

# AMD Reference Configuration: Altair on Dell PowerEdge 16G Servers

## AMD® Value Proposition for Altair® Better performance with 4<sup>th</sup>Gen AMD EPYC™ CPUs vs. 3<sup>rd</sup>Gen AMD EPYC™ CPUs

- Up to about 124% faster<sup>1</sup> for Altair® AcuSolve®\*
- Up to about 65% faster<sup>1</sup> for Altair® OptiStruct®\*
- Up to about 97% faster<sup>1</sup> for Altair® Radioss®\*

\* 2P 64-core 4th Gen AMD EPYC™ 9554 vs. 2P 32-core 3rd Gen AMD EPYC™ 75F3

### Dell PowerEdge for Altair



#### Performance node is Dell PowerEdge R7625

- 2U Rack Server
- 4th Generation AMD EPYC Processors
- Up to 24x DDR5 4800MHz memory
- Optional Direct Liquid Cooling (DLC)



#### Head/Visualization Node is Dell PowerEdge R6615

## Why run Altair applications on AMD processors?

Companies are investing in high-performance compute infrastructure with the best-performing processors to maximize the value of game-changing Altair applications. The 4<sup>th</sup> Gen AMD EPYC processors deliver the optimal architecture for Altair and help reduce constraints on the number, size, and complexity of simulation models while helping provide faster time to results. In addition, with AMD CPU-based systems, engineers can improve design quality and prototype performance and significantly reduce total cost of ownership (TCO) by using fewer servers to do the same work, helping reduce power and lower related emissions.

## How does AMD improve Altair applications' performance?

Compared to the prior generation, the new AMD EPYC 4th Gen processors achieve better performance<sup>1</sup> for Altair applications with up to 50% more cores, higher frequencies, support for AVX-512 instructions, more memory bandwidth, and faster PCIe® and Infinity Fabric™ data transfer rate. In addition, optimizing Altair applications with AMD compilers and libraries can help enhance performance further.

Radioss and AcuSolve users benefit from AMD EPYC processors with 3D V-Cache™ technology, providing triple the L3 cache compared to the regular 4<sup>th</sup> Gen EPYC CPUs.

## Dell PowerEdge® compute node systems configurations with AMD processors for Altair

Table 1 shows recommendations for Computational Fluid Dynamics (CFD) applications like AcuSolve. Dell PowerEdge servers with 4<sup>th</sup> Gen EPYC processors with 12 memory channels per processor and support for AVX-512 instructions can deliver high throughput per node for CFD applications like AcuSolve since they benefit from multicore parallelism and greater memory bandwidth.

Table 1: Sample Dell PowerEdge 16G configurations for Altair AcuSolve

	Server/Processor	Memory	Storage/Network
<b>Air Cooled</b>	<ul style="list-style-type: none"> <li>• Dell PowerEdge R7625 Server</li> <li>• 2x EPYC 9384X</li> <li>• 64 cores/node</li> <li>• 3.10 GHz   3.90GHz</li> <li>• L3 Cache of 768MB</li> </ul>	<ul style="list-style-type: none"> <li>• 384GB (24x) Dual-Rank DDR5-4800 16GB DIMMs, 1DPC</li> </ul>	<ul style="list-style-type: none"> <li>• 1x480GB SATA Read Intensive</li> <li>• 1 InfiniBand HDR100/Ethernet 100Gb 1-port adaptor</li> </ul>
<b>Liquid Cooled</b>	<ul style="list-style-type: none"> <li>• Dell PowerEdge R6625 Server</li> <li>• 2x EPYC 9384X</li> <li>• 64 cores/node</li> <li>• 3.10 GHz   3.90GHz</li> <li>• L3 Cache of 768MB</li> </ul>	<ul style="list-style-type: none"> <li>• 384GB (24x) Dual-Rank DDR5-4800 16GB DIMMs, 1DPC</li> </ul>	<ul style="list-style-type: none"> <li>• 1x480GB SATA Read Intensive</li> <li>• 1 InfiniBand HDR100/Ethernet 100Gb 1-port adaptor</li> </ul>

Table 2 shows recommendations for structural analysis using implicit Finite Element Analysis (FEA), like OptiStruct. Dell PowerEdge servers with lower-core count EPYC processors with high frequencies with support for AVX-512 instructions help efficiently utilize per-core software licenses and offer very high performance per core.

**Table 2: Sample Dell PowerEdge 16G configurations for Altair OptiStruct**

	Server/Processor	Memory	Storage/Network
<b>Air Cooled</b>	<ul style="list-style-type: none"> <li>Dell PowerEdge R7625 server, 8x2.5" chassis</li> <li>2x EPYC 9354</li> <li>64 cores/node</li> <li>3.25 GHz   3.80GHz</li> <li>L3 Cache of 256MB</li> </ul>	<ul style="list-style-type: none"> <li>1.5 TB (24x) Dual-Rank DDR5-4800 64GB DIMMs, 1DIMM per channel</li> </ul>	<ul style="list-style-type: none"> <li>1x 480Gb NVMe Read Intensive</li> <li>1 InfiniBand HDR100/Ethernet 100Gb 1-port adaptor</li> </ul>
<b>Liquid Cooled</b>	<ul style="list-style-type: none"> <li>Dell PowerEdge R6625 server</li> <li>2x EPYC 9174F</li> <li>32 cores/node</li> <li>4.10 GHz   4.40 GHz</li> <li>L3 Cache of 256MB</li> </ul>	<ul style="list-style-type: none"> <li>1.5 TB (24x) Dual-Rank DDR5-4800 64GB DIMMs, 1DIMM per channel</li> </ul>	<ul style="list-style-type: none"> <li>1x480GB SATA Read Intensive</li> <li>1 InfiniBand HDR100/Ethernet 100Gb 1-port adaptor</li> </ul>

Table 3 shows recommendations for crash applications using explicit FEA like Radioss. Dell PowerEdge with medium-core count EPYC processors with high frequencies and high cache-per-core and support for AVX-512 instructions offer very high performance per core to help efficiently utilize per-core software licenses.

**Table 3: Sample Dell PowerEdge 16G configurations for Altair Radioss**

	Server/Processor	Memory	Storage/Network
<b>Air Cooled</b>	<ul style="list-style-type: none"> <li>Dell PowerEdge R7625 Server</li> <li>2x EPYC 9384X</li> <li>64 cores/node</li> <li>3.10 GHz   3.90 GHz</li> <li>L3 Cache of 768MB</li> </ul>	<ul style="list-style-type: none"> <li>1.5TB (24x) Dual-Rank DDR5-4800 64GB DIMMs, 1DPC</li> </ul>	<ul style="list-style-type: none"> <li>2 RAID0 1TB NVME write intensive SSD drives for local scratch</li> <li>1 InfiniBand HDR100/Ethernet 100Gb 1-port adaptor</li> </ul>
<b>Liquid Cooled</b>	<ul style="list-style-type: none"> <li>Dell PowerEdge R6625 Server</li> <li>2x EPYC 9184X</li> <li>32 cores/node</li> <li>3.55 GHz   4.20 GHz</li> <li>L3 Cache of 768MB</li> </ul>	<ul style="list-style-type: none"> <li>1.5TB (24x) Dual-Rank DDR5-4800 64GB DIMMs, 1DPC</li> </ul>	<ul style="list-style-type: none"> <li>2 RAID0 1TB NVME write intensive SSD drives for local scratch</li> <li>1 InfiniBand HDR100/Ethernet 100Gb 1-port adaptor</li> </ul>

**Benefits: AMD CPU-based Dell PowerEdge servers with Altair**

- **Validated and optimized** solution with compute, storage, software, services, and financial options
- **On-site install, start-up, and integration services** delivered by Dell Technologies or a certified Dell Technologies business partner
- **Remote management** is available with proactive monitoring and remediation of any Altair operational issues.

**Key Contacts**

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