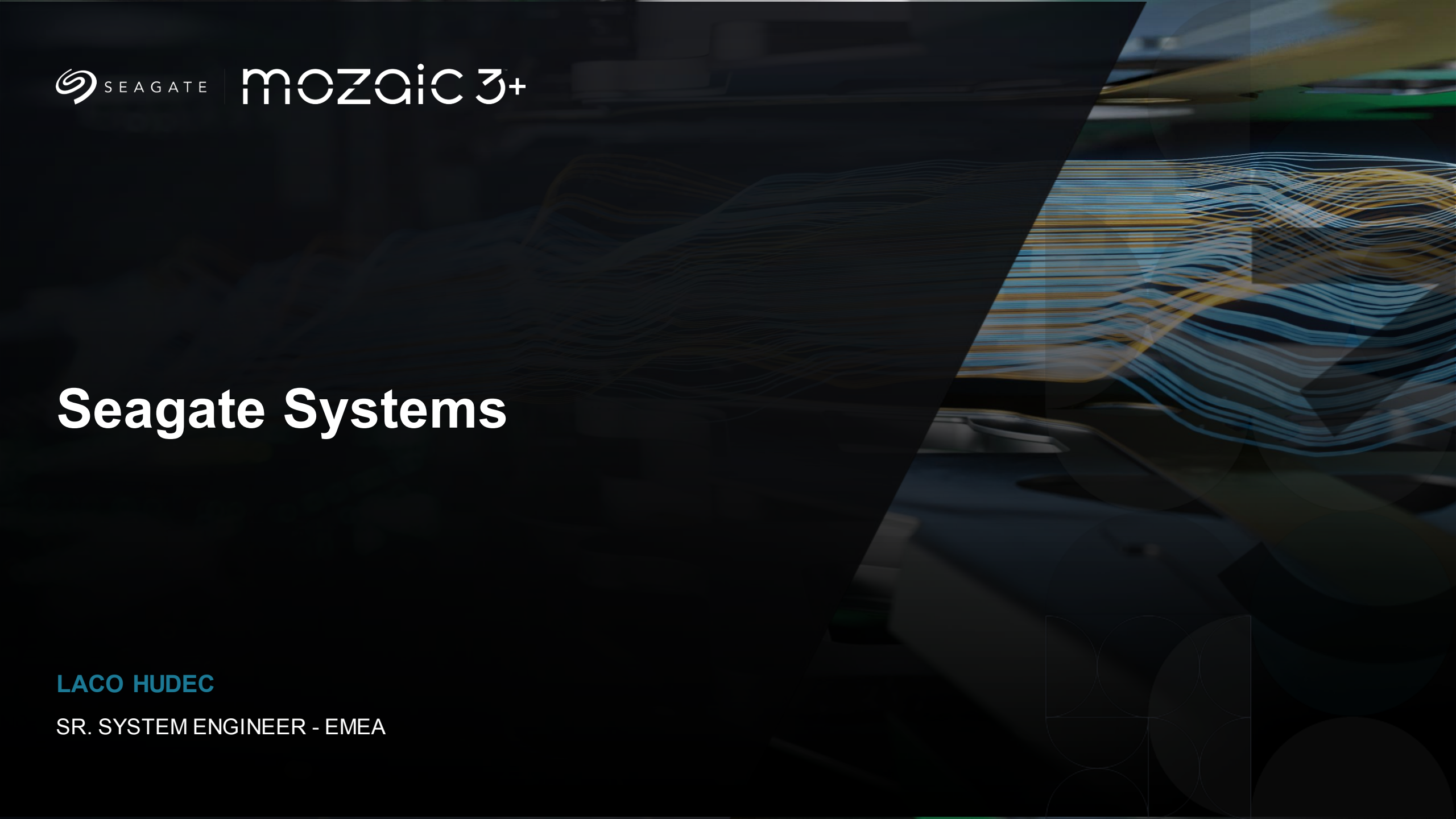
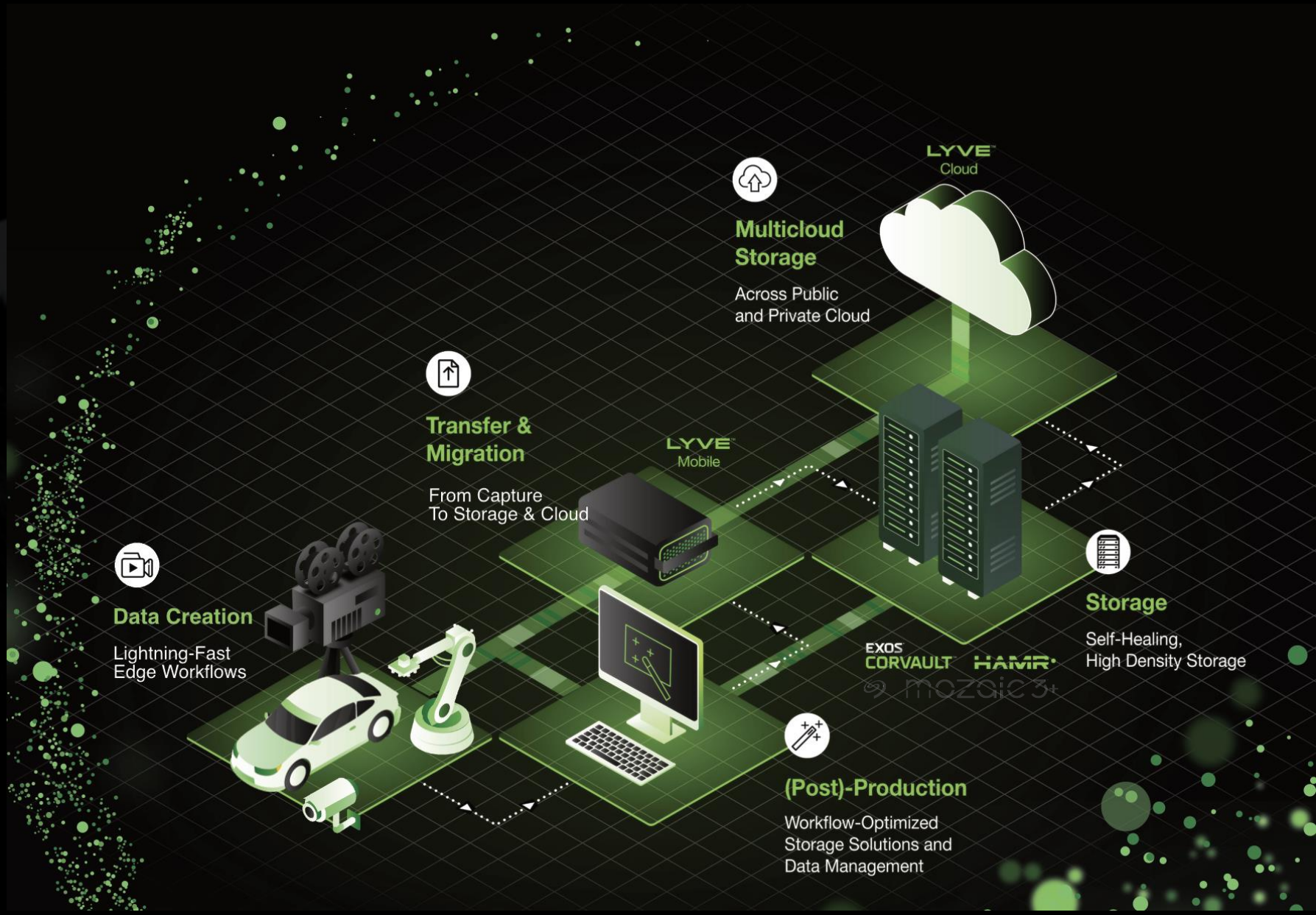


Seagate Systems

LACO HUDEC

SR. SYSTEM ENGINEER - EMEA

Open Technology Ecosystem



Reliable Self-healing Mass Capacity Storage

What is ADAPT?

Autonomic Distributed Allocation Protection Technology

- Foundational IP which enables Erasure Coding across a Pool of Disks
- Enables data protection, scale, and availability for Seagate Mass Capacity Systems
- Available in both Mozaic CORVAULT and Exos X 4006 product lines

How does ADAPT Enable Next Generation Seagate Devices?

1. Data Availability

ADAPT ensures high availability even with drive failures

Exposure to failure-related data loss during rebuilds is minimized (from Hours/Days to Mins/Secs)

2. Variable Capacity

Adapt Disk Pools can use drives of any size

Customers can consume next generation capacity drives without costly test and integration work

3. Self Healing

Ensures that all customer data is preserved with full access and performance after a drive failure

Triggers ADR to enable retention of 95% of disk capacity, avoiding disk replacement

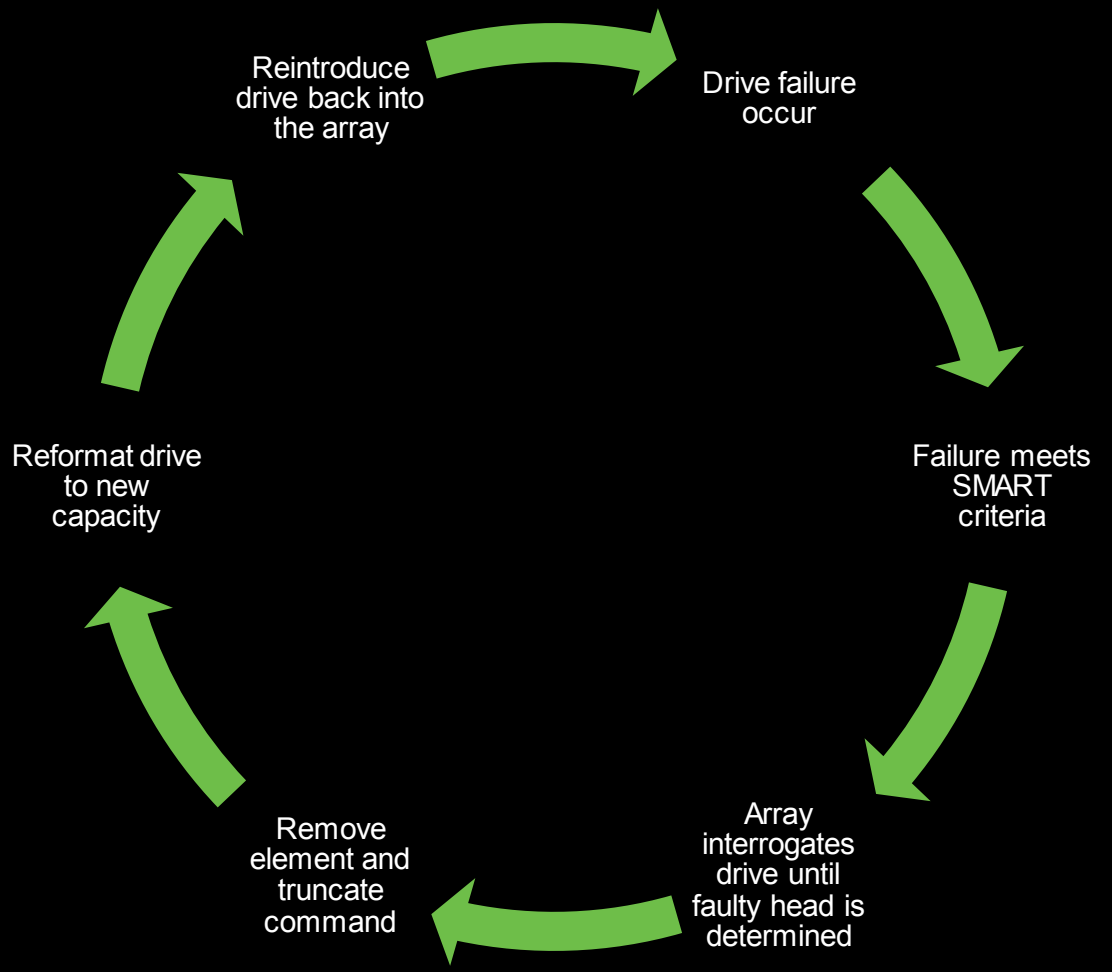
Autonomous Drive Regeneration

Seagate deployed CORVAULT as the first mass capacity system to perform ADR. ADR is a process where a single head failure is targeted, and a combination of reformatting and failure diagnosing is performed to recover the portion of the drive that is fully functional.

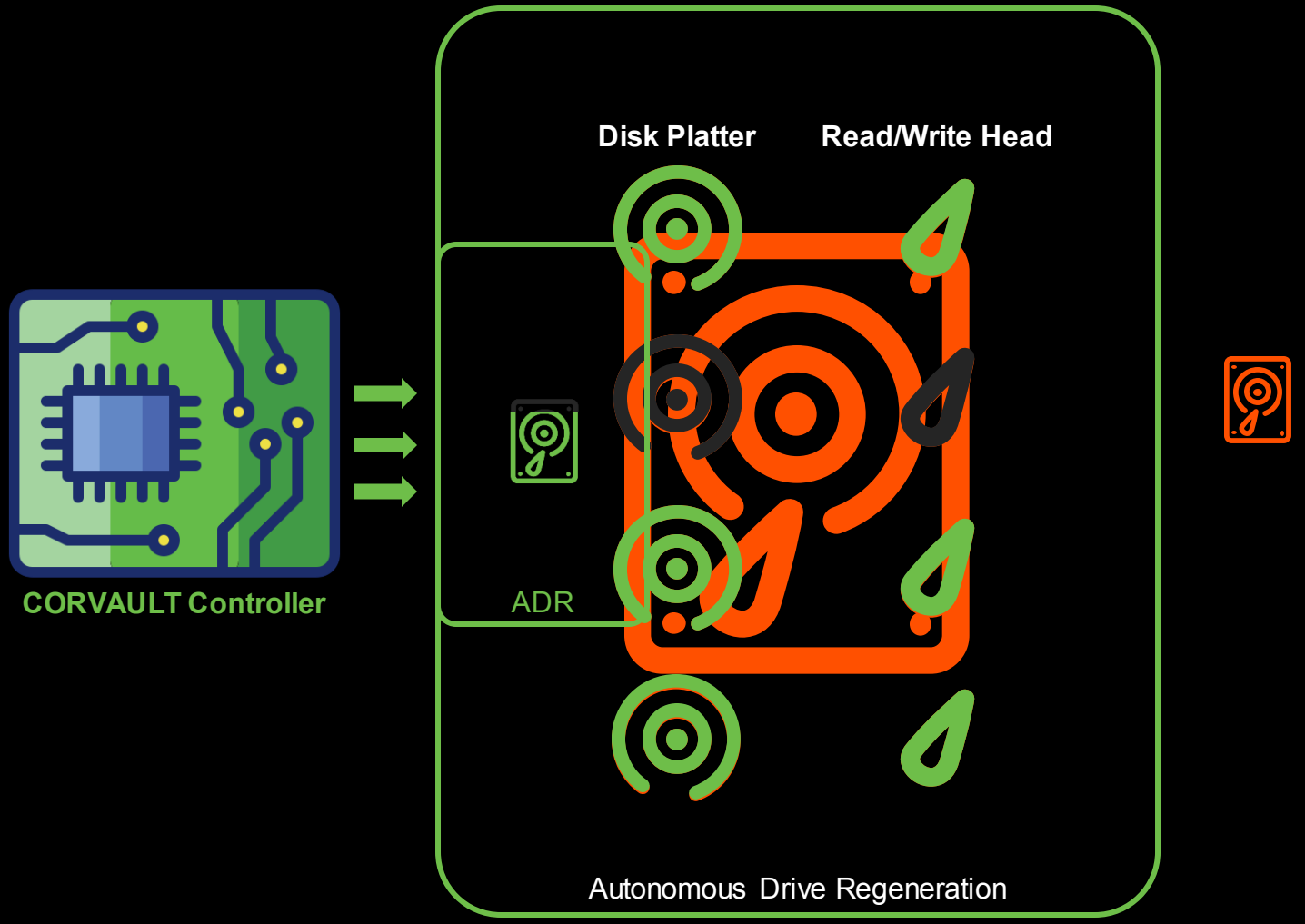
Read/Write Head Failure

Modern high-capacity drives now containing up to 20 heads, repairing the failed sections can regenerate up to 95% of the drive's capacity.

95%
Regenerated



CORVAULT regenerates failed drives with ADR

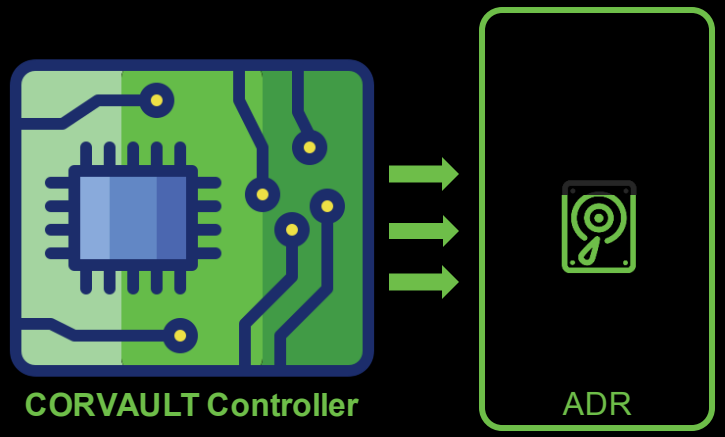


Read/Write Head Failure

Modern high-capacity drives now containing up to 20 heads, repairing the failed sections can regenerate up to 95% of the drive's capacity.

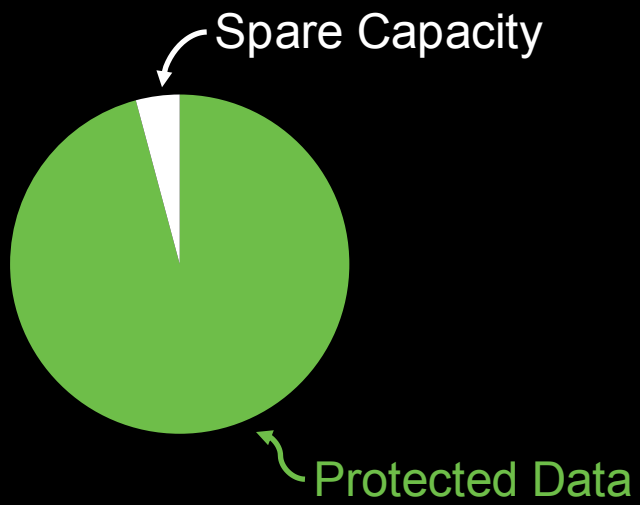
95%
Regenerated

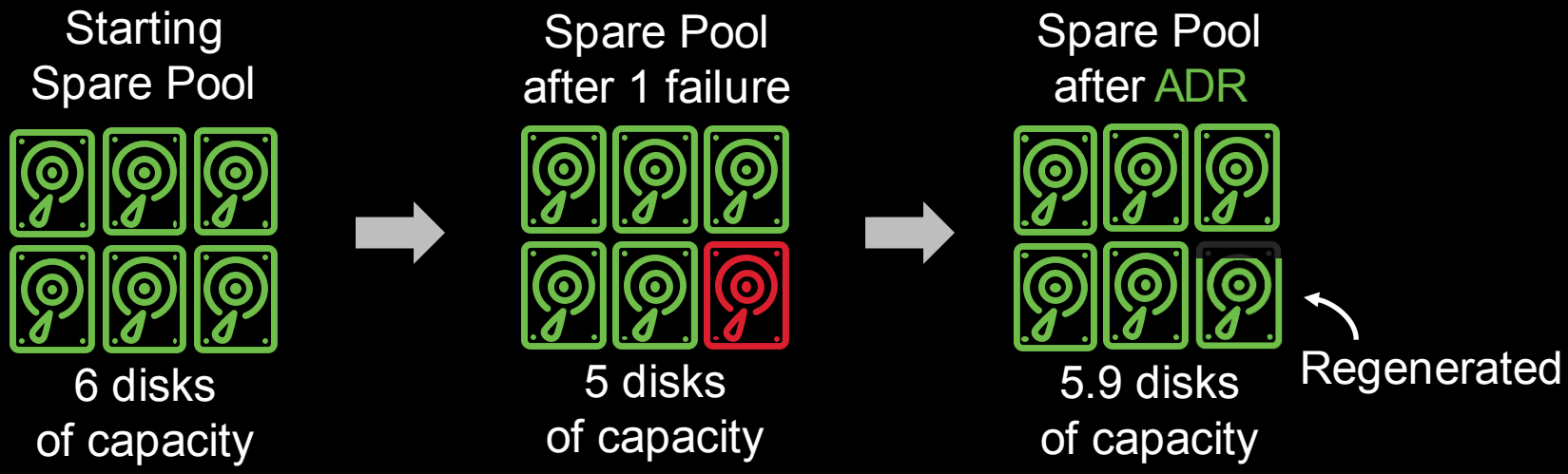
Regenerated drive is introduced back into the array



EXOS™ CORVAULT™ | mozaic 3+

Reduced Systems Maintenance: ADAPT + ADR





Drive replacement cost data centers on average $1,000 USD per device replacement.

Extending Hard Drive lifetime saves 275x more CO^2 than recycling and avoids e-waste

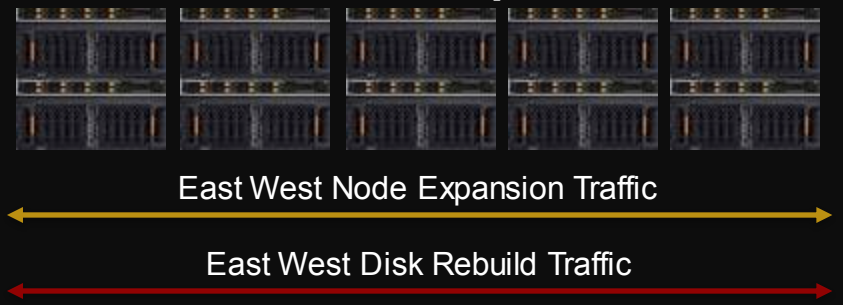
Higher Durability and Lower Cost with CORVAULT

Scaling out with CORVAULT reduces CPU resources by 60% and reduces RAM by 40%

Build with Simple JBOD

20PB Solution	720 CPU Cores	7,680 GB RAM

Scale-Out CEPH with a JBOD and External Compute



Single-Layer EC
- Disk failures will cause east west network traffic
- 10 nines data durability
- 16+4 EC

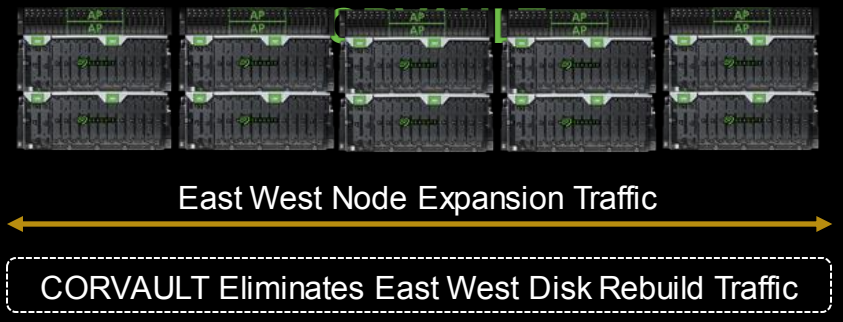
Build with CORVAULT

20PB Solution	256 CPU Cores	4,096 GB RAM

↓ 60% Less CPU

↓ 40% Less RAM

Scale-Out CEPH with Seagate AP and



Multi-Layer EC
- Disk rebuild traffic is localized to each CORVAULT
- Rebuild Traffic is eliminated
- 14 nine's data durability
- [16+2] + ADAPT

Products Overview

Devices

SAS HDD

SAS SSDs

Enclosure Platforms

EXOS CORVAULT
mozaic 3+

5U84

2U12

2U24

Controller Modules

Exos Corvault – Storage
4U/5U High Density
Hight Performance, Self-healing block storage

Exos AP – Storage Server
2U12/2U24/5U84
Compute & Storage Convergence Platforms

Exos X - Hybrid Flash Array
2U12 / 2U24 / 5U84
All Flash, Hybrid & Disk Arrays

Exos E – IOM (JBOD)
2U12 / 2U24 / 5U84 / 4U106
Expansion Enclosures & JBODs

Controller Interface

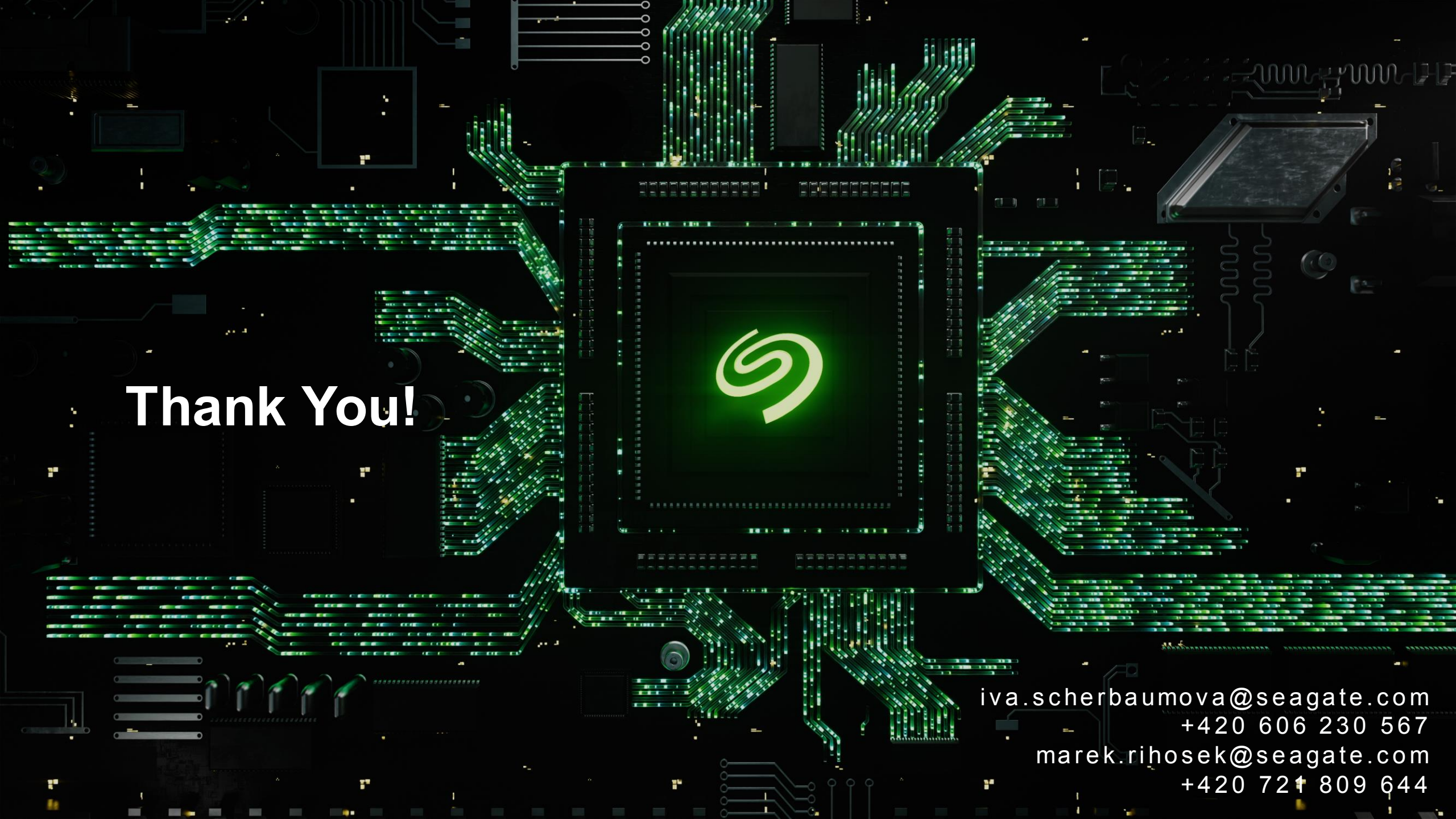
Corvault
12G SAS - Host

Exos AP-BV-1
Dual CX4 10/25GbE
*Dual CX5 50/40/25/10 GbE
*Dual CX5 100/50/40/25/10 GbE

12G SAS – Expansion

Exos X
1/10/25G iSCSI - Host
16/32G FC - Host
12G SAS – Host / Expansion

Exos E
12G SAS – Host / Expansion



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