

Workstations & Windows® Workhorses

changing the way you work

Attain higher fidelity and improved throughput of your ANSYS simulations leveraging the power of Dell and Microsoft HPC solutions.

Workloads are outpacing the capability of stand-alone development platforms

Your research is pushing you to the limits, and as it does, is requiring more resources out of your team and your computational capacities. Now you are **faced with significant challenges** if you what your projects to move forward:

- 1 **Timing.** You are waiting days for results which delays critical design decisions.
- 2 **Familiarity.** You and your team are already experts in your existing environment. You don't want to retrain your team, retool your environment or redo work.
- 3 **Affordability.** You need more accuracy, capacity and performance with a model that is also in balance with your capital acquisition and operations budget.
- 4 **Accuracy.** You want to test more design points but settle for a few, hoping your answer is "good enough."

But there is a way to address those challenges

There is no longer the need to completely retrain your team and change the way you work if your objective is to move to a cluster based solution.

Imagine being able to:

- ✓ **Afford a better solution.** Afford a solution that would come natural to use, but that will have the power to solve your needs.
- ✓ **Maximize Results.** With solutions that are designed to decrease run-times, accommodate multiple workloads with the level of granularity and output needed to increase quality.
- ✓ **Manage growth.** Have the capacity to scale based on your needs with a solid tested architecture.

Standardized Solutions for Ansys Applications

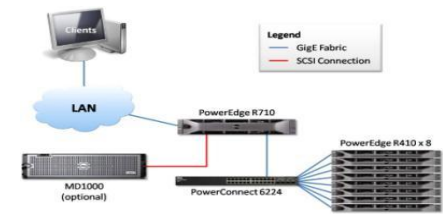
Ansys, Dell and Microsoft have partnered to develop high performance cluster-based architecture sizing guidelines. These workload centric recommendations provide a logical path for users to extend their desktop-based workloads to scalable compute systems. Designed as a "building-block" model the sizing guidelines are suitable for any-sized organizations that have standardized their development environment on Microsoft Windows technologies and require an agile growth path to achieve greater performance, fidelity and results for technical and high performance workloads.

In addition to sizing guidelines for scale around specific Ansys applications, each configuration underwent rigorous reviews and evaluation to assure streamlined migration, implementation and support.

Additional Alternatives to consider

Dell offers a broad range of scalable solutions hosting a wide array of industry leading partner technologies. The "spotlight" solutions featured here are a small sampling of available options from Dell's performance portfolio, with additional stack configurations available at www.dell.com/hpc.

Options can include (but are not limited to) blade systems, AMD processor technologies, the Cray CX1-iWS™ and Infiniband networking solutions. For high-end graphic requirements, the Dell Precision Workstation portfolio features a broad line of systems optimized for data analysis. The Dell performance portfolio is designed for agility and efficiency - sized and configured for your needs - with higher computational capacity, reduced operating cost and all within an affordable and scalable acquisition model.



Architecture Sizing Guidelines for ANSYS applications

Three key Dell™ HPC Cluster Architectures with Windows® HPC Server 2008

Deskside - 4-8 Nodes, Dual Socket, (32-64 core)

An entry-level 4-node / 32-core system is capable of running several simultaneous ANSYS fluid dynamics simulation models in the size range of 2M to 3M cells or ANSYS mechanical simulations in the range of 1M to 2M DOF. Or, fully utilizing the system memory, this configuration can handle fluid simulation model sizes up to 30-40M cells, and depending on solution type and memory configuration, mechanical model sizes up to 50 MDOF. For multiple simulation throughput, an entry-level 8-node system is approximately capable of eight times the number of runs you currently do on a single 8-core system in the same amount of time.

Departmental - 16-64 Nodes, Dual Socket, (128-512 core)

A 16-node / 128-core system is capable of running a dozen or more simultaneous ANSYS fluid dynamics simulation models in the size range of 2M to 3M cells, and several simulations in the size range of 10M cells. Fully utilizing the system memory per compute node, this configuration can handle fluid simulation model sizes up to 75M cells. For mechanical simulations, the 16-node cluster will handle models in the size range of 1M to 10M DOFS. Depending on solution type and memory configuration, model sizes up to 50 MDOF can be considered.

Enterprise - 128-256 Nodes, Dual Socket, (1024+ core)

Large-scale systems of 128 nodes and more are designed for scale. A 128-node enterprise-class system will typically support many simultaneous users running a variety of ANSYS simulation workloads.

Technologies Used

Deskside:

Server	Processor	Memory	Interconnect	Storage
Head Node - PowerEdge™ R710	Intel® 5500 series (8 Cores/Node)	8GB per node 32GB-	Gigabit Ethernet PowerConnect 6224	Local
Compute Nodes - PowerEdge R410 (4 to 8)	Intel 5500 Series (8 Cores/Node)	64GB Total RAM		

Departmental:

Server	Processor	Memory	Interconnect	Storage
Head Node - PowerEdge™ R710	Intel® 5500 series (8 Cores/Node)	8GB per node 128GB-	Infiniband	Local - MD1000 External attached storage optional
Compute Nodes - PowerEdge R410 (16 to 64)	Intel 5500 Series (8 Cores/Node)	512GB Total RAM for Compute Nodes		

Enterprise:

Server	Processor	Memory	Interconnect	Storage
Head Node - PowerEdge™ R710	Intel® 5500 series (8 Cores/Node)	8GB per node > 1024GB	Infiniband	Local - MD1000 External attached storage optional
Compute Nodes - PowerEdge R410 (16 to 64)	Intel 5500 Series (8 Cores/Node)	Total RAM for Compute Nodes		

Solution Providers

ANSYS, Inc.

ANSYS, Inc. has been a recognized leader in engineering simulation software for over three decades. ANSYS develops, markets, and supports engineering simulation software used to predict how product designs will operate and how manufacturing processes will behave in real-world environments.

Ansys continually advances simulation solutions by, first, developing or acquiring the very best technology; then integrating it into a unified and customizable simulation platform that allows engineers to efficiently perform complex simulations involving the interaction of multiple physics; and, finally, providing system services to manage simulation processes and data – all so engineers and product developers can spend more time designing and improving products and less time using software and searching for data.

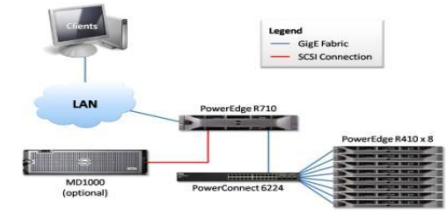
Dell - HPC Architectures

The Dell HPC solutions represent an extensive portfolio of high-performance servers and storage technologies, that deliver exceptional performance, in compact form factors and standards-based management tools to simplify operations.

In addition Dell is a leading provider of complete and scalable solutions for Windows environments worldwide - we encourage you to Discover Dell today to learn how we can help you achieve more.

Microsoft - Windows HPC Server 2008

Windows HPC Server 2008 provides a productive, cost-effective, and high-performance computing (HPC) solution that runs on x64-bit hardware. For customers who need to solve complex problems, Windows HPC Server 2008 helps accelerate time to insight by providing an operating environment that is simple to deploy, operate, and use with your existing infrastructure. In addition, the ability to submit jobs from a familiar Windows interface provides your end users with a comfortable, easily adopted solution.



For more information

ANSYS

Contact: hpcinfo@ansys.com
 URL: www.ansys.com/corporate/partners/partners-hpc-solns.asp

Dell

Contact: Karl Cain, HPC Business Development Manager (Karl_Cain@Dell.com)
 URL: www.dell.com/hpc

Microsoft

Contact: Tom Quinn, HPC Partner Manager (Thomas.quinn@microsoft.com)
 URL: www.microsoft.com/hpc