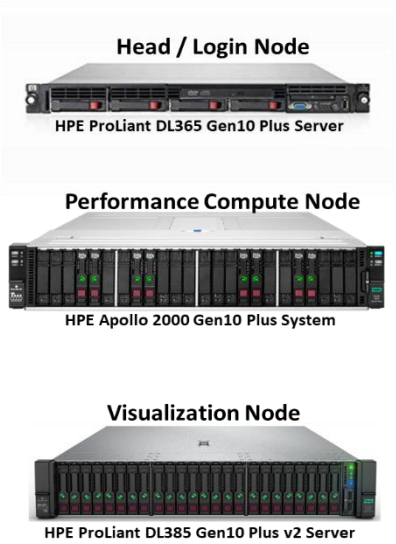
AMD Reference Configuration: SIMULIA Abaqus® on HPE

AMD Value Proposition for Abaqus

Better performance with 3rd Gen AMD processors

- Up to 112% faster[1] on Abaqus/Explicit than 2nd generation EPYC™
- Up to 30% faster[1] on Abaqus/Explicit with AMD 3D V-Cache™ technology versus standard 3rd Gen EPYC
- Up to 37% faster[1] on Abaqus/Standard than 2nd generation EPYC

Sample HPE Configuration for Abaqus



Why run Abaqus on HPC systems?

To realize the full potential value of the widely used Abaqus applications, from the SIMULIA brand of Dassault Systèmes, companies are investing in high-performance computing (HPC) infrastructure with the best-performing processors. This helps reduce constraints on the number, size, and complexity of simulation models while delivering faster time to results. It also helps engineers improve design quality and prototype performance and can significantly reduce total cost of ownership (TCO) by using fewer servers to do the same work, helping reduce power and lower related emissions.

Yet, challenges remain with HPC infrastructure

Even with modern systems, simulation workloads can be challenged by:

- Inadequate processor frequency and/or core density, requiring massive, expensive scale-out solutions for many simulation tasks
- Insufficient memory capacity and bandwidth, and low ratios of cache per core, hurt compute performance
- Poorly optimized I/O
- Lack of data security during computation

Why AMD for Abaqus?

AMD EPYC™ processors help overcome the above challenges and provide an optimal architecture for Abaqus.

Abaqus/Explicit users benefit from 3rd Gen AMD EPYC processors with 3D V-Cache™ technology, providing triple the L3 cache compared to standard 3rd Gen EPYC CPUs.

HPE compute node systems configurations with AMD EPYC processors for Abaqus

Hewlett Packard Enterprise (HPE) systems with high core count EPYC processors can deliver high throughput per node for Abaqus applications across a range of use cases.

In general, liquid-cooled options will deliver the highest performance. If liquid cooling is not an option, air-cooled systems are a great choice for price-performance.

HPE systems (Table 1) with medium-core count AMD EPYC processors with high frequencies and high cache-per-core are used for crash and explicit Finite Element Analysis (FEA) applications like Abaqus/Explicit. These processors offer superb performance per core to help efficiently utilize per-core software licenses.

Table 1: Sample HPE Apollo Gen10 Plus configurations for Explicit FEA: Abaqus/Explicit

	Processor	Memory	Storage/Network
Liquid Cooled	• 2x AMD EPYC 7573X • 64 cores/node • 4 nodes per chassis for a total of 256 cores • 2.80 GHz | 3.60GHz • L3 Cache of 768MB (with AMD 3D V-Cache)	• 256GB (16x) Dual-Rank x8 DDR4-3200 16GB DIMMs, 1DPC	• 1x480GB SATA Read Intensive • 1 InfiniBand HDR100/Ethernet 100Gb 1-port adaptor
Air Cooled	• 2x AMD EPYC 7543 • 64 cores/node • 4 nodes per chassis for a total of 256 cores • 2.80 GHz | 3.60GHz • L3 Cache of 256MB	• 256GB (16x) Dual-Rank x8 DDR4-3200 16GB DIMMs, 1DPC	• 1x480GB SATA Read Intensive • 1 InfiniBand HDR100/Ethernet 100Gb 1-port adaptor

Abaqus/Standard uses an implicit FEA solver for structural analysis. It performs well on HPE systems (Table 2) with low-core count, high-frequency 3rd generation EPYC processors without 3D V-Cache technology. These systems also utilize per-core software licenses efficiently.

Table 2: Sample HPE Apollo Gen10 Plus configurations for Structural Mechanics: Abaqus/Standard

	Processor	Memory	Storage/Network
Liquid Cooled	• 2x AMD EPYC 7373X • 32 cores/node • 4 nodes per chassis for a total of 128 cores • 3.05 GHz | 3.80GHz • L3 Cache of 768MB (with AMD 3D V-Cache)	• 1TB (16x) Dual-Rank x4 DDR4-3200 64GB DIMMs, 1DPC	• 2 RAID0 1TB NVME write intensive SSD drives for local scratch • 1 InfiniBand HDR100/Ethernet 100Gb 1-port adaptor
Air Cooled	• 2x AMD EPYC 7543 • 64 cores/node • 4 nodes per chassis for a total of 256 cores • 2.80 GHz | 3.60GHz L3 Cache of 256MB	• 1TB (16x) Dual-Rank x4 DDR4-3200 64GB DIMMs, 1DPC	• 2 RAID0 1TB NVME write intensive SSD drives for local scratch • 1 InfiniBand HDR100/Ethernet 100Gb 1-port adaptor

Get started with Abaqus on AMD EPYC CPU-based HPE systems:

- **Broad range of unique choices** of compute, networking, storage, software, services, and financial options
- **On-site install, start-up, and integration services** delivered by HPE or a certified HPE business partner
- **Remote management** available with proactive monitoring and remediation of any Abaqus operational issues.

Key Contacts

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[1] Source: 3rd Gen AMD EPYC™ processors deliver generational uplifts with SIMULIA Abaqus