Edge to Cloud & Everything in Between

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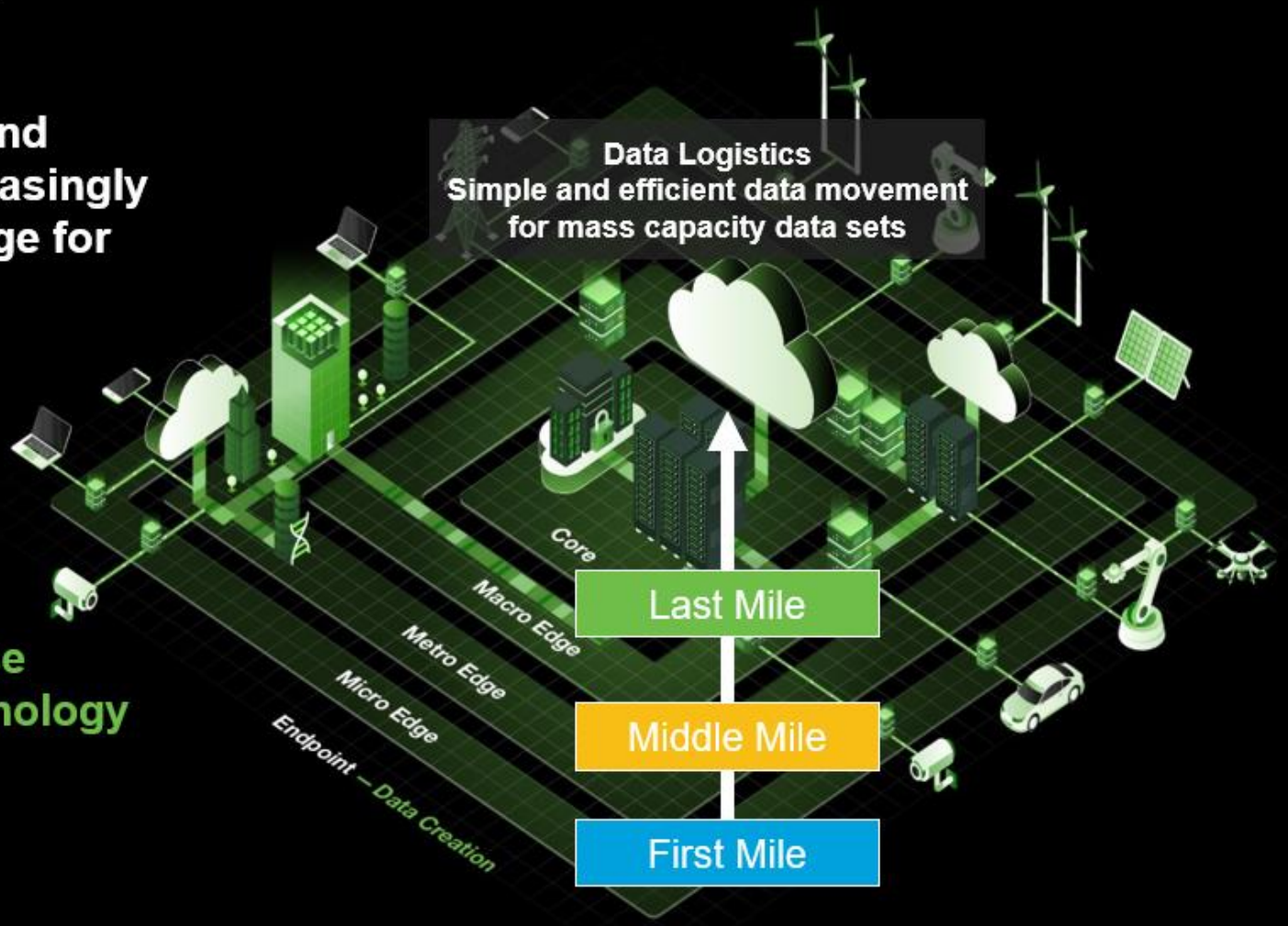
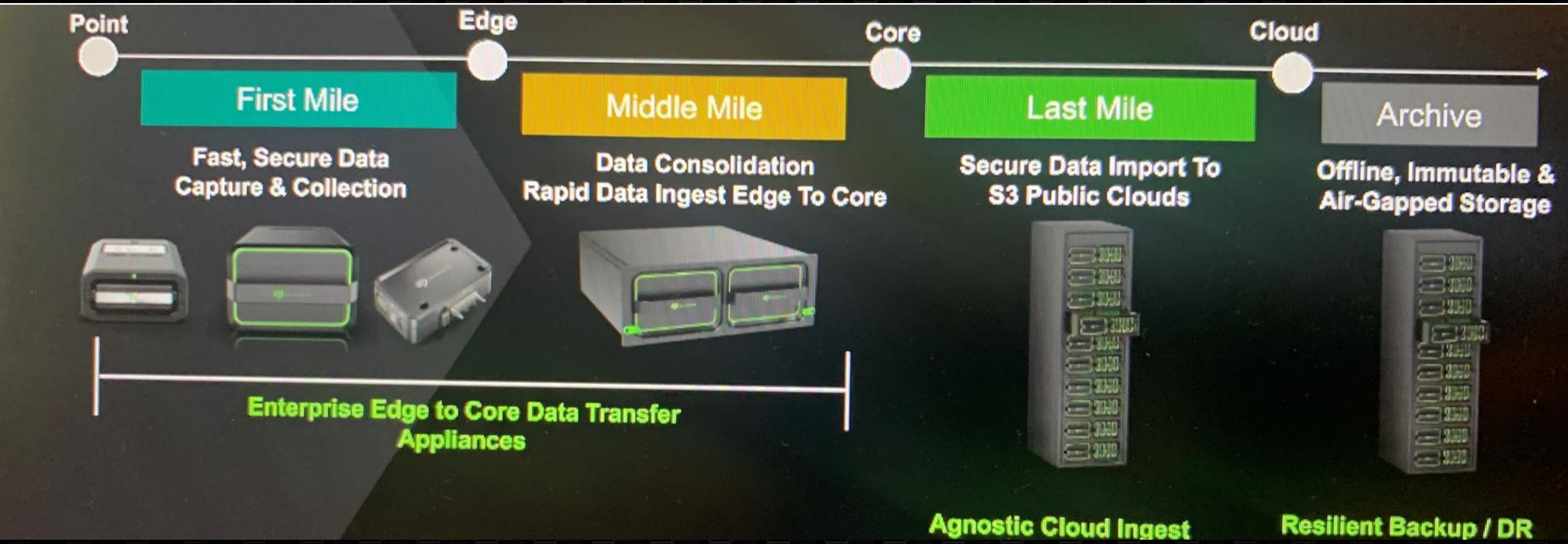
A New Way To Data

Efficient data logistics from end point to edge to core will increasingly become a competitive advantage for the distributed enterprise

- **Faster Time To Data**
- **Improved Time To Insight**
- **Acceleration of Revenue**

Advanced distributed enterprise companies will have their technology & business strategy linked.




Point
Edge
Core
Cloud
First Mile
Fast, Secure Data Capture & Collection
Middle Mile
Data Consolidation
Rapid Data Ingest Edge To Core
Last Mile
Secure Data Import To S3 Public Clouds
Archive
Offline, Immutable & Air-Gapped Storage
Enterprise Edge to Core Data Transfer Appliances
Agnostic Cloud Ingest
Resilient Backup / DR

A New Way for Data Mobility

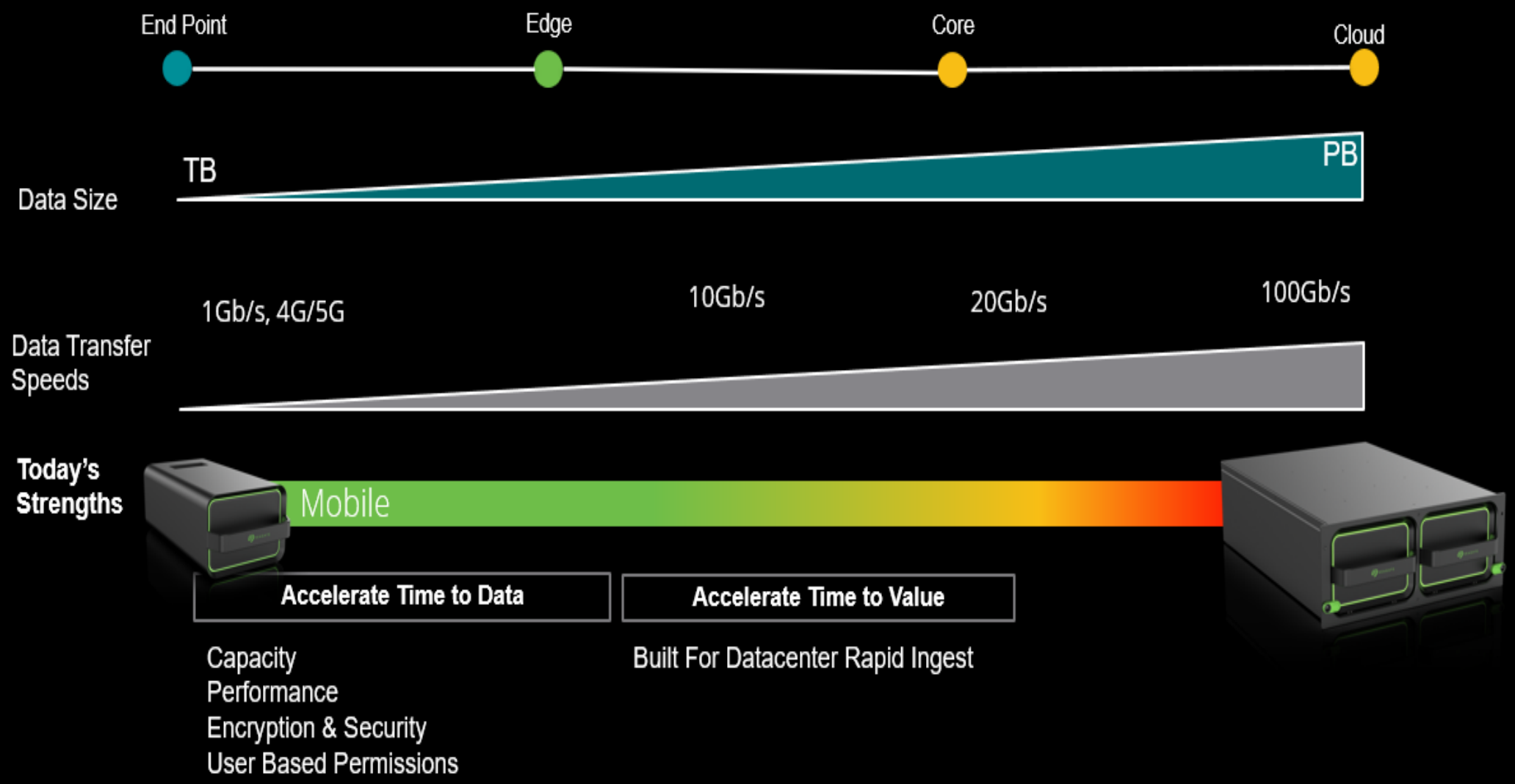
A high-capacity edge storage solution that enables businesses to aggregate, store, move, and activate their data.

Pay for what you need, when you need it, where you need it.

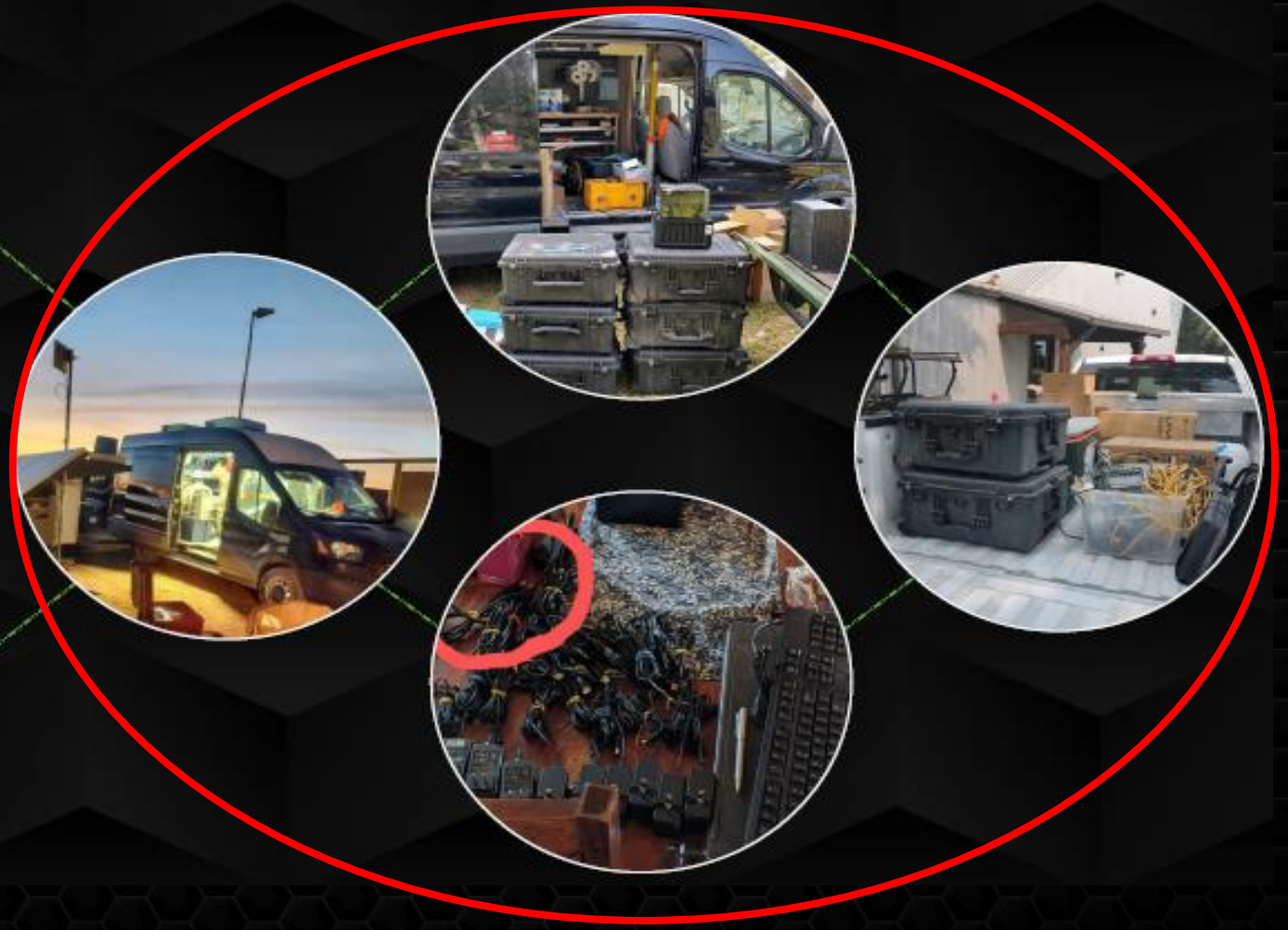
LYVE™ Mobile

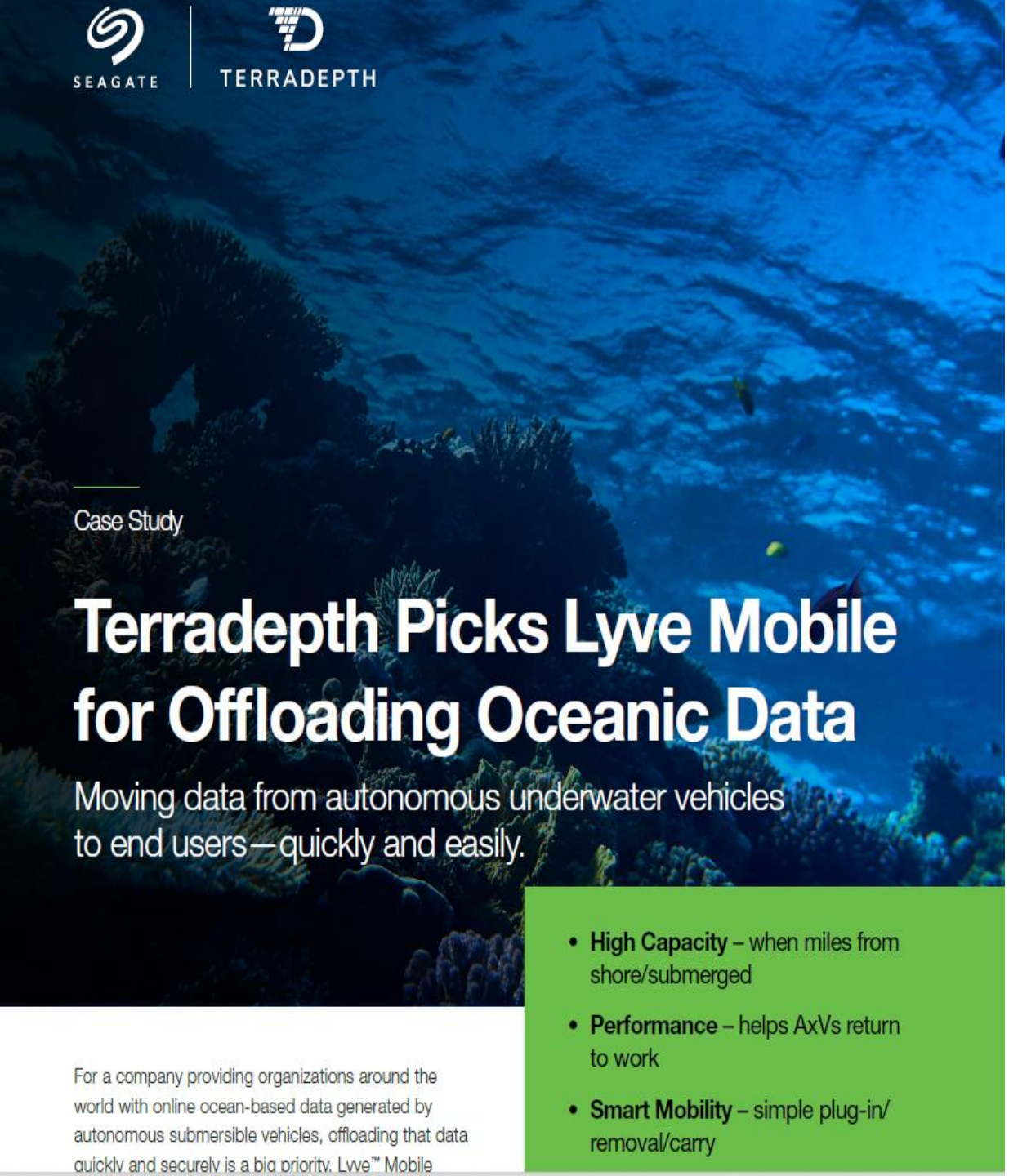
- Scalable, modular, and vendor-agnostic
- Reduce transfer time, no network dependencies
- End-to-end Encryption for secure data transfer
- Ingest service into **any** Cloud
- **Cost-efficient subscription model**

Data Logistics: Lyve Mobile



SEAGATE LYVE MOBILE CASE STUDIES





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Terradepth Autonomous Undersea Vehicles

- **Ocean Data-aaS**
- **Only 10% mapped**
- **Many TBs/mission**

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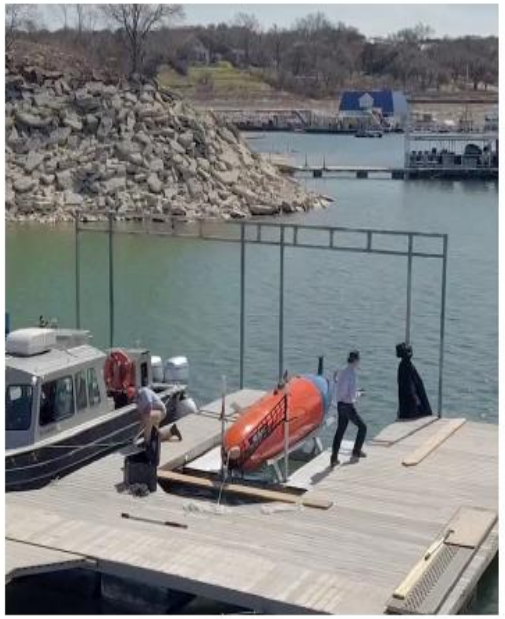
Their Problem

Wanted: Smooth Data Stream in Rough Waters

Terradepth's submersibles operate in some of the most inhospitable spots on the planet, frequently in the most remote ocean depths. When developing their operations, they knew they'd be challenged to provide reliable data transfer from their AUVs to customers. Often, traditional networking from their survey locations isn't an option, thereby requiring a steadfast solution in severe environments.



Their Solution

Data Transfer in Depth

Terradepth provides customers a variety of data sets including those for bathymetry (the measurement of depth of water in oceans, seas, or lakes) and hydrography (the science of surveying and charting bodies of water, such as seas, lakes, and rivers), which help toward endeavors such as geospatial mapping. The company utilizes a cloud-backed, browser-based, geospatial data platform called Absolute Ocean to provide storage, search, visualization, and analysis of collected ocean data. Among the industries served are the renewable energy market, offshore telecommunications and government concerns, and many organizations involved in ocean-based research and development. The company's goal is to become the

Currently, most ocean geospatial data is saved locally and not utilized through the cloud, according to Terradepth Chief Revenue Officer Ken Childress. In addition, the data is typically processed, viewed, shared, and generally used within organizations' workflows via desktop-based software rather than through internet access. Childress notes that Terradepth is trying to move the experience of collecting, sharing, and cataloging ocean data from something like using an older, legacy, static mapping website to something akin to today's modern, dynamic, interactive online map applications. According to Childress, only between 10 and 15 percent of the ocean floor is adequately mapped to modern standards, so both modernization and expansion are

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Teradepth Autonomous Undersea Vehicles

WORKFLOW:

- **Offload to 96TBLyve Mobile**
- **Encrypted and Rugged**
- **Xfer via Rackmount Receiver**
- **On-premises Cloud Access point**
- **2024: Lyve Mobile on AUV**

RESULTS & Users (Industries)

Simple | Safe | Secure | Fast

Energy | Telco | Government

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Accelerate Time to Data For Seismic Operations

Cost and Value of Field Data Loss

Time to value is critical

10TB
a day
$10k+
cost a day

500TB
a 3-4 wk project
$500k+
cost + value

500TB
upload to cloud
10 days?
30 days?
time to value

Acquisition → Edge → Core → Cloud

DATA LOGISTICS

FIRST MILE — LAST MILE

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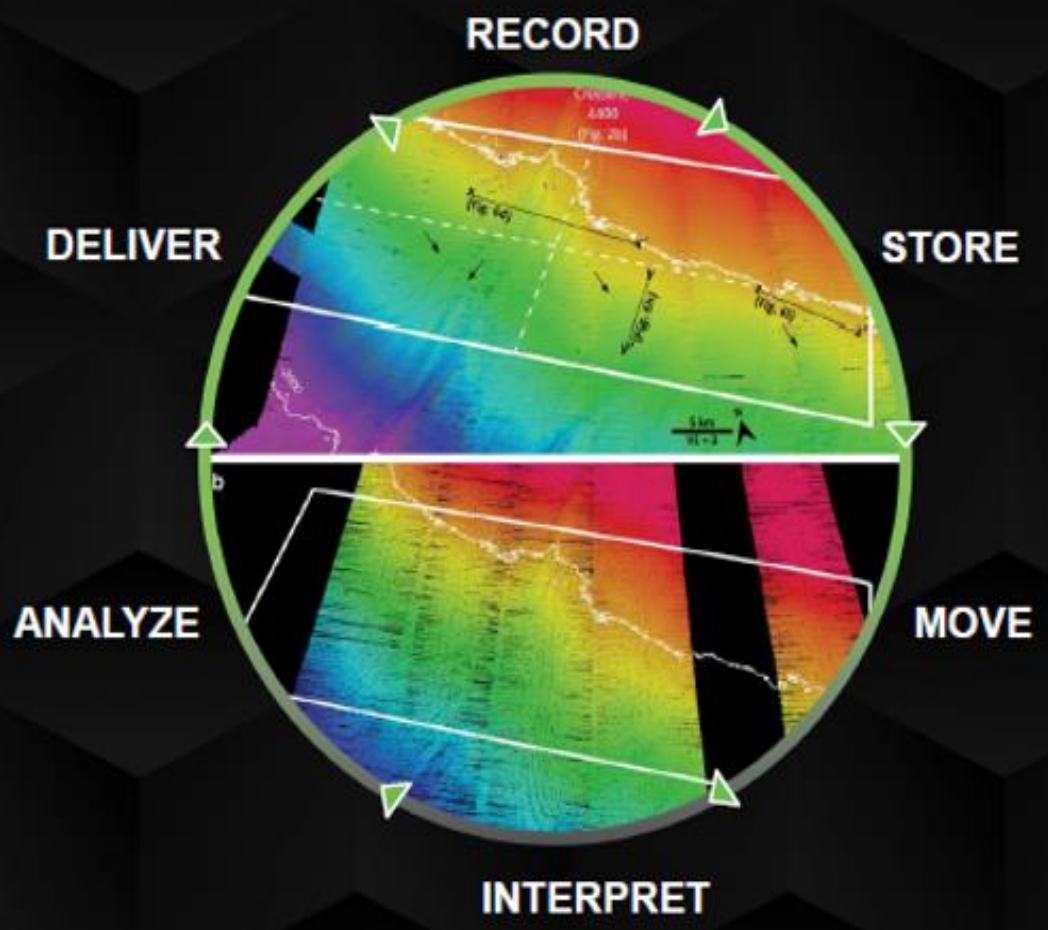
Geophysical Data

- Field Data Recording, Handling & Management
- Field Data Mobility & Transport
- Data Gravity & Field Bandwidth Limitations
- Time From Recording to Processing to Delivery



Neubrex introduced NEUBRESCOPE™

NEUBRESCOPE, the first and only commercially available cm-order Brillouin distributed strain and temperature sensing system. It provides highly accurate and reliable measurements data over long distance, using optical fiber. The first and only hybrid Brillouin-Rayleigh sensing system, which is capable of separating strain and temperature values in single SM fiber and offers spatial resolution as high as 2 cm.

Advanced technologies for:

- Optical fiber distributed Structural Health Monitoring in various Applications
- High measurement accuracy and high spatial resolution with NEUBRESCOPE™
- Optical fiber sensor FutureNeuro
- 3D in situ analysis software and service with NEUBRESTATION™

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PERMIAN BASIS – Texas/New Mexico

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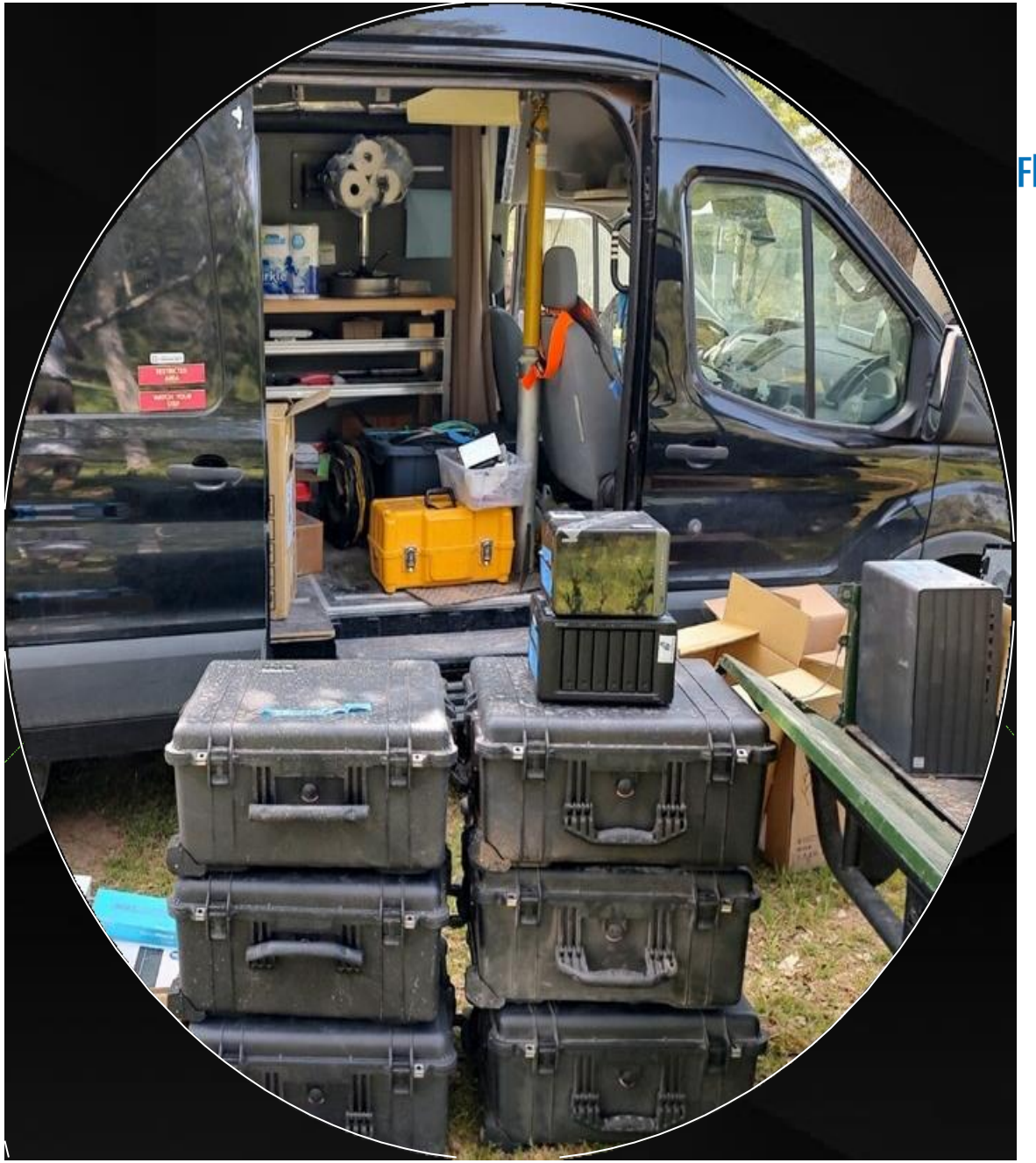

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Field Data Best Practices

When it comes to data management…

Implement an effective data management system

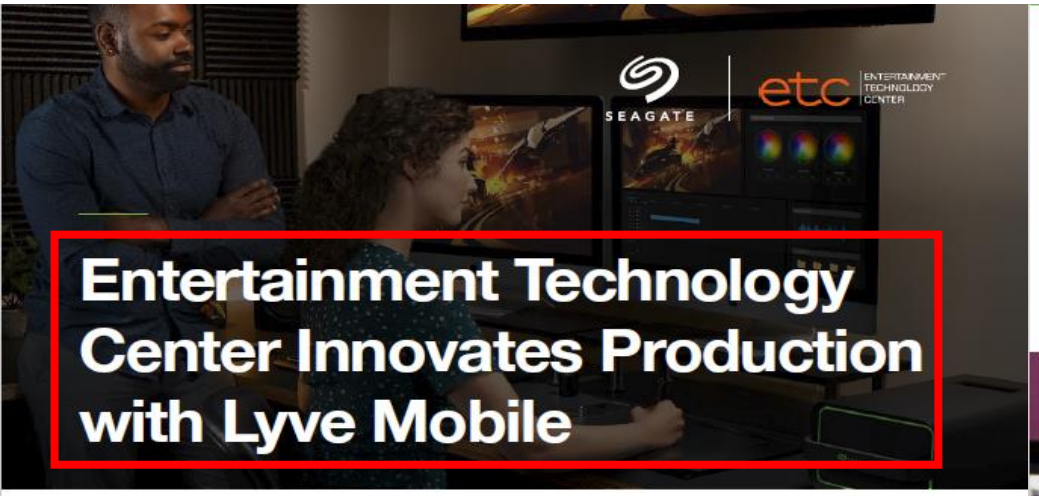
Field Acquisition
- Data integrity, device reliability
- Accelerate recording and processing efficiency
- Advance operational infrastructure

Consolidation & Transport
- Data redundancy
- Data governance
- Data security

Ingest, Delivery & Archive
- Data cataloging & repository mgmt
- Data compliance

Data management is continuous and iterative, processes must be repeatable and cost effective

USC Entertainment Technology Center (ETC)



Entertainment Technology Center Innovates Production with Lyve Mobile

Demand for Secure Storage is on the Rise

While proving out a virtual production system to enable crew to work remotely during the COVID-19 pandemic, the *Ripple Effect* production team relied on a relatively low-bandwidth internet connection on set—which meant that streaming backups to the cloud was not feasible. In order to ensure the integrity of the production data in real time, the producers backed up all their cameras using Lyve™ Mobile arrays from Seagate®.

- Facilitated high-capacity and high-performance data transfers.
- Enabled on-site backups.
- Integrated seamlessly with storage-as-a-service solution.
- Enabled safe remote collaboration.

Their Story

ETC focuses on new production ideas.

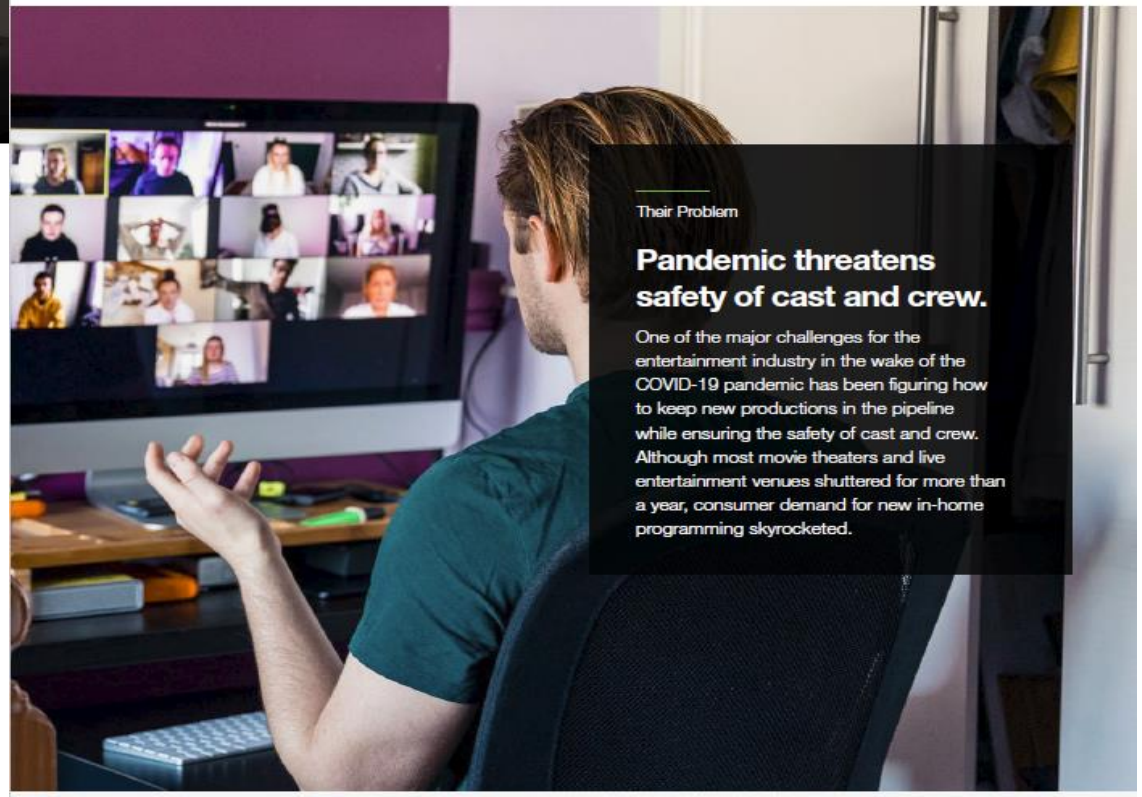
The Entertainment Technology Center (ETC) at the University of Southern California, which was founded with the support of filmmaker George Lucas in 1993, has become a proving ground for movie studios to test new production ideas and experiment with innovative workflow strategies. The center's work on remote production best practices is detailed in a white paper that discusses how *Ripple Effect* pushes the limits of virtual production. Improving production workflow is a big deal for studios that are investing in productions that cost millions or even hundreds of millions of dollars.

Low bandwidth prevented Cloud backup

ETC tests solutions for virtual production.

Their Goal

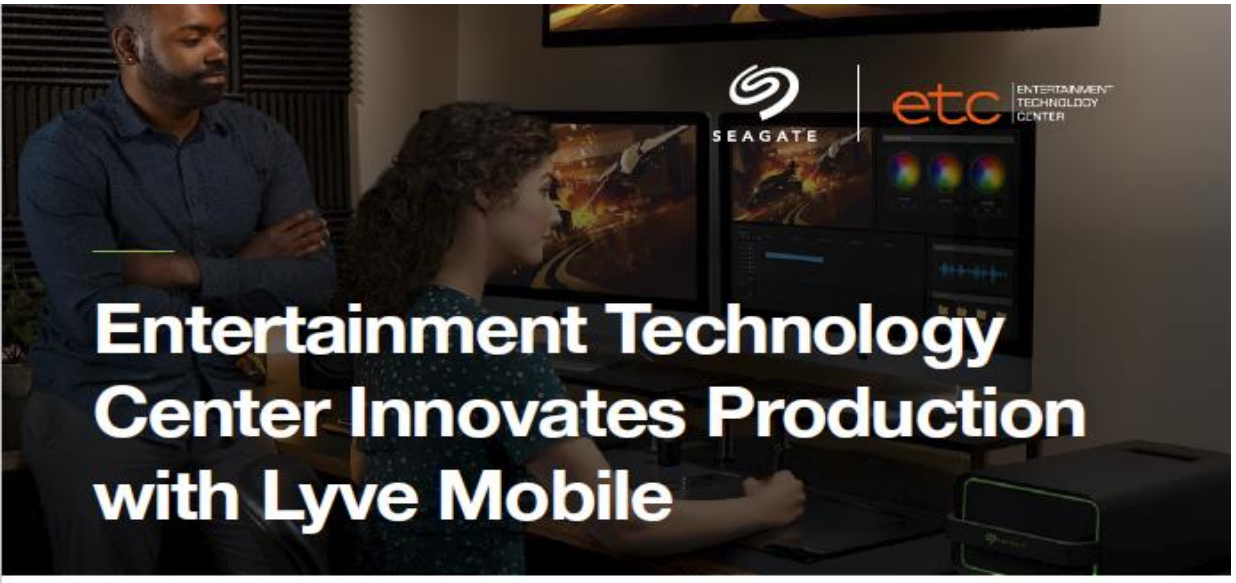
In an effort to develop a safe production environment, the ETC at the University of Southern California (USC) embarked on an ambitious live-action short film that was envisioned as a test bed for virtual and remote production technology. The producers hope to debut their movie, *Ripple Effect*, at a film festival later this year.



Their Problem

Pandemic threatens safety of cast and crew.

One of the major challenges for the entertainment industry in the wake of the COVID-19 pandemic has been figuring how to keep new productions in the pipeline while ensuring the safety of cast and crew. Although most movie theaters and live entertainment venues shuttered for more than a year, consumer demand for new in-home programming skyrocketed.



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USC ETC movie studio virtual proving ground

2TB/HOUR HDR

12TB/DAY

3 Backups/Scene

2 Stored in Cloud

1 Stored on Lyve

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Their Solution

Lyve Mobile takes center stage.

One of the cornerstones of a virtual or remote production environment is data. But managing large amounts of data while filming on a set—or on location—requires the orchestration of technology tools that can store and transport data flowing from cameras. Further, that data must be safe and secure, both at the edge and in the cloud.

The *Ripple Effect* production team relied on a relatively low-bandwidth internet connection on set, which meant that streaming backups to the cloud was not feasible. In order to ensure the integrity of the production data in real time, the producers backed up all their cameras using Lyve Mobile Arrays from Seagate.

The filmmakers used Alexa LF large-format cameras during production. They produced about 2TB per hour of HDR and ARRIRAW footage. At its peak, the project was generating about 12TB of data per day. Three backups were created after every scene, with two files ultimately stored in the cloud and one remaining on portable drives.

Storing the data in the cloud wasn't just for archiving. The ability to move all the production footage in the cloud enabled the *Ripple Effect* producers to provide their editing team with remote access to the data almost instantly, rather than days or weeks after production. One of the goals of the project was to reduce post-production costs by doing as much editing and related work as possible during production.

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Cloud enabled instant remote access vs. days to weeks

Post-production costs reduced with editing during production

"Virtual Remote Production requires orchestration of technology tools that can store and transport data flowing from cameras"

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Case Study

Producing Better Media Workflows

VAN ROTHE sets its sights on standardized technical film production.

With the pandemic fueling consumer demand for high-quality streaming content, VAN ROTHE leveraged **Seagate Lyve Mobile** to alleviate data processing bottlenecks on set and in post-production. This empowered the film consulting company to balance its operating costs, delivery schedules, and technician work-life harmony.

- Predictable SLAs
- Faster lead times
- A scalable business model
- Happier technicians

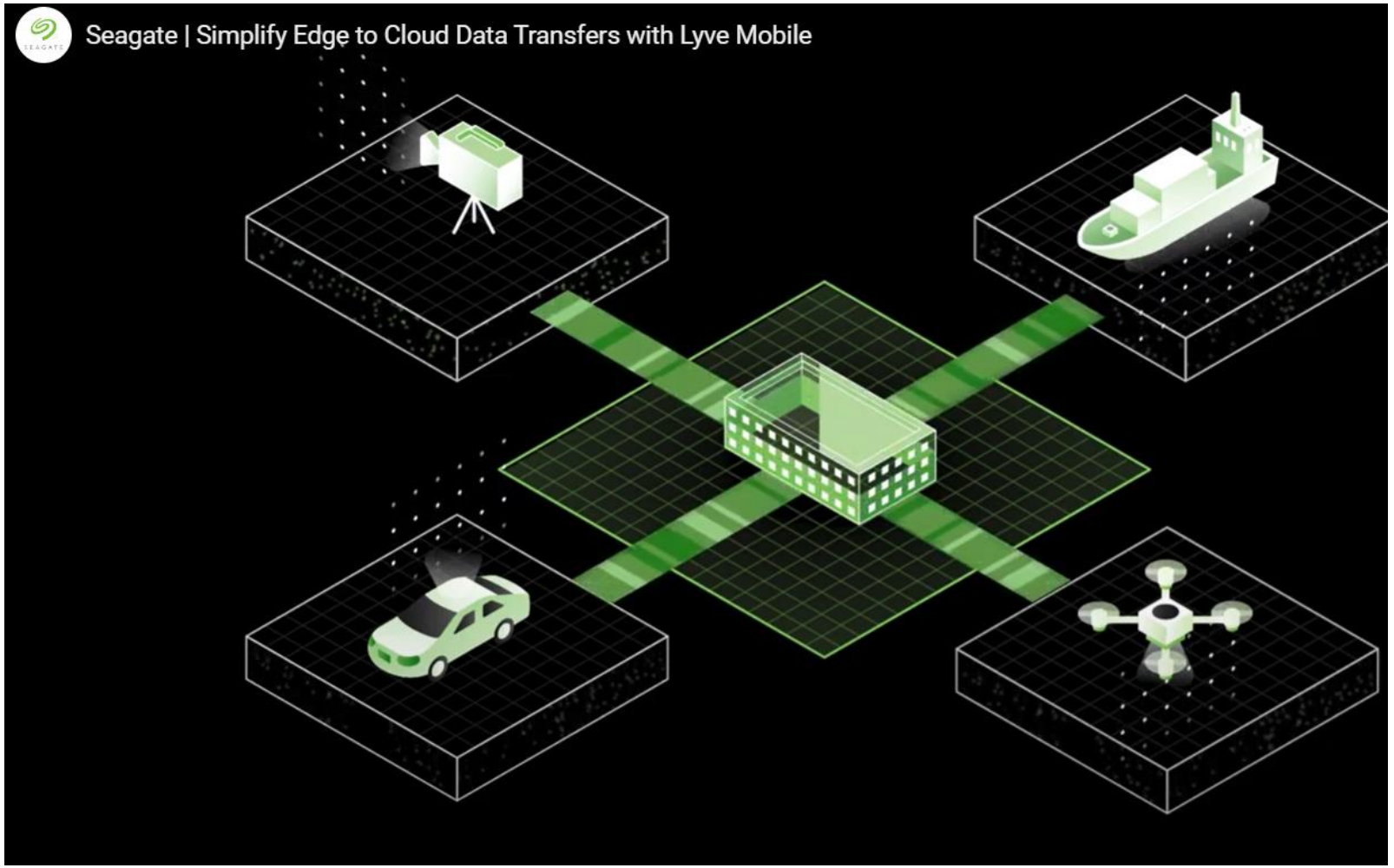
LYVE™ Mobile

"With Lyve Mobile, we can store new data while at the same time transcoding data that's already been stored. Lyve Mobile's uniform form factor allows for a standardized chain of data—from on set to post-production. This makes it easier for us to scale storage capacity based on customer needs, safely transport huge volumes of data, and build more automation into our processes."

ROBERT BOGS, VAN ROTHE PARTNER AND MOTION PICTURE ENGINEER

SEAGATE & VAN ROTHE | 5 |

Standardization in new digital era of Motion Picture Engineering with Vision Lab (mobile studio with real-time processing & VR)



- Connect film sets to the digital world
- Standardizing industry procedures
- Higher quality streaming content
- Multiple cameras
- 4K and HDR resolutions
- Film production schedules shrinking
- Previously 18 hours to wrangle data
- Ship resources to where needed
- Solves inefficient data offloading
- Bypasses slow network speeds
- Solves shortage of trained personnel
- Minimizes security risks in handling data
- Innovative services at competitive price
- Resource optimization
- Better working conditions
- More cost-effective scaling
- Win more business & grow faster
- Reduce financial risk

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Lyve Mobile Storage Solutions

Shuttle

- 16TB HDD
- 8TB SSD
- USB-C (×2), 10GigE (x1)
- 3-in-one device
- e-Ink screen
- SED AES 256-bit encryption
- TCG Opal encryption
- Hard shell case included

Mobile Array

- 60TB, 96TB (HDD)
- 46TB, 92TB (SSD)
- Fully enclosed 6-bay array
- V.A.S.P., Thunderbolt 3, USB-C
- Up to 6GB/s throughput
- TCG Enterprise encryption
- SED AES 256-bit encryption
- Hard shell case included

Rackmount Receiver

- 2 × independent slots for Lyve Mobile Arrays
- SAS, Fibre channel, iSCSI
- 2 × management network port
- Redundant power
- Roller systems for easy slot-ability
- Soft close locking mechanisms
- 4U, 19-inch Rack standard depth

PCIe Adapter & Mount

- Custom designed industrial mount directly attaches to vehicle, dongle locks into mount securely connecting Mobile Array
- PCIe Ports for SFF-8644 SAS3 1M cables
- 8 × PCIe Gen3 lanes for WIN10 and Linux servers

Managed with the included Lyve Client Software and your Lyve Portal Username

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LYVE™ Mobile

Thank You

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BACKUP SLIDES

LYVE™ Mobile

Thank You

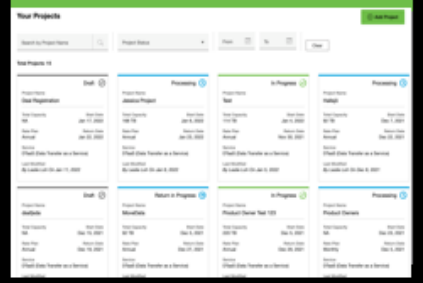
Lyve Management Portal

Full Access & Control

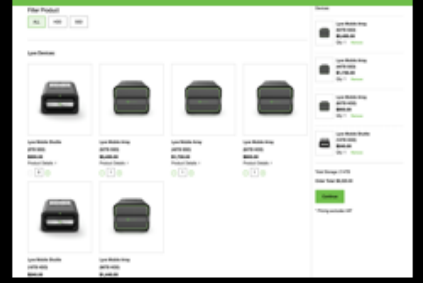
Device & User Management

Project Scalability & Return

Subscription Management



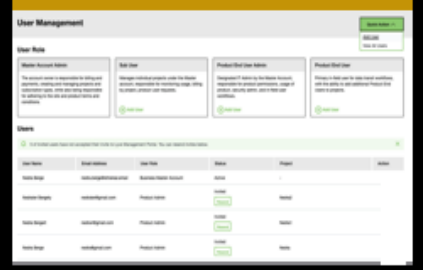
Project Ordering



Account Dashboards

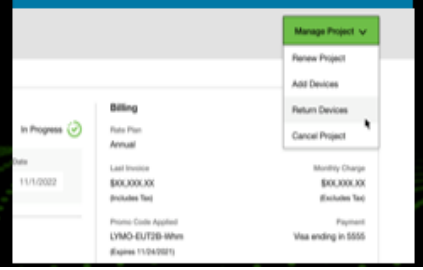
Device Provisioning

Multi-User Management



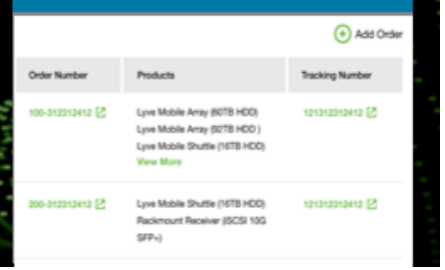
Customer Support

Power Up & Down



Return Management

Logistic Oversight



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SUMMARY: Lyve Mobile – the IDEAL EDGE TO CLOUD SOLUTION

A cost optimized suite of hardware, software and services.

Full Order Lifecycle Management

- Scalable, Modular, Agnostic
- Pay Only For What is Needed
- Simplify Device Management
- Quick Refresh of IT Equipment
- Predictable Monthly Cost Model
- Low Entry-Cost, Cash Flow Benefit
- No Asset Disposition

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FUTURE CASE STUDIES – Thursday 8:30am

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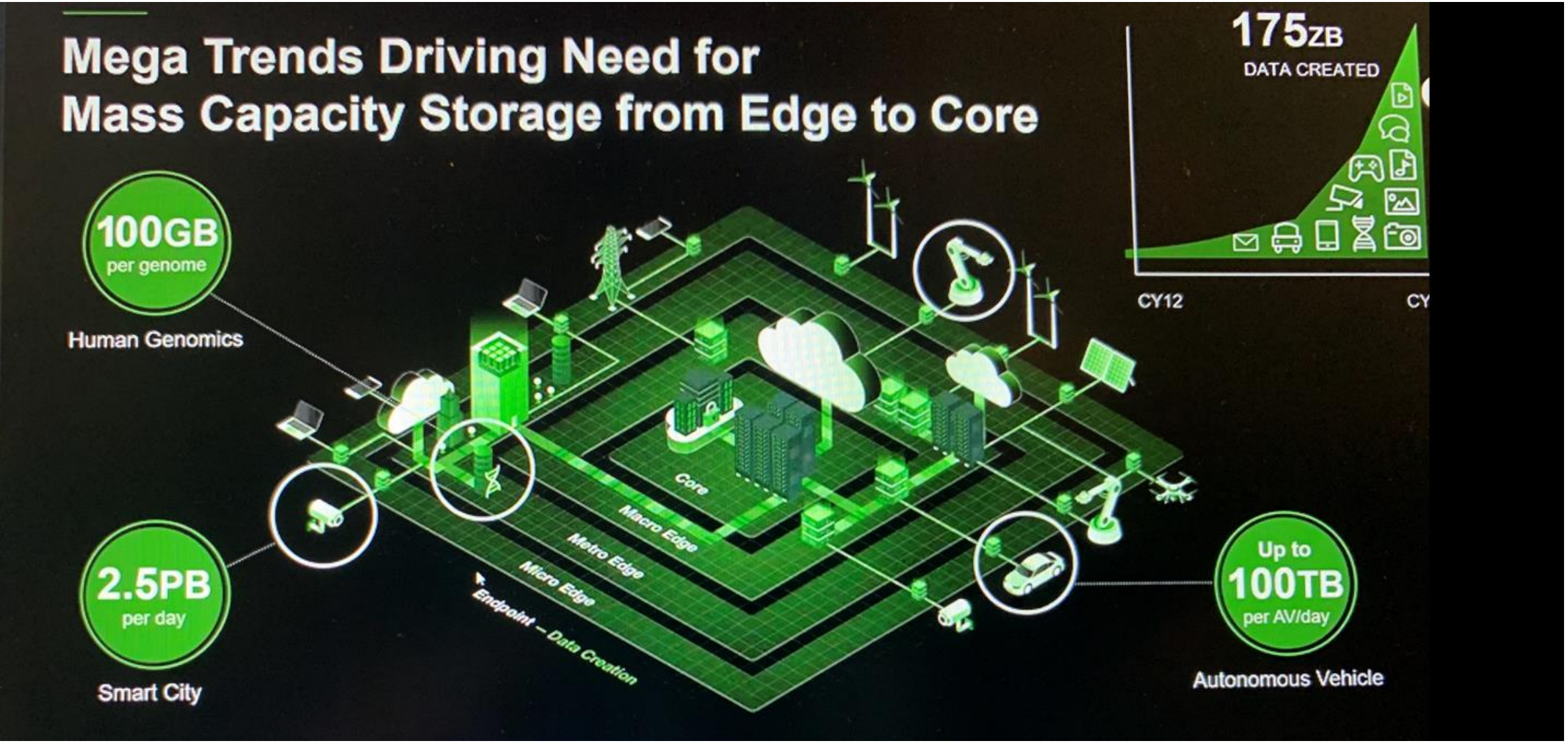

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