



AHEAD



Data Management for Edge AI with Dell PowerStore

How Dell & AHEAD are helping
organizations overcome the data storage
challenges of edge AI workloads

Edge AI adoption continues to grow as enterprises recognize the value of processing data closer to its source. By implementing edge inferencing, organizations can lower the bandwidth requirements and reduce latency for their AI workloads. This enables enterprises to process data in real time and generate insights faster.

However, the data requirements of AI workloads are straining traditional storage infrastructure. Edge AI systems require enormous amounts of data to be collected and managed to support inferencing, yet many traditional data storage options lack the flexibility to handle the scale and complexity of these workloads. That's why organizations need to consider a highly adaptable data storage solution that can meet the evolving demands of edge AI.

In this white paper, we'll discuss the data challenges of edge AI and ways Dell PowerStore can help overcome them. We'll also discuss how AHEAD can help organizations implement edge AI systems that integrate Dell storage infrastructure.

The Data Challenges of Edge AI Workloads

Edge AI offers enormous opportunities for innovation, but it also introduces data challenges that traditional storage infrastructure cannot overcome. Organizations will need to rethink their approach to data collection, management, and security to adapt to edge AI workloads.

AI models — particularly generative AI and large language models (LLMs) — require massive amounts of data for both training and inferencing. The problem is that it's difficult to store and manage these large datasets in a way that's accessible, cost-efficient, and secure. Most edge systems collect data from thousands of different devices, and these fragmented and often unstructured datasets need to be organized to support AI inferencing.

Edge systems also often require a smaller form factor with lower energy demands because they're deployed in more remote locations with constrained physical space and limited power access. A more compact device will likely lack the memory or storage capacity for large datasets, so edge data infrastructure needs to be highly efficient and adaptable to support the needs of an AI workload.

Physical security of the edge hardware and protection of the data stored on them are also challenging. The hardware assets themselves could be vulnerable to tampering or theft because they're deployed in decentralized locations that are more difficult to monitor and control access. This means adequate protection requires hardware security measures and the ability to push security updates after edge devices have been deployed in the field.



How Dell PowerStore Supports Edge AI

[Dell PowerStore](#) is an intelligent and adaptable storage solution that can support high-density workloads with high performance and cost efficiency. This comprehensive solution helps organizations modernize their data infrastructure for the most demanding edge AI workloads.

Simplicity

PowerStore's unified offering can support both structured and unstructured data within a single array to simplify procurement and deployment. Data can also be efficiently replicated back to a centralized data center for additional training or fine tuning.

Predictability

PowerStore ensures storage infrastructure costs are transparent and predictable for several years. The standardized hardware costs and minimal ongoing maintenance expenses make it easier to plan and operate large-scale edge systems.

Data Protection

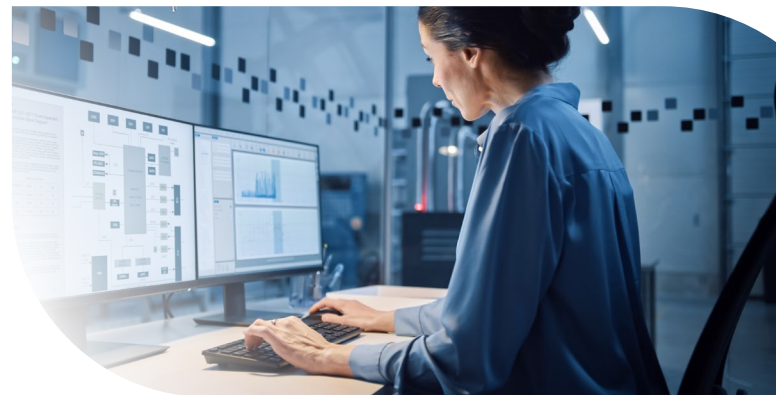
PowerStore integrates with leading file management and monitoring solutions like ProLion, Komprise, Commvault, and Varonis. It also includes encryption for data at rest and other data security features to protect storage workloads.

Agility

PowerStore can scale up storage drives vertically across edge infrastructure using a single interface with [CloudIQ](#) to optimize storage capacity. Scaling out is also possible by adding more nodes or devices to the edge system.

Physical Security

PowerStore supports Hardware Root of Trust (HWRoT) and other hardware security measures to enable a zero trust strategy and ensure edge devices are protected in the field.



In addition, [PowerStore Prime](#) combines the best of PowerStore 4.0 with even more business advantages. This includes a 5x data reduction guarantee, lowering storage capacity costs and enabling a smaller form factor to support edge AI workloads.

Dell PowerStore for Computer Vision in the Healthcare Industry

A leading healthcare company needed a low-latency computer vision system for monitoring patients. This edge AI system required processing data as close to the source cameras within patient rooms as possible rather than centralized cloud inferencing.

The healthcare company worked with AHEAD to deploy Dell PowerStore at the edge with both structured and unstructured layers: block storage to run and manage the AI model, and unstructured NAS storage to temporarily save the video recordings. If certain videos need to be stored long-term (perhaps for legal reasons), this could be done right within PowerStore using file level data retention policies.

This hybrid approach with PowerStore minimized the storage capacity needed to adequately support inferencing at the edge and enabled a smaller form factor suitable for deployment in hospital rooms. In turn, the healthcare company was able to deliver a more cost-effective and efficient computer vision solution.

AHEAD + Dell: Streamlining Data Storage for Edge AI

AHEAD is the leader in data, developer, and infrastructure platforms for enterprise organizations. Our consultative approach, technical expertise, and innovative solutions combine to accelerate the impact of technology in every client we serve.

AHEAD has the infrastructure expertise, Dell certifications, and deep experience to ensure clients' success necessary to implement innovative edge AI systems. In fact, [AHEAD is a Dell Technologies Titanium Black Partner](#) focused on consultative solutions and one of the top 3% of Dell partners globally. We've had 2000+ successful deployments and obtained 400+ certifications and 24 competencies in storage, server, data protection, client, and CI/HCI services.

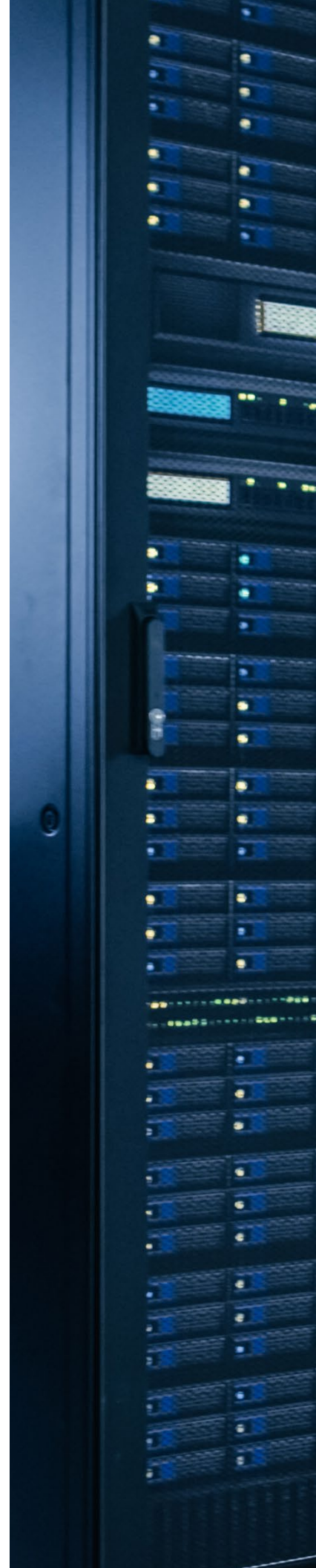
[AHEAD's Deployment and Managed Services](#) can help organizations with edge AI from conception through to implementation and maintenance. Our engineering team has deep expertise in Dell PowerStore and can assist organizations in understanding the specific requirements for their AI workloads to choose the best approach for implementing storage infrastructure.

AHEAD Foundry™ Facilitates a Turnkey Approach for Dell PowerStore

AHEAD Foundry provides comprehensive services for building and integrating all hardware and networking infrastructure at scale in our facility rather than on-site. We can help you more easily procure, deploy, orchestrate, and manage large-scale edge systems.

- **Our AHEAD Foundry offering includes:** Pre-deployment configuration: Pre-configured products leave AHEAD facilities in a consistent foundational state, ensuring reliability and performance, and economies of scale.
- **Rack integration:** Integrated solutions decrease DOAs (dead on arrival), reduce missing parts, and improve time to value.
- **Warehousing and kitting:** Kitting allows organizations to ship all items to our facility, regardless of who they are purchased from. Items are consolidated and palletized to simplify shipments.
- **Global logistics services:** Services performed by a dedicated global logistics team ensure compliance and efficiency across global shipments.
- **AHEAD Hatch platform for IT lifecycle management:** Our proprietary platform consolidates and normalizes all data from various software tools to provide a single-pane view of hardware engineering and logistics. This includes direct integration into Dell production facilities for real-time inventory tracking.

The adaptability of Dell PowerStore means AHEAD can pre-configure, integrate, and kit racks in AHEAD Foundry before shipping them to deployment sites globally. This turnkey approach accelerates the rollout of new storage infrastructure for edge systems and reduces the time to value for customers.



[AHEAD's Automation Hub](#) also has 400+ custom IP solutions to accelerate digital strategies, including accelerators for Dell PowerStore, Dell PowerMax, Dell PowerFlex, and more. This enables organizations to automate many different aspects of deploying and operating Dell infrastructure for edge AI and many other use cases.

Finally, our state-of-the-art lab outside of Chicago has a comprehensive Dell portfolio available for testing configurations, proof of concepts, and exploratory solution development. This can help organizations determine whether Dell PowerStore is right for their use cases before committing to a large-scale implementation.

In short, AHEAD's full-service hardware services can help you implement PowerStore data storage infrastructure for large-scale edge AI systems. [Contact AHEAD](#) to learn more about the adoption of AI with Dell Technologies.

AHEAD

Combining cloud-native capabilities in software and data engineering with an unparalleled track record of modernizing infrastructure, we're uniquely positioned to help accelerate the promise of digital transformation.

[Contact Us](#)

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