

AI Server Storage Requirements



AI Overview

AI server storage must balance high throughput, low latency, and scalable capacity to support training, inference, and data lifecycle management. Key Considerations

Workload Type: AI storage requirements differ significantly between training and inference. Training large models demands high-capacity, high-throughput storage to feed multiple GPUs simultaneously, often handling terabytes to petabytes of structured and unstructured data. Inference workloads prioritize low-latency, fast-access storage to deliver real-time responses, where speed directly impacts user experience.

Storage Performance: AI workloads require sub-millisecond latency and sustained throughput exceeding 100 Gbps to keep GPUs fully utilized. High-performance NVMe SSDs or parallel file systems like BeeGFS On Demand (BeeOND) are recommended for I/O-intensive tasks such as deep learning training or real-time inference.

Block storage is ideal for high-speed, random-access operations, while **file storage** supports collaborative workflows, and **object storage** is suited for large, unstructured datasets.

Capacity and Scalability: AI projects often need exabyte-scale capacity within a single namespace, with tiered storage strategies to balance cost and performance. Active datasets should reside on high-speed storage, while inactive or archival data can be moved to cost-effective solutions like Azure Blob Storage or other cloud object storage.

Data Lifecycle Management: AI data moves through stages—ingestion, preparation, training, inference, and archiving—each with distinct storage needs. Efficient storage solutions should support automated data movement, versioning, and consistency to ensure reproducible results and compliance.

Security and Compliance: Protecting sensitive AI data requires encryption, access control, and disaster recovery planning. Enterprise-grade storage should provide durability through replication or erasure coding and maintain always-on service resiliency.

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