



Modernize and Fast-Track Manufacturing Initiatives

Delivering Better Products Faster

Suzuki accelerates the speed of vehicle design and innovation by consolidating its Computer Aided Engineering (CAE) system on DDN

Leading European Aerospace Company are utilizing a DDN parallel file solution to drive higher resolution simulations and to enable deeper design space exploration.

Detroit-Based Auto Manufacturing Giant facing an explosion of data chooses DDN to deploy a scalable, manageable and high-performance environment to run parallel simulations and deliver services to an expanded number of internal stakeholders.

Rolls Royce leverages a DDN HPC infrastructure to transform their design chain, developing better designs, faster and cheaper.

A Well-Known Japanese Automotive Company uses a DDN parallel file system solution to reduce CAE processing times and TCO dramatically.

A Leading German Automotive Supplier chooses DDN because it's exceptional performance with both large and small files. They deployed petabyte scale parallel storage solution enabling higher fidelity simulation and exhaustive ensemble analysis solutions.

No other field generates data on the scale of academia and its institutions' multi-disciplinary research programs. Areas like genomics, molecular biology, fluid dynamics, and particle physics hold tremendous potential to change the world. However, this is only possible if they can successfully access, mine, and share the mountains of data being created and avoid the creation of single purpose data lakes. Now, universities and research institutions are increasingly turning to AI to unlock insights contained in those massive datasets. AI adds another tool to drive academic discovery based on data analysis and complements existing simulation-based methods, increasing precision of results.

With this AI-led progress come the complex demands for an increasingly sophisticated infrastructure. Research institutions are turning to DDN's zero-bottleneck parallel data paths to help perform the kinds of analysis needed for breakthrough applications. Throughout the discovery process, DDN innovative storage solutions deliver the large-scale data at speeds that are required to ingest, store, and distribute previously unheard-of volumes of raw data. These solutions also support the rising use of GPU hardware to run mixed-precision simulation algorithms.

Data Intensive Simulations In Manufacturing

The common thread across use cases in automotive, aerospace, consumer products, heavy industry and beyond is the reliance on CFD, CAE, and structural analysis applications. Over the last decade, many of these applications have adopted parallelization techniques like MPI and are increasing in scale and capability. These high-fidelity simulations now require thousands of cores, and the simulations often involve tens of thousands of elements, nearly a billion mesh/grid cells and I/O intensive computational models. Ensemble simulations are increasingly utilizing hundreds of simultaneous jobs for highly accurate design space exploration. This near exponential growth has resulted in dramatic increase in size of data sets and increasing reliance on parallel I/O techniques to enable faster application performance.

Emerging Trends In Manufacturing Simulations

The manufacturing industry is increasingly adopting newer materials with innovative structures, requiring advanced analysis to predict behavior under real-world usage models and stress factors. These emergent trends are driving manufacturers to AI, machine learning and HPC for use cases beyond traditional post-design analysis. Simulations and modeling for these emerging workflows are even more data intensive than traditional physical prototyping primarily due to the higher resolution meshes/grids, innovative mathematical modeling techniques, and additional sources of data involved.

Emerging Trends In Manufacturing Simulations

Manufacturing companies relying on legacy NAS-based solutions are experiencing frustratingly slow and disruptive design cycles, and consequently, severely degraded competitive capabilities. Legacy storage platforms designed for point to point I/O are a poor fit because their data provisioning mechanisms are inherently serial, and are unable to keep up with the requirements for capacity and performance to drive these new workloads. Many of the largest manufacturers have already begun adopting DDN parallel data storage environments to power their crucial research and development ecosystems to increase simulation fidelity and deliver broader ensemble analysis. By using fast, scalable, modular solutions manufacturing companies can boost key applications for shorter design cycles and better products faster today and in the future.