WILDCAT

REALiZM™

Reviewers Guide

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October 2004

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Introduction

- **Welcome to the Wildcat Realizm Reviewer's Guide**

  - Information and Contacts
  - Wildcat Realizm Family Overview
  - Workstation Benchmark Guide
  - Individual Benchmark Guides:
    - SPECviewperf® 8.0.1
    - SPECapc^{SM} for 3ds max™ 6
    - SPECapc for Maya 5
    - SPECapc for Pro/ENGINEER™ 2001
    - SPECapc for Solid Edge V14™
    - SPECapc for SolidWorks 2003

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Information

- **Product Page**
    - Datasheets, white papers, Q&A, etc
    - http://www.3dlabs.com/products/family.asp?fami=9
- **Logo and Product Images**
    - http://www.3dlabs.com/press/photos/
- **Press Area**
    - Download for Wildcat Realizm driver
    - Additional Reviewer materials
    - Wildcat Realizm Product Launch materials
    - General Wildcat Realizm technology information
    - Location: http://press.3dlabs.com/
        - Login name: WildcatRealizm
        - Password: Noboundaries (case sensitive)

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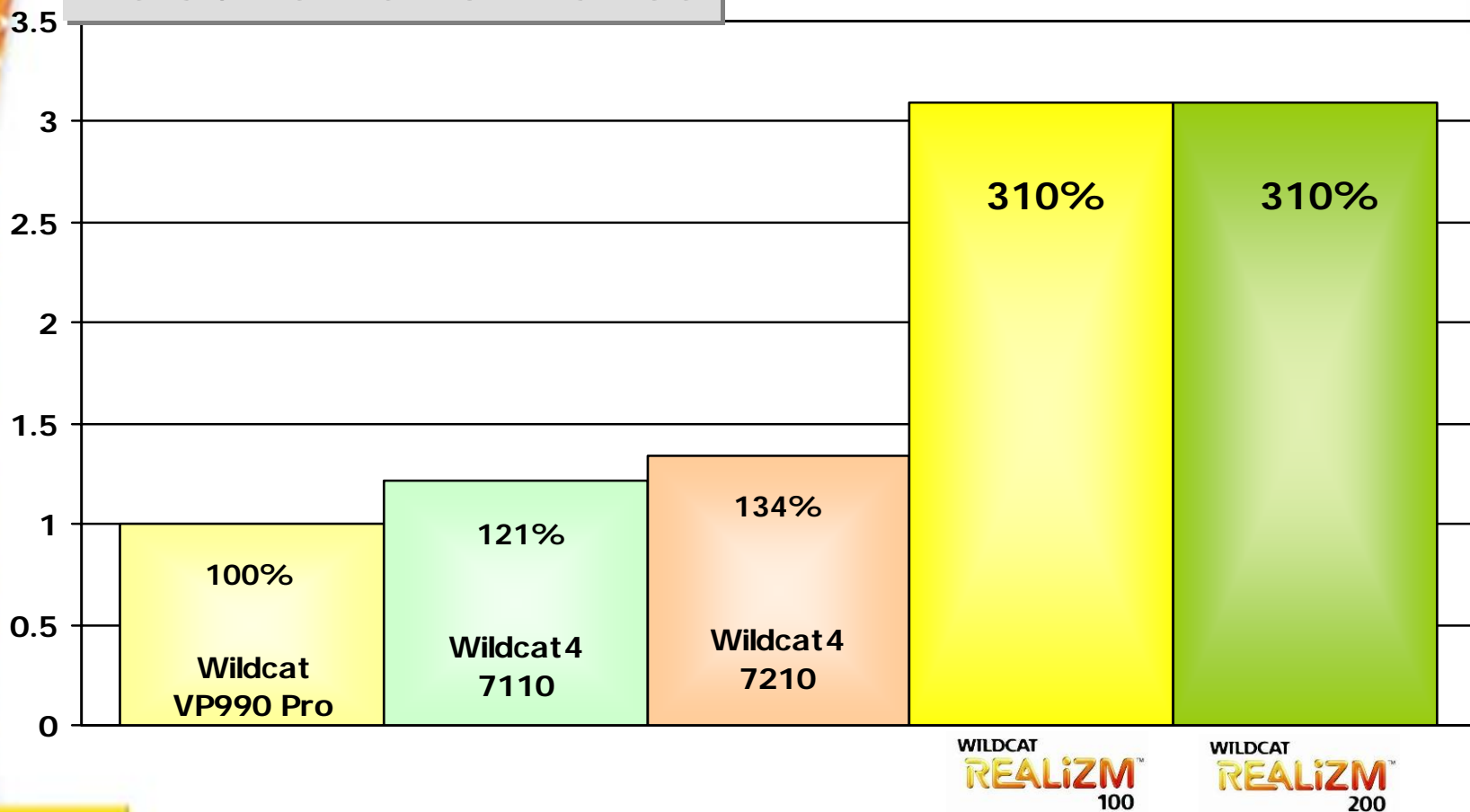   clifton.robin@3dlabs.com +1 256-319-1263

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Removing Boundaries…

**Wildcat Realizm
100 and 200
Overview**

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Wildcat Realizm vs. Previous Wildcat Products

Relative Performance

Bar chart showing relative performance:
- Wildcat VP990 Pro: 100%
- Wildcat4 7110: 121%
- Wildcat4 7210: 134%
- Wildcat Realizm 100: 310%
- Wildcat Realizm 200: 310%

Wildcat Realizm 100

- Single VPU
- AGP 8x (AGP 3.0)
- 256 MB GDDR3 memory
  - 256-bit wide
  - 32 GB/sec. memory bandwidth
- Two, single link DVI-I connectors
- 3-pin VESA stereo connector
- Dual 400 MHz 10-bit RAMDACs

- Quiet and efficient cooling solution
- Windows 2000 and Windows XP (32-bit) support
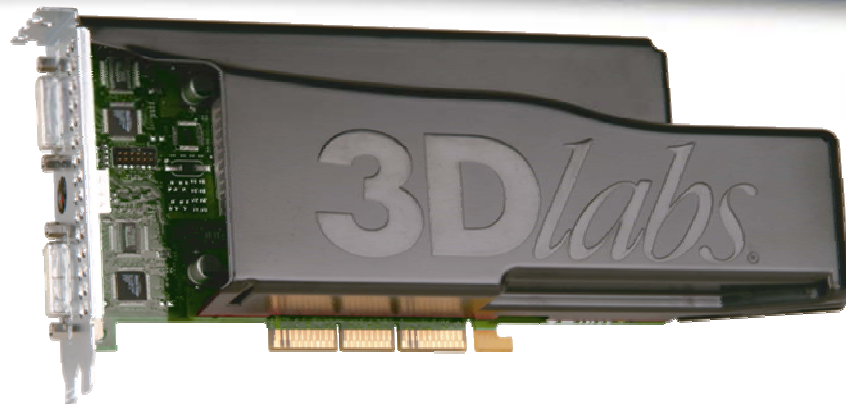- Coming soon! 32- and 64-bit Linux support
- MSRP = $1,249 (US)

Wildcat Realizm 200

- Single VPU
- AGP 8x (AGP 3.0)
- 512 MB GDDR3 memory
  - 256-bit wide
  - 32 GB/sec. memory bandwidth
- Two, dual link DVI-I connectors
- 3-pin VESA stereo connector
- Dual 400 MHz 10-bit RAMDACs
- Quiet and efficient cooling solution

- Windows 2000 and Windows XP (32-bit) support
- Shipping soon! Optional Framelock and Genlock support provided by Multiview Option Kit
- Coming soon! 32- and 64-bit Linux support
- MSRP = $1,599 (US)

The New Wildcat Family Lineup

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Market Segments	AGP	PCI Express
Ultra	WILDCAT REALiZM™ 200 512 MB GDDR3	WILDCAT REALiZM™ 800 640 MB GDDR3
High	WILDCAT REALiZM™ 100 256 MB GDDR3	
Mid	Wildcat VP **880 Pro** 256 MB DDR	
Entry	Wildcat VP 560 64 MB DDR	

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Wildcat Realizm 100 & 200 Vs. Quadro FX 4000

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	NVIDIA Quadro FX 4000	3Dlabs Wildcat Realizm 100	3Dlabs Wildcat Realizm 200
Bus	AGP 8x	AGP 8x	AGP 8x
Memory	256 MB GDDR3	256 MB GDDR3	**512 MB GDDR3**
Memory Bus Width	256-bit	256-bit	256-bit
Memory Bandwidth	32 GB/s.	32 GB/s.	32 GB/s.
Maximum Displays	2	2	2
Dual-link DVI	Yes - 2	No	Yes – 2
RAMDAC	Dual 400 MHz	Dual 400 MHz	Dual 400 MHz
Stereo Connector	Yes	Yes	Yes
Framelock/Genlock	No	No	**Optional**
OpenGL Support	OpenGL 1.5 – OpenGL Shading Language	OpenGL 1.5 – OpenGL Shading Language	OpenGL 1.5 – OpenGL Shading Language
DirectX Support	DirectX 9.0 – VS3.0 & PS 3.0	DirectX 9.0 – VS2.0 & PS 3.0	DirectX 9.0 – VS2.0 & PS 3.0
Fragment Shader Program Length	64 K	**256 K**	**256 K**
Power Requirements	120 W Max.	**75 W Max.**	**85 W Max.**
Viewperf 8.0.1			
3dsmax-03	30.47	**42.87**	**42.87**
catia-01	16.87	**26.35**	**26.35**
maya-01	31.25	**51.12**	**51.12**
MSRP	$2,199	**$1,249**	**$1,599**

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SPECviewperf 8.0.1 Benchmarks

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Wildcat 39 % Faster!

Frames/sec.

	3dsmax-03	catia-01	maya-01	sw-01
☐ Wildcat Realizm 100/200	42.87	26.58	51.12	25.48
☐ nVidia FX 4000	30.47	22.06	31.25	22.06
☐ nVidia FX 3000	25.61	14.83	30.32	14.83
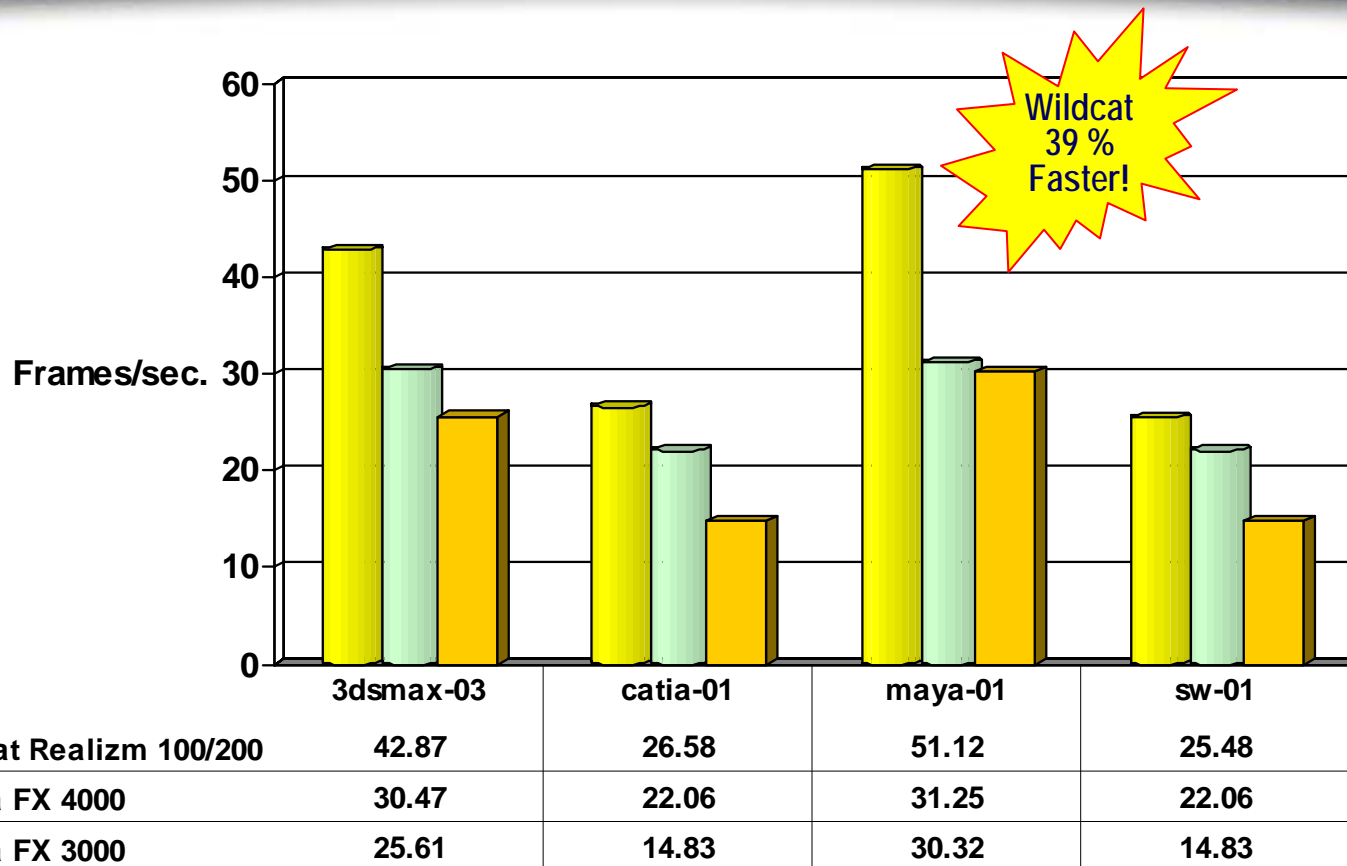
**Results as of Sept. 15th

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Wildcat Realizm Summary

- The ultimate high-end professional graphics architecture
- Significant advance in industrial-strength high-level shading language acceleration
- New programmable VSU enables dual-VPU solutions to double performance
- Single architecture scalable from AGP 8x to full x16 PCI Express
- Next-generation 3Dlabs Realizm driver with Acuity Windows Manager

**3Dlabs is the only graphics hardware developer
100% dedicated to professional graphics.
Only 3Dlabs could produce technology like..**

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Workstation Benchmarking Considerations

- **Memory sub-system**
  - All benchmarks require a minimum of 1.0 GB of system memory to run optimally
- **Virtual memory**
  - Virtual memory should be set to at least the same amount of memory that is currently in the system
- **I/O disk subsystem**
  - Many SPEC benchmarks measure CPU and I/O performance as well as graphics performance. For the best overall composite it is important that the fastest possible disk sub-system is used.
- **Windows swap file location**
  - It is strongly recommended that the standard Windows swap file is located on a separate disk partition from that of the installed benchmark and application
- **Disk driver fragmentation**
  - De-fragment the hard drive after benchmark and application installation
- **Background tasks**
  - It is important to cancel non-essential tasks running in the background Such tasks can include:
    - Anti-virus software, network connections, Windows XP user switching, etc

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Workstation Benchmarking – Essential Settings

1. Set the desktop resolution to 1280 x 1024
2. Set the color depth to 32 bpp
3. Set the monitor refresh rate to 75 Hz
4. Turn off all screensaver programs or utilities
5. Turn off all power saving options
6. Enable the Taskbar property option "Auto-hide"
7. Disable the Taskbar property option "Always on top"
8. Enable the Start Menu property option "Classic Start menu"
9. Set System Properties -> Advanced -> Performance Options -> Visual Effects to "Adjust for best performance"
10. Set System Properties -> Advanced -> Performance Options -> Advanced to "Programs" for both options
11. Follow the 3Dlabs Wildcat Realizm Display Settings shown for each specific benchmark
12. It is important to only use those application settings outlined in the documents governing the use of the benchmark

SPEC Benchmarks Overview

- **SPEC (Standard Performance Evaluation Committee) Benchmarks**
  - It is advised that the applications are installed and left in their default state
  - The only amendments to either registry settings or application settings are those outlined in the appropriate rules document
  - Often the second or third run of a benchmark will yield higher results as system caching stabilizes to see maximum steady state results
  - It is not mandatory, but for direct comparisons to SPEC submitted numbers it is appropriate to use the following application Build / Service Packs :
    - 3ds max 6 - 6 SP1
    - Maya 5 – Application Build 200304010010
    - Pro/ENGINEER 2001 – Application Build 2002100
    - Solid Edge V14 – n/a
    - SolidWorks 2003 - SP3.1

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Benchmarking Rules

- **SPECapc Graphics / Applications**
  - Specific Application Performance
    - 3ds max 6
    - Maya 5
    - Pro/ENGINEER 2001
    - Solid Edge V14
    - SolidWorks 2003
  - General OpenGL® Performance
    - SPECviewperf 8.0.1

- **SPEC/GPC Rules**
  - Consistency and fairness are guiding principles for SPEC. To assure these principles are sustained, the following guidelines have been created with the intent that they serve as specific guidance for any organization (or individual) who chooses to make public comparisons using SPEC benchmark results.

    - SPEC / GPC Fair Use Rule: http://www.spec.org/gpc/publish/fairuse.html

  - Benchmark results for publication other than by SPECopc (e.g. industry journals, vendor web sites, analyst reports) must adhere to Articles I and IV of the The OpenGL Performance Characterization Project Rules found at http://www.specbench.org/gpc/opc.static/Rulesv16.html

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SPECviewperf 8.0.1
Benchmark Guide

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SPECviewperf 8.0.1 Benchmark Background

- SPECviewperf® is a portable OpenGL performance benchmark program written in C

- Developed by IBM

- Later updates and significant contributions were made by SGI, Digital (Compaq, HP), 3Dlabs and other SPECopc^{SM} project group members

- SPECviewperf provides a vast amount of flexibility in benchmarking OpenGL performance

- Currently, the program runs on most implementations of UNIX, Windows XP, Windows 2000 and Linux

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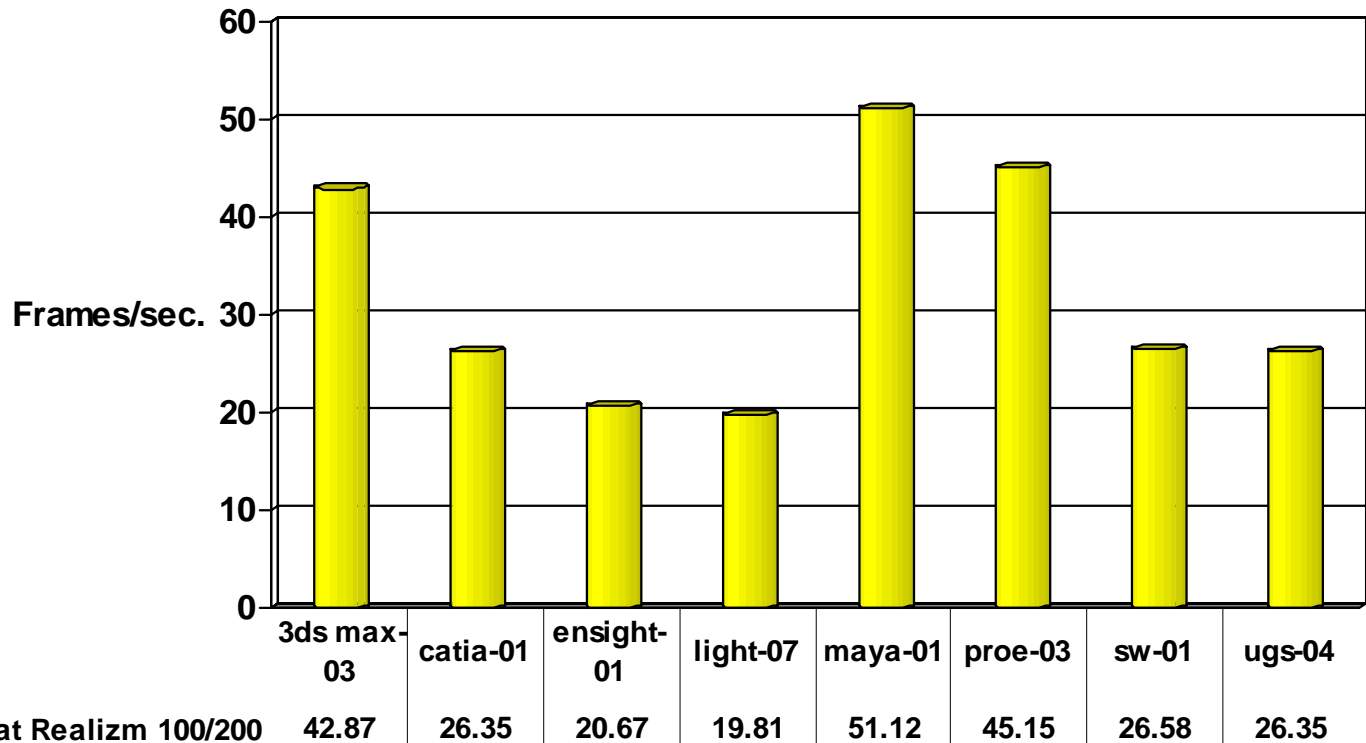
SPECviewperf 8.0.1 & Wildcat Realizm Settings

- **SPECviewperf 8.0.1 Settings**
  - SPECviewperf 8.0.1 is a standalone benchmark and as such, does not require specific application settings
  - For more information, go to http://www.spec.org/gpc/opc.static/whatis_vp8.html

- **3Dlabs Wildcat Realizm Display Properties Settings**
  - Wildcat Realizm "OpenGL" Display Properties
    - "Wait for Vertical Sync" must be disabled (driver install default)
  - Wildcat Realizm "Optimize" Display Properties
    - "Professional Software Defaults" must be selected as the "Optimized For" application
    - Disable the Acuity Task Bar
    - Disable the Acuity Windows Manger

Wildcat Realizm SPECviewperf 8.0.1 Benchmark Results

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	3ds max-03	catia-01	ensight-01	light-07	maya-01	proe-03	sw-01	ugs-04
▢ Wildcat Realizm 100/200	42.87	26.35	20.67	19.81	51.12	45.15	26.58	26.35

Frames/sec.

More information available on the SPEC site here:
http://www.spec.org/gpc/opc.data/vp8/summary.html
Results as of 13 October 2004

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SPECapc for 3ds max 6 Benchmark Background

- SPECapc for discreet 3ds max 6 measures performance based on the workload of a typical user, including functions such as wire frame modeling, shading, texturing, lighting, blending, inverse kinematics, object creation and manipulation, editing, scene creation, particle tracing, animation and rendering. The benchmark runs under both OpenGL and DirectX implementations of 3ds max 6, and tests all the components that come into play when running the application

- Test models within SPECapc for 3ds max 6 range from simple primitives to complex objects and large scenes. Multiple repetitions are used to test the limits of graphics cards. Based on user feedback, results are weighted 80%for interactive tests and 20% for rendering

- A new feature in the benchmark is the ability to generate images that enable comparisons between a custom 3ds max driver and a standard OpenGL driver. This gives users an easy way to visually check the quality of a custom driver

- The total number of seconds to run each test is normalized based on a reference machine, in this case a 2.4 GHz Intel Xeon with 2 GB PC800 ECC RDRAM, 40 GB ATA/100 hard drive, and NVIDIA Quadro 700XGL graphics running Windows XP SP1. The normalization process ensures a scoring system where a bigger score is better. Composite scores are reported for both rendering and interactive tests. An overall composite score is also reported

SPECapc for 3ds max 6 Settings

- **SPECapc for 3ds max 6 Settings**
  - Follow the Project Rules for running SPECapc for 3ds max 6 as defined in Section 5. <u>SPECapc Benchmark Specific Rules and Procedures</u> here <u>http://www.spec.org/gpc/apc.static/current.html</u>
  - The specific Project Rules section covering SPECapc for 3ds max 6 is defined in Section 5.20 <u>3ds max 6</u>
  - Load the 3Dlabs custom 3ds max 6 driver, available from the 3Dlabs press only site
  - Initialize 3ds max 6 for running the SPECapc benchmark:
    1. Open 3ds max 6
    2. From the drop down menus select "MAXScript" and then select "Run Script"
    3. Find and open the "MaxTest" script
    4. When the "MaxTest" script runs, it will open the "Max Profiler" window. It will also bring up a number of window tabs "Object, Shapes, Compounds, etc.." in the background
    5. Click on the "Objects" window tab (far left tab)
    6. Exit 3ds max 6
    7. 3ds max 6 is now initialized for benchmarking

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Wildcat Realizm Display Settings

- **3Dlabs Wildcat Realizm Display Properties Settings**
    - Wildcat Realizm "OpenGL" Display Properties
        - "Wait for Vertical Sync" must be disabled (driver install default)
    - Wildcat Realizm "Optimize" Display Properties
        - "3DStudio MAX" must be selected as the "Optimized For" application
        - Disable the Acuity Task Bar
        - Disable the Acuity Windows Manger

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SPECapc for 3ds max 6 Benchmark Results

- **Rendering Composite: 1.53**

- **Interactive Composite: 2.47**

- **Overall Composite: 2.24**

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SPECapc for
Maya 5

Benchmark Guide

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SPECapc for Maya 5 Benchmark Background

- **SPECapc for Maya 5 was developed by Alias in cooperation with SPECapc. It includes four scenarios created in Maya 5 that enable users to evaluate scene drawing and playback performance, CPU-intensive operations, and standard I/O performance.**

- **Each of the four models - a werewolf, human hand, insect and squid - are rendered and displayed in the five different modes used in Maya 5: wireframe, Gouraud-shaded, texture, texture highlighted with a wireframe mesh, and texture selected (texture with wireframe mesh and control points). The benchmark is unique in its ability to test performance for large texture sizes and multiple viewports.**

- **SPECapc for Maya 5 consists of 30 individual tests, 27 of which are run three times. The final scoring is based 70% on graphics, 20% on CPU performance, and 10% on I/O.**

- **The reference system for computing the normalized ratio is a 1.50 GHz Pentium 4 running Windows 2000 SP3 with 1 GB of PC800 ECC RDRAM, an NVIDIA Quadro2 Pro graphics card, and a 20 GB ATA/100 hard drive.**

- **A fully licensed, released version of Maya 5 is required.**

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SPECapc for Maya 5 & Wildcat Realizm Display Settings

- **SPECapc for Maya 5 Settings**
  - Follow the Project Rules for running SPECapc for Maya 5 as defined in Section 5. <u>SPECapc Benchmark Specific Rules and Procedures</u> here <u>http://www.spec.org/gpc/apc.static/current.html</u>
  - The specific Project Rules section covering SPECapc for Maya 5 is defined in Section 5.18 <u>Maya 5.0</u>

- **3Dlabs Wildcat Realizm Display Properties Settings**
  - Wildcat Realizm "OpenGL" Display Properties
    - "Wait for Vertical Sync" must be disabled (driver install default)
  - Wildcat Realizm "Optimize" Display Properties
    - "Maya" must be selected as the "Optimized For" application
    - Disable the Acuity Task Bar
    - Disable the Acuity Windows Manger

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SPECapc for Maya 5 Benchmark Results

- Graphics: **4.45**

- CPU: **2.69**

- I/O: **2.85**

- Overall Composite: **3.85**

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SPECapc for Pro/ENGINEER 2001

Benchmark Guide

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SPECapc for Pro/ENGINEER 2001 Benchmark Background

- SPECapc for Pro/ENGINEER 2001 is a completely new benchmark developed in conjunction with Cognitive Advantage, a Nashua, N.H., contract software engineering and performance evaluation firm. The results for SPECapc for Pro/ENGINEER 2001 cannot be compared to those of previous versions of the benchmark.

- The new benchmark uses a complex model of a race car assembly to exercise all areas of system performance relevant to Pro/E users. The model was provided by PTC, developers of Pro/ENGINEER. Eight tests are run to measure performance in five categories: CPU, I/O, wireframe graphics, shaded graphics, and file time. Scores are compiled for individual tests, then calculated as weighted composites for each of the five categories and as an overall composite.

- Users must have a 3D graphics display device recognized by Pro/ENGINEER in order to run the benchmark.

- A fully licensed, released version of Pro/ENGINEER 2001 is required. If a floating license is used, the workstation's network must be configured as documented in the Pro/ENGINEER installation guide.

- The reference system for computing the normalized ratio is a Pentium III 1 GHz, with an 840 chipset, Quadro2 Pro graphics card, Windows 2000 SP2, 1 GB RDRAM PC800, and an 18 GB Quantum Atlas2 10K hard drive.

SPECapc for Pro/ENGINEER 2001 & Wildcat Realizm Display Settings

- **SPECapc for Pro/ENGINEER 2001 Settings**
  - Follow the Project Rules for running SPECapc for Pro/ENGINEER 2001 as defined in Section 5. <u>SPECapc Benchmark Specific Rules and Procedures</u> here
    <u>http://www.spec.org/gpc/apc.static/current.html</u>
  - The specific Project Rules section covering SPECapc for Pro/ENGINEER 2001 is defined in Section 5.15 <u>Pro/Engineer 2001</u>

- **3Dlabs Wildcat Realizm Display Properties Settings**
  - Wildcat Realizm "OpenGL" Display Properties
    - "Wait for Vertical Sync" must be disabled (driver install default)
  - Wildcat Realizm "Optimize" Display Properties
    - "PRO/Engineer" must be selected as the "Optimized For" application
    - Disable the Acuity Task Bar
    - Disable the Acuity Windows Manger

SPECapc for Pro/ENGINEER 2001 Benchmark Results

- Graphics
  - Wireframe: **4.97**
  - Shaded: **4.41**
- CPU: **4.04**
- I/O: **3.74**
- File Time: **3.67**
- Overall Composite: **4.1**

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SPECapc for Solid Edge V14

Benchmark Guide

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SPECapc for Solid Edge V14 Benchmark Background

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- **SPECapc for Solid Edge V14 was developed by EDS PLM Solutions in cooperation with the SPECapc group. It represents typical user operations that are valuable in evaluating the performance of systems running Solid Edge V14.**

- **SPECapc for Solid Edge V14 is an updated benchmark that reflects new features such as dynamic display clipping. The new benchmark runs on Windows 2000 and Windows XP, and includes performance tests on four typical types of models:**
    - a well-head assembly with 2,546 parts and 3.8 million polygons;
    - a DVD player with 40 parts and 200,000 polygons;
    - a jet ski with seven parts and 46,000 polygons; and
    - a landing strip and airplane scenario with nearly 11,000 parts and 3.35 million polygons.

- **The benchmark measures three areas of performance:**
    - Graphics - measured by commonly used commands in three modes: smooth, wireframe and smooth-shading with textures and reflections;
    - File I/O - measured by opening each model, activating all entries, then closing each file while saving; and
    - CPU - measured by mass property calculations on the well-head and landing-strip models.

- **The reference system for computing the normalized ratio is a 1.50 GHz Pentium 4 running Windows 2000 SP3 with 1 GB of PC800 ECC RDRAM, an NVIDIA Quadro2 Pro graphics card, and a 20 GB ATA/100 hard drive.**

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SPECapc for Solid Edge V14 & Wildcat Realizm Display Settings

- **SPECapc for Solid Edge V14 Settings**
  - Follow the Project Rules for running SPECapc for Solid Edge V14 as defined in Section 5. SPECapc Benchmark Specific Rules and Procedures here http://www.spec.org/gpc/apc.static/current.html
  - The specific Project Rules section covering SPECapc for Solid Edge V14 is defined in Section 5.19 Solid Edge V14

- **3Dlabs Wildcat Realizm Display Properties Settings**
  - Wildcat Realizm "OpenGL" Display Properties
    - "Wait for Vertical Sync" must be disabled (driver install default)
  - Wildcat Realizm "Optimize" Display Properties
    - "SolidEdge" must be selected as the "Optimized For" application
    - Disable the Acuity Task Bar
    - Disable the Acuity Windows Manger

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SPECapc for Solid Edge V14 Benchmark Results

- CPU Composite: **1.52**

- Graphics Composite: **2.70**

- Overall Composite: **2.00**

SPECapc for SolidWorks 2003 Benchmark Background

- SPECapc for SolidWorks 2003 is designed to represent a day in the life of a typical SolidWorks 2003 user. The benchmark was developed by SolidWorks. It is written in Visual Basic and C, and runs on Windows 2000 and Windows XP platforms. The benchmark uses different-sized CAD/CAM solid models, the largest of which is an engine model with 3.13 million vertices.

- Eight tests are included within the benchmark: I/O-intensive operations, CPU-intensive operations, and six different graphics tests. A single number is derived from a weighted geometric mean of the normalized score for all eight tests. Scores are also reported for each of the eight individual tests and for the geometric mean of the six graphics tests.

- The reference system for computing the normalized ratio is a 1.5 GHZ Pentium4 with an Intel 850 chipset, 1 GB PC800 ECC SDRAM, 40 GB ATA/100 and NVIDIA Quadro2 Pro graphics.

- A fully licensed, released version of SolidWorks 2003 (service pack 3.1) is required.

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SPECapc for SolidWorks 2003 & Wildcat Realizm Display Settings

- **SPECapc for SolidWorks 2003 Settings**
  - Follow the Project Rules for running SPECapc for SolidWorks 2003 as defined in Section 5. <u>SPECapc Benchmark Specific Rules and Procedures</u> here http://www.spec.org/gpc/apc.static/current.html
  - The specific Project Rules section covering SPECapc for SolidWorks 2003 is defined in Section 5.17 <u>Solidworks 2003</u>

- **3Dlabs Wildcat Realizm Display Properties Settings**
  - Wildcat Realizm "OpenGL" Display Properties
    - ◆ "Wait for Vertical Sync" must be disabled (driver install default)
  - Wildcat Realizm "Optimize" Display Properties
    - ◆ "SolidWorks" must be selected as the "Optimized For" application
    - ◆ Disable the Acuity Task Bar
    - ◆ Disable the Acuity Windows Manger

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SPECapc for SolidWorks 2003 Benchmark Results

- CPU Intensive: **2.84**

- File I/O Intensive: **2.72**

- Graphics Composite: **4.38**

- Overall Composite: **3.51**