

Case Study

Enabling Mass Field-to-Multicloud Data Transfer for Subsea Asset Inspection.

Seagate Lyve Mobile Array and Cloud Import Services handle Zupt's large-scale data movement and storage.

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Key Results

- Enabled Giant Haul of Data**
 Zupt's cameras run for weeks at a time, producing hundreds of terabytes of data.
- Accelerated Data Delivery**
 Lyve Mobile sped up Zupt's transfer from field to cloud by a few weeks.
- Preferred Destination**
 Seagate Cloud Import seamlessly transferred data to multiple cloud locations.

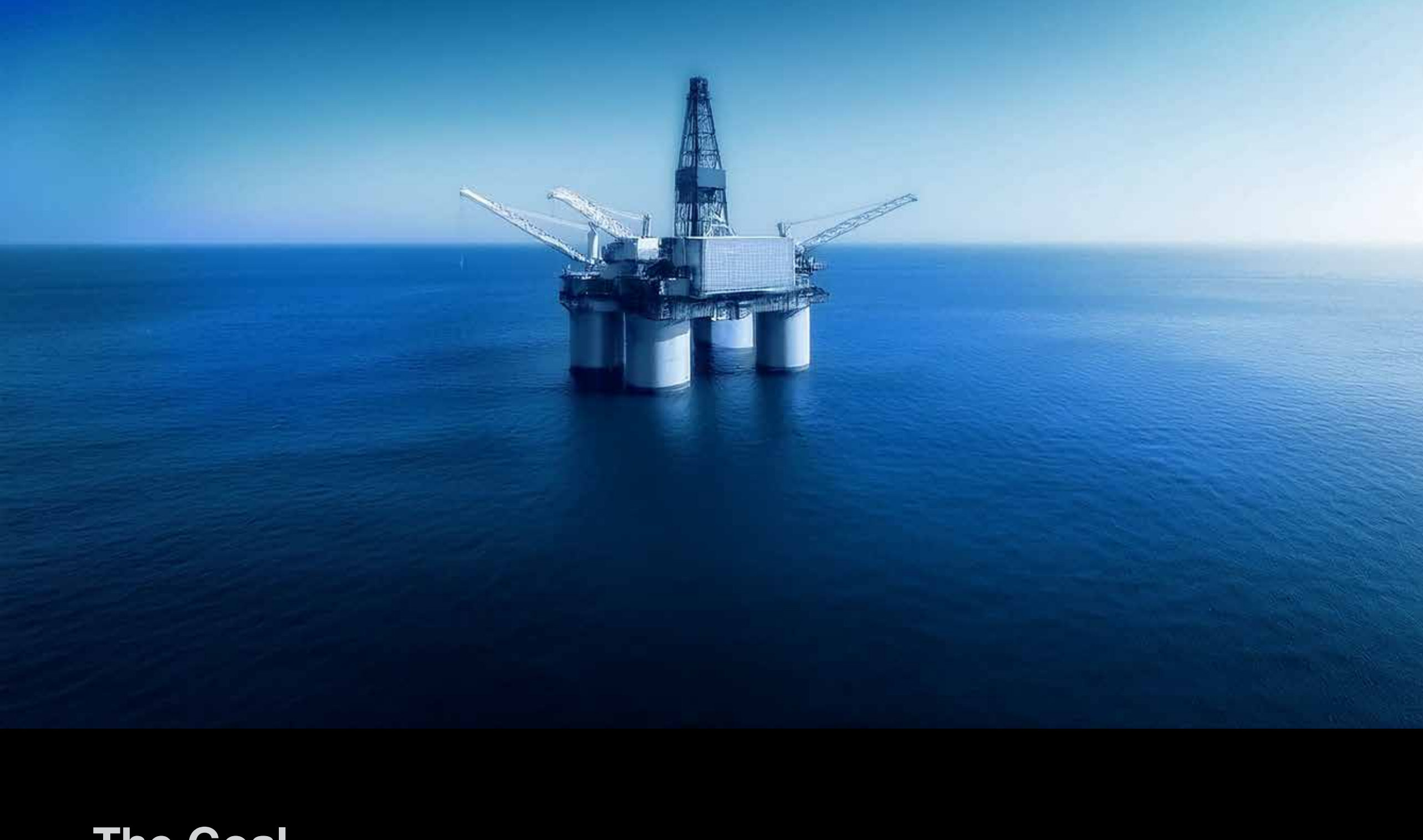
Introduction

Zupt, a Houston-based survey and technology services company, performs subsea surveys for a variety of offshore energy clients. Real-time processing and agile field data management are crucial for these projects. However, in remote subsea environments such as subsea oil fields, it wasn't easy to quickly and safely transport mass amounts of collected data from offshore site surveys to Zupt's own storage for processing as well as the customer's cold storage in AWS. With a combination of Lyve Mobile data transfer as a service and Cloud Import Service solutions, Seagate rose to meet Zupt's challenges.

The Story

Zupt utilizes Remotely Operated Vehicles (ROVs) equipped with their 3D Recon specialty stereo camera technology to inspect integrity of subsea assets. The cameras can run for weeks at a time, producing hundreds of terabytes of coordinate data, spatially accurate digital 3D Models, video, and images.

The data collected by these Zupt's 3D recon gets transmitted via a subsea fiber-optic umbilical to the support vessel, where it is stored into Seagate Lyve Mobile arrays. This setup allows Zupt to access and analyze the data in real time, ensuring data acquisition of the hundreds of structures that need analysis.



The Goal

Zupt was asked by a supermajor (one of the world's biggest publicly owned oil and gas corporations) to conduct specialized offshore inspection surveys on the customer's subsea structures. This required a robust offshore field-to-ingest-ready solution to transport and help protect the massive data volumes involved. The harsh conditions and remote nature of the bathypelagic zones (open ocean extending from a depth of 1,000 to 4,000 meters [3,300 to 13,000 feet] below the ocean surface) mean that periodic inspections are required for integrity. This is where ocean-bottom structures, such as Zupt's customer's, are installed. It's also where disastrous consequences can potentially occur, such as pipeline corrosion and subsequent point-source pollution. Zupt needed a way to transfer their vast amounts of collected inspection data quickly, easily, and securely.

The Challenge

Zupt faced several primary challenges:

- High volume data management.** A large volume of data is difficult to manage with conventional in-field storage.
- Remote-field locations and limited connectivity.** Given the nature of remote offshore and subsea surveys, real-time cloud uploads were impossible, necessitating a reliable on-site storage solution aboard the survey vessel and mothership.
- Logistics and time management.** Traditional data transfer methods like tapes and stacks of drives were impractical due to the project's scale and the need for ruggedized equipment.
- Transfer to multicloud ingest.** Zupt needed a solution to transfer data to multiple end locations, but struggled with offshore bandwidth for managing the import process from field to delivery.
- Data protection and archiving.** Remote data collection is expensive, and data loss can be catastrophic. Single devices (solid-state drives and hard drives) can often fail (and may require a rescan of one or more sections of pipeline). Zupt needed a way to get survey data into durable cloud storage as quickly as possible for data protection and archiving.



The Solution

Zupt found the winning formula in a combination of Seagate's Lyve Mobile Array and Cloud Import Service. The Lyve Mobile Array is ruggedized, mass-storage solution for in-field acquisition where data volume is too high and connectivity is too limited to move directly to the cloud. With Seagate's Cloud Import Service, data can be saved securely on devices such as the Lyve Mobile Array and imported to the cloud destination of choice.

Now, once the support vessel arrives back in port, Zupt uses the Lyve Management Portal to create shipping labels for their Lyve Mobile Arrays containing both raw and processed data. The arrays are placed into a ruggedized shipping carrier and sent to Seagate's Cloud Import Service for uploading into Zupt's designated CSP's buckets – their own processing cloud, as well as cold storage in AWS for the end customer.

As part of the project with their supermajor oil and gas customer, Zupt created a round-robin process in which empty Lyve Mobile Arrays are readily available at the port for the next survey, saving both time and money.

Seagate's Lyve Mobile edge storage solution, with a fleet of ruggedized, infinitely scalable mass capacity arrays, and Cloud Import Services, with fully managed cloud-agnostic ingestion to any location of choice, provided a comprehensive solution to Zupt's challenges. The data from the 3D Recon Imaging Sensors is consolidated into Seagate Lyve Mobile arrays housed in a rackmount receiver on the support vessel. The receiver is linked to on-board processing centers, acting as a miniature "seaborn data center."

This setup enables real-time access to the data for live asset inspection. Additionally, using mass-capacity Lyve Mobile arrays means that Zupt field technicians aren't limited by the headaches of managing individual bare drives or similar legacy hardware. Lyve Mobile Arrays enable streamlined field data management and simplify the transfer process, significantly reducing time and logistical efforts required to manage such large volumes of data. They also help reduce the risks of valuable data loss due to individual drive damage.

Once the data is consolidated, Seagate's Cloud Import Services facilitates the transfer of this data to cold storage for Zupt's data archive, while the client's deliverable data gets ingested into another cloud for processing and deliver to Zupt's end customer. This process involves shipping the Lyve Mobile Arrays to Seagate's ingest center, where the data is uploaded to the specified cloud buckets. Zupt and their end client. With Seagate-managed cloud import and multicloud ingest capabilities, Zupt saves on project logistics, circumvents multicloud restrictions, and significantly accelerates data delivery time from field to cloud by a few weeks.



The Success

Seagate's solution provided several key benefits to Zupt, including:

- Efficiency and in-field management.** Seagate's solutions streamlined the data transfer process, significantly reducing the time and logistical efforts required to manage large volumes of data.
- Data security.** Quick movement to the cloud for a backup as well as the use of ruggedized arrays and simple field storage management reduced the risk of expensive data loss.
- Scalability and edge logistics.** For Zupt, the amount of data is too large and there is too little bandwidth offshore to upload direct to cloud. Seagate provided a way to both scale to volume and deliver to Zupt's customers' preferred final cloud destination.
- Cost-effectiveness.** Seagate solutions helped reduce costs associated with simplified field-logistics, with no need to provision new storage devices, by allowing customers to utilize an OpEx model of pay-per-TB as needed.
- Cloud-agnostic delivery.** Seagate's ability to handle data imports to various cloud platforms provided flexibility and met the diverse needs of Zupt and their customers.

Data collection and transmission can have their challenges in the most normal of circumstances. Add the unpredictability of working at the bottom of the sea and with multiple remote vessels, and those challenges can understandably multiply.

Thanks to Seagate Lyve Mobile Arrays and Cloud Import Services, Zupt was able to scale acquisition to a volume previously unfeasible in remote offshore locations, as well as count on data protection both in the offshore environment and in the cloud.

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