DDN®
AI · BIG DATA · HPC

Solution Brief

Autonomous Transportation

Stable and Scalable Infrastructures for Autonomous Vehicles

A world-leading peer-to-peer ridesharing company selected DDN to create, deploy and optimize a global AI-enabled IT Infrastructure for its autonomous vehicle program.

A leading US university is leading a joint project between the private sector, government and academia together to advance transportation safety, sustainability, and accessibility.

A premium auto manufacturer deployed a DDN all-flash solution to simplifiy data aggregation at scale, and uses an open storage system that works with a variety of compute architectures.

Whether its planes, trains or automobiles, the move towards autonomous vehicles is revolutionizing the transportation industry. Powered by big data, AI and millions of dollars in research, the creation of safer, smarter, more reliable transportation systems is quickly being realized.

Autonomous vehicles engage some of the toughest workloads in AI and at an unprecedented scale. They require the handling, ingest and delivery of a broad range of dataset types and sizes, generated from many different sources such as video cameras, radar, lidar, sensors, and in-vehicle software. Very large datasets captured over millions of miles undergo many cycles of processing, labeling, sub sampling and categorization before being presented to deep learning (DL) applications that ultimately deliver the best-in-class self-driving vehicle.

However, to do so, self-driving vehicles require the maximization of the number of testing scenarios to improve vehicle perception accuracy and operational autonomy. This requires a reliable data storage framework that scales to Terabytes per second of throughput and hundreds of Petabytes of capacity. Ride-sharing companies, auto manufacturers, as well as freight and shipping companies leverage DDN solutions to support massive data collected by extensive and complex DL frameworks that are trained, tested and refined for the autonomous driving.

DDN enables infrastructures to harness data at an immense scale, which successfully and reliably build an advanced AI framework. DDN storage platforms effortlessly handle concurrent ingest of massive data streams, organizing and structuring the underlying datasets. This allows millions of GPU cores to continuously access DDN systems while executing extensive and complex training processes, and continuously refining self-driving capabilities.

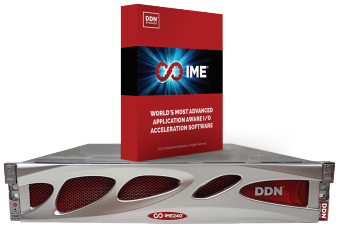
Managing Data at the Endpoint, Edge, and Core

		Workload	Features
Endpoint	 Vehicle Collection	Modest ingest rates, small and large files, extremely high sequential egress rates. Between 40-200TB per day per vehicle.	Low-power, high-data rates or removable, simple management.
Edge	 Regional Data Center	High concurrent sequential ingest rates. Steady egress rates in syncing data to core(s). 10s of PBs.	Data management and tracking of data sets to core.
Core	 Core Data Center(s)	**Transform:** Random and sequential read and write intensive. Large variety of file sizes. **Train:** Compute/GPU intensive, read heavy, random, small files common. **Inference:** Compute heavy, read intensive. 100s of PBs	Hybrid Cloud, full data management between CORE systems and EDGE datacenters. Auditing and control.

DDN Solutions for Autonomous Transportation

A³I

DDN A³I storage solutions are fully-optimized to accelerate machine learning and artificial intelligence (AI) applications, streamlining deep learning (DL) workflows for greater productivity. Working with industry leaders like NVIDIA and Hewlett Packard Enterprise (HPE), A³I artificial intelligence storage solutions harness the knowledge from customer-proven deployments to make AI-powered innovation easy. A³I is a turnkey, AI data storage infrastructure for rapid deployment, featuring faster performance, effortless scale, and simplified operations through deeper integration—all backed by the data-at-scale experts.



IME

IME delivers up to 1000X application and file system speed-up with the world's most advanced application-aware I/O acceleration software, removing randomness out of workflows and reducing uncertainty and erratic performance in the cluster. This break-through storage application eliminates POSIX contentions, enabling you to convert problem I/O-bound applications into easily resolvable compute-bound challenges. Developed to drive faster time to results, IME delivers game-changing latency reduction, more bandwidth and unmatched IOPS.

Parallel Filesystem Solutions

DDN's file system solutions delivers best-in-class analytics, parallel file system and NAS for the most data-intensive and performance-demanding environments. Next-generation Appliances tightly integrate award-winning DDN HPC storage technology with the power of parallel file systems to provide flexible choices for data protection and availability, offering ease of access through traditional NFS or CIFS as well as the option for high performance client access.

Block Storage

To perform cutting-edge workflows and analytics, our highly versatile SFA Platforms deliver award-winning technology with the necessary breakthrough performance and capacity with NVMe, SSD and intelligent disk tiering. Maximizing their innovative PCIe fabric plus the option to leverage the power of embedded processors, applications and file systems within the storage array to significantly reduce complexity, latency and data center footprint. From the performance focused SFA 200NVX and 400NVX all flash NVMe systems, to the versatile hybrid SFA7990X and the ultimate in performance and capacity with the SFA18KX, DDN has the form factor to fit the uniqueness of your use case.

About DDN®

DataDirect Networks (DDN) is the world's leading big data storage supplier to data-intensive, global organizations. DDN has designed, developed, deployed, and optimized systems, software, and solutions that enable enterprises, service providers, research facilities, and government agencies to generate more value and to accelerate time to insight from their data and information, on premise and in the cloud.

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