

SIMULIA Abaqus on Dell Infrastructure

Tap into the power of HPC to speed finite element analysis

Customer results

Billions

of simulations per year at McLaren¹

4.5X

faster simulations at PING²

15,000

CAT iterations over a weekend³

For engineers, leveraging robust simulation software powered by high-performance computing (HPC) clusters vastly reduces physical testing requirements, helping reduce product costs and enhance quality while speeding time to market. As artificial intelligence (AI) advances and converges with HPC, engineers have continued to drive the adoption of advanced computing technologies. For example, SIMULIA® Abaqus® software from Dassault Systèmes® revolutionizes finite element analysis (FEA) to help speed time to market with higher-quality products.

Dell Technologies is working to enhance workload performance for applications such as Abaqus through scalable, flexible Validated Designs for HPC Digital Manufacturing. Comprised of standardized building blocks, these designs simplify and speed the configuration of clusters that have been rigorously tested and tuned for computer-aided engineering applications. The modular designs include servers, storage, networking, software and services in customizable configurations designed to deliver faster deployment, better performance and easier scaling while reducing risk.

SIMULIA Abaqus delivers realistic simulation applications that enable users to reveal the world we live in. Dell Technologies engineers tested and optimized the software-hardware stack together in Validated Designs for the SIMULIA Abaqus Unified FEA software suite. The combination offers powerful solutions for both routine and sophisticated engineering problems, covering a vast spectrum of industrial applications. This engineering-Validated Design for SIMULIA Abaqus uses a flexible approach, with individual building blocks that can be combined to build or scale HPC systems optimized for SIMULIA Abaqus.

Validated Design and performance benchmarking

The Validated Design for Abaqus outlines the performance of SIMULIA Abaqus workloads on Dell infrastructure. The design guide shows the solution design, provides sizing and scaling guidance, and demonstrates system performance with SIMULIA Abaqus software. It also outlines the system building blocks with Dell servers, networking and storage, available with a single point of contact for hardware and software support. Workload management and job scheduling can be handled efficiently with Bright Cluster Manager®.

The HPC team at Dell Technologies works together with Dassault Systèmes to design systems, provide performance tuning and collaborative support.

¹ Dell Technologies Case Study, "[Data-driven innovation starts at racing's edge to improve race car aerodynamics — and speed.](#)" April 2021.

² Dell Technologies Case Study, "[Driving golf forward with iron-clad digital tools.](#)" June 2021.

³ Dell Technologies Video Case Study, "[High Performance Computing Drives Cummins' Industry Leading Engine Design and Development.](#)" accessed October 2021..

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. As always, Dell Technologies HPC and AI experts are available to assist you with designing a solution for your specific needs. [Dell Technologies Services](#) — ranging from consulting and education to deployment and support — are available when and where you need them. Dell Technologies also offers a broad range of financial options, including flexible consumption models to evolve with you over time.

Infrastructure servers	Compute building blocks	Operational storage	System networking	Management software	Storage
<ul style="list-style-type: none"> PowerEdge R650 or R6515 	<ul style="list-style-type: none"> PowerEdge R650, R6525, R750, R7525, C6520, or C6525 	<ul style="list-style-type: none"> PowerEdge R740xd 	<ul style="list-style-type: none"> PowerSwitch N3248TE-ON Ethernet switch NVIDIA® QM8790 HDR InfiniBand 	<ul style="list-style-type: none"> Bright Cluster Manager 	<ul style="list-style-type: none"> PowerScale A300, F600, or Validated Design for HPC BeeGFS Storage high-performance configuration

Resources

- See the AMD-based [Validated Design](#)
- See the Intel-based [Validated Design](#).
- Get performance testing information on the [Dell InfoHub](#).
- Explore the [Dell Technologies HPC & AI Innovation Lab](#).
- Join the Dell Technologies HPC Community at [dellhpc.org](#).

Learn more

[Dell InfoHub](#)
[delltechnologies.com/hpc](#)

SIMULIA Abaqus and Dell Technologies

The [Abaqus Unified FEA product suite](#) offers powerful and complete solutions for both routine and sophisticated engineering problems covering a vast spectrum of industrial applications. In the automotive industry engineering work groups are able to consider full vehicle loads, dynamic vibration, multibody systems, impact/crash, nonlinear static, thermal coupling, and acoustic-structural coupling using a common model data structure and integrated solver technology. Best-in-class companies are taking advantage of Abaqus Unified FEA to consolidate their processes and tools, reduce costs and inefficiencies, and gain a competitive advantage.

Dell Technologies helps organizations and individuals build their digital future and transform how they work, live and play. The company provides customers with the industry's broadest and most innovative technology and services portfolio for the data era. With Dell Technologies by your side, you can confidently innovate and adapt to take your organization further.

