Balanced computing –

The path to improved productivity

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Our Goal – Help You To Accelerate Your Creativity

AutoCAD® Design Suite
Extending the power and flexibility of your familiar AutoCAD workflow with tools to help you create, capture, connect, and showcase your designs with impact.

Building Design Suite *
Access comprehensive tools that building professionals need for Building Information Modeling (BIM) and CAD workflows.

Entertainment Creation Suite *
Experience the creative freedom of having a palette of industry-leading 3D animation toolsets at your fingertips.

Factory Design Suite *
Design, optimize, and communicate the most efficient factory layout before any equipment gets installed.

Infrastructure Design Suite
Plan, design, build, and manage utility and civil infrastructure with the tools included in this comprehensive software solution.

Plant Design Suite *
Design, model, and review plant engineering projects more effectively.

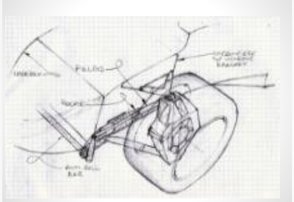
Product Design Suite *
Control the entire product design workflow 3D design, visualization, simulation, and data management software.

Compute enables a New Scientific Method*

Technical computing and R&D workflow innovation

Iterate

- Hypothesis

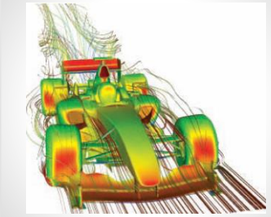


- Prediction

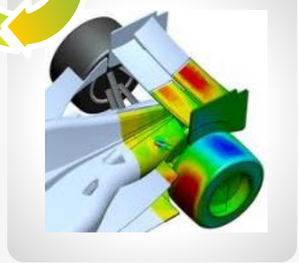
- Physical Prototyping

- Analysis
- Conclusion
- Refinement

Accelerates the Method



- Hypothesis



- Modeling & Simulation
- Experiment Refinement
- Prediction

- Physical Prototyping

- Analysis
- Conclusion
- Refinement

To Compete, You Must Compute

1. Satava, Richard M. "The Scientific Method Is Dead-Long Live the (New) Scientific Method." Journal of Surgical Innovation (June 2005).

Maximizing Your Compute ROI

Better, faster, cheaper

Topline
Innovation

Faster time-to-market

Better products

$

Lower design & production costs

R&D

Bottom-line
Costs

Hardware deployment & maintenance

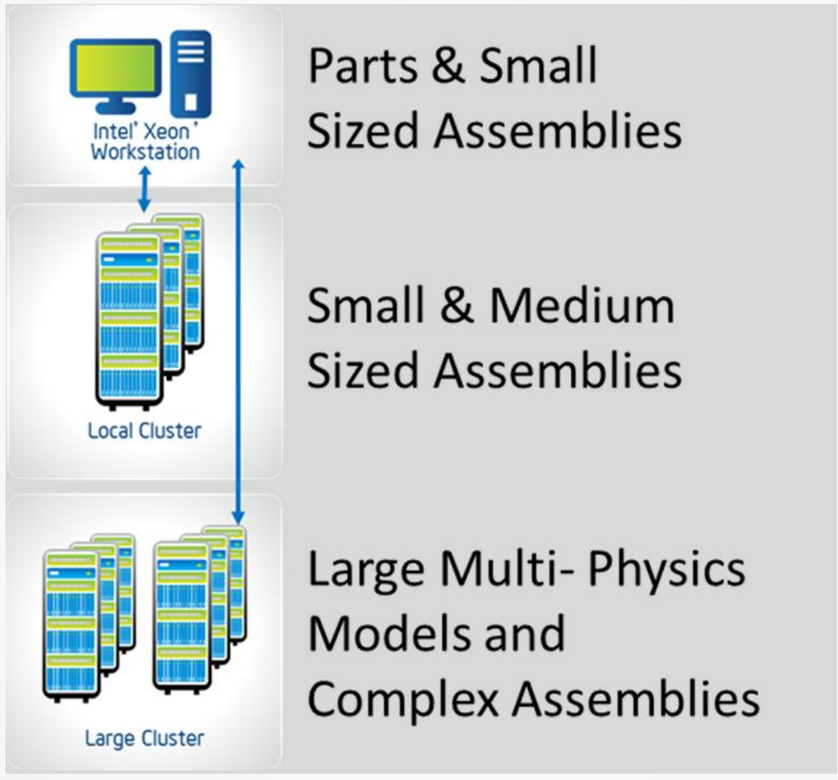
Software development & deployment
Biggest investment

IT

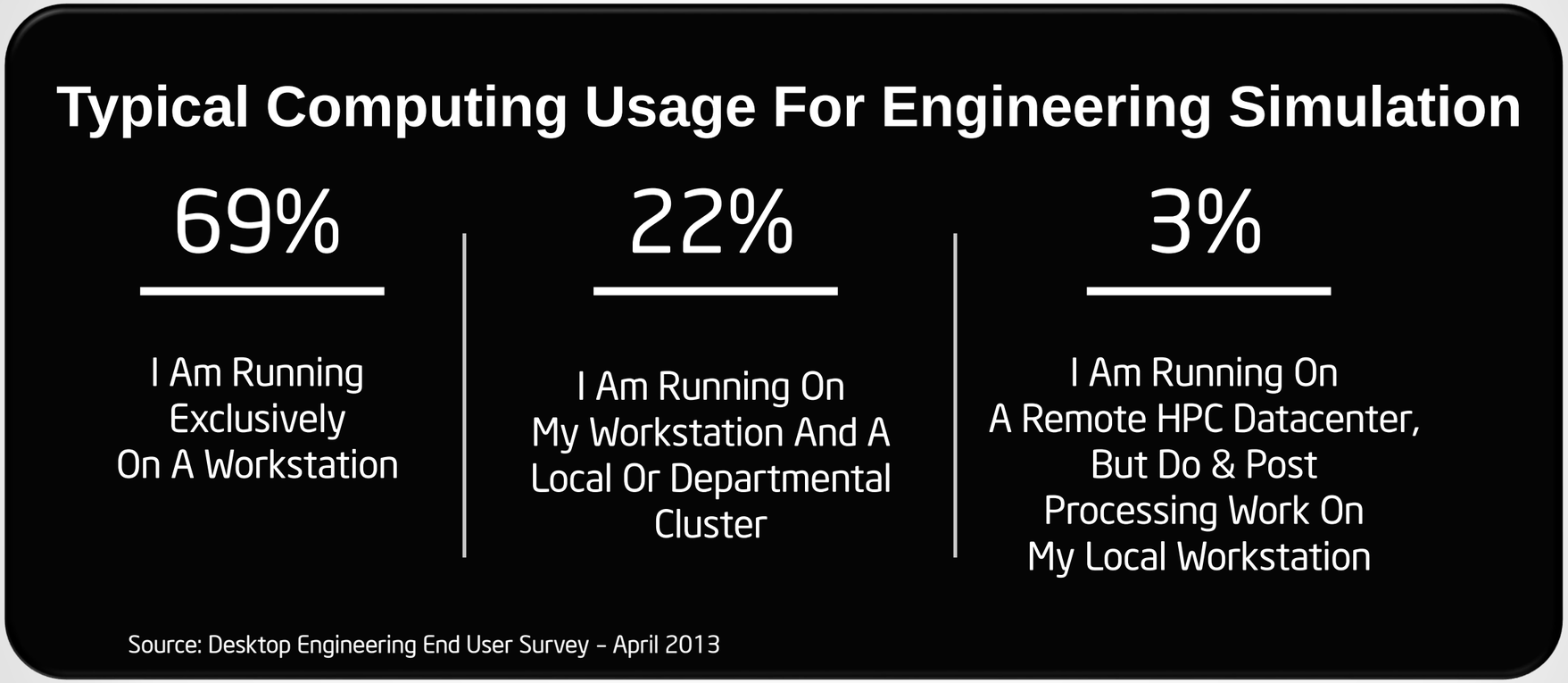
Helping You To Accelerate Robust Design Through The Your Entire Ecosystem

The Right Tool for the Job:

A Continuum of Computing



Where Are Users Performing Simulation

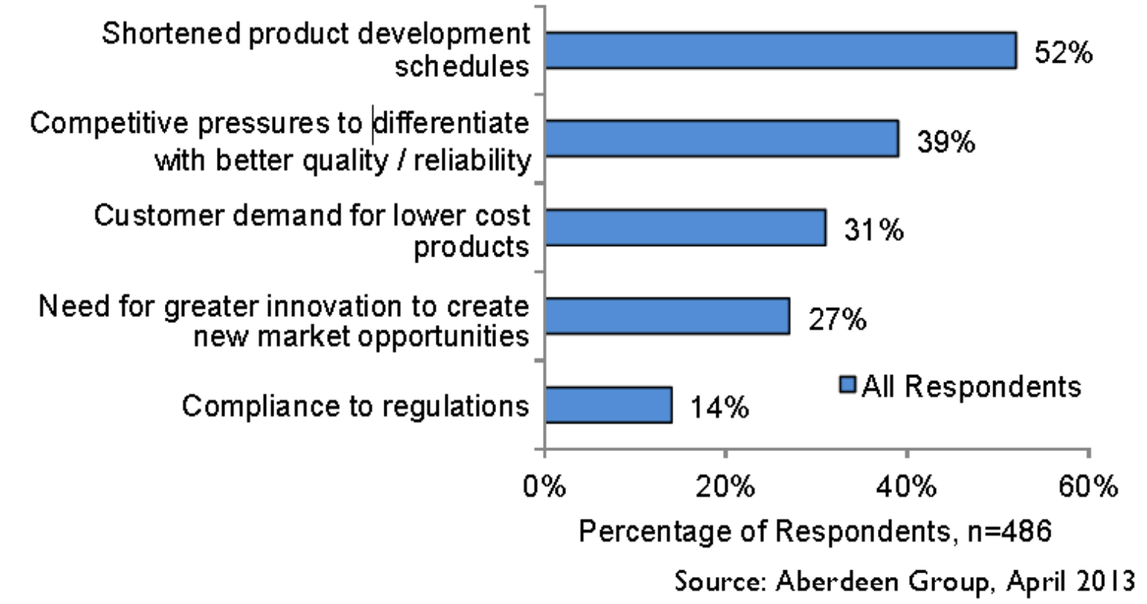


Accelerating Design
the path to a competitive advantage

“Design directly influences more than 70% of the product life cycle cost … companies with high product development effectiveness have earnings three times the average earnings of their competitor.”

Source: Aberdeen Group: Enhance Engineering: Reduce Time and Optimize Products With Simulation Best Practices – June 2013

Figure 1: Drivers for Better Understanding of Product Behavior



Aberdeen Group
A Harte-Hanks Company

Accelerating Design

the path to a competitive advantage

THE WALL STREET JOURNAL.

JOURNAL REPORTS: LEADERSHIP

Design Revolution Sweeps the Auto Industry

New technology and computing power allow vehicle makers to conceive and test designs much more quickly—and cheaply

By MIKE RAMSEY

Oct. 20, 2013 4:59 p.m. ET

Ford Motor Co. engineer Kevin Tallio holds up a twisty series of loops made of hardened sand and declares that the object—a mold for a new engine part, a cylinder head—was an impossibility not long ago.

Journal Report

- Insights from The Experts
- Read more at WSJ.com/LeadershipReport

More in Leadership: Information Technology

- The Hot New Thing in Business Attire Is Technology
- The Corporate Downside of Big Data
- Welcome to the Firm. Good Luck With IT.

Mr. Tallio, a senior engine developer at Ford, is taking part in a revolution in vehicle design that has swept the auto industry. Advances in computer-aided engineering and big investments in computing power have given manufacturers new tools to create designs and the ability to test their ideas in a fraction of the time and at far less cost than they could before.

The result: Many more design ideas are being conceived and tested than ever before, and the best are being adopted quickly, helping manufacturers improve the fuel efficiency and the performance of cars, trucks, buses and motorcycles.

"This new process is allowing us to do a lot of innovation," says Nand Kochhar, executive technical director of computer-aided engineering at Ford.

Fast Track

Car makers are using computers to run through dozens of design possibilities in the time it once took to produce a single prototype.

Altair design software produces ideal shapes for vehicle parts like this motorcycle frame. Altair

Only a few years ago, it might have taken as long as eight months to get from the idea for a new cylinder head to the building of a prototype, and it would have cost millions of dollars, Mr. Tallio says.

The time and expense involved in developing new parts discouraged vehicle makers from looking at many daring or innovative designs that could yield small gains in fuel economy, because a failure could be so costly.

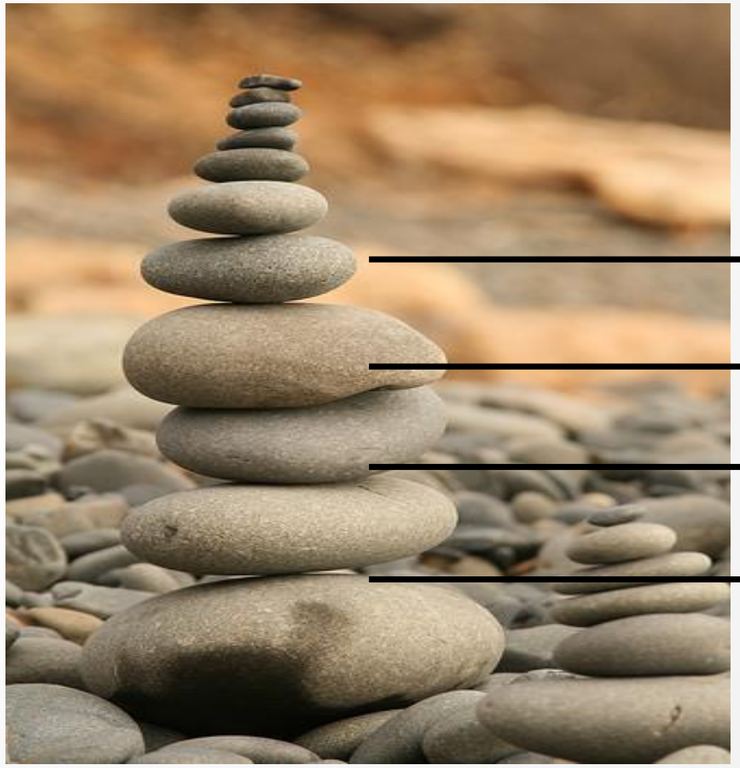
Today, the part was created in a computer simulation that came up with the most efficient design possible. Engineers then altered that design to account for manufacturing constraints and tested the revised design virtually in models that used decades of data on material properties and engine performance as a guide. Ford then created the mold to make a real part that could be bolted onto an engine for further testing.

The entire process took days instead of months and cost thousands of dollars instead of millions—savings that make design risks worth taking. "It's like a parachute

The result:
Ford is doing in days what took months
Ford is now spending thousands vs. millions
They are more competitive
You can be too

Building A Balanced Workstation and Improving Your Experience

If Your System Is Slow So Are Your Engineers, Artists, Animators & Analysts



Storage

Graphics

Memory

Processors

Which Processor & Why?

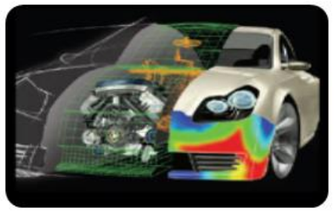
Designed And Built for Professional Users

Intel® Xeon® Processor
E5-2600v2 Product Family

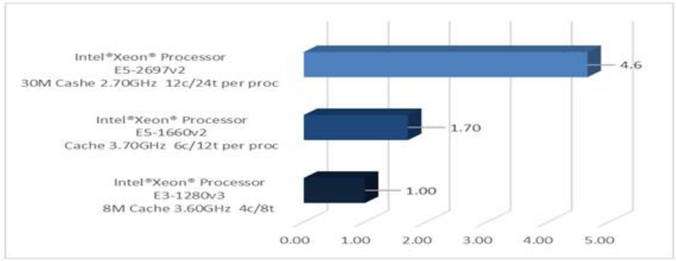
Intel® Xeon® Processor
E5-1600v2 Product Family

Intel® Xeon® Processor
E3-1200V3 Product Family
With Intel® HD Graphics P4600

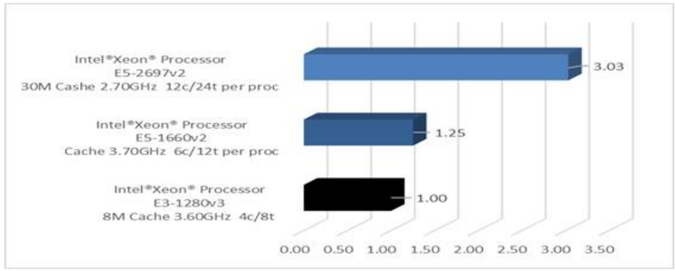
We Can Help You Get There Faster



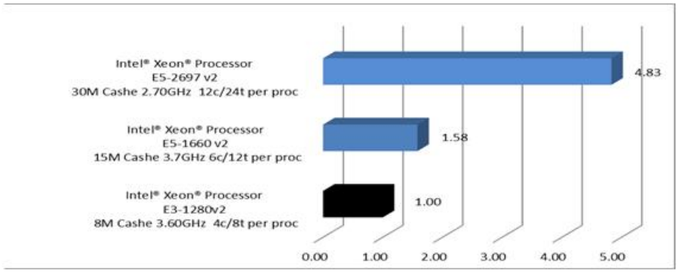
CAD/CAE
4.6 X Faster
Computational Fluids
ANSYS* Fluent*



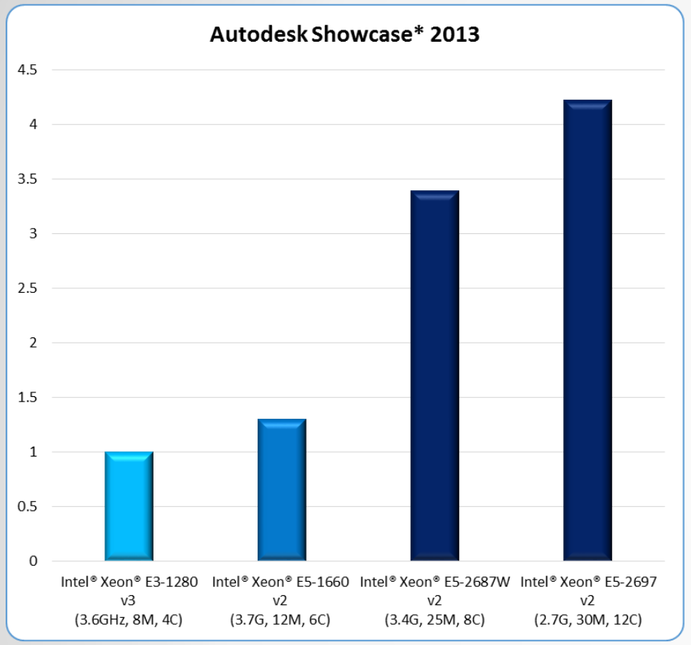
Digital Content
3.03 X Faster
Photorealistic Ray
Tracing Luxology



Financial Services
4.83 X Faster
FSI Black Shoals &
Monte Carlo workloads

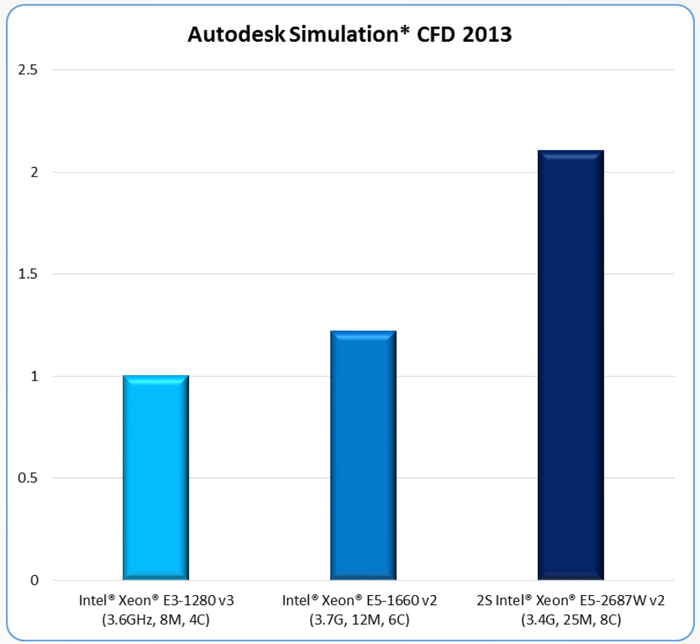


If You Are Using Suites Then Be More Productive: Start right with a 2S Expert Workbench



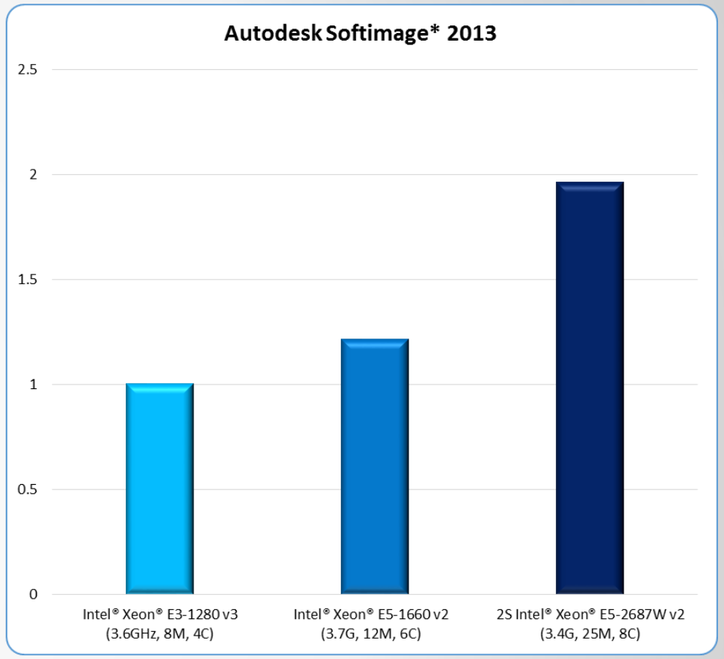
SHOWCASE*

Real Time Rendering
Up to 4.2X



SIMULATION*

Computational Fluid Dynamics
Up to 2.1X



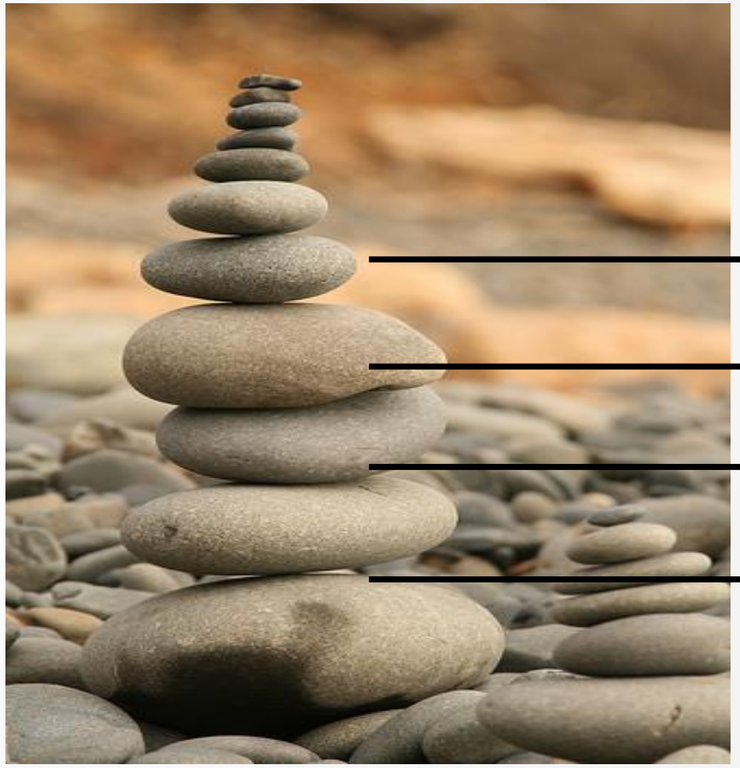
SOFTIMAGE*

3D Animation and Visual Effects
Up to 1.9X

Digital Simulations Up To 4 X Faster

Building A Balanced Workstation and Improving Your Experience

If Your System Is Slow So Are Your Engineers, Artists, Animators & Analysts



Storage

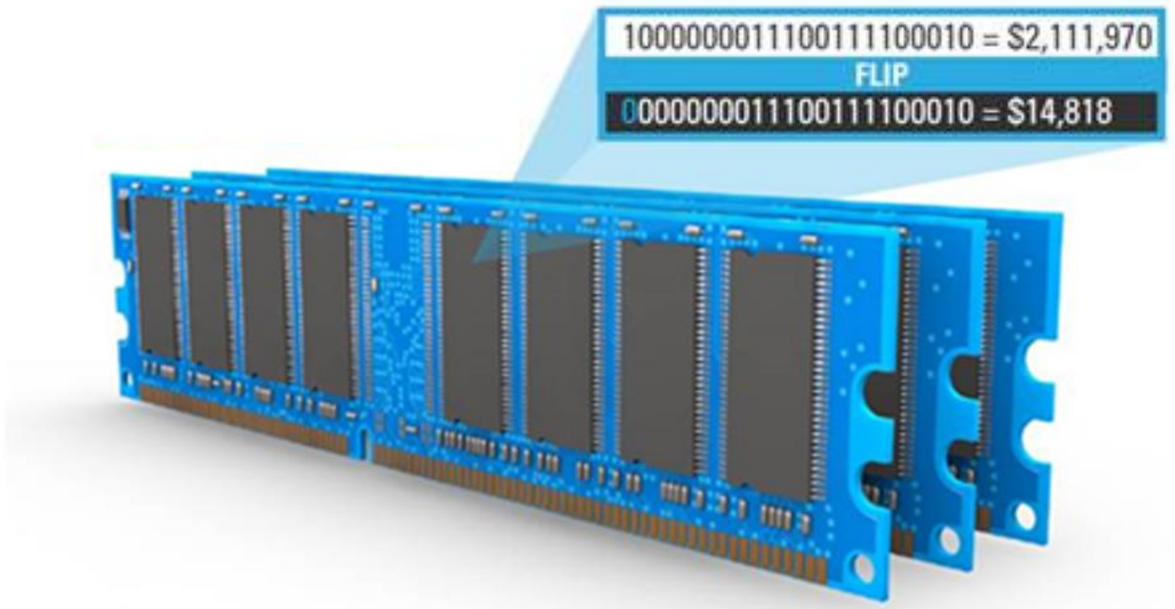
Graphics

Memory

Processors

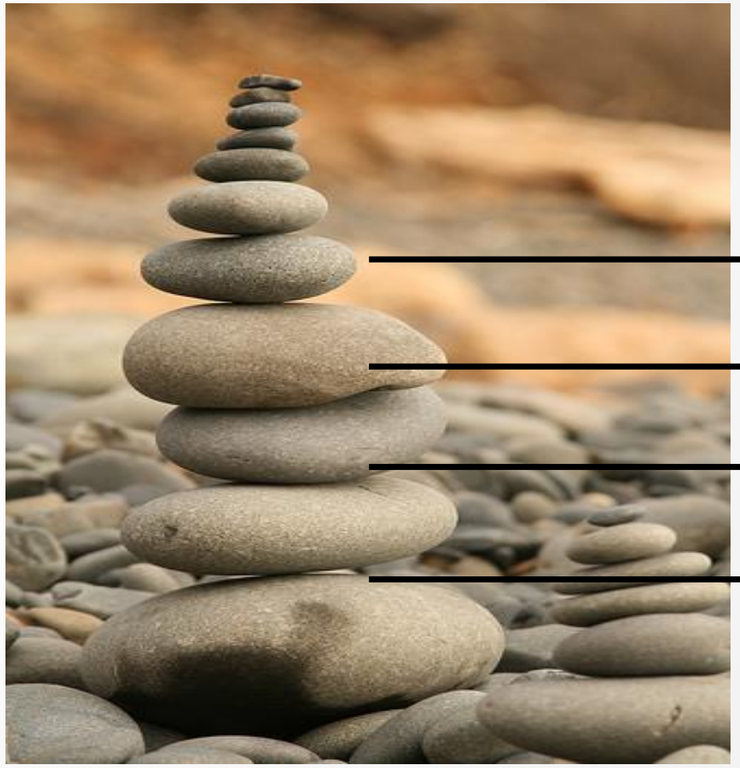
Memory Guidance

All data processed on a computer spends time in **SYSTEM MEMORY**. Here it is stored as a **"BIT": A 1 OR 0**. If this data is stored in regular (non-ECC) system memory, outside factors can cause that bit to **"FLIP"**. Sometimes this memory error causes a BLUE SCREEN—and sometimes your information just changes **WITHOUT ANY VISIBLE ERROR**.



Building A Balanced Workstation and Improving Your Experience

If Your System Is Slow So Are Your Engineers, Artists, Animators & Analysts



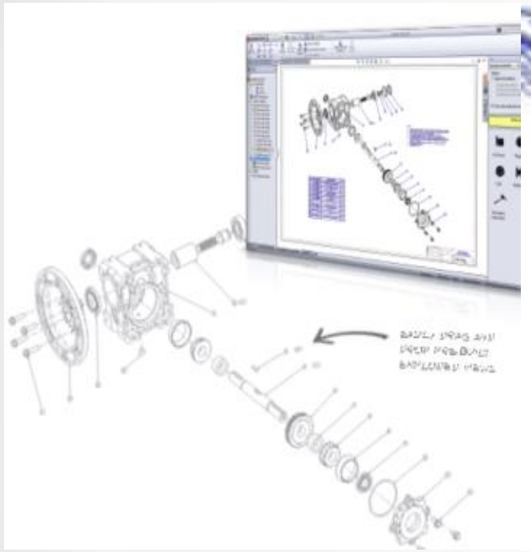
Storage

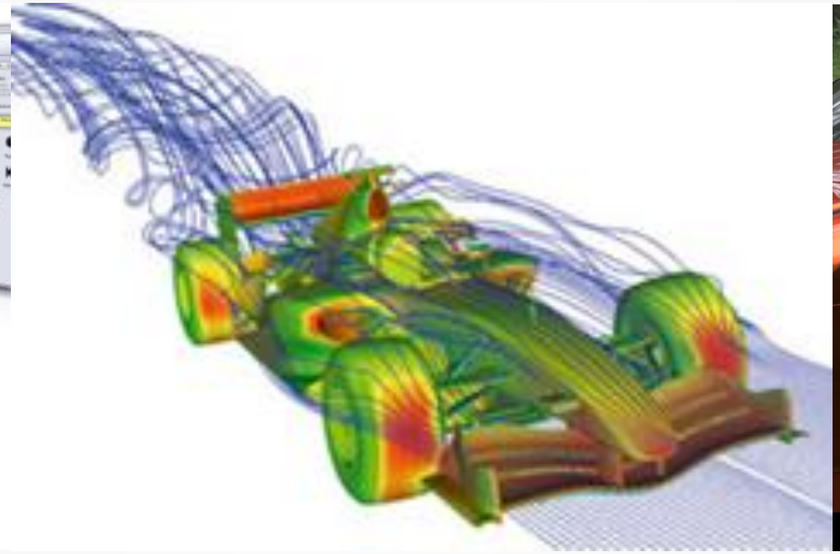
Graphics

Memory

Processors

Which Graphics Card Do I Need





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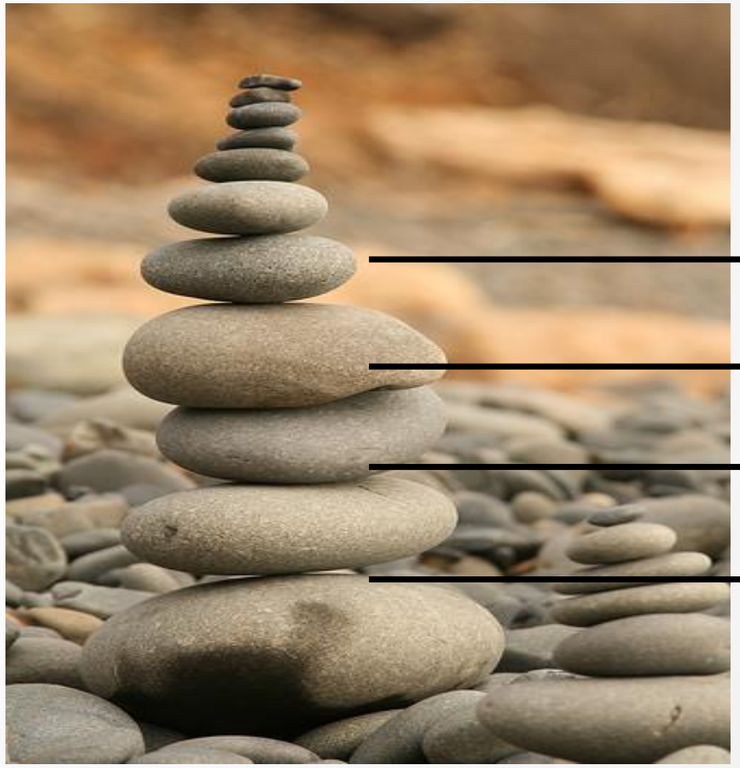


Storage

Graphics

Memory

Processors

http://www.intel.com/design/flash/nand/maximizeinvestment.htm

Day In the life of a CAD User

A case study by CATI

Productivity Pointer

- Replacing the 7200 RPM hard drive with a solid-state hard drive yielded a 47% increase.
- Further optimizing the hard drive configuration saved 2 hours and 13 minutes, a 56% improvement.

Source: CATI* Case Study

Intel® SSDs – Accelerating Parallel Processes

Intel: SSD shows better TCO than DRAM for circuit simulation

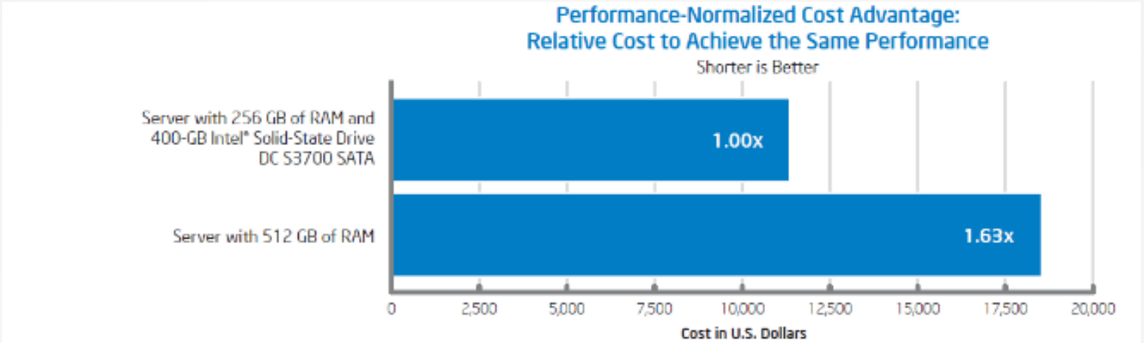


Figure 1. Performance-normalized cost advantage with solid-state drives. Using Intel® Solid-State Drive (Intel® SSD) DC S3700 SATA as swap space delivered a 1.63x performance-normalized cost advantage. Electronic Design Automation performance was only 12 percent lower than a full RAM configuration, but server cost was greatly reduced. (Intel IT internal measurements, DELL server list prices, www.dell.com, and Intel SSD list prices, www.intel.com, August 2013.)

https://www-ssl.intel.com/content/www/us/en/it-management/intel-it-best-practices/advantages-of-solid-state-drives-for-design-computing-brief.html

- Microstrategy* BI Workstation: 2x Faster Cube Load & History List Gen[1]
  - https://iref.intel.com/GetDoc.aspx?RefLibObjectID=0902007c80020810
- Ansys* Mechanical Modeling: Up to10x jobs per day & better multi-core scaling1
  - http://www.ansys.com/staticassets/ANSYS/staticassets/partner/Intel/ANSYS-14.5-Intel-SSD-Benchmark.pdf
- Minecraft* Overviewer* – 12.6 million players[1]: Up to 8x Faster Map Renders1
  - http://overviewer.org/ or https://github.com/overviewer/Minecraft-Overviewer/

[1]Results based on internal Intel analysis and/or 3rd party evaluators and are provided for informational purposes only.
*Other names and brands may be claimed as the property of others.

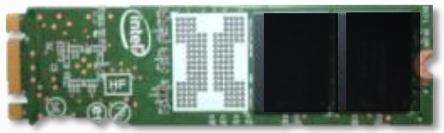
Introducing Intel® SSD Pro 1500 Series

Enhanced security and manageability

256-bit AES encryption, TCG* Opal* specification ready, Intel® vPro™ technology, and Intel SCS 9.0

Power efficient performance

Up to 540 MB/s throughput and SATA DevSleep



Quality and reliability

Reduce employee downtime and lower TCO

Stable and predictable

Intel® Stable Image Platform Program (Intel® SIPP) and predictable platform life cycle

[1]Results based on internal Intel analysis and/or 3rd party evaluators and are provided for informational purposes only.
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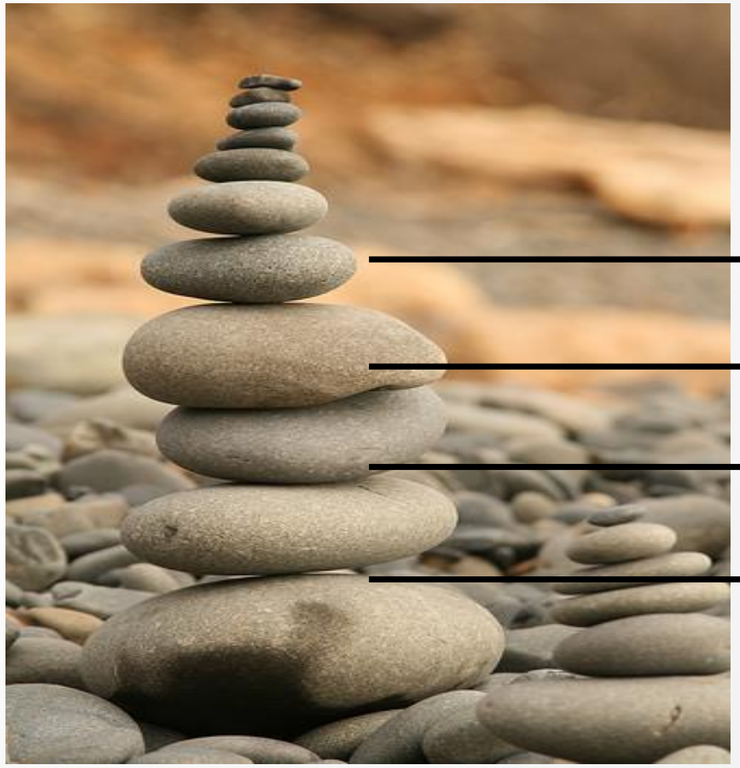
Putting It All Together

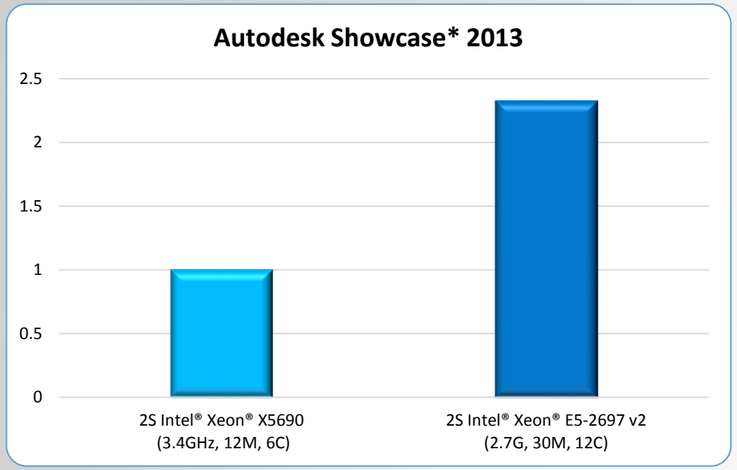
If Your System Is Slow So Are Your Engineers, Artists, Animators & Analysts



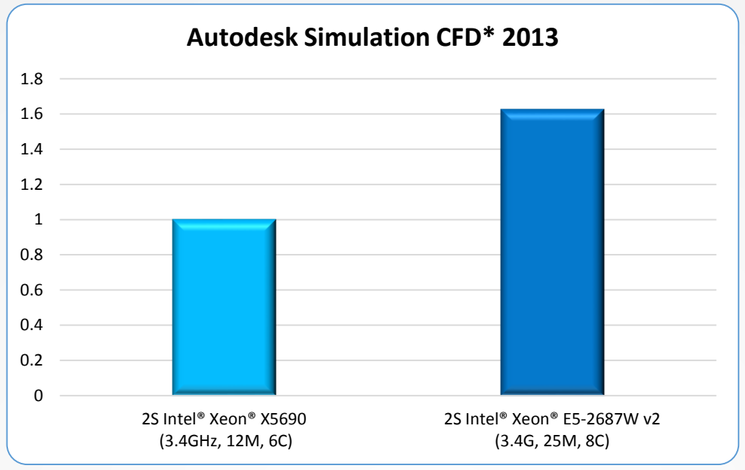
Configuration Tool

http://www.intel.com/content/www/us/en/workstations/workstation-configurator-tool.html

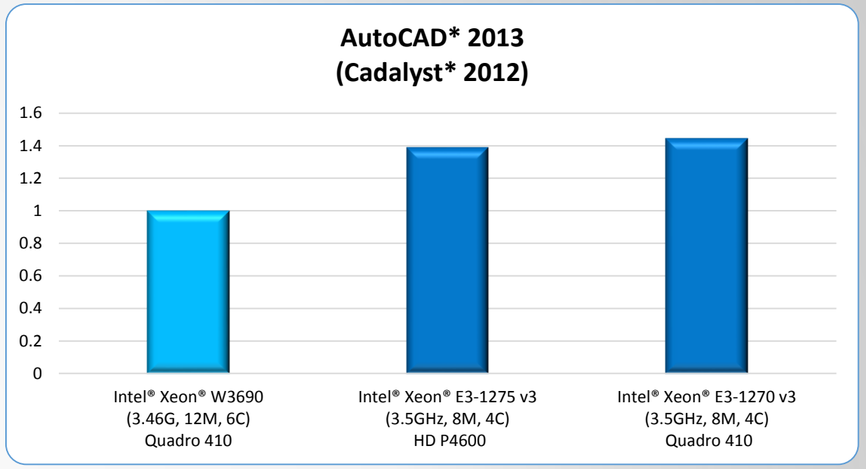
Be More Productive: Refresh your 3 yr old workstation



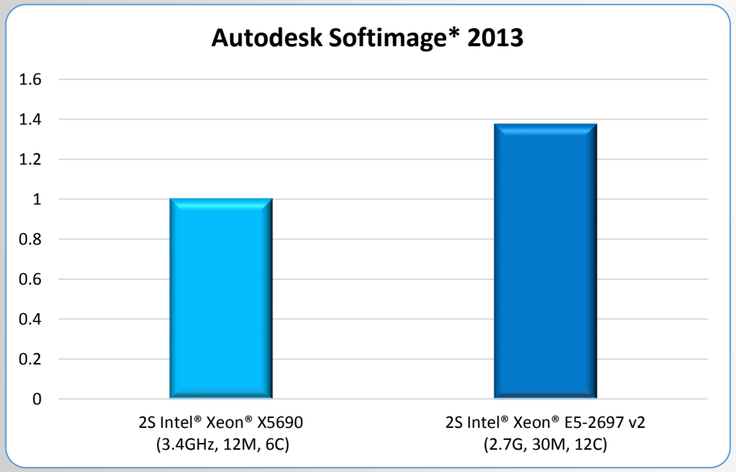
SHOWCASE* Real Time Rendering
Up to 2.3X



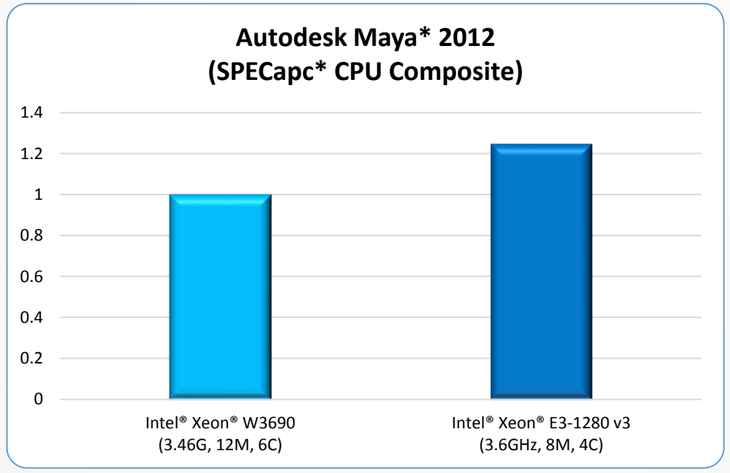
SIMULATION* Computation Fluid Dynamics
Up to 1.6X



AUTOCAD* CAD Design
Up to 1.4X

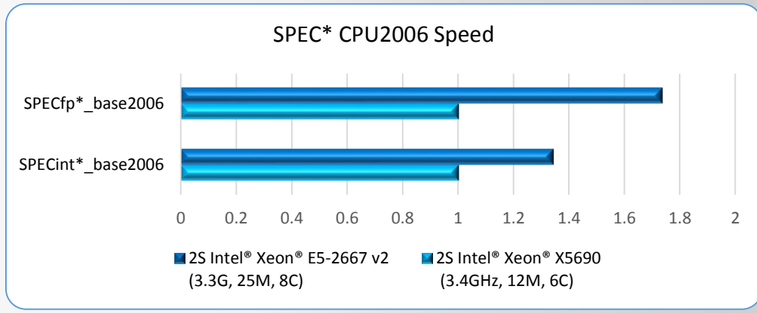


SOFTIMAGE* 3D Animation and Visual Effects
Up to 1.3X

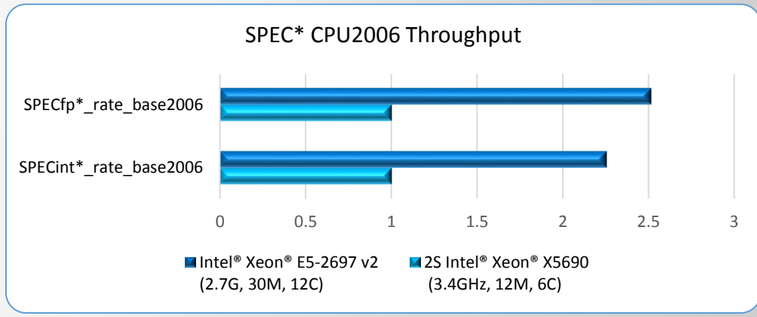


MAYA* 3D Animation
Up to 1.2X

spec*
Single Thread Performance



spec*
Throughput Performance



Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.. For more information go to http://www.intel.com/performance. Intel does not control or audit the design or implementation of third party benchmark data or Web sites referenced in this document. Intel encourages all of its customers to visit the referenced Web sites or others where similar performance benchmark data are reported and confirm whether the referenced benchmark data are accurate and reflect performance of systems available for purchase. Configuration: X5690(24GB, HDD), W3690(16GB, HDD), E3-1270/75/80 v3(16GB, SSD), E5-2697 v2(64GB, SSD). SPEC results: best scores www.spec.org as of 11/21/2013. Intel Internal measurements as of November 2013. Refer to backup for additional details. * Other names and brands may be claimed as the property of others.

intel AUTODESK

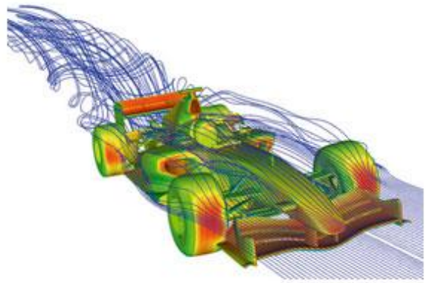
What Make A Great Workstation?

Intel® Xeon ® Workstation

+Concurrent interactive design and visualization

Intel® Xeon® Processor E5-2600v2 Product Family

+More complex modeling, interactive design and visualization



Intel® Xeon® Processor E5-1600v2 Product Family

Trusted, Reliable Performance, Manageability

Intel® Xeon® Processor E3-1200 v3 Product Family

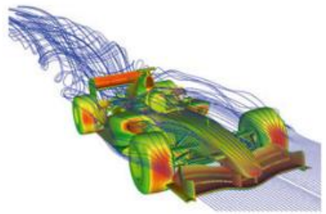
Where Can You Purchase Workstations

helping you achieve more in less time than ever before

Dell Precision T5610 & 7610*
HP Z620 & 820*
Lenovo D30 & C30*

Intel® Xeon® Processor
E5-2600v2 Product Family

HP Z420*
Lenovo S30*
Dell Precision T3610*



Intel® Xeon® Processor
E5-1600v2 Product Family

Lenovo E32*
Dell Precision T1700*
HP Z230, Z1*

Intel® Xeon® Processor
E3-1200 v3 Product Family

Intel® Xeon® processors: When the Results Really Matter

Risk Factors

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