

# Dell EMC Ready Architecture for Altair HyperWorks

Tap into the power of HPC to speed computer-aided engineering

## Customer results

50

simulations per hour<sup>1</sup>

70–80X

parallel calculations<sup>2</sup>

15,000

CAT iterations over a weekend<sup>3</sup>

The manufacturing sector has been one of the earliest adopters of high performance computing (HPC), using powerful clusters to run compute-intensive design, modeling and simulation workloads. As artificial intelligence (AI) gains traction and converges with HPC, manufacturers continue to lead the way in the application of advanced computing. In particular, HPC-powered analytics and AI are revolutionizing computer-aided engineering (CAE), helping manufacturers speed time to market with higher-quality products.

Dell Technologies is pushing the boundaries of performance for manufacturing workloads with scalable, flexible Dell EMC Ready Solutions for HPC Digital Manufacturing. These standardized building blocks simplify design and speed configuration and ordering of clusters that have been rigorously tested for CAE applications. The modular designs include servers, storage, networking, software and services in preconfigured yet customizable configurations to deliver faster deployment, better performance and easier scaling while reducing risk.

Dell Technologies is expanding its Ready Solutions for HPC Digital Manufacturing with an architecture created specifically for Altair® HyperWorks®. HyperWorks software enables CAE ranging from model-based systems design and early geometry ideation to detailed multiphysics simulation and optimization. This Dell Technologies architecture is configured specifically for Altair HyperWorks digital manufacturing workloads, to enhance performance for CAE applications. This solution for Altair HyperWorks uses a flexible building block approach to HPC system design, where individual building blocks can be combined to build HPC systems that are optimized specifically for Altair HyperWorks workloads and use cases.

## Architecture and performance benchmarking

The [Dell EMC Ready Solution for HPC Digital Manufacturing — Altair Performance](#) architecture outlines the performance of various Altair HyperWorks solutions, including Altair OptiStruct®, Altair RADIOSS™, Altair AcuSolve® and Altair Feko™, with benchmarking workload management by Altair PBS Professional®. The performance benchmarking reported shows the solution design, demonstrating system performance with Altair HyperWorks software.

The paper also outlines the system building blocks for the Dell Technologies engineering-validated design for Altair HyperWorks. This solution leverages Dell EMC PowerEdge servers, Dell EMC PowerSwitch networking and Dell EMC PowerVault storage, all backed by a single point of contact for support with additional service options. Workload management and job scheduling can be handled efficiently with Altair PBS Professional, part of the Altair PBS Works™ suite.

Dell Technologies and Altair engineering teams work together to develop joint reference architectures, tune customer solutions and provide collaborative support.

<sup>1</sup> Dell EMC Case Study, "[Safer Driving](#)," June 2018.

<sup>2</sup> DE247, "[Propelling Shipping to be Faster and Greener at Nakashima Propeller](#)," June 2018.

<sup>3</sup> Dell EMC Video Case Study, "[High Performance Computing Drives Cummins' Industry Leading Engine Design and Development](#)," July 2019.

Because the optimum solution configuration will depend on the specific mix of applications and types of simulations being performed, a table of recommended options are provided, along with relevant criteria to consider when making these selections. As always, Dell Technologies HPC and AI experts are available to assist you with designing a solution for your specific needs. And [Dell Technologies Services](#) — ranging from consulting and education to deployment and support — are available when and where you need them.

Infrastructure servers	Compute building blocks	Basic building blocks	Operational storage	System networking	Software
<ul style="list-style-type: none"> <li>PowerEdge R640 Server with dual Intel® Xeon® 3106 processors</li> </ul>	<ul style="list-style-type: none"> <li>PowerEdge R640 or C6420 Servers with Intel Xeon 6200 series processors</li> </ul>	<ul style="list-style-type: none"> <li>PowerEdge R840 Servers with quad Intel Xeon 6142 processors</li> </ul>	<ul style="list-style-type: none"> <li>PowerEdge R740xd Server with dual Intel Xeon 4110 processors</li> </ul>	<ul style="list-style-type: none"> <li>PowerSwitch S3048-ON Ethernet switch</li> <li>Mellanox® SB7890 36-port EDR InfiniBand® switches (recommended)</li> </ul>	<ul style="list-style-type: none"> <li>Altair HyperWorks</li> </ul>

## Resources

- See [reference architecture](#).
- Get performance testing information at [hpcatdell.com](http://hpcatdell.com).
- Explore the [Dell Technologies HPC & AI Innovation Lab](#).
- Join the Dell Technologies HPC Community at [dellhpc.org](http://dellhpc.org).

## Learn more

[delltechnologies.com/hpc](http://delltechnologies.com/hpc)

## Altair and Dell Technologies

Altair is a leading provider of enterprise-class engineering software, enabling innovation, reduced development times and lower costs through the entire product lifecycle from concept design to in-service operation. Altair’s simulation-driven approach to innovation is powered by an integrated suite of software that optimizes design performance across multiple disciplines encompassing structures, motion, fluids, thermal management, electromagnetics, system modeling and embedded systems, while also providing data analytics and true-to-life visualization and rendering.

Dell Technologies enables organizations to modernize, automate and transform their data center using industry-leading converged infrastructure, servers, storage and data protection technologies. Businesses get a trusted foundation to transform their IT and develop new and better ways to work through hybrid cloud, the creation of cloud-native applications, and big data solutions.

