NVIDIA Quadro by PNY

Quadro Graphics for Design Professionals

Modern CAD Workflow

Conceptualize and Design

Detailed Design

Physical Simulation

Collaborate and Review

The Modern Manufacturing Workstation

Conceptualize and Design	Detailed Design	Physical Simulation	Collaborate and Review

- Create in 3D right at conceptual phase
- Manipulating realistic models requires dedicated frame buffer memory

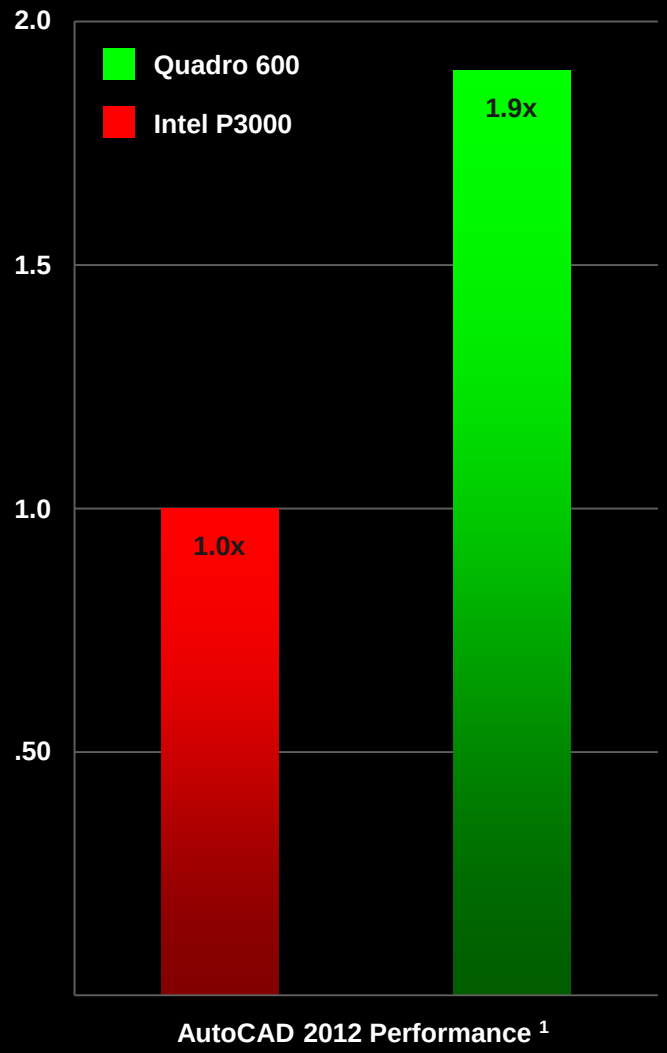
- Manipulate complex assemblies
- High quality views with shading and materials

- Animate, visualize, review
- Simulation of assemblies
- GPU accelerated FEA/CFD*

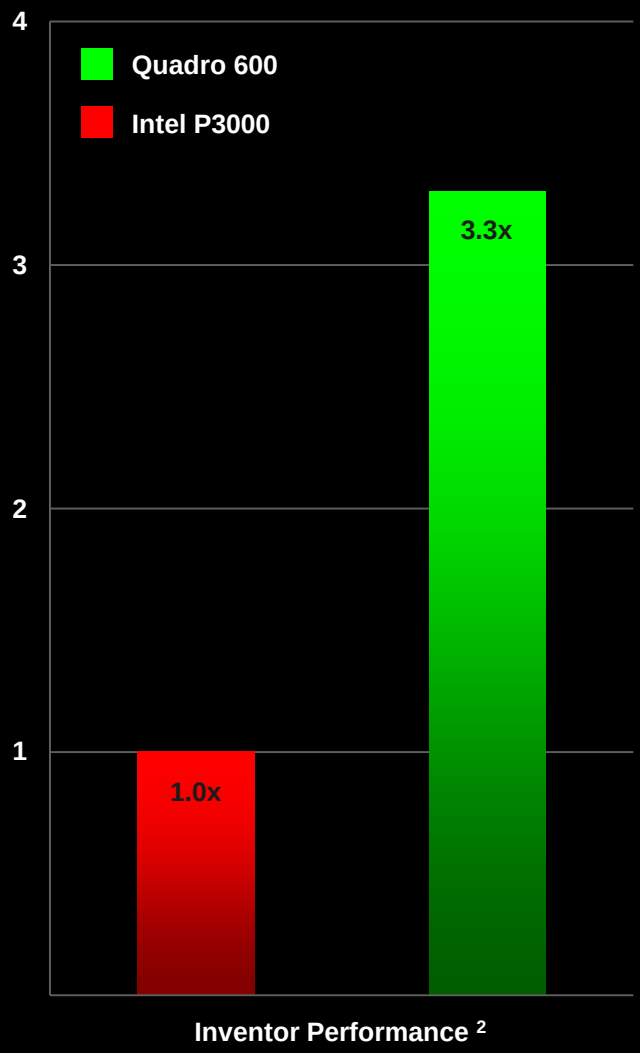
- Virtual prototyping for design review
- Interactive walkthroughs
- Photorealistic images and videos for clients/marketing

* Finite Element Analysis and Computational Fluid Dynamics

Quadro Accelerates Your Workflow



AutoCAD 2012 Performance [1]

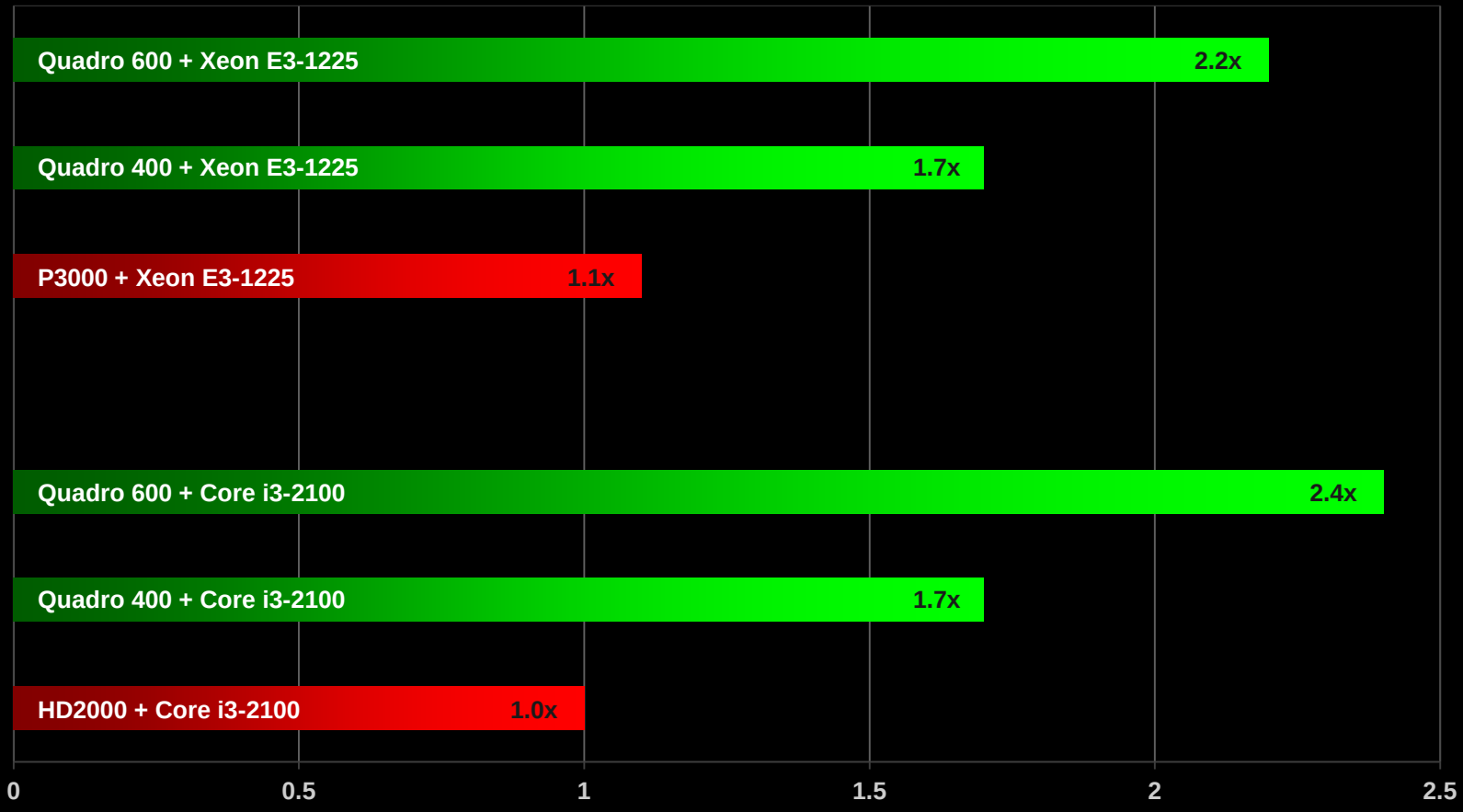


Inventor Performance [2]

[1] Normalized to P3000 + Xeon E3-1225 performance | No performance driver, hidden line view | 2560 x 1600 resolution

[2] Normalized to P3000 + Xeon E3-1225 performance | Shaded with “Edges and Reflections” view | 2560 x 1600 resolution

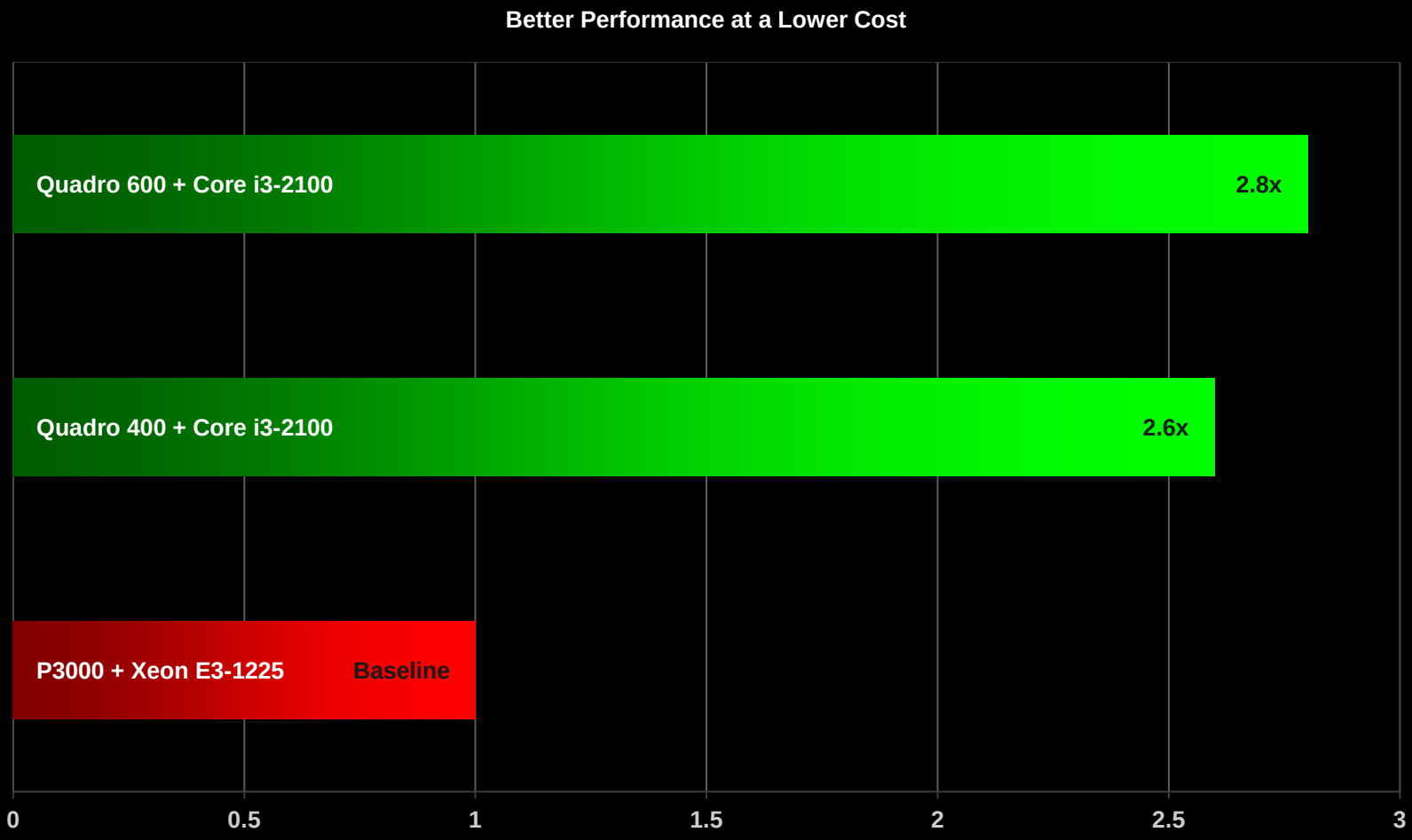
SolidWorks Performance Advantage with Quadro



Performance calculated as the SolidWorks fps geomean rotating 11 small-size assemblies with the “Shaded with Edges” view driving a 2560 x 1600 display | Normalized to Core i3 (HD2000) performance | Both the Core i3 and Xeon E3-1225 systems were configured with 4GB DRAM running Windows 7 64-bit

Source: NVIDIA

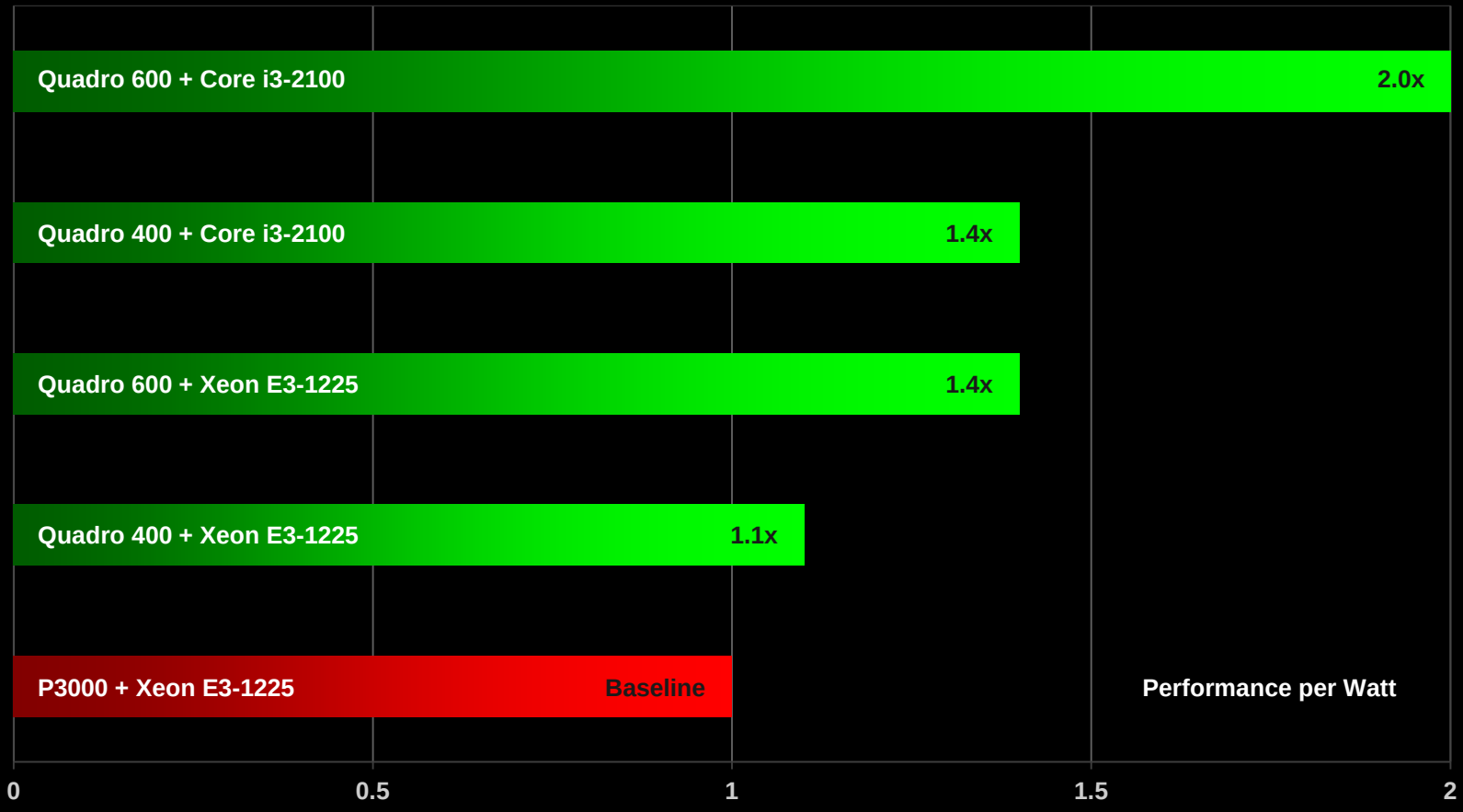
Affordable Workflow Acceleration



Performance calculated as the SolidWorks fps geomean rotating 11 small-size assemblies with the “Shaded with Edges” view driving a 2560 x 1600 display | Normalized to Core i3 (HD2000) performance | Both the Core i3 and Xeon E3-1225 systems were configured with 4GB DRAM running Windows 7 64-bit | Core i3 is baseline cost, Xeon = $250, Quadro 400 = $149, Quadro 600 = $199

Source: NVIDIA

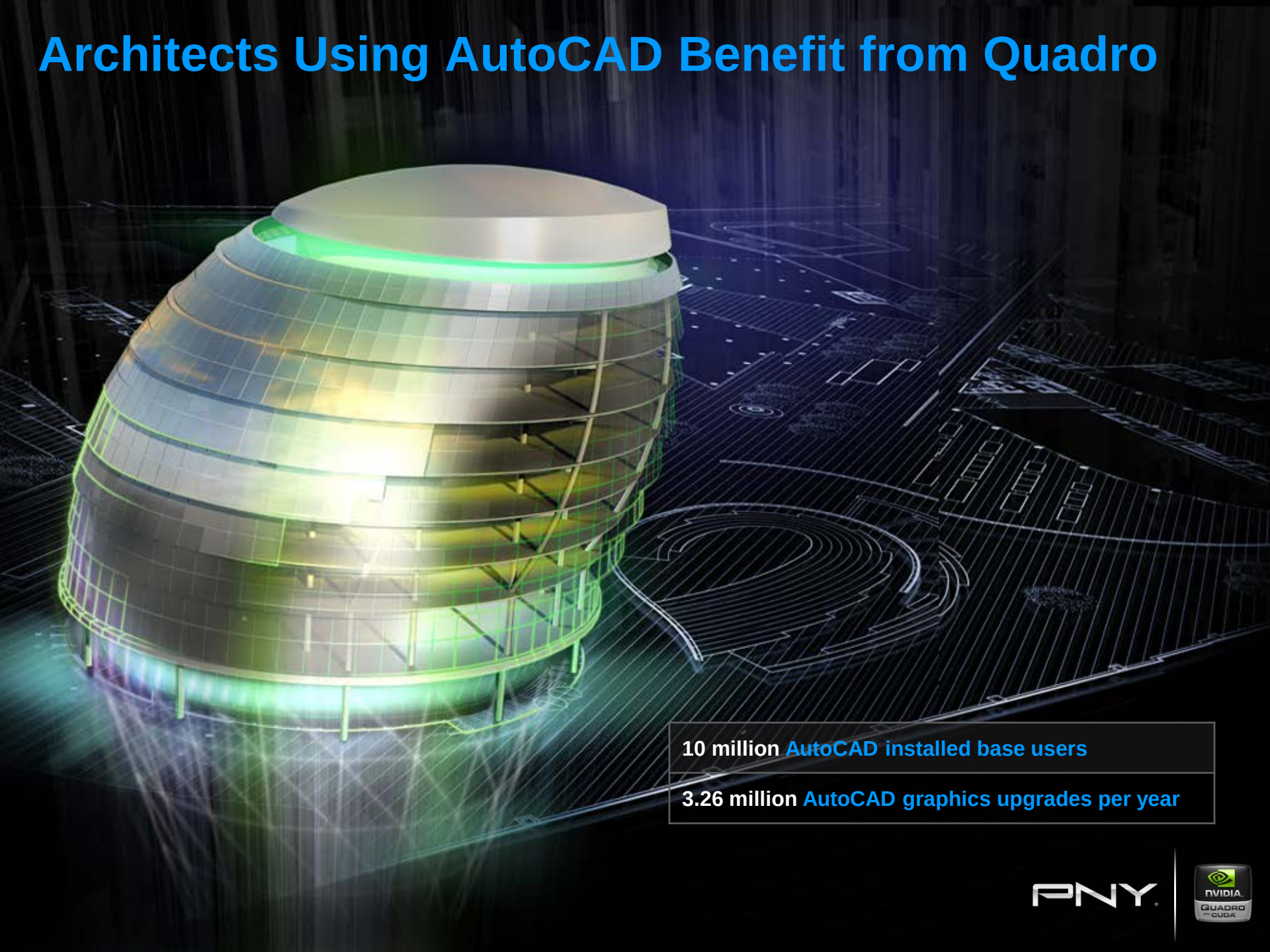
Better CAD Performance, Efficiently



Performance calculated as the SolidWorks fps geomean rotating 11 small-size assemblies with the “Shaded with Edges” view driving a 2560 x 1600 display | Normalized to Core i3 (HD2000) performance | Both the Core i3 and Xeon E3-1225 systems were configured with 4GB DRAM running Windows 7 64-bit | Power calculated as combined CPU + GPU | Xeon E3-1225 = 95W, Core i3 = 65W, Quadro 400 = 35W, Quadro 500 = 40W

Source: NVIDIA

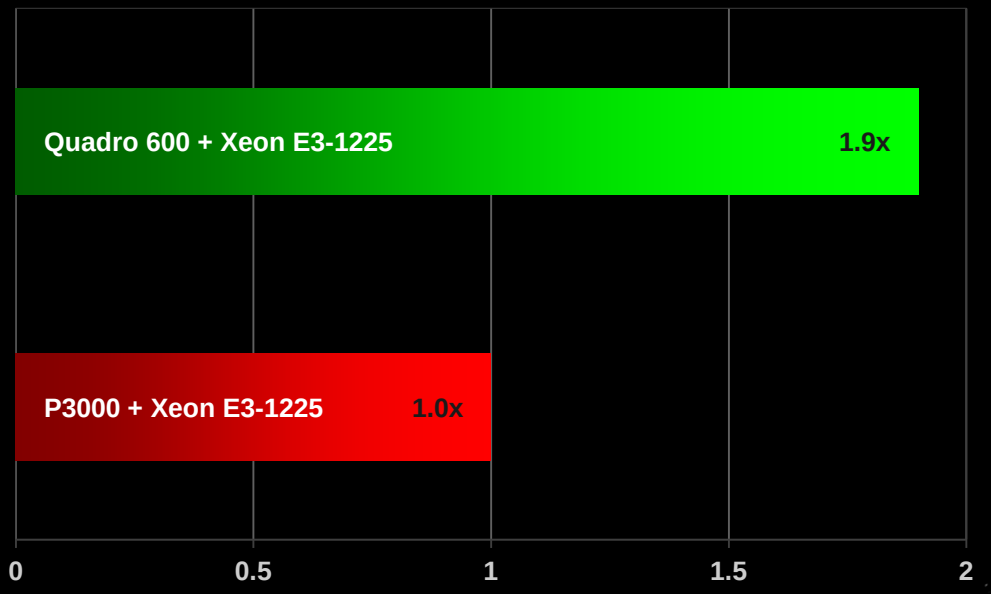
Architects Using AutoCAD Benefit from Quadro



10 million AutoCAD installed base users
3.26 million AutoCAD graphics upgrades per year

Architects Using AutoCAD Benefit from Quadro

▪	Maximum uptime with AutoCAD certified and qualified graphics drivers
▪	Break even point reached on a Quadro 600 investment in approximately 1 month
▪	$7,000 worth of productivity savings delivered by Quadro over 3 year workstation lifespan



Source: NVIDIA

CAD Performance and Price Points

Source: NVIDIA

Graphics Performance Comparisons

Graphics	Cost	Performance (FPS)	Power	Performance per Watt	Performance per $
Xeon E3 + Quadro 600	$165	26.5	135W	0.19	0.15
Xeon E3 + Quadro 400	$145	19.1	130W	0.15	0.13
Xeon E3 + P3000	$60	12.4	95W	0.13	0.20
Core i3 + Quadro 600	$105	26.5	105W	0.26	0.26
Core i3 + Quadro 400	$85	19.1	100W	0.19	0.23
Core i3 + HD2000	$0	11.3	65W	0.17	NA

Xeon Configuration	Relative Performance
Xeon E3 (P3000)	1.0
Xeon E3 + Quadro 400	1.5
Xeon E3 + Quadro 600	2.0

Core i3 Configuration	Relative Performance
Core i3 (HD2000)	1.0
Xeon E3 + Quadro 400	1.7
Xeon E3 + Quadro 600	2.4

Configuration	Performance per Watt
P3000	1.0
Xeon E3 + Quadro 400	1.1
Xeon E3 + Quadro 600	1.4
Core i3 + Quadro 400	1.5
Core i3 + Quadro 600	2.0

Configuration	Performance per $
Xeon E3 (P3000)	1.0
Core i3 + Quadro 400	1.1
Xeon E3 + Quadro 600	1.3

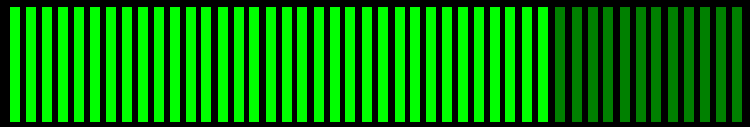
SolidWorks geomean performance in FPS while rotating 12 small-sized assemblies using “Shaded with Edges” view | 2560 x 1600

Scale your Workload with Confidence

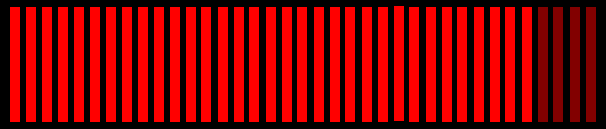
Quadro releases valuable system memory

4GB total memory with Intel integrated graphics
▪ Resources tight, responsiveness slowed
5GB total memory with Quadro 600
▪ 1GB of dedicated graphics memory keeps workstation responsive

Quadro 600 Delivers Memory Head Room



Intel Integrated Graphics Uses System Memory



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NVIDIA QUADRO CUDA

100 Reasons for Peace of Mind

Quadro professional application certifications

100+

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NVIDIA QUADRO CUDA

Enhanced Image Quality

SolidWorks RealView with Quadro	
▪	Incredible realism through complex material surfaces, reflections and shadows
▪	Full Scene Anti Aliasing (FSAA) – produces higher quality, more realistic images
▪	Not available with consumer or integrated graphics

SolidWorks

Without RealView

With RealView

PNY

NVIDIA QUADRO CUDA

PC Magazine Editors Agree…

Processor	Graphics	PCMark Vantage	3DMark Vantage Entry	3DMark Vantage Extreme
Intel Xeon E31245 (3.3GHz)	1GB NVIDIA Quadro 600	16,688	15,038	1,571
Intel Xeon E31245 (3.3GHz)	Intel HD Graphics P3000	16,130	11,276	753

"When I added the NVIDIA Quadro 600 card, the scores went up significantly"*

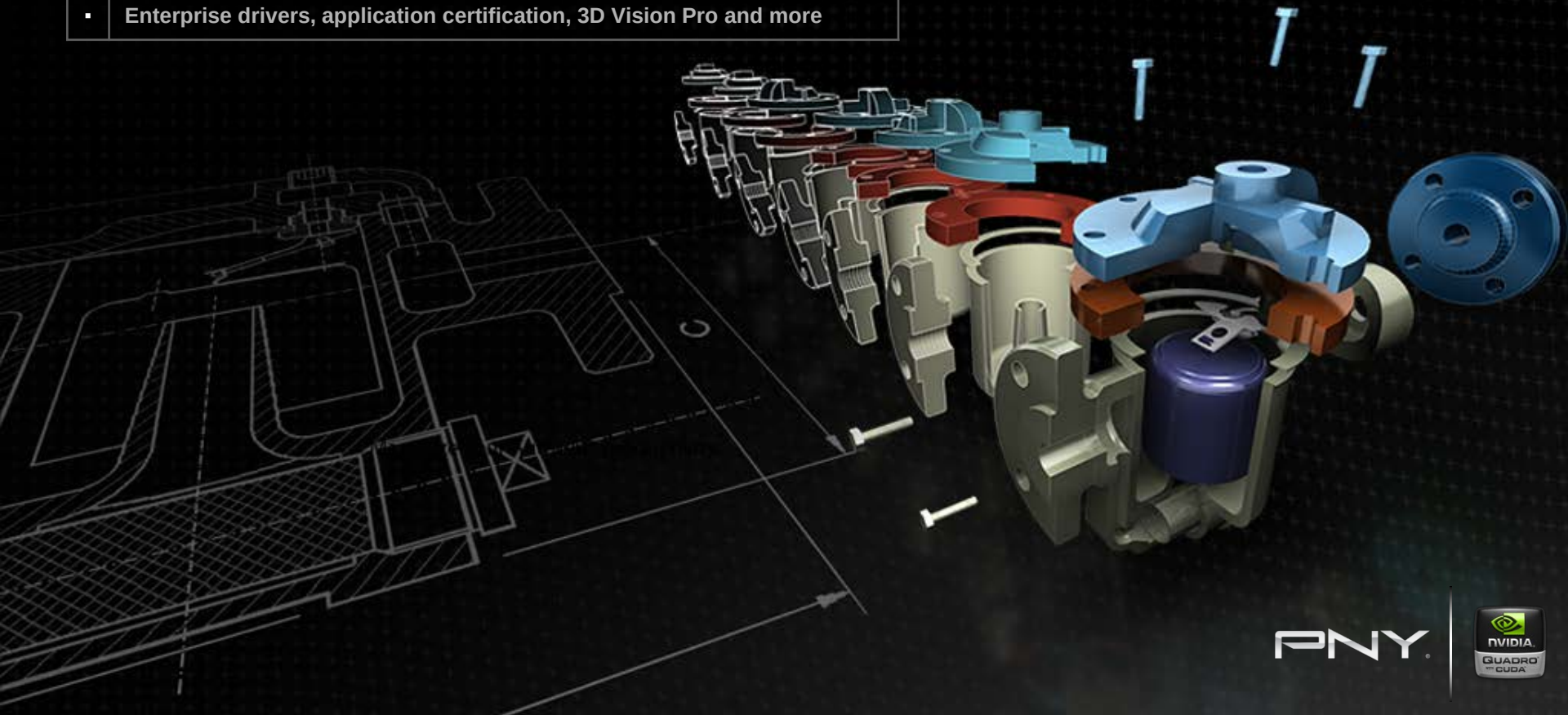
* PCMAG.COM Editors Choice, www.pcmag.com/article2/0,2817,2388438,00.asp

Workstation Graphics for CAD Professionals

	Productivity	Cost Effectiveness	Performance Per Watt	Scalable Displays	3D Vision Pro
NVIDIA Quadro	2x	2x	2x	8	✓
Integrated Graphics	1x	1x	1x	2	x

Step up to Professional Graphics for CAD

Be more productive	
▪	2x faster than integrated graphics
More performance for fewer dollars	
▪	2x performance per $
▪	2x performance per watt
Get professional features	
▪	Enterprise drivers, application certification, 3D Vision Pro and more



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