

Infortrend Storage Fuels AI Deep Learning Application At One Of The World'd Top 5 Space Research Organizations

Organization

One of the world's top 5 space research organizations

Challenges

- The customer's outdated storage systems didn't deliver sufficient performance for demanding AI deep learning, which made the application unfeasible
- Storage capacity was not enough to store vast amounts of images captured by space exploration equipment

Solution

EonStor GS 4000U NVMe hybrid flash storage and JB 3000 expansion enclosure:

- 2 x Ultra-high performance EonStor GS 4024U NVMe hybrid flash storage with support of 100GbE RDMA, 16 x 7.68TB U.3 NVMe SSD, PCIe Gen.4
- 2 x Expansion enclosure JB 3016, 26 x 18TB enterprise 3.5" SAS 12Gb/s HDD, 7200RPM

"When selecting a high performance storage, our exclusive consideration was Infortrend's solution. Without it, our AI neural networks for image analysis and interpretation would not be operational. In essence, Infortrend has effectively enabled our space exploration endeavors," remarked the Director of Data Visualisation Group of Earth Observation Department at one of the world's top 5 space research organizations.

The space research organization is one of the top 5 space exploration agencies in the world. It focuses on the development of payloads, instruments, and space-based systems for various satellite missions and applications.

The space research organization has been increasingly using AI in various aspects of space exploration. It utilizes the popular Anaconda platform for AI and machine learning, and XFS high-performance file system to manage large data sets. Within images captured by satellites, remote sensing instruments, or other space exploration equipment, the AI algorithms developed by the organization can automatically recognize and classify objects (e.g., craters or mountains), scenes (e.g., geological formations or atmospheric conditions), activities (e.g., movement of objects). This contributes to efficient content moderation (filter out content that may not be suitable for analysis) and content tagging (e.g., "Martian landscape"). By using AI algorithms for recognition and classification, the organization can process and analyse vast amounts of visual data more efficiently. The AI-processed data contributes to scientific research by providing accurate and detailed information about planetary or celestial features, which is essential for risk assessment and mission planning. In this application, high performance storage plays a crucial role in handling the large volumes of data generated by AI-driven processes. However, the organization's outdated storage failed to deliver the performance required for AI deep learning and didn't support 100GbE connectivity which was also necessary for the application. Thereby, the organization sought for Infortrend storage solution to empower their AI deep learning network, aiming to reduce the time needed for insights and discoveries in the field of space exploration.

Challenges

- AI deep learning algorithms required a data storage solution featuring ultra-high throughput which was not provided by the outdated customer's storage.
- Storage capacity was not enough to store vast amounts of images captured by space exploration equipment.

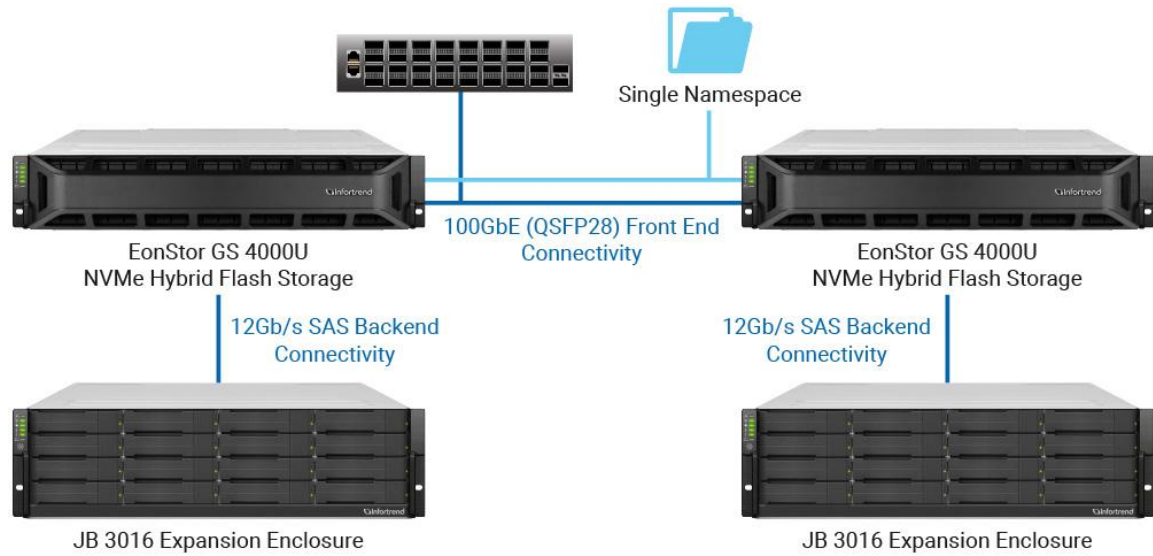
Solution

The organization adopted two units of Infortrend's ultra-high performance EonStor GS 4024U NVMe hybrid flash storage and two expansion enclosures JB 3016. To maximize performance, the GS 4024U appliances connect to the network switch through a 100GbE QSFP28 front-end interface. The storage appliances are loaded with 16 x 7.68TB U.3 NVMe SSD, PCIe Gen 4, to handle I/O-intensive AI deep learning workloads. JB 3016 expansion enclosures are loaded with 26 x 18TB enterprise 3.5" SAS 12Gb/s HDD, 7200RPM. Overall, the solution provides 590TB capacity to store visual data captured by space exploration equipment. The GS storage solution is future-proof for increased AI workload volumes: more SSDs can be added to the storage appliances to linearly increase performance and capacity, with each appliance capable of delivering up to 17GB/s and 6GB/s in read and write file throughput. To optimize storage efficiency, the auto-tiering function allocates data undergoing AI analysis on the high-performance SSD pool on GS and already analyzed data — on the cost-saving HDD pool on JBOD. A single namespace allows all the data spread across GS appliances to appear as if it were stored within a single GS, making it easy for users to locate and access data.

Why Infortrend

- Ultra-high performance of the U.2 NVMe hybrid flash storage GS 4000U ideally suitable for AI deep learning workloads
- High storage efficiency with hybrid storage
- High capacity to store vast amounts of visual data captured by space exploration equipment
- A single namespace simplifies for users the process of locating and accessing data

**EonStor GS NVMe Hybrid Flash Storage for AI Deep Learning Application
at the Space Research Organization**



About the Space Research Organization

The space research organization is one of the top five space exploration agencies in the world. It is dedicated to advancing space technology and applying it for societal benefits, including communication, broadcasting, navigation, disaster monitoring, meteorology, oceanography, environmental monitoring, and natural resource surveying. The organization has significantly contributed to scientific and planetary research by launching missions to explore celestial bodies such as the Moon and Mars.